

DOCUMENT RESUME

ED 365 415

PS 021 646

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 TITLE U.S. Health Care for Children.
 INSTITUTION Center for the Future of Children, Los Altos, CA.
 REPORT NO ISSN-1054-8289
 PUB DATE Dec 92
 NOTE 196p.; Individual articles appearing in this journal are indexed in CIJE.
 AVAILABLE FROM Center for the Future of Children, The David and Lucile Packard Foundation, 300 Second Street, Suite 102, Los Altos, CA 94022.
 PUB TYPE Information Analyses (070) -- Collected Works -- Serials (022)
 JOURNAL CIT Future of Children; v2 n2 Win 1992
 EDRS PRICE MF01/PC08 Plus Postage.
 DESCRIPTORS Adolescents; *Child Health; Children; Federal Programs; *Health Care Costs; Health Insurance; *Health Needs; Health Programs; *Health Services; Mothers; Pregnancy; State Programs
 IDENTIFIERS *Health Delivery Systems; Health Resources Utilization; *Maternal and Child Health Services; Maternal Health

ABSTRACT

The articles in this journal issue provide an overview of ways in which health services are presently delivered to children, youth, and pregnant women; the means by which these services are financed; and some of the major deficiencies in meeting the health needs of these groups. In the first article, the Center for the Future of Children presents several recommendations for policies to make the United States health care system more responsive to the needs of children and pregnant women. The second article offers an analysis of the health care system that focuses on the relationship between health care and children's health, and examines the issues of efficiency, access, and affordability. The succeeding articles are: (1) "Child and Adolescent Health Status Measures" (Barbara Starfield); (2) "Effectiveness of Health Care Services for Pregnant Women and Infants" (Andrew D. Racine, Theodore J. Joyce, Michael Grossman); (3) "Health Care Services for Children and Adolescents" (James Perrin, Bernard Guyer, Jean M. Lawrence); (4) "Health Care Resources for Children and Pregnant Women" (Janet D. Perloff); (5) "Expenditures on Health Care for Children and Pregnant Women" (Eugene M. Lewit, Alan C. Monheit); (6) "The Role of Private Health Insurance in Children's Health Care" (John F. Sheils, Patrice R. Wolfe); (7) "The Role of Medicaid and Other Government Programs in Providing Medical Care for Children and Pregnant Women" (Ian T. Hill); (8) "Children without Health Insurance" (Alan C. Monheit, Peter J. Cunningham); (9) "Nonfinancial Barriers to the Receipt of Medical Care" (Lorraine V. Klerman); and (10) "Child Indicators: Teenage Childbearing" (Eugene M. Lewit). References are included at the end of each article, and a selected bibliography concluded the collection. (TJQ)

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CENTER FOR THE FUTURE OF CHILDREN • THE DAVID and LUCILE PACKARD FOUNDATION

The Future of Children

VOLUME 2 • NUMBER 2 - WINTER 1992



U.S. HEALTH CARE
FOR
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Statement of Purpose

The primary purpose of *The Future of Children* is to disseminate timely information on major issues related to children's well-being, with special emphasis on providing objective analysis and evaluation, translating existing knowledge into effective programs and policies, and promoting constructive institutional change. In attempting to achieve these objectives, we are targeting a multidisciplinary audience of national leaders, including policymakers, practitioners, legislators, executives, and professionals in the public and private sectors. This publication is intended to complement, not duplicate, the kind of technical analysis found in academic journals and the general coverage of children's issues by the popular press and special interest groups.

In this issue of *The Future of Children*, we provide an overview of the ways in which health services are presently delivered to children, youth, and pregnant women; the means by which these services are financed; and some of the major deficiencies in meeting the health needs of these groups. We have attempted to do so objectively from multiple perspectives in a format that is accessible to a broad readership.

As the nation addresses the problems of health care reform for the entire population, it is important to appreciate the special nature and needs of children, youth, and pregnant women because of the long-term, amplified effect that their health status has on the well-being of society. The articles presented here summarize the knowledge and experience that has been accumulated about the health care of children, youth, and pregnant women. It is hoped that the individual perspectives, descriptions, and analyses they contain will provide the basis for a better understanding of the issues and will suggest reasonable policies and program strategies to pursue. The Analysis, authored by the staff of the Center for the Future of Children, draws from these articles and from our own research and deliberations.

We invite your comments and suggestions as you read this issue of *The Future of Children*. Our intention is to encourage informed debate about health reform proposals and their potential effects on the health of children, youth, and pregnant women. To this end we invite correspondence to the Editor. We would also appreciate your comments about the approach we have taken in presenting the focus topic and welcome your suggestions for future topics.

Richard E. Behrman, M.D.
Editor

The Future of Children

Published by the Center for the Future of Children, The David and Lucile Packard Foundation

Volume 2 • Number 2 – Winter 1992

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U.S. Health Care for Children

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The next issue of
The Future of Children will focus
on Adoption.

Introduction

Although there is considerable disagreement about what should be done and by whom, virtually no one disputes the need for health care reform in this country. As various specific changes in health care are considered, it is critical to assure that these changes result in improvements in the health of children, youth, and pregnant women.¹ It is equally important that, in our zeal for reform, we do not make the kinds of changes that would have adverse consequences for these groups.

Our ability to accomplish these objectives depends on an understanding of what good health means for children, youth, and pregnant women, an accurate assessment of what services are now provided to them and the costs of these services, and a recognition of the significant differences in many dimensions of health care for these groups compared with care for the rest of the population. Because to know where we are going, we need to know where we are, this issue of *The Future of Children* deals primarily with the ways in which existing programs are working in regard to preventive, acute, and chronic medical and surgical services for children, youth, and pregnant women.

A subsequent issue of the journal will be devoted entirely to the system for providing specialized mental health services to children; therefore, this important and complex issue is not separately dealt with here. (It has been estimated in a report prepared by the Institute of Medicine that at least 12% of children have a diagnosable mental illness.²) The oral health of children is encompassed in a limited fashion within discussions of Medicaid, the Early Periodic Screening, Diagnosis, and Treatment (EPSDT) program, the Title V Maternal and Child Health Care Block Grant, and the article on expenditures for children's health care.

Dr. Barbara Starfield, a pediatrician who heads the Division of Health Policy and Management at Johns Hopkins University, describes the health status of children from several points of view. She notes important distinctions from measures of adult health and suggests new ways of viewing child health.

Drs. Racine, Joyce, and Grossman of the National Bureau of Economic Research focus attention on the effective-

ness of prenatal, obstetrical, and neonatal care in terms of infant morbidity and mortality related to pregnancy. They discuss recent trends, the cost-effectiveness of neonatal intensive care, and new neonatal technologies.

The current spectrum of health care services delivered in the private and public sectors is reviewed in articles by Perrin, Guyer, and Lawrence, and by Janet Perloff. Perrin, Guyer, and Lawrence discuss the need for community integration of certain programs such as immunization, injury prevention, and services for adolescents. In addition, Perloff reviews the supply, distribution, and accessibility of medical and obstetrical services and providers for children and pregnant women.

Drs. Eugene Lewit of the Center staff and Alan Monheit of the Agency for Health Care Policy and Research provide significant new data and analyses on which to base estimates of the annual medical expenditures for children from conception through 18 years of age, including expenditures on pregnancy and delivery. This information is critical to making effective health policy because financial information about the health care system in general may mask important considerations that are applicable to children in particular.

The next three articles address the important issue of insurance coverage for children and pregnant women. John Sheils of Lewin-ICF and Parice Wolfe of MEDSTAT Systems provide a review of the current role of private health insurance, which is the primary source of coverage for most children and pregnant women. Ian Hill of Health Systems Research, Inc., describes and analyzes the existing coverage of children and pregnant women

under Medicaid and other government programs. Drs. Alan Monheit and Peter Cunningham of the Agency for Health Care Policy and Research present new information about children who do not have private or public insurance and the implications of various strategies that might be implemented to deal with this problem.

Finally, Dr. Lorraine Klerman of the University of Alabama discusses the nonfinancial barriers that may prevent families of children and pregnant women from

obtaining medical care. This issue needs to be addressed if reform of the health care system is to achieve its goals.

In addition to the foregoing articles, the Center staff provides an analysis of the major issues involved in health care for children, youth, and pregnant women in the United States. This summary and the staff's recommendations are based on a consideration of the views discussed by the preceding authors, a reexamination of the literature, and conversations with leaders in various fields.

Richard E. Behrman, M.D.
Editor

1. National Research Council, Institute of Medicine. *Including children and pregnant women in health care reform*. Washington, DC: National Academy Press, 1992.
2. Institute of Medicine. *Research on children and adolescents with mental, behavioral, and developmental disorders: Mobilizing a national initiative*. Washington, DC: National Academy Press, 1989.

Recommendations

The following are the Center for the Future of Children staff recommendations for policy in response to inadequacies of the health care system for children and pregnant women in the United States. An Analysis discussing these recommendations follows.

1. Develop and implement a system of financing for all effective health care services for children and pregnant women so that access will be assured regardless of income level, employment status of parent or guardian, or geographic location of child or pregnant woman. Covered services should include care for acute and chronic illnesses and prevention.
2. Develop procedures to evaluate the effectiveness of health care services for children and pregnant women. Assessments should include patients' and parents' perceptions of health status as well as clinical outcomes. The evaluation process should be continuous and ongoing so that new services are assessed as they become available. Evaluation results should be used as a basis for reimbursement under any health care financing system.
3. Replace incentives for technology-intensive, high-cost care with incentives to identify high-risk children and pregnant women and to provide risk-reducing interventions for them. Rechannel resources from wasteful, duplicative, and ineffective health services to provide care for underserved populations.
4. Establish incentives to redress the imbalance between primary care providers and specialists. In addition, incentives should be established to redress the geographic maldistribution of pediatricians and obstetricians by altering relative rates of reimbursement to encourage migration of providers to underserved areas and to discourage their continued concentration in overserved areas.
5. Develop and implement community-based programs for important health problems, such as environmental hazards, accident prevention, and safety, which can be best addressed by public action.
6. Maintain and expand data collection efforts designed to monitor the health status and health care needs of children on a regular basis. Develop and apply new tools to measure children's health status. Shift

health status measures and objectives from mortality statistics, which provide little information about the health of most children, to reliable measures of morbidity, satisfaction, functional status, and quality of life.

7. Develop active outreach and support programs to increase access to medical care for pregnant women who do not actively pursue it and for children whose parents do not otherwise seek care for them. Enhance the ability of pregnant women to seek care for themselves and the ability of parents to seek care for their children.

8. Develop the capability of providers to deal effectively with a culturally diverse and multilingual patient population. Provide for translators and other intermediaries where possible or channel patients to appropriate providers to assure that patient-parent-provider interactions are maximally effective.

9. Reduce the fragmentation in the system and increase collaboration and coordination among providers and between the personal health care system and the public health system. Decrease dependence on categorical funding, and finance most special services through the same system used for routine care to assure greater stability and uniformity of service delivery in different communities and improved access as family situations change.

10. Develop, maintain, and enhance provider arrangements which effectively meet the needs of underserved, high-risk, or special populations. Such entities should, however, be integrated into the mainstream health care system to allow for coordination of patient care, access to specialized services without duplication, adequate funding, and flexibility to be responsive to changing circumstances.

Analysis

Americans are increasingly dissatisfied with their health care system and feel that it is in need of change. A summer 1991 *Los Angeles Times-Gallup* Poll indicated that 91% of respondents thought there was a health care crisis in the United States and 85% thought the health care system needed reform.¹ Of respondents in another 1991 poll, 55% identified the high cost of care as the most

important health care issue facing the country, and 32% chose the problem of the uninsured as most important.² Recently, other polls have, for the first time, documented rising levels of dissatisfaction expressed by individuals with the health care received by their families and themselves.³

But what is happening to children as health care costs continue to escalate and access problems multiply? The evidence suggests that their health care is being adversely affected by the very same forces that are buffeting the entire U.S. health care system. For many, health care is excellent and health status is high; for many others, health care appears deficient and health status wanting. For all, health care is expensive, perhaps needlessly so, causing a shift of resources from other worthwhile pursuits, and health care is at times uncertain as dynamics in the private health insurance market make continued insurance coverage unpredictable.

Because health plays such a pivotal role in the development and well-being of children, we believe that children and pregnant women cannot afford to wait while the health care crisis deepens to the point where reforms are unavoidable. Accordingly, this journal issue focuses on the health care system for children and pregnant women in the United States because of the need to advance health care policy for children now. Each article in this issue addresses a specific component of the complex U.S. health care system for children. In this article, we synthesize the individual analyses and our own research to highlight the system's strengths and weaknesses and the interconnections among the various components of the system, and to assess the impact of forces at work in the system on the well-being of children.

Assessing the role of the U.S. health care system in assuring and improving children's health is difficult because children's health results from a complex interaction of health care, genetics, parental behavior, family and community environment, and individual behavior. Evaluation is further complicated because the resources devoted to health care for children and pregnant women are obtained at the expense of other desirable activities for this group or at the expense of other population groups. Nonetheless, we feel a health care system which is efficient and ensures access for all who need care at a price society can afford is a reasonable minimum goal for the nation.⁴ This goal provides both criteria with which to review the current health care system for children and pregnant women and guidelines for potential reforms. We begin by examining the relationship between health care and children's health. We then turn our attention to the issues of efficiency, access, and affordability. Throughout, our objective is to help build a consensus for actions which will make the system more responsive to the needs of children and pregnant women.

Medical Care and Children's Health

The primary purpose of medical care is to preserve and improve health. Health, when perceived as "state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity,"⁵ is clearly desirable in its own right. In addition, especially for children, good health is essential for the multidimensional processes of growth and development. Indeed, children's health status is in part manifested in the process of their development.

Children's health depends on a complex array of factors. Medical care is but one element of the matrix. Family, home, and community environments play major roles in determining children's health. Because adequate nutrition, safe environments, and healthy life-styles may be as important to children's health as timely access to appropriate medical care, we begin this analysis with an overview of how these factors impact health through the developmental stages of pregnancy and infancy, childhood, and adolescence. We then turn our attention to assessing how well the U.S. health care system is serving the needs of children and pregnant women.

Pregnancy and Infancy

Children's health status begins with the conditions from which children emerge. A child's genetic endowment and intrauterine and neonatal environments are crucial determinants of health. Maternal health status, diet, and use of unhealthy substances such as tobacco, alcohol, and illegal drugs during pregnancy can all influence the health of the infant at birth and throughout childhood. Negative influences in the prenatal environment are expressed most dramatically in neonatal mortality and serious congenital abnormalities and, less dramatically but more frequently, in infants born pre-term or with low or very low birth weights. Low birth weight babies are much more likely than heavier babies to die during infancy, to experience chronic health conditions, and to encounter problems in school.

Childhood

Even during childhood, health status may depend more on parental and community factors than on health care. Parents' responsibilities include encouraging healthy life-styles, assuring a safe home environment, and seeking necessary medical services. Parental behavior has an important impact not only on the mental and emotional health and development of children, but as in the case of parental cigarette smoking for example, on their physical health as well.

Injuries are today the major cause of mortality, morbidity, and disability in children. In addition to accidental injuries, child deaths from homicide are increasing, and intentional violence is an important threat to health in many communities. Medical care has an important role to play in treating the trauma caused by accidents and violence, but injury prevention remains primarily in the purview of the family and the community. Protecting children from exposure to lead and other environmental toxins and dangerous physical environments, providing safe toys, using car seats and smoke detectors, and not leaving children unattended are all important health promoting and sustaining activities which rest largely within the family. Community activities which create safe environments and protect children from violence inside and outside their homes also contribute to children's health.

Adolescence

Behavioral and environmental factors similar to those that affect the health of children also play a major role in determining the health of adolescents. In adolescence, however, responsibility for behavior and health increasingly shifts from parents to the teenager. In part because of high-risk behaviors engaged in by some adolescents and the hazardous environments they may inhabit, the 10- to 19-year-old age group is the only segment of the U.S. population in which mortality rates have not declined substantially over the past 20 years. Unsafe driving, smoking, alcohol and drug abuse, premature and unprotected sexual activity, and violent, delinquent behavior all take their toll. These behaviors cannot be addressed solely or sufficiently by the health care system.

RECOMMENDATION: Implement community programs to address important health problems that can be most effectively addressed by public action.

Our Frame of Reference

To those who view health comprehensively as a state of "complete well-being," making distinctions among the health-enhancing roles played by the health care system, the family, and the community may strike a false chord. Indeed, we would agree that the public health community has played and should continue to play important roles in educating parents in ways to promote the health of children, in discouraging unhealthy behaviors, and in promoting safe communities. These efforts are to be encouraged and supported. Some societal problems such as poverty may be too substantial and intractable for the public health community to address effectively and will require more broad-based action.

Ultimately, however, any analysis of the health care system reflects explicit decisions regarding what behaviors and environmental conditions are the responsibility of the system and what are beyond the system's borders. In this analysis we focus on the traditional medical care system. We believe that what most people want first from a health care system is prompt and effective treatment of illness and trauma. Specific services that are touched on in this context include diagnosis and treatment of illness; amelioration of symptoms to improve the quality of life; prognostic services to facilitate planning and coordination of medical and nonmedical services; and prevention of certain illnesses through early intervention and immunizations. We recognize that even when narrowly defined, health care can provide many other services such as comfort, reassurance, and guidance that are highly valued by parents and children. We recognize, too, that ultimately any answer to questions about how well a health care system is serving the needs of children reflects individual preferences. In the absence of agreements on how to measure preferences and to distinguish the preferences of parents from those of children, we, like most

others, rely on objective measures of health status in performing our analysis.

Efficiency

Given Americans' concern over the high cost of health care, it is reasonable to ask if the system is efficient. Efficiency is a desirable characteristic of a health care system because, in a world where resources are scarce and wants are not, an efficient system will produce a desired level of health with a minimum of waste, expense, or unnecessary effort. As compared with an inefficient health care system, an efficient system will release resources to satisfy other wants or to produce a higher level of health for a given expenditure.

Determining the efficiency of the U.S. health care system for pregnant women and children requires accurate measurement of both the value of resources entering the system and the value of outcomes attributable to the system. Expenditures on inputs—doctors' time and expertise, hospital care, drugs, tests and x-rays—can be used as a measure of the value of resources going into our health care system. By this measure, the U.S. health care system is the most expensive in the world. It is estimated that we will spend \$3,057 per person on health care in 1992,⁶ one third more than Canada, the country with the second-highest rate of expenditure on health care in the world.⁷ Although data do not exist from other countries to compare with U.S. data about expenditures on health care for pregnant women and children, there is reason to believe that our expenditures for these population groups may also be the highest in the world. U.S. expenditures on health care for children and pregnant women totaled \$67.1 billion in 1987. (See the article by Lewit and Monheit in this journal issue.)

Moreover, expenditures on children and pregnant women have been growing rapidly. Lewit and Monheit find that, even after adjustments for inflation, aggregate expenditures on health care for children nearly doubled between 1977 and 1987. Their analysis suggests that expenditures on obstetrical care for pregnant women were also increasing rapidly during this period. If we are concerned about efficiency, it is not unreasonable to ask whether the increase in resources devoted to health care has resulted in a commensurate improvement in the health of pregnant women and children.

Measuring Outcomes

The measurement of outcomes is vital to assessing the efficiency of the health care system. However, measuring children's health status is a complex undertaking. The complexity derives in part from the facts that children are generally perceived as healthy and that they experience low mortality rates. When deaths occur at the rate of less than 5 per 10,000, as they do for children 1 to 14 years old, it is unreasonable to view death rates as useful measures of the health status of the 99.95% of children who survive.⁸ Even among infants, death is also an infrequent event, so the infant mortality rate may not be a reliable guide to the health of the overwhelming majority of infants who survive.

Starfield's review in this issue of the various measures of health status confirms that it is easier to catalog and count specific diseases than it is to measure "health." In fact, the key to adequately accessing the health care system may be to develop a set of fairly comprehensive measures which capture the severity, variety, co-occurrence, and recurrence or persistence over time of children's health problems. Such health status measures are crucial for identifying problem areas that need attention and successes that may provide models for subsequent remedial activities.

Outcome measures also need to capture the distribution of health problems in the population and the severity of illness. Health problems are not evenly distributed in the population. Children living in extreme poverty and children with severe chronic illness have a relatively high likelihood of experiencing a variety of health problems which call for a medical care response. (See the articles by Starfield and by Perrin, Guyer, and Lawrence in this journal issue.) Identification of these children is necessary if their needs are to be addressed. Recognition of the multiplicity of their needs is necessary if treatment is to be successful. Severity of illness is an important characteristic of health status that may be difficult to reflect in overall health status measures. Fortunately, serious health problems among children are relatively rare; but when they do occur, they have a significant impact on the child and his family, and they offer a challenge to the health care system.

RECOMMENDATION: Develop new tools to measure children's health status and expand data collection to regularly monitor the health status and health care needs of children.

Although it may be difficult to reach consensus on a single set of indicators to measure children's health status, American children are on average healthy.⁹ Nonetheless, on some key health indices, children's health status does not appear in line with expenditure levels and may actually be declining despite rising expenditures.

Infant Mortality

Although infant mortality continues to decline, the rate of decline in infant mortality in the United States has slowed over the past decade. In 1991, the U.S. infant mortality rate of 8.9 deaths per 1,000 births was higher than infant mortality rates in 22 other industrialized nations.¹⁰ In addition, infant mortality rates for blacks and certain other minority population groups are consistently considerably higher than the rate for the population as a whole. (See the article by Racine, Joyce, and Grossman in this journal issue.)

Low Birth Weight

Birth weight is a key indicator of the health of newborn infants. Low birth weight babies (those weighing less than 5½ pounds) are much more likely than other babies to die during their first year of life and to suffer from long- and short-term disabilities. Approximately 7% of babies in the United States are born at low birth weight. This rate, which has not changed in the past decade, is higher than the rate in 30 other countries. The rate for black infants, which is almost twice the rate for white infants, has actually increased in recent years.¹⁰

Preventable Diseases

Many of childhood's communicable diseases can be prevented with routine immunizations. Yet immunization rates for preschool children in the United States are low, and the country has experienced measles outbreaks in many cities in recent years. Although these diseases are frequently not serious, deaths and significant neurologic morbidity have resulted from these outbreaks. Moreover, failure to protect children from the risk of mor-

idity and possibly serious illness at reasonable cost is further evidence of inefficiency in the health care system for children.¹¹

Chronic and Disabling Conditions

At least 15% of children are affected by chronic and disabling conditions including mental and nervous disorders which limit normal childhood activities.¹² Some of these conditions may have been easily prevented or substantially ameliorated by timely health care and reductions in environmental risks. For other conditions, prevention may be extremely difficult or impossible given the current state of knowledge. All of these children could benefit from effective health care. As Perrin, Guyer, and Lawrence note, providing care efficiently for these children has become a major challenge to the health care system.

Improving Efficiency

The evidence suggests that the health care system is not functioning efficiently for children: costs are high and rising, and health indices are disappointing. Improving the system's efficiency begins with the identification of health care services that have been reasonably well demonstrated to provide significant net benefits for patients with specific clinical conditions. Then choices have to be made between alternative approaches to clinical problems and incentives established to assure that wasteful practices are avoided while effective care is encouraged. There is reason to believe that efficiency could be substantially increased if these three steps were followed in the delivery of acute and preventive care for children, and of prenatal care.

Acute Care

Because of financial and nonfinancial barriers, many children do not receive timely acute care. Although most childhood illnesses will improve whether they are treated or not, delays in obtaining effective care can sometimes lead to extended periods of morbidity and discomfort and to more serious illnesses or disability.¹³ Limitations on access to appropriate acute care are more likely to occur among low-income children who may be at increased risk for a number of health problems. These are the very children for whom timely care might be most effective. Ultimately, most children will receive care for serious illness. By then, their overall health and development may have been compromised and the care

may be more costly than it would have been if the disease had been treated earlier.

Although much attention has been focused on the health problems resulting from under-treatment of illness in children with limited access to health care,¹² less attention has been focused on over- or inappropriate treatment. Yet, there is evidence to suggest that the unnecessary and inappropriate treatment, which is a serious source of inefficiency in the U.S. health care system as a whole, affects children also. For example, until recently tonsillectomy on children was the most frequently performed surgical procedure in the United States, although it is now agreed that these operations are rarely of value.¹⁴ Similarly, the use of antibiotics to treat common upper respiratory infections of viral etiology and decongestants to treat otitis media are common practices, but of doubtful efficacy.¹⁵

RECOMMENDATION: Evaluate the effectiveness of health care services and use the assessments as the basis for reimbursement.

Preventive Care

In the area of preventive care, the Office of Technology Assessment (OTA) has questioned whether the protocol for well-child care recommended by the American Academy of Pediatrics (AAP) and practiced by many physicians has a positive effect on children's health.⁹ Immunizations for a number of childhood illnesses, however, are not only effective but appear to be cost-saving as well. Accordingly, it has been recommended that in otherwise healthy children, well-child visits be limited to those necessary to carry out the required number of immunizations and timed to coincide with the immunization schedule. The resources freed up by reducing the visit schedule could be reallocated to increase the likelihood that children receive immunizations and other effective health services, and to offer a more intensive, nontraditional set of services for high-risk children.¹⁶ Currently, 150 experts from various disciplines are developing National Guidelines for Health Supervision for Infants, Children and Adolescents as part of the Bright Futures project. They will address the issue of the appropriate

periodicity of well-child visits by first looking at content and the need to fashion care to the circumstances of different children. Efficiency may be improved if incentives can also be developed to target services to appropriate populations.

Exposure to ineffective acute or preventive care can cause discomfort, and places children at risk of treatment-induced illness. It also wastes resources. Moreover, the financial incentives that reward ineffective medical care divert resources from the provision of necessary care to needy children. The nation cannot afford to waste medical care resources when many children are not receiving basic effective services such as timely acute care and immunizations. Efforts should be directed at evaluating the content of health care for children with the objective of identifying effective health care services. Incentives should be established to encourage a shift in resources from the provision of ineffective care to the provision of effective services to children in need.

RECOMMENDATION: Replace incentives for high-cost and ineffective care with incentives to rechannel resources to high-risk, underserved populations.

Nor should efforts to increase efficiency be limited to an attack on ineffective interventions. Attention should also focus on alternative ways to produce and deliver care. Increased utilization of paraprofessionals and alternative ways of organizing service delivery, as in community health centers, may efficiently enhance service delivery and health levels. (See the article by Perloff in this journal issue.) Similarly, organizing networks of providers capable of delivering health care at different levels of technological sophistication, as in perinatal referral networks and chronic care hierarchies, holds out the promise of constraining the duplication of the very costly high technology services which are the hallmark of the U.S. health care system, while facilitating access to these cutting-edge technologies for those children who need them. (See the articles by Perloff, Racine, Joyce, and Grossman; and Perrin, Guver, and Lawrence in this journal issue.)

Prenatal Care

Early and comprehensive prenatal care for pregnant women has been identified as an effective intervention to improve both maternal and infant health. Yet, despite the recent attention focused on prenatal care by policymakers and the maternal and child health community, in 1990, 1 in 4 American infants was born to a mother who did not receive early prenatal care, and since the mid-1980s, the proportion of expectant mothers who receive early prenatal care has declined somewhat.¹⁰

While the United States was making little progress expanding utilization of prenatal care services in the late 1980s, the number of high-risk pregnancies was increasing. The number of children born to families with incomes below 185% of the federal poverty level—which is \$11,570 for a family of three—increased to almost 2 million infants per year, 50% of all births. In addition, the percentage of births to unwed and teenage mothers has been increasing (see the Child Indicators section). Both groups tend to receive less prenatal care and are at increased risk of delivering low birth weight infants.

RECOMMENDATION: Provide outreach and support for otherwise underserved pregnant women, parents, and children.

It may be time for a serious reevaluation of U.S. policy on pregnancy and birth outcomes. Slow but steady progress in reducing the U.S. infant mortality rate in the face of constant or slightly increasing rates of low birth weight births has been achieved by applying increasingly sophisticated and technologically advanced therapies to high-risk infants. As a result, U.S. mortality rates for low birth weight babies are the lowest in the world. We pay, however, a high cost for this technologically intensive approach to infant health. Low weight babies who account for 7% of all births consume almost 60% of the health care costs of all newborns.¹⁰ In addition, many will require costly medical, educational, and other special support services for many years after their initial hospitalization.

Since the incidence of low birth weight may be reduced by comprehensive prenatal care and other support services, the failure of the U.S. health care system to deliver this care to a substantial segment of the population of pregnant women is a significant source of inefficiency in the system. Because of financial and other barriers, many high-risk mothers have little or no prenatal care. Their babies, however, receive expensive and very technologically sophisticated care once they are admitted to a neonatal intensive care unit (NICU). There is also reason to believe that the prenatal care received by many low-risk women, who primarily just need watching and guidance, can be unnecessarily invasive and expensive.¹⁷ The high frequency of use of expensive procedures such as ultrasound, electronic fetal monitoring, and cesarean delivery in low-risk women may be a waste of resources, particularly when evidence suggests that use of these interventions may be as much a function of financial incentives as clinical necessity.¹⁸

It may be time to rethink the delivery of pre- and perinatal care. Population-based clinical protocols could be developed to provide for a reasonable, cost-effective standard of care for all pregnant women.¹⁷ The content of prenatal care should be examined to identify the specific components that work and the populations for which they are effective. Research emphasis should be shifted away from advancing the frontiers of survivability in the NICU to developing innovative programs, such as active case management, to reach and effectively care for high-risk women. Because whether or not a baby is wanted is an important factor in pregnancy outcomes and child health, family planning and preconception care should also be encouraged.

Access

The problems caused by restrictions on the access of children and pregnant women to needed medical care services are growing and attracting more attention. For many, the problem of access is defined by a growing pool of individuals without health insurance or with inadequate coverage in an environment of rising health care costs. It appears that the declining rate of health insurance coverage is itself a product of the rapid increase

in health care costs. In addition, however, there are a number of important nonfinancial barriers which seriously limit the access of children and pregnant women to health care. Efforts will need to be made to reduce these nonfinancial barriers if the health care system is to successfully address the needs of children.

The Lack of Health Insurance

Because it reduces the out-of-pocket costs of health care at the time when services are received, health insurance, both private and public, plays a crucial role in facilitating access to health care services. Depending on the breadth of services covered, health insurance may enhance use of prenatal care, may improve pregnancy outcomes and infant health and, as a result, have a beneficial impact on the entire range of child health and development. Consequently, concern over children's health engenders a focus on disparities in health insurance coverage for children and pregnant women.

Because health insurance can play such an important role in children's health, it is disheartening to note that over 8 million children under the age of 18 years and 9% of pregnant women (433,000) were without health insurance in 1991.¹² These numbers reflect a more than decade-long falling trend in the percent of children covered by private, largely employment-related coverage. Moreover, these numbers understate the total number of children uninsured at some time during a year. Almost 1 in 4 children (23%) were without health insurance at some time in 1987. (See the article by Monheit and Cunningham in this journal issue.)

Monheit and Cunningham document that compared to children with either private or public insurance, uninsured children are less likely to have a usual source of care and have fewer physician visits for particular acute illnesses. Uninsured children are also less likely to be adequately immunized than children with health insurance. Others have documented the relationship between inadequate insurance coverage and inadequate prenatal care.¹⁹ Moreover, the increased use of expensive inpatient hospital care by uninsured children appears to be, in part, a consequence of delays in obtaining effective acute care.¹³

Overall, the impact of a large population of children and pregnant women

without health insurance is multifaceted. Children suffer increased incidence of illness, morbidity, and perhaps death because access to care is constrained. Families suffer because of uncertainty about their ability to obtain timely care for their children and because of the substantial burden of paying for care for a seriously ill child represents. Moreover, the burden on society is substantial; ultimately, society absorbs the costs of medical care for uninsured pregnant women and children who cannot pay for their own care. This burden is greater than it need be if the uninsured are more costly to care for because of reduced access to timely care. Added to the financial burden of providing care for the uninsured are the costs of increased morbidity and reduced potential among those in poor health. The facts argue strongly for action to expand financial access to basic effective health care services for all children and pregnant women.

RECOMMENDATION: Implement a system of financing to pay for all effective health care services for pregnant women and children, regardless of income, employment status, or location.

Medicaid

Recognition of the vulnerable health status of children and pregnant women and of the importance of prenatal care and children's health care were (as discussed by Hill in this journal issue) important elements in the decisions to expand Medicaid coverage for pregnant women and children in the 1980s. Several states have also extended health insurance coverage to uninsured children who do not qualify for Medicaid.

Enacted in 1965 by the federal government but administered by the individual states with some federal funding, Medicaid has been called this nation's health care safety net. Unfortunately, Medicaid's complexity and variability from state to state in coverage options and eligibility criteria have resulted in many inequities and inconsistencies regarding who is served and the services to which they are entitled. As a result of a series of federally mandated Medicaid expansions, states are now re-

quired to cover all pregnant women and children 0 to 6 years old in families with incomes up to 133% of the federal poverty level. In addition, states may expand coverage for this group to include those with incomes up to 185% of the poverty level. States are also required to phase in coverage for children 6 to 19 years old in families with incomes up to 100% of the poverty level so that all children in this category are covered by 2002. Although these expanded eligibility criteria may add millions of children to the Medicaid program nationwide, many children will remain uninsured, and poor children 10 years of age and older today will never be insured under the 10-year phase-in because they will always be older than the advancing age cutoff point. Clearly, although the recent expansions of Medicaid eligibility criteria are to be applauded, they still fall far short of assuring access to health care for all children.

Because so many children remain uninsured despite recent Medicaid expansions, at least six states have developed programs using their own funds to provide health care coverage for children ineligible for Medicaid.²⁰ Minnesota, through its Children's Health Plan, created an insurance program for children up to age 18 in families with incomes at or below 185% of poverty. For a nominal annual premium of \$25 per child, the plan covers primary and outpatient medical services, dental services, prescription drugs, and limited mental health services. Inpatient hospital care, however, is not covered, an important limitation. In January 1992, almost 25,000 children were covered by the plan which is financed by general state revenues in addition to the premiums.²¹

Although there have been no formal evaluations of the Minnesota program, the state has expanded the concept into a general health plan, Health Right, which will be phased in over several years. It will offer coverage for inpatient hospital care and expand eligibility criteria to include children and adults in families with incomes up to 275% of the poverty level. The expanded plan will be financed in part by premiums graduated according to income level and tailored to the benefit package.

We have previously suggested an incremental approach to universal health insurance coverage for children and pregnant women.²² Minnesota's incremental approach of expanding the breadth of services covered, extending coverage to larger

groups of uninsured populations, and relying on a mix of financing mechanisms is an example of how such a strategy might operate. Minnesota's experience is certainly worthy of further study to evaluate how well the plan is serving the needs of its targeted population and to identify features of the plan which facilitated its implementation and function. Ultimately, the approach may serve as a model to other states and even the federal government for tackling the problems of uninsured children.

Programmatic Barriers to Access

Lack of private health insurance and ineligibility for Medicaid coverage are not the only financial barriers pregnant women and children face in gaining access to medical care. Particularly with regard to Medicaid, utilization of health care has been limited by programmatic and administrative complexities and low provider reimbursement rates. Recently, private insurers have increasingly invoked administrative controls to limit utilization and costs. (See the article by Sheils and Wolfe in this journal issue.)

Hill, in this issue, provides a catalog of Medicaid policies and procedures that effectively reduce access to care for children and pregnant women, and a description of the actions many states have taken recently to reduce these administrative barriers. Although the jury is still out regarding how effective these reforms will be and whether or not all states will participate in the movement to expand access, these changes are a long time in coming and should be encouraged. Facilitating enrollment in Medicaid is particularly important for pregnant women because delay in establishing eligibility can thwart and discourage pregnant women who are attempting to receive care early in pregnancy.

Some state Medicaid programs are also engaging in active outreach, case-finding, and public education activities. Although these initiatives are also largely unevaluated, available in limited areas, and even experimental, they hold out promise not only for enhancing access to prenatal care but also for facilitating utilization of the health care system and improving the health-related practices of targeted populations. The potential favorable fallout from these efforts for the long-term health of the children of mothers exposed to these programs warrants further investigation.

Unfortunately, as Hill notes, the laws that expanded coverage for poor mothers and their children have not stimulated activities to enroll children commensurate with the activities directed toward pregnant women. For example, the Early Periodic Screening, Diagnostic, and Treatment (EPSDT) program, a part of Medicaid for more than 20 years, could have a substantial impact on the health of poor children. Yet, EPSDT services are used by only a minority of eligible children. Effective use of these and other services requires outreach, marketing, and public information campaigns designed to make families aware of the availability and utility of these services and of eligibility criteria so that children are enrolled in a simple and timely manner. Most states have yet to make programmatic adjustments to enhance access for children eligible for Medicaid benefits.

Lack of Providers

Perhaps the most pervasive obstacle to health care access for both pregnant women and children on Medicaid is inadequate provider participation in Medicaid and inadequate supply of providers in neighborhoods where poor families live. Low reimbursement rates and administrative and programmatic complexities which make obtaining reimbursement costly and problematic have resulted in low and declining rates of participation in Medicaid programs by obstetrical care providers and pediatricians. Rising concerns about malpractice suits are also cited as discouraging obstetricians from treating low-income women at risk for poor pregnancy outcomes. Apparently, physicians feel the low Medicaid fees are not commensurate with the increased intensity of care necessary to treat at-risk women or with the risk of a lawsuit because of a bad outcome.²³ Efforts to increase access for children and pregnant women by expanding Medicaid and other insurance programs may be compromised if the pool of providers available to accept enrollees in these programs is shrinking as enrollment is expanding.

Janet Perloff, in this journal issue, analyzes the dilemma wrought of more than 25 years of health manpower policy in this country: a generous supply of physicians has developed, but the resulting geographic distribution of pediatricians does not match that of U.S. children. As a result, although excellent access to health care is

experienced by many children, the increase in the supply of pediatricians has not improved access for the underserved Medicaid population, the poor in inner cities, and children in rural areas.

Hospital emergency rooms, outpatient departments, and health centers play an important role in providing both primary acute care and preventive care for many children, and help offset some of the disparities in the distribution of physicians. However, dependence on some of these facilities for care by the uninsured, minorities, and those who live in underserved communities has long been regarded as one of the shortcomings of the U.S. health care system serving children. Care in some of these settings is frequently unnecessarily expensive and does not provide the continuity and comprehensiveness of care that developing children require.²⁴ Facilitating access of currently underserved children to more effective modes of primary care could improve their health status, perhaps at little or no increase in cost.

Perloff provides several suggestions to improve access: (1) bolster the supply of family physicians; (2) lessen medical professional liability problems for maternity care providers; (3) support the National Health Service Corps to provide physicians to underserved rural and urban areas; and (4) continue efforts to increase physician participation in serving Medicaid-eligible women and children. These recommendations could have a salutary effect on the barriers to access faced by some. They do not, however, address the issue of rising health care costs or provide a lasting solution to the failure of health manpower policy to improve access for traditionally underserved populations.

Manpower Policy

U.S. manpower policy has focused on increasing the supply of providers with the goal that eventually access for the underserved would improve. However, many of the additional providers wind up practicing in areas that were already well-served by the existing provider pool. This leads to a rapid escalation of costs, little improvement in access for the underserved, and a widening gulf between the level of services received by those with access to care and those without. For example, Monheit and Cunningham report that the gap between the amount of ambulatory care services received by insured and uninsured children widened between 1977 and 1987. Per-

haps more telling is the fact that pediatricians' and obstetricians' income rose steadily during the past decade despite an increase in the proportion of the population without health insurance, a decrease in physician participation in the Medicaid program, and a substantial increase in the physician-to-population ratio.²⁵ These data suggest that the increase in the number of practicing physicians during the past decade was largely absorbed in providing more services at higher fees to that substantial segment of the population that enjoys excellent access to health care.

RECOMMENDATION: Establish incentives to redress the geographic maldistribution of physicians and the imbalance between primary care providers and specialists.

It is time to establish incentives to redress the geographic maldistribution of providers, especially in urban areas. Relative rates of reimbursement should be altered to encourage providers to locate in underserved areas and to discourage their continued concentration in overserved areas. In addition, the use of reimbursement incentives to redress the imbalance between the number of primary care providers and the number of specialists should also be explored. Current attempts to revise the physician fee schedule under Medicare and the efforts of some states to increase participation in Medicaid by raising fees may provide some guidance for a revised manpower policy. Ultimately, policies that effectively address the persistent problems of the maldistribution of medical manpower may not only increase access, but also improve health status, increase efficiency, and moderate the increase in costs by shifting expensive resources into more productive employment.

Special Providers for Special Populations

In the absence of an effective, uniform policy to assure access for all to needed health care services, programs have been developed to meet the identified needs of special populations. These include local health department clinics and other ambulatory care facilities receiving a combination of federal, state, and sometimes local funds to deliver principally preventive care (immunizations, well-child and

prenatal care) in a limited number of communities. Unfortunately, these clinics are frequently overburdened and in short supply, effectively limiting access for the populations they are intended to serve.

Community health centers and migrant health centers, supported by government and other sources of funds, also provide comprehensive primary and preventive care to people in medically underserved areas. Their focus has been on reducing infant mortality and childhood disease and disability. It has been estimated, however, that the number of centers does not begin to match the need for their services, and many have called for a substantial increase in funding to support the expansion of existing centers and to build many new ones.¹²

Few doubt that existing centers play an important role in providing care to otherwise underserved populations. There has been, however, some reluctance to expand them because of concern that a major expansion will create a "two-tiered system" of health care, that it may be difficult to sustain adequate political support for health care institutions that cater exclusively to the poor, and that creation of special programs for special populations may frustrate attempts to solve the larger problems of the entire health care system. Recent changes in federal Medicaid laws may provide a reasonable compromise toward preserving the special service features of community health centers and other "look-alike" federally qualified health centers. New regulations require that state Medicaid programs reimburse these providers on the basis of 100% of their costs of providing care. Health centers have historically relied heavily on grants for their funding; however, if they can successfully switch to Medicaid and other third-party payers for financing, they may be able to tap a reliable source of funds for operating costs and to lay the groundwork for potential expansion.

Ultimately, given adequate financial support, centers may emerge as accepted mainstream providers of health care in their communities. From a funding perspective, they may become indistinguishable from other providers; and because of full cost reimbursement, they should be able to offer an enhanced package of services tailored to the needs of the communities they serve.

RECOMMENDATION: Develop and support provider arrangements which meet the needs of special populations but integrate them into the mainstream health care system.

Children with Special Health Care Needs

Although most children are basically healthy, approximately 2 million have severe conditions that require extensive health services. Perrin, Guyer, and Lawrence note that, largely as a result of the dramatic shift in medical technology during the past quarter century, at least 90% of children with severe long-term illness survive to early adulthood. These remarkable survival rates, themselves evidence of some of the important technological successes of U.S. health care, create imperatives for improving the quality of life of these children and preparing them to become productive adults.

Yet, not only is the care that keeps these children alive expensive, it is also frequently difficult to coordinate and manage effectively. These children may require highly specialized care which is now available in many urban areas through children's hospitals and major teaching hospitals. Access to these specialized services, however, may be problematic for many children in rural areas, where the demand is insufficient to support a variety of specialized providers. In addition, because chronically ill children have multiple health care needs, they tend to utilize multiple providers. Collaboration and coordination among providers is often lacking; and because of the disease-oriented approach of many specialists, the primary and preventive care needs of these children may be overlooked.

RECOMMENDATION: Reduce fragmentation and increase collaboration and coordination among providers, the public health system, and the financing system.

Federal and state Title V Maternal and Child Health programs for children with special health care needs typically provide

services for low income children with chronic illness. Nonetheless, services vary greatly from state to state. Although private insurance plans may provide for many of the medical care needs of these children, social and other important support services may not be covered. Parents of children with significant chronic illness increasingly find that some private insurers will not provide coverage over the entire period of illness. Limiting insurance coverage may compromise the care received by a child and place a substantial financial burden on a family. Even if children formerly covered by private insurance are eligible for public programs, parents may not know about these programs or may face procedural impediments to enrollment.²⁶

To help families take advantage of the full range of specialty and comprehensive services (publicly and privately financed) for children with chronic illness, Perrin, Guyer, and Lawrence recommend closer collaboration between the public health system and personal health service providers. This activity could be facilitated by patient- and/or family-centered case management. Such case management would be responsive to the needs of the child and would provide liaison with and coordinate multiple providers. Case managers should also be able to link families with sources of funding for necessary services which may be available through special programs.

Adolescents

For many adolescents, the traditional health care system works well, and rates of serious illness are low. However, because many adolescent health problems are related to high-risk behavior and because adolescents are in a transition state between dependency and adult status, they may have problems accessing the health care they need.

The 1991 Office of Technology Assessment Report on Adolescent Health identified a number of barriers to health care among adolescents which are also discussed in this issue by Klerman and by Perrin, Guyer, and Lawrence. These barriers include low income and lack of health insurance coverage, both private and public; requirements for parental consent or notification; teens' lack of knowledge about the need for and availability of services; scarcity of providers who want to deal with the health problems of teenagers; and

geographic and cultural factors which also can be important barriers for other population groups. In addition, access may be particularly difficult for adolescents (runaways, dropouts) who may have no regular contact with the health care system.

The health problems of at-risk adolescents are complex and largely beyond the scope of this issue. Alternative models of health care delivery such as school-based clinics (discussed in the Spring 1992 issue of the journal) and street-front or shopping-center-based clinics are being developed to meet the health care needs of adolescents. These efforts are to be encouraged, but they will need to be thoroughly evaluated before they can be touted as solutions to the health care needs of adolescents. It is unlikely that any one improvement in access to personal health services will be successful in addressing adolescent health problems caused by violence, substance abuse, and other high-risk behavior. These will require broader, community-based interventions.

Other Nonfinancial Barriers to Care

As Klerman points out, "at some time almost everyone encounters one or more legal, geographic, institutional, or personal barriers to health care." Certain populations—including the economically deprived, racial and ethnic minorities, those in isolated rural areas, migrants, undocumented aliens, homeless families, children in foster care homes or institutions, and runaways—experience these obstacles more often. To reduce these barriers requires the recognition that each patient may face a different set of impediments. Accordingly, facilitating access starts with identifying specific impediments, implementing policies to reduce them, and evaluating the changes to gauge their effects. At all stages, the process should involve those experiencing the barriers. When resources are limited, it will be necessary to implement these activities in the order of their actual costs and expected effects.

RECOMMENDATION: Develop the capacity of providers to deal with a diverse patient population.

Affordability

Although expenditures on health care for adults are many times greater than expenditures on health care for children, health care for children is still costly. The Lewit and Monheit analysis presented in this issue indicates that average expenditures on all children 0 to 18 years old were \$737 in 1987. Extrapolation based on the trend in growth of aggregate expenditures suggests that expenditures per child were \$1,130 in 1992.²⁷ Expenditures are lowest for 3- to 12-year-olds and highest for infants. In 1989, the cost of medical care for a normal pregnancy and delivery exceeded \$4,500, cesarean deliveries cost about \$3,000 more, and the cost of intensive care given a very low birth weight infant can exceed \$100,000.²⁸

Families faced with the need to make decisions on expenditures for health care for their children know very well that health care purchases result in foregone consumption of other goods. Similarly, families who purchase health insurance for themselves and their children either independently or through employer groups know that health insurance is not "free" and that insurance benefits received reflect premiums paid. Ultimately, although health insurance can reduce the burden of paying for medical care at the time of utilization, health care must be paid for, and increasing access to medical care, particularly in a highly inflationary environment, can be obtained only by increasing efficiency or reducing expenditures on other goods and services.

Private Health Insurance

The demand for health insurance, whether purchased individually or through employers, depends on a consumer's ability and willingness to pay for it. As a benefit of employment, employer-provided health insurance is part of a total compensation package, received as an alternative to higher wages or other benefits. The Monheit and Cunningham analysis indicates that the largest group of uninsured children are in poor or low-income families. Although many of these families have at least one employed parent, their low incomes may make it unfeasible for them to acquire insurance either privately or as a condition of employment. Because children in the poorest single parent households are likely to be insured through the Medicaid program, the bulk

of children without insurance are found in families with incomes too high to qualify for Medicaid but too low to afford private coverage.

Sheils and Wolfe chronicle how dramatically rising costs are eroding the private insurance market that provides protection for most Americans. As costs have risen, employers have increased cost sharing and employee premiums for dependent coverage. In this environment, it is not surprising to find that as employees are asked to pay a larger part of the costs of dependent coverage, more (particularly low-wage) employees are choosing to drop it. This trend has been exacerbated for children because they are more highly concentrated in families where earnings are low.²⁹

Countervailing trends within the employment-based insurance market have differing impacts on children. Technically speaking, the term "health insurance" is a misnomer. Most private health care coverage is a combination of insurance against the large expenditures associated with infrequent serious illness and prepayment for common predictable services (such as treatment for otitis media or prenatal care). One response of employers to rising health care costs has been to increase the first-dollar cost sharing (co-payment and deductibles) features of traditional health insurance plans while expanding coverage for costly illness. Because much health care for children is characterized by preventive and primary care, such changes in insurance plans may make this care less affordable. Some families may even drop dependent coverage if they believe the premium contribution is not justified by the reduced benefits received under the plan.

Running counter to the trend to increase first-dollar cost sharing is the increasing popularity of various managed care plans which attempt to control costs by limiting access to expensive health care services. Typically, these plans offer access to primary and preventive care with little or no cost sharing with the idea that, by keeping enrollees healthy, they can reduce the total cost of care. Although managed care plans have been able to market their services at premiums typically 10% below those charged by traditional health insurance plans, the impact of managed care on children's health status and utilization of services has yet to be fully determined. Some observers are concerned that the

incentives in managed care plans are as likely to lead to restricted access to needed services as to improvement in health. As enrollment in managed care plans grows, it will be necessary to monitor the effects of these plans on children's health status—particularly the health of children with infrequent, costly illness—to see how their care compares with care received in the traditional health care system and with reasonable, objective standards of care for children with these serious illnesses.

Uncompensated Care and Cost Shifting

Because of increases in the number of uninsured persons and increasingly aggressive cost-containment efforts in many public and some private programs, there has been an increase in the level of uncompensated and undercompensated care, particularly at hospitals and other organized provider settings.³⁰ This has led to increased cost shifting as providers raise charges to insured paying patients in order to cover losses caused by caring for the uninsured. Ironically, this practice may actually increase the level of uncompensated care as it reduces the affordability of private insurance. Moreover, as some parents realize that, by presenting themselves at hospital emergency rooms, they can obtain expensive care for their children regardless of their ability to pay, they may reassess the utility of the risk protection feature of private health insurance and reduce their coverage as premiums rise.

As a result of these various cross-subsidies, the current system of financing health care for children and pregnant women is so complex that it is difficult to identify where the burden of paying for health care actually falls. For example, it appears that health care for the uninsured is largely paid for by cost shifting to those who are insured. This suggests that a system which provided health insurance to all children and pregnant women might not be much more costly in the aggregate if provider cost shifting were eliminated and charges to all insured patients were reduced to reflect the absence of cross-subsidies.³¹ An analysis performed by Lewin ICF for the National Commission on Children¹² and the Lewin and Monheit analysis in this issue both suggest that health insurance coverage could be extended to many currently uninsured children at only a modest increase in overall expenditures.

Whether currently uninsured children and their families come out ahead under an expanded health insurance program, however, depends critically on how that program is financed. Under the present system, because of provider cost shifting, resources are shifted from well-insured higher income families to uninsured lower income families. A more uniform mandatory insurance program, financed, for example by a payroll tax, might shift the burden of paying for expensive health care back to lower income families. Careful attention will need to be paid to the financing of any expanded insurance program to make sure that it is equitable.

Health Care and Other Programs for Children

Government expenditures for health care for children and pregnant women face budget constraints similar to those which exist within families and businesses. Efforts to expand health care services for these vulnerable populations compete with other programs which serve these groups, as well as with programs which serve other constituencies.

Evidence of the realities of public budget constraints is common. The recent proposal by the state of Oregon to institute a public rationing scheme in order to provide health insurance for more uninsured adults and children by reducing federally mandated benefits for poor children and pregnant women but not the elderly is a highly publicized example of competition among vulnerable populations for limited public funds.³² Similarly, in 1989, the National Governors Association asked Congress for a moratorium on further expansions in the Medicaid program because of difficulties with paying for previously enacted expansions.³³ Even more to the point are administrative and other obstacles to health care under Medicaid and other public programs which reflect, in part, efforts to control costs.

The trade-offs among different programs benefiting children are evident in the current recessionary environment as expenditures on health care compete for public funds with income support programs, aid to urban areas, and support for schools. The reality is that health care for children and pregnant women is but one part of a larger bundle of necessary services. When making decisions about expanding health care delivery, policymakers must carefully balance the bene-

fits to be gained from program expansions against the costs of alternative services foregone.

Ultimately, the issues of efficiency, access, and affordability are linked. If health care can be made more efficient, it will be more affordable. We will be able to afford healthier children and possibly by redistributing the savings, greater equity. In the absence of gains in efficiency, growth in health care for children will face increasingly stiff competition from other children's programs and from the claims of other groups. Some knowledgeable observers believe that growth in health care costs will not be controlled without explicit rationing.³⁴ Should that eventuality present itself, children's interests will be best served if the problems of inefficiency and lack of access are already under control.

Conclusion

As health care costs continue to escalate and access problems multiply, a consensus has emerged that the U.S. health care system will not change radically until a major crisis makes it impossible for the current system to continue.³⁵ However, incremental change appears inevitable given the pressures building up in the system. We believe there are several important reasons for focusing any impetus for incremental change on the health care system for children and pregnant women. First, children and pregnant women are being seriously affected by the same forces that plague the larger health care system, but they cannot wait until the system implodes for their health care needs to be addressed. Because health and development are so interrelated in children, failure to address their health care needs adequately may result in lifelong deficiencies. Moreover, children, more than other population groups, are increasingly living in poverty and in high-risk environments, which may compromise their health and increase their need for health care services.

Second, although the health care system for children is in many ways a microcosm of the entire health care

system, children's health care problems may be more manageable. Expenditures on health care for children are high, but they represent less than 14% of total health care expenditures. Moreover, because of the projected growth in the elderly population, this percentage should decline in coming years. In addition, it may be easier politically to build reform of the health care system for children and pregnant women on the base of the many existing public programs that serve this population and on the pro-child sentiment that led to the substantial expansions of the Medicaid program only a few years ago.

Last, two major provider groups, the American Academy of Pediatrics and the National Association of Children's Hospitals and Related Institutions, have proposed major reforms of the health care system for children.³⁶ Because opposition of providers to reforms is regarded as a major impediment to reform of the health care system, having the support of these influential groups should expedite action on children's health care reforms.

Concern about the well-being of children and families has become a staple of the political debate in this very political year. But as the debate has made clear, a general concern for children, no matter how sincerely felt or eloquently expressed, does not provide the guidance, wherewithal, or accountability for sound child health policies. We believe that a minimum goal for the nation is an efficient health care system for children and pregnant women that ensures access for all who need care at a price the nation can afford. This goal is reasonable but will require some effort if it is to be realized. Many concrete suggestions for improvement in the system are provided in this analysis, the accompanying list of recommendations, and the individual articles in this issue. Moving to implement these suggestions, either as a first step in a more global overhaul of the entire U.S. health care system or because of the special needs of children, is good public policy.

Eugene M. Lewin
 Carol S. Larson
 Deanna S. Gomby
 Patricia H. Shion
 Richard E. Behrman

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11. Virtually all studies of childhood immunization have found that immunizations not only reduce disease but also offer substantial health care cost savings. On this basis, failure to immunize a large portion of the population of young children is a source of inefficiency. See note no. 9, above.
12. National Commission on Children. *Beyond rhetoric: A new American agenda for children and families*. Washington, DC: 1991.
13. Many acute illnesses in children (for example, ear infections, asthma, and lead poisoning) can be successfully treated in their early stages, but may lead to serious chronic disability or death if untreated. However, establishing a relationship on a population basis between lack of access to timely health care for acute illness and increased severity of illness or higher health care costs has been difficult. Recently, several researchers have examined this relationship by looking at variations in rates of hospitalization of children for conditions that are responsive to effective primary care. Using this approach, Valdez and Dallek have documented substantially increased rates of hospitalization in Los Angeles for poor black and Latino children for conditions which Valdez and Dallek judged were unlikely to lead to hospitalization with adequate ambulatory care. Other factors which may contribute to higher rates of hospitalization among poor children with limited access to primary care include: increased frequency or severity of disease among poor children, parents' inability to pay out-of-pocket for treatment on an ambulatory basis, and physician concerns that family, community and other factors might undermine outpatient therapy. Accordingly, while suggestive, the results from Los Angeles cannot be regarded as definitive proof that lack of access to adequate ambulatory care is the primary cause of high rates of hospitalization among poor children in Los Angeles. Valdez, R.B., and Dallek, G. *Does the health system serve black and Latino communities in Los Angeles County?* The Tomás Rivera Center, Claremont, CA, February 1991.
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Child and Adolescent Health Status Measures

Barbara Starfield

Abstract

This paper reviews evidence concerning the state of health of the nation's children and youth. Although the major causes of death in this population are related to injuries, the most common abnormalities on physical examination involve the ear, the teeth, and the skin. Findings from household interview surveys and from visits to physicians indicate that upper respiratory infections and influenza, ear infections, and allergies are the most common health problems among children and youth. Chronic physical illness and mental health problems are present in 10% to 20% of this population, although these types of conditions are not readily apparent in routinely collected data. Newer conceptualizations of health suggest that, rather than being distributed independently, multiple health problems coexist in individual children and that characteristics of ill health tend to persist over time in these children. These findings indicate the need for health policies that place priority on primary care which provides a source of continuous, comprehensive, and coordinated services over time, and for health status measures that reflect not only the incidence and prevalence of specific health problems but also their interrelationships and the variety of functional impairments associated with them.

Although much is known about the health problems of children and adolescents, little is known about their health. It is far easier to catalog and count specific diseases than it is to define and measure health. Yet it is the measurement of health that is the appropriate concern of a health services system. The mere presence of a medically identifiable disorder signifies little if the disorder does not compromise life expectancy, interfere with normal functioning, or cause undue discomfort. Conversely, the absence of a medically defined disorder does not prevent individuals from feeling ill or from being at risk of an abnormally short life span. Biological entities as yet unnamed and social entities not in medical lexicons can and do affect the way people feel and behave.

These generalizations, of course, apply to adults as well as to children and youth, but their implications are greater for young people than for older people. Young people are healthy by adult standards because, on average, they have fewer medically definable illnesses and particularly because, on average, they have fewer chronic disabling or life-threatening disorders. In fact, a recent report on the state of health of children in the United States concluded that "the vast majority of children are healthy."¹

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Other characteristics of children distinguish their health problems from those of adults. There is more biologic variability in health among younger people as compared to adults because the biologic deterioration that comes with aging narrows the range of healthy functioning. Even where there are existing illnesses in children, they are often in an earlier stage of development and hence may be harder to identify.

In addition, the concept of health in children and youth is different from the concept in adults. Children are in a developmental phase; ill health may be manifested by decelerations in the normal rate of development as well as by reversals in the process of development. That is, abnormalities may not be manifested by pathology but only by inadequate or delayed attainment of physiological and behavioral milestones. Furthermore, a health indicator that is relevant at one age is often not relevant at another, since the process of development changes both the exposure to various threats to health and the vulnerability of individuals to those threats.

The concept of health in childhood and adolescence and that in adults differs in yet another way. We know, more or less, what a healthy adult should be like; self-sufficiency and economic productivity are prime concerns at least until retirement age. Other than attendance at school and educational achievement for children over the age of 5, society's expectations of children are limited; self-sufficiency is not expected. From a utilitarian point of view, future economic productivity is a desirable goal, but it may be difficult to measure. Even if expectations were broadened to encompass characteristics other than economic productivity, we still would not know what the important characteristics are from the viewpoint of children.

Furthermore, the implications of labeling are greater for children than for adults. Any health status measure that emphasizes handicap makes children appear to be more dysfunctional than they may be because children have inherently greater developmental potential and hence greater capacity to adapt to or compensate for their infirmities than do adults.

Lastly, the concept of positive health, as embodied in the definition set forth by the World Health Organization as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity,"² is most meaningful for children because the greatest danger may result from interference with the attainment of characteristics that make individuals resistant to future threats to their health.

The way in which society views and measures child health determines its judgments about children's health care needs. The following sections of this paper discuss (1) how health is measured and what we know about the existence of important health problems and threats to health in different age groups of childhood and adolescence; (2) the health problems of children from low-income families and others at

special risk; and (3) new ways of viewing health and how they may help society to plan more appropriate and adequate services.

Health Status Measures

Vital Statistics

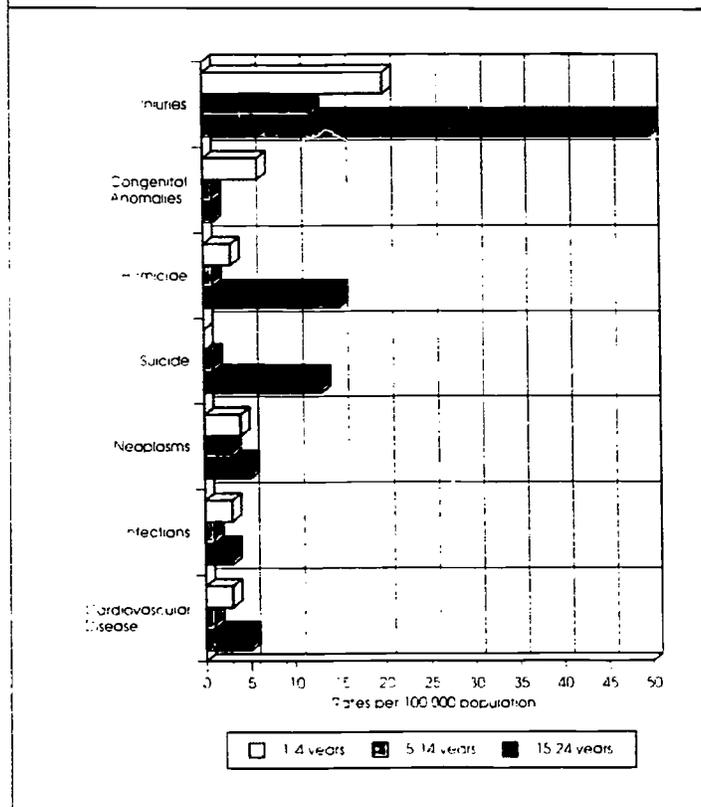
The most conventional method of measuring the health of populations is by means of vital statistics, including birth statistics and death statistics. Birth statistics provide information on birth weight, a very important correlate of health in infancy and childhood, and death statistics provide information on the major causes of mortality at different ages. Both low birth weight and infant mortality are more frequent in the United States than in other economically developed countries. The proportion of infants born at low birth weight (defined as less than 2,500 grams, or about 5½ pounds) is higher than that in at least 16 other countries. Because low birth weight is associated with a greater likelihood of subsequent death or health problems,³ the low standing of the United States is of considerable concern. Infants of very low birth weight (under 1,500 grams, or about 3½ pounds) are at especially high risk of health problems. A decade or so ago, most of these infants would have died, but it is now not uncommon for infants weighing less than 1,000 grams (just over 2 pounds) to survive. About 1 in 6 have persistent problems consisting of congenital anomalies or developmental delay; babies who weigh under 750 grams at birth (about 1½ pounds) have a 25% to 30% chance of being so affected. (See the article by Racine, Joyce, and Grossman in this journal issue.) The lower the birth weight, the greater the likelihood of persistent problems. An overall increase in the number of children with disability in the country may be, in part, a result of the success of medical technology in keeping many low birth weight newborns alive.⁴

Infant mortality in the United States is twice as high as in some countries and higher than in at least 20 countries. This is a result, in part, of the greater frequency of low birth weight. (See the article by Racine, Joyce, and Grossman in this journal issue.) In fact, mortality in the first month of life within each low birth weight group is lower in the United States than in other countries, suggesting the successes of technology-intensive neonatal care in salvaging infants born

immature or with health problems that otherwise would be fatal. The relatively high mortality in the remainder of the first year of life is not primarily a result of the greater frequency of low birth weight.

The five major causes of death in infancy are congenital anomalies, sudden infant death syndrome, disorders relating to short gestation or low birth weight, respiratory distress syndrome, and conditions that result from maternal complications. These causes differ greatly from the major causes of death later on in childhood, which are shown in figure 1. The major cause in preschoolers is injury, which far surpasses congenital anomalies, infections, cancer, and homi-

Figure 1. Major Causes of Death for U.S. Children, 1988



Source: National Center for Health Statistics (NCHS), Advance Report of Final Mortality Statistics, 1988. Monthly Vital Statistics Report: 39 (7) supplement Hyattsville, MD: Public Health Service, 1990.

cide. In the school-age years (5 to 14 years old), the most common causes are injuries and cancer, with other causes trailing far behind. In adolescence and young adulthood (15 to 24 years old), the most common cause of death is injuries, with suicide and homicide less than one-fourth as common. Cancer is the fourth most common, with cardiovascular problems emerging for the first time in this age of transition to adulthood. Rates of death are much lower in childhood than in adulthood. Total mortality in childhood (excluding the first year of life) does not approach the death rate associated with the most common cause of death (heart disease) in adults.⁵

Population Surveys — Parental Reports

Information on the frequency of acute illnesses in the child population can be obtained each year from the National Health

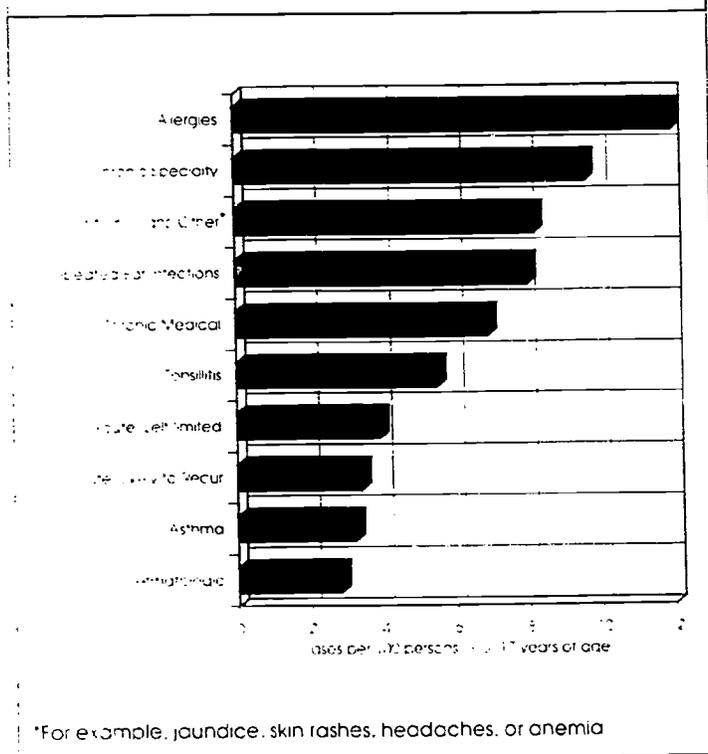
Interview Survey (NHIS). The most common acute conditions in childhood (under 18 years) are upper respiratory problems. Injuries are the second most common type of condition: the frequencies of all types of injuries is 22.7 and 28.9 per 100 children per year for ages under 5 and between 5 and 17, respectively. Among preschoolers, the frequencies of these acute conditions are greater for males than females; between the ages of 5 and 17, the frequencies are equal except for higher rates among males for injuries (34.7 per 100 children per year for males, compared with 22.8 per 100 children per year for females).⁶

Supplements to the NHIS provide information about other specific conditions common in childhood. Figure 2 shows that the most commonly reported physical condition in childhood (ages 0 to 17) is allergy, which is reported as present in 12% of children in a single year. Chronic specialty conditions, including curvature of the spine, hearing problems, and vision problems as well as bone or muscle problems, are experienced by almost 10% of children in a given year. About 8% of children have repeated ear infections, and an equal percent have ill-defined conditions consisting of symptoms or signs such as jaundice, skin rashes, headaches, or anemia. Chronic medical conditions such as arthritis, epilepsy, or diabetes are reported for about 7% of children, and almost 6% have one or more episodes of tonsillitis. Four percent have an acute self-limited condition such as a urinary tract infection, and more than 3% have asthma. Specific dermatologic conditions, such as acne, are reported for almost 3%.⁷

Information on the restriction and limitation of normal activity caused by illness is another aspect of health status measured in household surveys. Children experience, on average, about three acute illnesses a year with about 8 days of restricted activity per year, including days lost from play or school, days spent in bed, and days when activity is otherwise restricted (see table 1). Children reported by parents as being in poor health are much more likely than children in good health to have a limitation of their ability to perform activities associated with their specific age group as a result of one or more chronic conditions.

Until recently, reliable national data on the frequency of occurrence of developmental and behavioral problems in

Figure 2. The Prevalence of Children's Health Problems in the United States, 1981



Source: Starfield, B., and Newacheck, P. Children's Health Status, Health Risks, and Use of Health Services. In *Children in a Changing Health System: Assessment and Proposals for Reform*. M. Schlesinger and L. Eisenberg, eds. Baltimore: Johns Hopkins University Press, 1990, pp. 3-25.

children have been hard to come by. Yet these problems can interfere with a child's schooling and peer relationships, severely strain family functioning, and result in costly interventions, typically either in the schools or the medical care system. Information collected from adult family members, however, as part of the 1988 National Health Interview Survey of Child Health shows that developmental, learning, and behavioral disorders are among the most prevalent chronic conditions of childhood and adolescence.⁸ Nearly 20% of 3- to 17-year-olds were reported to have had at least one mental health problem at some time during their lives. The frequency of reported problems was highest (29%) among males 12 to 17 years old and lowest for girls 3 to 5 years old. In general, the reported rates of illness rose with age because learning disabilities and emotional and behavioral problems frequently go unrecognized until children reach the ages of 6 to 8 years. Evaluation of survey results suggests that black and Hispanic parents may have underreported the incidence of developmental, learning, and behavioral problems in their children for a number of reasons

and that the frequency of occurrence of these problems among children may therefore be higher than reported.

Developmental, learning, and behavioral disorders are among the most prevalent chronic conditions of childhood and adolescence.

Information from surveys is limited to the types of things that mothers know about the health problems of their children. They would not know, for example, about problems that are undiagnosed because they are in a very early stage of development. They also cannot report conditions that would be identified only by a doctor's examination when the child has not seen a doctor. Health surveys also cannot provide accurate information on uncommon but important problems because they either would not be encountered in a sample survey, even one as large as the National Health Interview Survey, or would be encountered too infrequently

Table 1. Restricted Activity Resulting from Acute Conditions and Limitation of Activity Because of Chronic Conditions, U.S. Children and Youth

	Age Group (years)	
	Under 5	5 to 17
Number of acute conditions per 100 persons per year	395.5	252.5
Number of restricted activity days resulting from acute conditions per 100 persons per year	955.9	793.7

Percent of children limited in activity because of chronic conditions	Age Group (years)	
	Under 5	5 to 17
of all children in fair or poor health*	22.5	37.3
of all children in good to excellent health*	1.7	5.5
of all children	2.3	6.2

*Parental report of activity limitations and as to whether child's health is excellent, very good, good, fair, or poor. In these tabulations, good health means reports of excellent, very good, or good, and poor health means reports of fair or poor health.

Data from 1989 except restricted activity days by limitation of activity and parent assessed health (1984-88).

Source: Adapted from Adams, P., and Benson, V. Current Estimates from the National Health Interview Survey, 1989. *Vital and Health Statistics* 10(176). National Center for Health Statistics, 1990. Calculations and special tabulations from Ries, P., and Brown, S. Disability and Health: Characteristics of Persons by Limitations of Activity and Assessed Health Status. U.S. 1984-88. Advance data from *Vital and Health Statistics*, no. 197. Hyattsville, MD: National Center for Health Statistics, 1991.

to yield stable estimates of their true prevalence in the population. For this reason, other sources of information are needed to round out the picture of child health problems.

Health Examination Surveys

Health examination surveys conducted by the National Center for Health Statistics in the 1970s provide information on those health problems that can be detected by an examination and by a select number of laboratory tests.⁹ Table 2 lists the frequency of these conditions in three different child age groups. The most common conditions found on examination are those related to the teeth, the skin, and to the ear or the eye. Cardiovascular or neuromuscular abnormalities are also found in about 1 in 20 children, but suspicious conditions that are discovered during a screening examination may prove on further testing to be non-pathological.

One important problem not detectable by examination but detectable by laboratory testing as part of a health examination survey is lead poisoning. Between 10% and 15% of newborns and young children have blood lead levels that

put them at high risk of later developmental abnormalities.¹⁰

Surveys of Health Care Providers

Because conditions that are less common or are not discoverable by physical examination may not be detected by health examination surveys, diagnoses made when children seek care in medical facilities serve as an additional source of information about the frequency of child health problems in this country.

The National Hospital Discharge Survey obtains information each year on the discharge diagnoses of individuals in a representative sample of U.S. acute general hospitals. Table 3 shows the distribution of problems leading to hospitalization among children in 1984. In infancy (but excluding newborns), the five major causes of hospitalizations are acute respiratory infections, pneumonia, systemic infections, noninfectious enteritis or colitis, and diseases of the central nervous system. The main causes of hospitalization in preschoolers are diseases of the central nervous system, pneumonia, acute respiratory infection, asthma, and noninfectious enteritis/colitis. Chronic tonsil and adenoid disease is

Table 2. Percent of Children with Abnormalities on Physical Examination

Condition	Percent of Children in Each Age Group (years)		
	1 to 5	6 to 11	12 to 17
Abnormalities of the ear or ear canal	NA*	20%	15%
Hearing difficulty	NA	1	1
Dental problems	17	64	54
Significant skin problems	14	17	36
Poor vision	NA	5	5
Cardiovascular findings**	NA	3	5
Neuromuscular or joint findings	NA	4	8

*NA indicates that the examination either did not include the condition or that it was too uncommon to provide stable estimates. Only problems with a frequency of at least 1 per 100 are listed.

**Includes findings such as innocent murmurs that may prove nonpathological on subsequent testing.

Source: Adapted from Kozak, L., Norton, C., McManus, M., McCarthy, E. Hospital Use Patterns for Children in the U.S., 1983 and 1984. *Pediatrics* 1987, 80:481-90. Starfield, B., and Newacheck, P. Children's Health Status, Health Risks, and Use of Health Services in *Children in a Changing Health System: Assessment and Proposals for Reform*. M. Schlesinger and L. Eisenberg, eds. Baltimore: Johns Hopkins University Press, 1990. pp. 3-26.

the top cause of hospitalization in the 5- to 14-year-old age group, followed by fractures, asthma, appendicitis, and systemic infections. The main causes of hospitalization are quite different from the main causes of death (see figure 1) in each age group. It is worth noting that hospitalization rates among both children and adults have been steadily falling since 1983: between 1984 and 1990, hospitalization rates for children under age 15 fell about 29%, both overall and for most of the major causes. (See the article by Perrin and Guver in this journal issue.)

Information obtained from medical facilities has drawbacks. It fails to reflect the health problems of children who do not use services, and it underrepresents the problems of people who seek care infrequently. It also reflects health problems only to the extent that practitioners

recognize them. Problems found in populations that use services less, problems for which people are less likely to seek care, and problems that are poorly diagnosed are underrepresented in information from medical facilities. A related drawback is that the data reflect problems at a more serious stage than their distribution in the population because more serious problems are more likely to receive medical attention.

The National Ambulatory Medical Care Survey provides additional national and regional estimates of the frequency of diagnoses among children. Because, however, this information is collected from a sample of office-based physicians, the findings are limited to the population of children cared for in office-based physician practices. Acute medical problems such as colds (acute upper respiratory infections),

Table 3. Rates of Hospital Discharge* by Main Diagnosis and Age, U.S. Children, 1984

Diagnosis	Age Group (years)			
	Less than 1	1 to 4	5 to 14	All less than 15
All conditions	224.5	70.1	41.2	62.0
Infections	18.2	4.1	1.8	3.6
Diseases of the nervous system	16.7	7.6	2.6	5.0
<i>Otitis media</i>	10.3	4.5	1.0	2.7
Diseases of the respiratory system	53.6	24.0	10.1	17.0
<i>Acute respiratory infection</i>	22.7	5.4	1.2	3.9
<i>Chronic tonsil and adenoid disease</i>	—	4.5	4.5	4.2
<i>Pneumonia</i>	19.6	6.5	1.3	4.0
<i>Asthma</i>	3.9	4.6	2.1	2.9
Diseases of the digestive system	32.0	8.5	5.1	7.9
<i>Appendicitis</i>	—	—	1.9	1.3
<i>Inguinal hernia</i>	6.7	1.3	5	1.1
<i>Noninfectious enteritis/colitis</i>	17.1	4.6	1.3	3.3
Congenital anomalies	1.9	3.8	1.3	3.2
Perinatal conditions	45.5	—	—	3.2
Injury and poisoning	7.8	9.0	8.3	8.5
<i>Fractures</i>	2.6**	1.5	3.4	2.8

*Per 1,000 children; total and most common main diagnoses only

**Estimate is unstable because numbers are small

Source: Adapted from Kozak, L., Norton, C., McManus, M., and McCarthy, E. Hospital Use Patterns for Children in the U.S., 1983 and 1984. *Pediatrics* (1987) 80:481-90.

sore throats, viral infections, and contact dermatitis are common at all ages and are the most common diagnoses made for children and adolescents seen in office-based practice. Chronic sinusitis and bronchitis account for at least 1% of visits at all ages. Conditions of substantial frequency only in preschoolers include croup (laryngitis/tracheitis), thrush (candidiasis), and need for a vaccination. Diagnoses seen primarily in the middle years (ages 5 to 17) include forearm fractures and hyperactivity; other fractures and sprains are particularly common in late childhood and early adolescence. Allergic rhinitis occurs with

relatively high frequency at ages 5 and above. On the other hand, internal ear problems (otitis media) almost disappear in late adolescence. Asthma appears to peak in middle childhood and then wane in late adolescence. Normal pregnancy accounts for almost 8% of visits among 15- to 21-year-olds; diseases of the sebaceous glands are the second most frequently cited cause for a visit by members of this age group. It is important to note that the problems of children and adolescents who receive their care in hospital clinics, emergency rooms, and facilities other than office practices are not included in these data. Because lower-income children disproportionately seek care from facilities of this type, this listing of problems may not adequately represent the relative magnitudes or types of problems found among these children.

Table 4. Estimated Prevalence of the Major Uncommon* Diseases and Conditions in Children

Disease/Condition	Estimated Prevalence per 1,000 Children
Congenital heart disease	7.0
Seizure disorders	3.5
Cerebral palsy	2.5
Arthritis	2.2
Paralysis from injury	2.1
Diabetes mellitus	1.8
Cleft lip/palate	1.5
Down's Syndrome	1.1
Blindness	0.6
Mental retardation due to fragile x chromosome	0.5
Sickle cell disease	0.5
Neural tube defect	0.5
Autism	0.4
Cystic fibrosis	0.3
Neurofibromatosis	0.3
Hemophilia	0.2
Duchenne muscular dystrophy	0.1
Acute leukemia	0.1
Deafness	0.1
Other hereditary metabolic disorders**	0.1

*Conditions with frequency in the child population of less than 1%.

Source: Adapted from Gortmaker, S.L., and Sappentfield, W. Chronic Childhood Disorders: Prevalence and Impact. *Pediatric Clinics of North America* (1984) 31:3-18. **Personal communication with Dr. N.A. Holtzman

Despite the variety of information sources described above, many important problems are not apparent from these routinely collected sources. Special studies are required to learn about these problems.

Special Surveys of Childhood Diseases

Information about selected childhood disorders may be obtained from epidemiologic surveys designed to detect specific conditions. Table 4 shows the percent of children with those conditions that have been identified by means of these special surveys. All of these conditions are present in fewer than 1% of children. Diabetes, for example, is present in fewer than 2 children per 1,000; many other diseases are even less common, as the table shows.

Special surveys also document the extent of other types of problems among children, such as mental health problems and problems associated with health-compromising behaviors which are common in the teenage population. For example, almost 1 in 5 high school seniors reports using marijuana in the past month, and 3% report using cocaine at least once in that period. Alcohol use is much more common: 1 in 25 seniors drink an alcoholic beverage at least once daily, and 35% have five or more drinks in a row within any 2-week period.¹¹ Despite the high frequency of these types of problems, they are poorly recognized by most health practitioners so that special studies are required to document their frequency in the population.¹²

Other important problems are missed in routinely collected data. Many childhood illnesses are relatively uncommon but completely preventable. These include measles, mumps, German measles, polio, and whooping cough. Because immunizations can prevent all of them, rates of immunization are an important aspect of child health. Special surveys are required to document rates of immunization in the population: these indicate that only about 60% of preschool children in this country receive all the immunizations that they should receive.¹³ In 1990, more than 26,000 cases of measles were reported in the United States. Another growing problem not reflected in routinely collected data is AIDS. By 1991 approximately 3,385 cases of pediatric AIDS had been reported and many more are expected in the coming decade.¹⁴ Inadequate nutritional intake is another problem that may be "invisible" in many conventional data sources.

These special problems are relatively uncommon. They do, however, occur disproportionately in low-income segments of the population. The next section of this paper deals with the special problems of low-income children and youth.

Health Problems of Low-income Children and Others at Special Risk

About 1 child in 5 and 1 very young child in 4 live in families with incomes below the federal poverty level, and many more live in families marginally above the poverty level. Because health problems in childhood compromise future health, the health problems of low-income children should be of considerable concern in a country dedicated to equality of opportunity. Low income is responsible for much if not most of the disadvantages found among children in other high-risk groups such as racial minorities.¹⁵

The summary in table 5 indicates that poor children are more likely to become ill and have more serious illnesses. Among the reasons for this are increased environmental exposures resulting from poor housing and hazardous neighborhoods, poor nutrition, and inadequate preventive care.¹⁶ However, the higher rates of the more serious problems and the increased death rates from diseases at all childhood

ages also reflect poor access to medical care.¹⁷

The 15 million children who live in rural areas of the country are another group at high risk. These children comprise one third of all children in the nation, and almost one half of them reside in the South. Rural and urban children do not differ much in their overall death rates, and the frequency of the major chronic conditions and limitation of activity associated with them are very similar. Rural children have slightly lower rates of acute conditions, however.¹⁸ The major disadvantage of rural children is a result of their greater likelihood of death from injuries, particularly those caused by exposure to farm machinery, firearms, and falling objects; and drowning and injuries to occupants of motor vehicles (especially pick-up trucks).^{19,20} (See the articles by

Table 5. Relative Frequency of Health Problems in Low-income Children Compared with Other Children

Health Problem	Relative Frequency in Low-income Children
Low birth weight	double
Delayed immunization	triple
Asthma	higher
Bacterial meningitis	double
Rheumatic fever	double-triple
Lead poisoning	triple
Neonatal mortality	1.5 times
Postneonatal mortality	double-triple
Child deaths due to accidents	double-triple
Child deaths due to disease	triple-quadruple
Complications of appendicitis	double-triple
Diabetic ketoacidosis	double
Complications of bacterial meningitis	double-triple
Percent with conditions limiting school activity	double-triple
Lost school days	40% more
Severely impaired vision	double-triple
Severe iron-deficiency anemia	double

Source: Starfield, B. *Effectiveness of Medical Care: Validating Clinical Wisdom*. Baltimore: Johns Hopkins University Press, 1985.

Perrin, Guver, and Lawrence, and by Klerman, in this journal issue.)

New Ways of Viewing Child Health

The previous sections provided detail about the conditions afflicting children, interfering with their activities, and leading to premature death. Such catalogs are very useful in pointing directions to needed research about their cause and treatment. For example, the relatively high injury rate among rural children serves as a stimulus to directing research on how injuries might be prevented. They are also useful in indicating where resources need to be directed to deal with localized clusters of problems or apparent epidemics. For example, increased rates of acute but preventable communicable diseases may signify that additional resources are required to provide immunizations. Similarly, the observation that poor children have increased rates of serious illness provides a rationale for expanding access to health services through programs such as Medicaid.

Statistics on the frequency and distribution of individual conditions or types of problems are less useful, however, for the overall planning of health services. Health services should be organized so that they are best suited to meeting the health needs of individuals. The health needs of indi-

A substantial proportion of children have a relatively high likelihood of experiencing several different types of health problems simultaneously.

viduals are less well represented by separately counting the frequency of specific diagnoses than by characterizing individuals according to their burdens of morbidity and functional derangement. In other words, a person-oriented view of health rather than a disease- or condition-oriented approach is preferable for designing and operating a health services system.

Three characteristics of health problems deserve consideration in developing policy concerning health services. They are variety and variability, co-occurrence, and recurrence or persistence over time. The following section reinterprets the

data provided earlier in the context of these characteristics when related to individuals in the population.

Variety and Variability

Concepts of illness, as expressed by children and youth themselves, have several components. "Illness" can be reflected by somatic (bodily) feelings, objective signs of abnormality, specific diseases or conditions, states of mood or behavior, limitations of activity and role deviations, or by activities that jeopardize health.²¹ Children of all ages report somatic feelings within their concept of health; but the older the children, the more likely they are to include mental feelings and functional limitations as well. There is no standardized measurement instrument which includes all of these various concepts of health. As a result, their distribution in the population is unknown. However, we have some knowledge of the distribution of some of them.

Table 6 contains information from the National Health Interview Survey. In this analysis, each child in the survey was categorized according to the number of five main types of conditions that a parent reported a child to have in the year preceding the interview. The five types included acute self-limited conditions, acute but recurring conditions, chronic medical or chronic surgical conditions, and psychosocial and psychosomatic conditions. Almost 3 in 5 children had no conditions in the survey year; this category of children includes those without any conditions on the checklist as well as children with only minor acute illnesses, injuries, or mental health problems. Of children with one or more types of conditions on the checklist, however, 25% had two types and 11% had three or more types. The table also shows that children with increased burdens of morbidity have increased disability as reflected by days spent in bed, days on which activity was otherwise restricted, number of physician visits, and number of days spent in the hospital.⁷

In addition, other data from a variety of sources, which include diagnostic information from health maintenance organizations in different parts of the country, and similar information from a state Medicaid program all attest to the wide variety of types of problems encountered by individual children.²²

Co-occurrence

The second characteristic of morbidity is co-occurrence. The information presented above on variety of illness also demonstrates the extent to which illnesses co-occur. The concept of co-occurrence can be viewed in another way: as the number and frequency of minor conditions experienced by a child over a 6-year period increase, the likelihood of other types of conditions such as injuries, chronic illnesses, and psychosocial conditions also increases over the same period.²³ Other information sources suggest that health problems are not evenly distributed in the population and that a substantial proportion of children have a relatively high likelihood of experiencing several different types of health problems simultaneously.²⁴

Recurrence and Persistence

The third characteristic of health problems is their recurrence or persistence over time. Children with psychosomatic conditions, "specialty" problems (involving vision, hearing, or orthopedic problems), or allergies in a given year are about twice as likely as other children to experience the same problems in a subsequent year.²³ Persistence is, of course, a feature of chronic conditions. For example, asthma in a child is about seven times more likely to be diagnosed in a given year if the child had the diagnosis in a previous year than if the child did not. More generally, year-to-year persistence has been found to be a feature of the morbidity patterns of a number of children, includ-

ing some not afflicted with what have traditionally been regarded as chronic conditions.²³ Furthermore, children with high burdens of morbidity (as reflected in the number of different types of health problems) are much more likely than other children to have similarly high burdens in subsequent years.²²

Conclusions and Implications for Health Policy

This overview of child health status demonstrates that "health" may be characterized in many different ways and by several different methods. The proportion of children who are considered healthy or ill depends on the measure used to characterize them and on the way in which the characteristics are measured. From the viewpoint of health policy, what is the most appropriate conceptualization of health?

Conventionally, the health of populations of children has been measured by a group of indicators that are obtainable from data collected as part of vital statistics or as part of ongoing surveillance systems. Infant mortality rates, childhood mortality rates, proportion of infants born at low or very low birth weight, and adolescent fertility rates are indicators that are available from vital statistics. Rates of various communicable diseases are indicators available through ongoing surveillance systems.²⁵ There are some indicators that are known as "sentinel events" because

Table 6. The Burden of Physical Illness for Children Under 18 Years of Age, as Reported by a Parent—United States, 1981

	Percent of Children	Avg. Annual Bed Days**	Avg. Annual Restricted Activity Days**	Avg. Annual Physician Visits**	Hospital Days per 1,000 Children
No conditions*	58.1	3.4	7.3	2.8	132
One type of condition	27.1	6.0	13.7	4.7	443
Two types of conditions	10.3	8.9	18.8	7.4	625
Three or more types of conditions	4.6	9.6	27.7	10.8	1,476
All children	100.0	5.1	11.1	4.2	329

*As ascertained by administering a checklist of 100 conditions but *excluding* most acute conditions, injuries, and mental health problems.

**Per child per year

Source: Starfield, B., and Newacheck, P. Children's Health Status, Health Risks, and Use of Health Services. In *Children in a Changing Health System: Assessment and Proposals for Reform*. M. Schlesinger and L. Eisenberg, eds. Baltimore: Johns Hopkins University Press, 1990, pp. 3-26.

their occurrence in a population signals a need for special attention. These include the occurrence of a case of measles, tetanus, diphtheria, poliomyelitis, congenital syphilis, mental retardation caused by phenylketonuria or hypothyroidism, vitamin D-deficient rickets, and death associated with diarrheal disease.²⁶ Other indicators that are believed to be useful in assessing children's health status include failure to thrive, elevated blood lead levels, inadequate immunization status, growth stunting, suicides, iron deficiency anemia, and child abuse or neglect.²⁷ Some additional indicators thought to be useful in research or evaluations of specific interventions include multiple foster home placements, days missed from school, disabling conditions, perceptual disorders, learning disability, school failures or dropouts, inappropriate school placements, behavioral disturbances, involvement in violent crime, and substance abuse.

Most of the routinely or easily available indicators are useful for monitoring of major changes in large populations. Because they are relatively rare events, however, random fluctuations in their occurrence would produce unstable and, therefore, uninterpretable rates in small communities (for example, in populations of fewer than 500,000 people).

It is apparent, however, that individual characteristics of health cannot capture the range of characteristics that are relevant to the health of children. At the very least, measures that reflect rates and causes of death have to be separated from those reflecting characteristics of living children. The higher the rates of death of children with health problems, the lower will be the frequency of illness in the population, other things being equal. That is, if illness rates are stable in the population, a higher case-fatality rate will leave fewer individuals characterized as ill. Because mortality rates thus "compete" with morbidity rates, they cannot be combined in an index, at least not without a differential weighting; because there is no accepted method for assigning appropriate weights to death versus life short of personal judgments, weighting is not likely to be achievable.

Health among the living also has several components. The most conventional of these is morbidity as characterized by conditions diagnosed by physicians. These characterizations do not reflect the variety of other types of manifestations of health.

Table 6 characterizes children according to one of these other manifestations of health: restriction or limitation of activity. But even in this instance, the characterization depends upon the concomitant presence of an associated health condi-

Discontinuities in the normal process of development cannot be recognized without a health system that provides for continuity of care.

tion. Particularly absent in any existing source of data is health as characterized by physical or mental feelings (symptomatology), by self-perceptions of well-being, by achievement of normal developmental expectations (including the development of social relationships), or by the presence or absence of characteristics that increase or decrease the likelihood of subsequent good or poor health.

When health problems are viewed as isolated events, which are generally self-limited in nature and expressed as medical diagnoses, it makes little difference how health services are organized as long as they are readily available. Care from individual specialists, each focusing on the type of health problem within their area of expertise, might be all that is needed. Newer concepts of viewing health—which emphasize the variety of manifestations of problems, the interrelationships among problems, and their persistence over time—indicate the need for deeper commitments to reorganizing services so that they are better able to deal effectively with challenges to the health of children. The developmental process that characterizes children and youth assures that the manifestations of health and illness change with time. Discontinuities in the normal process of development cannot be recognized without a health system that provides for continuity of care regardless of the presence or absence of particular types of medically defined conditions.

Variety of morbidity within individuals, coexistence of different types of morbidity, and the likelihood of recurrence or persistence are characteristics that demand primary care. Such care is readily accessible and recognizes the interrelationships of problems within people. It is

broad in scope and encompasses all of the various aspects of health, including health promotion, disease prevention, early recognition of problems and deviations from normality, as well as management of the wide variety of manifestations of problems. Primary care is care that is longitudinal in time and person-focused rather than disease-focused. It is care that is comprehensive rather than piecemeal. It is care that involves coordination of services rather than fragmentation of services. Primary care entails a relationship over time between a practitioner and a patient who, therefore, come to know each other. This knowledge facilitates recognition of patients' problems and their management; it is especially important in the recognition and management of developmental, behavioral, and other psychosocial problems that may otherwise be poorly recognized by health practitioners. Care that is consistent over time leads to a better appreciation of the relationships among different types of morbidity, thus making possible the design of better preventive and management strategies. It also makes recognition of discontinuities in normal development easier. Coordinated services provide a better basis for efficient care and effective care than do fragmented services, in which each problem or problem type is managed by a different specialist.

Primary health care services in the United States are far from adequate, particularly as compared with the health systems of many comparable industrialized nations. In contrast to many of these nations, the United States lacks a well-developed primary health services sector to complement its highly developed specialty services.²⁸

Countries with well-developed primary care systems have clear lines of demarcation between primary care and specialty services. Patients are either not permitted to visit specialists on their own initiative or are discouraged from doing so. The rewards for primary care practice are relatively greater than they are in the United States. As a result, the proportion of physicians practicing primary care is much greater in those countries than it is in the United States. This emphasis on primary care may explain why the level of the health of children in these countries is superior to that in the United States regardless of the measure of health.²⁹

Better ways of characterizing health should facilitate the recognition of the variety of types of problems, their interrelationships, their change over time, and their response to health services interventions. A profile of health, which includes the several most important domains encompassed by the concept of health, would facilitate the recognition of the variety of health problems in the population; the documentation of systematic differences across population subgroups characterized by social class, race, and ethnicity; and changes over time that may occur as a result of changes in health policies or health services. Such a profile is under development.³⁰ It has five principal domains (and several subdomains within each of the domains) which address physical activity and physical fitness, physical and emotional symptoms, self-

The United States lacks a well-developed primary health services sector to complement its highly developed specialty services.

perceptions of health and satisfaction with health, achievement of developmental milestones including social interrelationships, and "resilience" (the degree to which there are characteristics that influence subsequent health). In addition, the profile includes an index of diagnosed morbidity based upon the number of types of conditions as described earlier in this article. Such a profile will make it easier to determine what types of problems are most common, which are distributed most unevenly in the population, and which need more attention in a health services system striving toward greater accountability.

No standard of health is possible. Any standard will change over time, as recent knowledge and social advances replace old types of problems with newer ones. An appropriate goal would be the elimination of systematic differences in health that now exist across subgroups of the population. Where these differences cannot be equalized as, for example, where there is handicap resulting from birth defect or genetic cause, the goal should be

continuous improvement over time in at least those aspects of health that are amenable to improvement.

Descriptions of health status are useful only to the extent that they lead to the

adoption of policies directed at making health services more responsive to health needs. This paper suggests areas for newly directed attention and societal commitment toward improving child health.

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Effectiveness of Health Care Services for Pregnant Women and Infants

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Abstract

The authors of this paper focus on the health care services received by pregnant women and infants, and consider the ways in which these services affect child health outcomes. They examine the impact of prenatal, obstetrical, and neonatal care on two measures of infant health: the rate of low birth weight births and the rate of infant mortality. There is strong evidence that these two outcomes respond favorably to the application of appropriate health services, particularly prenatal care and neonatal intensive care. The delivery of prenatal care in the United States needs improvement: slightly more than 76% of women received early care in 1989, and discrepancies in prompt receipt of care among different ethnic and economic groups are large and persistent. Improved distribution of prenatal care services could have a significant impact on the rate of low birth weight births and infant deaths. In addition, expanded regionalization of prenatal, obstetric, and neonatal care in a coordinated approach to the entire continuum of gestation, labor, delivery, and early development holds out the promise of continued improvement in infant health. Health care initiatives need to focus more on the needs of poor families and of mothers and infants with special problems, especially high-risk pregnancies resulting from maternal substance abuse and pregnancies complicated by HIV infection. The authors describe advances in obstetrical technology and neonatology, and conclude that efforts to identify programs and activities which offer the greatest potential for improving newborn survival with the least investment should have high priority.

Children are developing organisms. They continually grow and differentiate from one physical and psychological state to the next. An understanding of childhood health status, therefore, begins with an understanding of the conditions out of which children emerge. Intrauterine and neonatal environments are crucial determinants of a child's well-being. A mother's health throughout pregnancy, the process of labor and delivery, and a child's experiences during the first critical hours and days of life will influence health status for months and years

afterward. Moreover, poor birth outcomes have been associated with impeded cognitive development, reductions in years of formal schooling completed, and lower levels of lifetime earnings and other measures of economic well-being.¹

Recognition of these principles has led policy analysts to give increasing attention to prenatal and neonatal health care services. In this paper we focus on health care services received by pregnant women and infants, and consider the ways in which these services affect child health outcomes. For our purposes, these services include prenatal medical care received by women during the course of their pregnancies, obstetrical care received at the time of delivery, and medical care received by newborn infants during the first 28 days of life (the neonatal period). We consider trends in these services over time, differentials in the receipt of these services among various groups in the population, and the impact utilization of these services has on child health outcomes.

Two population outcome measures to which we devote particular attention are rates of low birth weight (LBW) and infant mortality. A low birth weight baby is one born weighing less than 2,500 grams (about 5½ pounds). The LBW rate is the number of such births per 1,000 live births in the population in a given year. The infant mortality rate is measured by the annual number of deaths among children in the first year of life per 1,000 live births. Because LBW babies have a higher risk of death than normal weight babies, these two rates are closely related. Though birth weight and infant mortality each have a genetic component, birth weight depends very much upon the length and quality of the fetal experience during pregnancy while infant mortality depends also upon the type of care, medical and otherwise, that a child receives after birth. Therefore, these two measures may tell us much about the effectiveness of prenatal and neonatal care.

We begin with a discussion of prenatal care and its relationship to low birth weight and then proceed to a consideration of obstetrical and neonatal care and how they affect infant mortality. We shall also mention some promising new technologies being applied in the field of neonatology.

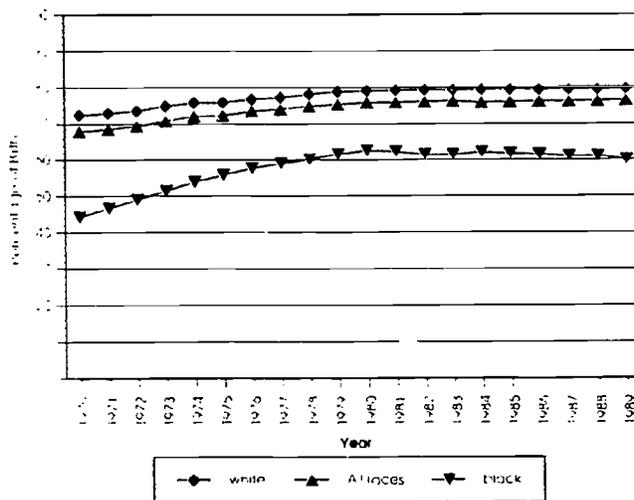
Prenatal Care

Much of what influences the health of a newborn baby is beyond the control of policymakers. Factors such as maternal weight and height at the beginning of pregnancy, heritable genetic conditions, a mother's previous obstetric history, ethnicity, and marital status are conditions that are, to a large extent, fixed with

respect to most policy options. Other factors, however, are amenable to change. A woman's nutritional condition during pregnancy, and her exposure to substances known to be harmful to developing fetuses, her blood pressure, blood sugar levels, and her exposure to sexually transmitted diseases are some of the environmental factors that can influence the health of her newborn baby. These and other conditions, especially if identified early in pregnancy, can be treated so as to improve neonatal outcome. In general, the earlier in the course of fetal development that interventions are initiated, the more favorable the result. For this reason attention to maternal health during the course of pregnancy is central to improving newborn health.

Prenatal care has been shown to be a crucial avenue by which interventions in maternal and thus newborn health status can be delivered. What services are included under this rubric, how receipt of these services has changed over time, and what the evidence is for their effectiveness are considered below.

Figure 1. Percentage of Births with Early* Prenatal Care, 1970-1989



*First prenatal care visit within 3 months of conception (first trimester).

Source: National Center for Health Statistics, U.S. Department of Health and Human Services, Advance Report of Final Natality Statistics, 1989. Monthly Vital Statistics Report, vol. 40, no. 8, supplement, Hyattsville, MD: Public Health Service, 1991.

The Content of Prenatal Care

Access, utilization, and the efficacy of prenatal care have dominated the infant health policy and research agenda for the past 20 years. Until recently, the actual content of prenatal care received relatively little attention. One reason for this omission may have been the repeatedly observed association between the initiation of early prenatal care and healthy infant outcomes. Whatever the content of prenatal care, it seemed to work. The policy implications appeared straightforward: expand prenatal care utilization, and infant health will improve.

Unfortunately, though increasing utilization seems to be a necessary condition for improvements in infant health, it may not be sufficient. As we shall see, for example, when we consider low birth weight rates in more detail, white/black differences in rates of low birth weight and infant mortality have persisted over time despite significant relative gains in the percentage of black women receiving early prenatal care (see figure 1). And although researchers and policymakers can cite a wealth of studies that appear to demonstrate the effectiveness of prenatal care, specific explanations of how the intervention operates remain conspicuously absent from most discussions.

The standard guidelines for prenatal care as recommended by the American College of Obstetricians and Gynecologists (ACOG) call for care to begin as early as possible in the first trimester of pregnancy.² Additional visits are recommended every 4 weeks until the 28th week, followed by visits every 2 to 3 weeks until the 36th week. Beyond the 36th week, visits should occur weekly until delivery for a total of 13 to 15 visits over the course of a normal pregnancy. By contrast, the Panel on Health Service Expert Panel on the Content of Prenatal Care recommends only 7 visits for healthy women who have had previous, uncomplicated deliveries and 9 visits for first-time mothers.³

Both the ACOG and the Panel emphasize that prenatal care should have three basic components: early and continuous risk assessment, health promotion, and when necessary, medical and/or psychological intervention. Although the Panel recommends fewer visits for a healthy woman than does the ACOG, the Panel's most novel contribution is its emphasis on enriching the content of care and on ex-

panding the time frame for prenatal care.³ Panel members urge, for example, that a preconception visit occur as one of the 7 or 9 recommended visits. Such a consultation permits the identification of medical or behavioral problems before conception and offers the mother and clinician the greatest range of options, from delaying the pregnancy to providing immunizations that would be contraindicated once the woman becomes pregnant. Prenatal care, according to Panel members, should also be viewed as a means of promoting the health and well-being of the entire family. Thus, they highlight attention to parenting skills and family counseling as ways to enhance the care and nurturing of the fetus beyond delivery.

The Panel's report focuses on the identification and management of high-risk pregnancies. This includes the possible use of specialized tests such as amniocentesis and ultrasound imaging to screen the genetic and structural development of the fetus; the use of routine blood pressure and blood sugar monitoring, and other blood tests to detect exposure to certain viruses and to verify the mother's blood type; and the occasional use of more specialized tests to evaluate fetal well-being.

Yet the advantages of the more highly specialized of these strategies may be limited. As an example, consider amniocentesis, a procedure in which fluid is removed from the sac containing the fetus to detect the presence of genetic abnormalities. Because congenital abnormalities are a leading cause of neonatal mortality and about 25% of birth defects are primarily of genetic origin,⁴ early recognition of these conditions in time to permit termination of unwanted pregnancies could have a considerable impact on neonatal mortality.

But who should be screened using this procedure? At one time it was thought that amniocentesis should target women over 35 years of age who are at increased risk for having babies with Down's syndrome, one of the more common identifiable chromosomal disorders, which affect about 5,000 newborns a year. Yet, the majority of Down's syndrome births are to younger women,⁵ so a policy of targeting women over 35 years of age for testing cannot by itself substantially reduce the incidence of the syndrome. Furthermore, it is now appreciated that approximately 5% of chromosomal defects which result

in Down's syndrome originate with the father,⁶ making identification of appropriate candidates for screening even more difficult. Therefore, without knowing whom to target, even effective screening procedures such as amniocentesis may have limited impact on overall outcomes.

The recent expansion of Medicaid eligibility for pregnant women may improve the utilization of prenatal care, but that may not be sufficient to improve birth outcomes substantially.

The content of prenatal care recommended by the Panel, including home visits, case management, substance abuse treatment programs, and three categories of psychological risk assessment, is comprehensive and ambitious. Despite the lack of cost-effectiveness evaluations of many of its recommendations, the Panel has outlined a broad agenda that focuses much more sharply on the policy-relevant questions that need to be addressed. The recent expansion of Medicaid eligibility for pregnant women may improve the utilization of prenatal care, but that may not be sufficient to improve birth outcomes substantially.⁷ (See also the Hill article in this journal issue.) By focusing on the content of prenatal care, the Panel has developed a more general framework for understanding why nonspecific interventions may yield disappointing results.

Trends and Differentials in Prenatal Care

As we have seen, standard medical protocol calls for the initiation of prenatal care within the first 3 months of pregnancy. For a time the United States appeared to be making significant progress in the numbers of women receiving early care. Trends in the percentage of live births for which care began in the first trimester by race for the years 1970 through 1989 are shown in figure 1. For white women, the percent receiving early care rose by 9.7% between 1970 and 1980 and then remained the same. For black women, it increased dramatically by 40.5% in the decade of the 1970s and then declined by 2.1% in the decade of the 1980s. The percentage of live births in which there was either no prenatal care or in which prenatal care began in the third trimester conversely

decreased in the 1970s and then either leveled off or increased (not shown).

Figure 1 documents the discrepancy in the prompt initiation of prenatal care between blacks and whites. The rapid increase in the number of black women who received early care in the 1970s reduced but did not eliminate this discrepancy. In 1988, 79.4% of white women and 61.1%

early prenatal care for 90% of all pregnant women regardless of race or ethnicity.¹⁰

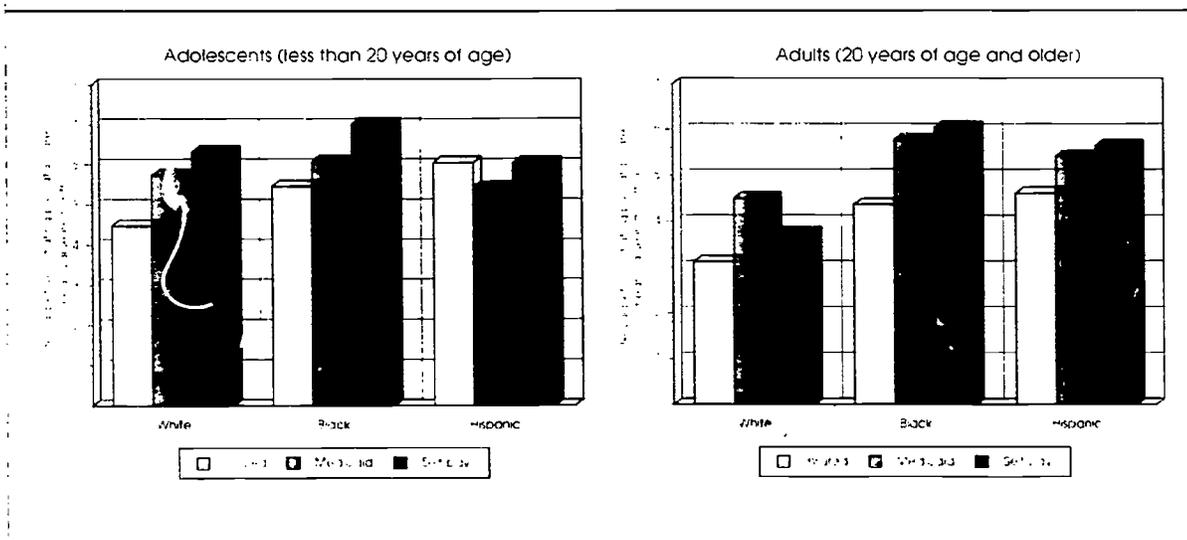
In 1988 the Institute of Medicine conducted a detailed review of the literature dealing with a variety of determinants of the inadequate receipt of prenatal care.¹¹ In addition to age, race, and marital status, the Institute identified poverty, lack of education, lack of health insurance, high birth order, and residence in inner cities and isolated rural areas as key determinants of this outcome (see the Klerman article in this journal issue). The importance of almost all of these factors persisted in analyses that assessed the independent effect of a given factor with other factors held constant.¹² The implication is that an effective strategy to address the problem of inadequate prenatal care may need to operate on several fronts simultaneously.

Lowering financial barriers to the receipt of prenatal care has been a popular tactic of public policymakers because it appears feasible given the traditional tools at their disposal (see the Hill article in this journal issue), but conventional approaches to these problems have their limitations. Medicaid, for example, is often chosen as a convenient vehicle to alleviate financial barriers for poor pregnant women. Yet women whose births are

Women whose births are financed by Medicaid have been found to delay longer before initiating prenatal care than women whose births are financed by private health insurance.

of black women began care in the first trimester.⁸ In the same year, the percentage of black women who received third trimester or no care was more than double the percentage of white women who received third trimester or no care (10.9% versus 5.0%).⁸ Teenagers and unmarried women are also at substantially increased risk of obtaining late or no prenatal care.⁹ Overall, just over 75% of pregnant women received prenatal care in 1989, far below the Public Health Service 1990 goal of

Figure 2. Interval Between Date of Last Menstrual Period and First Prenatal Visit by Insurance Status, New York City, 1984



Source: Joyce, T.J., and Grossman, M. Pregnancy Wantedness and the Early Initiation of Prenatal Care. *Demography* (February 1990) 27:11-17

financed by Medicaid have been found to delay longer before initiating prenatal care than women whose births are financed by private health insurance.^{11,13-15} Figure 2 depicts the magnitudes of these differentials among New York City women of various age, race, and ethnic groups in 1984. Black adults on Medicaid can be seen to delay the initiation of prenatal care approximately 1 month longer than black adults with private health insurance. Similar differentials are observed for white Medicaid versus white private insurance patients regardless of age. Somewhat smaller differentials are also found between the Medicaid and self-pay categories for adolescents and Hispanic adults. These differences are all statistically significant in a multivariate analysis which controlled for a number of confounding factors in addition to age, ethnicity, and insurance status.¹⁴

Why do pregnant women with Medicaid receive less prenatal care than women with private health insurance? The Institute of Medicine lists factors such as the time-consuming nature of the Medicaid enrollment process, the failure of some physicians to accept Medicaid patients, long travel times and clinic waits, and lack of information and unfavorable attitudes concerning prenatal care. These factors underscore the potential value of outreach programs and programs that aim to deliver, as opposed to finance, prenatal care for the poor.¹¹

Beyond the financial barriers to prenatal care, certain demographic factors have begun to receive increasing attention. Marital status has been of particular relevance in this regard because changes in this factor have been dramatic over the decade of the 1980s. The number of births to unmarried mothers rose 64% over this period. And while the birth rate (that is the number of births per 1,000 women in a given category) for married women actually declined 6% between 1980 and 1989, the birth rate for unmarried women increased 42%. As a result of these trends, more than 1 baby in 4 was born to an unmarried mother by 1989.¹⁶ The increase in the birth rate for unmarried women has alarming implications for infant health because unmarried mothers are more than three times as likely as married mothers to obtain late or no prenatal care and because the association of marital status and receipt of prenatal care remains

largely unelucidated. It will be important to determine whether unmarried women receive less prenatal care because of financial barriers, educational differentials, general lack of social support, or other factors which may be difficult to measure. Each of these explanations implies different policy approaches.

Efficacy of Prenatal Care

The consensus of an extensive literature on the efficacy of prenatal care is that care works. In particular, women who initiate care earlier in their pregnancies give birth to healthier infants, are less likely to give birth to an infant weighing less than 2,500 grams, and are less likely to give birth to an infant who dies in the neonatal period. Following a detailed review of the literature, the Office of Technology Assessment concluded: "The weight of the evidence on the effectiveness of prenatal care . . . supports the contention that birth outcomes can be improved with earlier or more comprehensive prenatal care. . . . The evidence appears to support the value of both early and frequent prenatal

The evidence appears to support the value of both early and frequent prenatal care and the provision of enhanced services to adolescents and high-risk women.

care and the provision of enhanced services to adolescents and high-risk women."¹⁷ Several years earlier, the Institute of Medicine reached a similar conclusion: "The overwhelming weight of the evidence is that prenatal care reduces low birth weight. This finding is strong enough to support a broad, national commitment to ensuring that all pregnant women, especially those at medical or socioeconomic risk, receive high-quality care."¹⁸

While this consensus is impressive, certain considerations suggest that caution is required in interpreting and applying it. Despite the agreement, for example, of most researchers and policy analysts that prenatal care improves newborn health, there is no consensus on the quantitative relationship between the intensity of care delivered and the improvement in birth outcomes. Yet this may be the critical issue in deciding how to allocate scarce re-

sources among different programs designed to achieve better newborn health outcomes.

No agreement exists on the relative magnitude of the effect of prenatal care because studies on this subject do not use data from prospective, randomized controlled trials. This raises the possibility that the results which emerge are biased and either over- or underestimate the true effect of prenatal care on newborn health outcomes.¹⁹

For example, the true effect of prenatal care is underestimated in studies where women who anticipate a problematic birth outcome based on conditions unknown to the researcher seek out more care while women with positive expectations seek out less. The opposite occurs when the early care group is dominated by women who eat more nutritiously, suffer less stress, smoke less, and receive more emotional support from their families. Omission of these hard-to-measure factors overstates the impact of care.

The importance of correctly measuring the efficacy of prenatal care is illustrated by consideration of the Public Health Service goal of care within the first trimester of pregnancy for 90% of all pregnant women. To achieve this goal, the number of white women receiving early care must rise by approximately 12%, and the number of black women receiving such care must rise by almost 50%. Achieving this goal may be a costly undertaking, and even if care is efficacious, birth outcomes may not improve substantially if there are marked differences in the content of care or in other characteristics between new and current recipients. Moreover, it is not clear that

limited resources would be better spent increasing the proportion of women who receive early care rather than increasing the number of women who get intermediate care (second trimester care) by reducing the number who get late or no care. Recent research by Joyce suggests that most of the gains to prenatal care in New York City accrued from moving women from the inadequate care to the intermediate care category and that the gains from moving women from the intermediate care category to the early/adequate care category are much smaller.²⁰ The Joyce study does not address the issues of how care works or of whether resources are better spent on increasing the rates of earlier initiation of care or on enhancing the content of care for women at particular risk for an unfavorable birth outcome. These are all important questions for those with limited resources looking to implement programs to improve birth outcomes.

In considering what we know about the receipt of prenatal care services and its effect on infant health outcomes, we are left in a situation in which we have good theoretical reasons to believe that prenatal care is important to produce healthy newborns; we have evidence, imperfect though it is, that groups who receive more prenatal care have better neonatal outcomes than groups who receive less, though how much better those outcomes are remains a subject of dispute; and we can see that over time, for different groups, as the receipt of prenatal care increases, so does the percentage of good outcomes.

Yet our knowledge is far from complete, chiefly because we do not know how prenatal care works or, for that matter, how well. And though these questions become relevant only once the issue of whether prenatal care works has been definitively addressed, they are still of great importance in and of themselves. If, for example, prenatal care serves principally to identify high-risk women early and intervenes to minimize the effect of pre-existing risk factors in these women, then from the standpoint of policy alternatives, populations in which known risk factors are particularly prevalent should be preferentially recruited into prenatal care. This might involve extensive outreach and case management efforts including reducing financial barriers, relocating facilities into underserved areas, and providing child care for women using these services.



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If, on the other hand, improved neonatal outcomes derive from the elimination of risk factors either before or very early on in the pregnancy, then one could argue that strategies such as reducing exposure to tobacco, to illicit substances, or to other environmental stresses should receive priority. Settings other than prenatal service centers may more efficiently produce these policy objectives. Future research on these critical questions will be of enormous utility to policymakers.

Obstetric and Neonatal Care

If birth weight is a valid indicator of the intrauterine experience and thus, indirectly, of the effectiveness of prenatal care services, infant mortality (death within the first year of life) is an indicator of the quality and impact of obstetric and neonatal care services. Because, in countries like the United States, most children who die in the first year of life do so in the first month, those factors that influence the birth process and the immediate postnatal condition of the baby may be expected to have a discernible impact on the infant mortality rate. To appreciate what the receipt of obstetric and neonatal care means for the health status of children, we begin with a look at infant mortality.

Infant Mortality

Much progress has been made in reducing the U.S. infant mortality rate during the twentieth century. It fell from 100 deaths per 1,000 live births in 1915 to 9.1 deaths per 1,000 live births in 1990.²¹ Improvements in medical care and advances in medical technology played an important role in this process, particularly the introduction of sulfonamide and other antimicrobial drugs in the period from 1935 to 1950²² and advances in neonatology since the late 1960s.^{23,24} Until recently, the only interruption in the downward trend in infant mortality occurred in the late 1950s and early 1960s.²⁵

There are two components of infant mortality: neonatal mortality and postneonatal mortality. The former refers to deaths of infants before the first 28 days of life, while the latter refers to deaths of infants between the ages of 28 and 365 days. Neonatal deaths are usually caused by congenital abnormalities, conditions associated with prematurity, and complications of delivery; while postneonatal

mortality results primarily from sudden infant death syndrome (SIDS), infectious diseases, and accidents. In the early 1900s, approximately 70% of all infant deaths occurred in the postneonatal period. By 1989, only 36% of infant deaths occurred in the postneonatal period. Unlike earlier in this century, recent trends in the infant mortality rate have been dominated by declines in the neonatal mortality rate. Today, the mortality rate (that is, the chance of dying) for a baby's first month of life is more than twice as high as the mortality rate during the remainder of the first year.

Neonatal mortality, in turn, is highly negatively correlated with birth weight so that the birth weight distribution of a population is a major determinant of its neonatal mortality rate. Those populations with higher proportions of low (less than 2,500 grams) and very low (less than 1,500 grams) birth weight babies have higher rates of neonatal mortality. Once the distribution of birth weights in a population is taken into account, the mortality rates specific to each birth weight category are determinants of overall neonatal mortality. By multiplying the proportion of births in each birth weight group by the birth weight specific mortality rate for that group, one arrives at the overall neonatal mortality rate for a population.

Despite the rapid decline in infant mortality, substantial differences in this outcome and in its most proximate determinant—low birth weight—have persisted between different groups over time.^{26,27} The most notable of these is the excess mortality of black babies who presently experience an infant mortality

Black babies presently experience an infant mortality rate twice that of their white counterparts.

rate twice that of their white counterparts. In addition, the black low birth weight rate has typically been more than twice as large as the white rate. Among the Hispanic population, Puerto Rican women give birth to LBW infants at approximately three-fourths the rate of blacks, while the low birth weight rates of other Hispanics are similar to those of white non-Hispanics.²⁸

In addition, the U.S. infant mortality rate remains higher than those of a number of other developed countries even when the rate is limited to whites.¹⁷ Finally, Marks and others report that in 1980 "differences between the States of the U.S. in infant . . . mortality are greater than those between the U.S. and the countries of Scandinavia [with the lowest infant mortality]."²⁹

These facts have led some observers to conclude that U.S. infant mortality policy has reached a crossroad.³⁰ Two decades of dramatic declines in infant mortality have failed to improve the survival prospects of black infants relative to white infants or of white infants born in the United States relative to those born in other developed countries. Moreover, during the decade of the 1980s, tentative evidence emerged that the period of rapid decline may have ended. The fall in mortality slowed to an average year-to-year reduction of 2.5%,³¹ and the incidence of low birth weight stopped declining. In 1984 the fraction of LBW births reached an all-time low for both races: 5.59% for whites and 12.36% for blacks. The corresponding figures in 1989 were 5.7% for whites and 13.5% for blacks.^{16,32}

The U.S. infant mortality rate remains higher than those of a number of other developed countries even when the rate is limited to whites.

The infant mortality rate in 1990 was 6% less than the rate in 1989.³³ The introduction of treatment with artificial surfactant, which helps prevent deaths of premature infants from respiratory distress syndrome, and the expansions in Medicaid coverage for prenatal care may have contributed to this decline.³¹ Obviously it is too early to determine whether this change represents a reversal of the deceleration in the downward trend during the 1980s. It is clear, however, that three important 1990 infant health goals of the Public Health Service as set forth in *The 1990 Health Objectives for the Nation: A Midcourse Review* have not been met.¹⁰ These are an infant mortality rate no higher than 12 per 1,000 live births for any minority group (the black rate was 17.6 per 1,000 live births in 1988), a low

birth weight rate of 5% of all infants, and a low birth weight rate of 9% for any minority group.

Trends in Obstetric Services

Where a child is born, how that child is delivered, and who attends the delivery may all be important determinants of neonatal outcome under certain circumstances. The volume of obstetrical procedures in the hospital where birth occurs, for example, has been shown to be related to survivorship in low birth weight babies though not in term, normal birth weight babies.³⁴ Recent trends indicate that increasing numbers of infants in the United States are being born in the hospital. For white infants the percentage of babies born in a hospital rose from 96.6% in 1975 to 98.7% in 1989, while for non-white infants the comparable percentages were 94.6% in 1975 and 99% in 1989.³⁵

In addition to in-hospital deliveries, cesarean section rates have also been on the rise since the middle of the 1960s. In 1965 the chances of being born via cesarean section were about 1 in 20. By 1989 the likelihood had increased to 1 in 4. Most authors attribute this rise to the increase in electronic fetal monitoring, changes in the legal atmosphere surrounding obstetrical care, and the policy of discouraging spontaneous vaginal deliveries in women who have undergone previous cesarean sections.³⁶ The increase in these procedures has not been shown to have any positive contribution to neonatal outcome.³⁷

Trends in Neonatal Intensive Care

As we noted earlier, the most important component of infant mortality in the United States today is the death rate of babies less than 28 days old. This rate, in turn, depends upon the distribution of birth weights in a population and the specific death rate associated with each birth weight category.

In the first part of this paper we discussed some of the factors that influence the birth weight distribution of a population, particularly the provision of adequate prenatal care for pregnant women. We now turn our attention to developments that have influenced birth weight specific mortality rates. The most important of these has been the expansion in the availability of neonatal intensive care services.

Over the past 2 decades in the United States, the single most significant trend in the delivery of neonatal health services has been the emergence of regionalization as a guiding principle in the provision of care for high-risk mothers and newborn babies.³⁸ Many hospitals began to introduce intensive care units for newborns during the decade of the 1960s, but it was not until the early 1970s that a comprehensive set of guidelines was developed to organize the distribution of these services within given geographic areas by incremental levels of intensity.

The 1977 National Foundation–March of Dimes recommendations,³⁹ subsequently refined by the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists,⁴⁰ include three levels of infant care: (1) Level I nurseries to provide routine newborn care; (2) Level II nurseries, manned by board certified pediatricians, to provide care to seriously ill infants with life-threatening conditions for finite periods and to maintain ongoing liaisons with (3) Level III nurseries which serve as regional referral centers offering the most sophisticated neonatal care including specialized respiratory support systems, pediatric surgery services, and infant transport teams capable of delivering seriously ill neonates to and from the hospital.

In practice there has been some blurring of the distinction between Level II and Level III nurseries as the competition for patients has intensified in recent years.⁴¹ Nevertheless, specific standards have arisen for adequate staffing, physical design, ancillary services, and transport facilities appropriate to the most advanced levels of neonatal care.^{40,42}

During the decade of the 1980s, the number of Neonatal Intensive Care Units (NICUs)—combined Level II and Level III units—in U.S. hospitals has risen dramatically (see figure 3). While the total number of hospitals, as surveyed by the American Hospital Association in their annual survey, rose 14.33% from 1979 to 1988, the number of NICUs climbed 44.33% from 485 to 700 and the number of NICU beds increased 66.97% from 6,591 to 11,005 during this period.⁴³

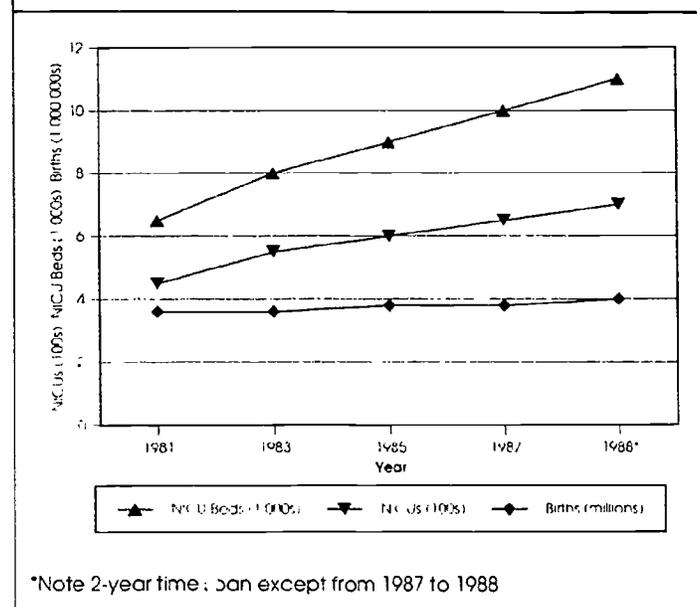
Although no national data bases exist which provide information on the utilization rates of these NICUs, the Office of Technology Assessment (1987) estimated that there were between 150,000

and 200,000 admissions to NICUs annually in the mid-1980s.⁴⁴ In recent years, anecdotal evidence suggests that a greater and greater proportion of NICU admissions have gone to infants weighing less than 1,500 grams while the proportion of admissions of moderately low birth weight infants has declined.⁴⁴ One study from Cleveland reported increases in the numbers of extremely low birth weight admissions (babies born weighing less than 751 grams) from the early to the late 1980s of 30%.⁴⁵ Whether these trends result from recent tendencies to focus more aggressive resuscitative efforts on smaller and smaller neonates remains to be fully elucidated. Whatever the origin of this trend to lower birth weight NICU admissions, this development inevitably forces policymakers to confront the question of how much improvement in health outcomes can reasonably be anticipated from such high tech attention to smaller and smaller babies.

Efficacy of Neonatal Intensive Care

In view of the rapid growth in the number of NICUs during the past 15 years, the substantial expense attendant upon caring for newborns in such environments, and

Figure 3. Trends in Number of NICUs, NICU Beds, and Births



Source: American Hospital Association, *Hospital Statistics*. Chicago: American Hospital Association, 1980, 1989.

the trend to lower birth weight NICU admissions, it was inevitable that questions would arise as to whether the expenditure of such prodigious resources was worthwhile. (See the Lewit and Monheit article in this journal issue.) Clinicians, epidemiologists, and economists have all addressed this issue, with each group approaching it from the vantage point of its own particular discipline.

As practitioners, neonatologists have been anxious to demonstrate that the specific content of care provided by NICUs makes a difference in the outcome of patients treated there.

As practitioners, neonatologists have been anxious to demonstrate that the specific content of care provided by NICUs makes a difference in the outcome of patients treated there. To make this case, investigators have applied two different methods. One approach compares the experiences of successive cohorts of infants treated at the same institution during two time periods to show how the development of new technologies has improved birth weight specific survival rates for all but the very smallest babies.^{45,46} Increasing willingness to refer high-risk pregnancies to centers with neonatal intensive care units, the antenatal use of steroids to hasten fetal lung development, improvements in techniques to assist breathing artificially, and the ability to provide adequate intravenous nutrition to extremely immature infants have all been implicated in the trend toward increased birth weight specific survival over time.

A second type of study makes use of cross-sectional comparisons among several NICUs to demonstrate that different applications of similar technologies may also affect outcomes.^{47,49} After controlling for the potentially confounding influences of race, birth weight, and gender, these investigations were still able to demonstrate significant intercenter differences in various outcome measures. The results of these studies imply that appropriate application of assisted mechanical ventilation in NICUs can significantly reduce morbidity and mortality among immature newborns.

Epidemiologists have looked at the impact of neonatal intensive care on the mortality rates of entire populations and have come to the conclusion that new neonatal technologies, properly distributed, provide significant improvements in this measure of health status. For example, an early Canadian study covering the period 1967 to 1974 documented a 43% decrease in the neonatal mortality rate for the province of Quebec coincident with several important institutional developments including (1) an increase in the proportion of sick and premature newborns cared for in referral centers; (2) the establishment of perinatal intensive care units in two university hospitals; and (3) the regionalization of the high-risk obstetric service associated with McGill University, where fully 14% of the province's births occurred.⁵⁰ The authors of this study were able to show that the improvement resulted from decreases in mortality rates within birth weight categories, not from any dramatic shift in the birth weight distribution itself, and that the diffusion of specialized care both to high-risk mothers and their newborn infants played a significant role in the observed decline in Quebec's neonatal mortality rates. Subsequently, Lee and his colleagues arrived at similar conclusions using data from the United States for the period between 1950 and 1975.⁵¹

When considering the effectiveness of neonatal intensive care, economists have used their particular skills to accomplish two functions: (1) to estimate the magnitude of improvement in outcome associated with neonatal intensive care and (2) to construct cost-benefit or cost-effectiveness analyses of these services.

As an example of the first type of contribution, Harris reported that an increase in the annual volume of deliveries in the hospital of birth lowered the probability of neonatal death (including late fetal death) among black babies in Massachusetts in 1975–1976.⁵² A 10% increase in the annual volume of deliveries was found to lower the death rate by approximately 5%.⁵³ A similar approach using data for white infants born in Michigan in 1984 found that birth in a hospital with a neonatal intensive care unit lowered the probability of a late fetal or neonatal death by approximately 30%.

This type of analysis has been generalized to examine the impact of the use of

neonatal intensive care services on neonatal mortality using data that cover almost the entire U.S. population. These studies show that a 10% increase in neonatal intensive care use was found to lower the mortality rate of white low birth weight infants by 2%. For black infants, a 10% increase in use lowered the death rate by 3%. These findings indicate how much improvement in mortality can be expected from increases in the availability of neonatal intensive care to low birth weight babies.⁵⁴

Cost-effectiveness of Neonatal Intensive Care

Faced with limited resources and the need to make decisions about the implementation of costly but effective programs to improve infant health, policymakers have increasingly relied on the tools of cost-benefit and cost-effectiveness analysis to help determine whether the observed improvements in health are worth the costs expended to achieve them. Yet these techniques are not easy to apply.⁵⁵ First, because traditional accounting practices within hospitals use revenue from one source to offset shortfalls elsewhere (a practice known as cost shifting), dollar costs of neonatal intensive care are often difficult to determine accurately. Furthermore, costs of the long-term care required by some severely disabled NICU survivors are also difficult to estimate. On the benefits side, the probabilities of various outcomes are not easily determined and vary substantially among institutions. Moreover, to perform a full cost-benefit analysis, it is necessary to assign a monetary value to survival with and without different degrees of disability. This often proves an intractable problem. As a result of these difficulties, the conclusions drawn from cost-benefit studies must be regarded with caution.

Despite these and other obstacles, however, attempts have been made to compare the costs and benefits of neonatal intensive care in monetary terms. Budetti and his colleagues concluded that, while NICU care for babies weighing less than 1,500 grams was marginally cost-effective given the data available to them at the time of their analysis, such care for infants weighing less than 1,000 grams was not.⁵⁵ Because of the potentially large expenditures required to care for severely disabled NICU survivors, as the numbers of such survivors increased in lower birth weight

groups, Budetti and his colleagues found that the costs of providing this type of care began to substantially outweigh the benefits. Other investigators have reached similar conclusions.⁵⁶

To perform a full cost-benefit analysis, it is necessary to assign a monetary value to survival with and without different degrees of disability.

In a very careful analysis conducted in Hamilton-Wentworth County in Ontario, Boyle and others used cost-benefit, cost-effectiveness, and cost-utility analysis to evaluate NICU care.⁵⁷ In the last of these approaches, an attempt is made to adjust life-years gained by a factor which takes into account the quality of life for individuals who survive with disabilities. As in previous studies, the findings were birth weight dependent. For infants in the 1,000- to 1,499-gram range, the cost of neonatal intensive care was found to be \$59,500 (1978 Canadian dollars) per survivor, \$2,900 per life-year gained, or \$3,200 per quality-adjusted life-year gained. The corresponding figures for infants in the 500- to 999-gram category were \$102,500, \$9,300, and \$22,400. The authors concluded that "by every economic measure neonatal intensive care for infants weighing 1,000 grams to 1,499 grams is superior to neonatal intensive care for infants weighing 500 grams to 999 grams." Neonatal intensive care for the lower birth weight group appeared to generate a net economic loss in all scenarios analyzed. Yet, when the analysis focused on clinical outcomes, it yielded a different conclusion. Here it was found that neonatal intensive care for infants weighing 750 grams to 999 grams at birth resulted in the largest survival gain for any subgroup. The apparent inconsistency introduced by evaluating neonatal intensive care from these alternative perspectives highlights the difficulties attendant to decision making regarding high-cost, high technology medical services.

As authors of these and other studies are quick to point out, cost-benefit analyses can help identify those programs that not only provide a health benefit to participants but also pay for themselves in an economic sense. Programs that are considered cost-beneficial produce not only a



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survivor for the cost outlay, but also the future economic productivity of that survivor. Because this situation is akin to a man's going into a store to buy a loaf of bread and coming out with not only the bread but also more money than when he went in, it is a very restrictive criterion by which to judge a medical intervention. More pertinent questions to pose, especially if costs outweigh the benefits in dollars generated by a program, are (1) whether society deems the net costs worth undertaking in view of the health benefits produced by the program under consideration and/or (2) whether alternative, less costly strategies exist to achieve similar health outcomes.

Knowing that the economic costs of caring for very low birth weight infants (those weighing less than 1,000 grams) outweigh the economic benefits forces policymakers to decide either that these expenditures are worthwhile despite the costs or that alternative strategies for saving infants' lives need to be entertained.

A recent study by Joyce, Corman, and Grossman speaks directly to this dilemma.⁵⁸ They found that expansion of prenatal care is a more cost-effective method of saving additional infant lives than expansion of neonatal intensive care. For whites, the cost of saving an additional life by expanding the number of women who receive prenatal care in the first trimester is \$31 per additional life saved in 1984 dollars. The cost of saving an additional life by expanding the number of low birth weight babies who receive neonatal intensive care is \$2,834 per additional life saved. The comparable figures for black women and infants are \$39 in the case of

prenatal care and \$2,150 in the case of neonatal intensive care.⁵⁹ These cost-effectiveness ratios although suggestive are far from definitive because they do not consider improvements in neonatal intensive care technology. As with many policy alternatives, changes in technology, particularly in rapidly developing fields of inquiry, may be expected to shift the advantage of one or another approach to a given problem over time.

New Neonatal Technologies

Faced with the desire to improve the health of newborns and rapidly rising costs for the care of sick infants, the policymakers' dilemma is that not all technological innovations with potential clinical application may be cost saving. Two examples of recent improvements in NICU respiratory care, artificial surfactant and extracorporeal membrane oxygenation (ECMO), illustrate this point.

During the first week of life, many premature infants are faced with the problem of breathing effectively with immature lungs. When clinically significant, this problem is called respiratory distress syndrome (RDS). RDS results from the failure of the premature infants' lungs to produce surfactant, a substance that allows the small air sacs in the lungs of premature infants to remain inflated during all phases of respiration. Providing premature newborns with exogenous surfactant ameliorates RDS. Since the efficacy of exogenous surfactant was demonstrated in 1980, it has been synthesized commercially and is now instilled in the windpipes of newly born premature infants in an attempt either to prevent or to treat RDS and thereby decrease the accompanying morbidity and mortality.

The early experience with artificial surfactant has been favorable.⁶⁰⁻⁶⁸ At a wholesale cost of approximately \$900 per treatment for a neonate, it is relatively inexpensive and can be administered at virtually any Level II or Level III nursery without special equipment or monitoring. A recent analysis from England suggested that the use of surfactant was cost-effective in very low birth weight infants,⁶⁹ and there has been speculation that the dissemination of the use of this material was responsible for the decline in infant mortality witnessed in 1991.⁷⁰

The second technology mentioned, ECMO, is a technique for bypassing the newborns' lungs altogether by placing the

child on a machine similar to one used during open heart surgery. Not indicated for routine use in premature babies with RDS, ECMO is reserved for desperately ill, full-term babies whose condition is unresponsive to the conventional treatment of respiratory assistance. Very few newborns are candidates for ECMO so the potential effect of ECMO on neonatal mortality is limited. Nonetheless there appear to be more centers in the United States with the capability to perform ECMO than are warranted by the number of infants who would benefit from the therapy.⁷¹ Accordingly, there is concern that the therapy may be used inappropriately and that costs associated with this technique may be difficult to contain. As Southgate, who studied the use of ECMO in Georgia concluded, "Short-sighted proliferation of ECMO units will almost certainly result in an increased consumption of shrinking health care dollars, as well as the unnecessary duplication of services. . . ."⁷²

Careful analysis of both the cost and the clinical efficacy of new technologies would be helpful in guiding the allocation of resources so as to optimize both infant survival and the ultimate health of survivors.

Conclusion

We have considered the impact of prenatal, obstetrical, and neonatal care on the most important and easily measured outcomes of infant health, namely the rate of low birth weight births and the rate of infant mortality. Though not all the studies published to date have been well controlled, abundant evidence has accumulated demonstrating that these two outcome measures do respond to the application of appropriate health services.

Despite the recent slowing in the rate of decline of infant mortality and the leveling off in the decline of the low birth weight rate, there are continued reasons for optimism. The discrepancies that persist between white and nonwhite low birth weight rates imply that an improved distribution of prenatal care services could have a significant impact on the rate of low birth weight births. The development of new agents to aid in the treatment of respira-

tory distress syndrome raises hope that more widespread application of such treatments will significantly improve neonatal survival as well. Finally, expanded regionalization of prenatal, obstetric, and neonatal care in a coordinated approach to the entire continuum of gestation, labor, delivery, and early development holds out the promise of greater progress on both fronts. Though there is reason to be optimistic, recent experience has highlighted the needs of mothers and infants with emerging special problems. These include the increase in high-risk pregnancies caused by maternal substance abuse (see the Spring 1991 issue of *The Future of Children*, which deals with this problem) and pregnancies complicated by HIV infection which, although few in number, present the problems of severe chronic illness in both the mother and the infant (see the article by Perrin and Guyer in this [Winter 1992] journal issue for a more complete discussion of HIV infection in children). Perhaps the greatest challenge, however, because of the sheer number of individuals affected, is to improve birth outcomes in the face of increasing rates of poverty and an increase in the number of births to poor families.¹⁸

The advance of obstetrical technology into more advanced genetic and fetal screening,⁷³ fetal therapies to ameliorate potentially serious infant conditions before birth,^{74,75} and other technologies such as home uterine monitoring to detect possible premature labor⁷⁶ as well as continued advances in neonatology may present both problems and benefits. Though there is clearly progress to be made, the politics of competing claims on limited resources dictates that those programs and activities which can deliver the greatest potential improvement in newborn survival for the least investment are likely to prove the most attractive to decision makers. The effort to identify such programs and activities deserves a prominent place on the research agenda in the immediate future.

We are indebted to Victor R. Fuchs and Eugene M. Levit for helpful comments on an earlier draft. We wish to thank Patricia DeVries for research assistance.

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Health Care Services for Children and Adolescents

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Abstract

The authors of this paper identify risks to health and other factors that determine the need for health care services among children and adolescents. They document service utilization patterns in the areas of well-child care and immunizations, acute ambulatory care and hospital services, and injury prevention. They also acknowledge the special health care needs of adolescents and of children with chronic illnesses.

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It appears that neither the traditional personal health service delivery system nor the public health system alone can effectively provide all of the health services children need. Collaboration between public health and personal health service providers is essential to future efforts to improve the health of children and adolescents. Recommendations include development of community-based preventive care programs in all parts of the country, extension of current traditional primary care capabilities, assurance of access to primary care services, enhancement of public health activities, expansion of specialized adolescent health programs, and coordination of a comprehensive set of medical and other services for children with chronic illness and their families. The authors conclude that, to be effective, future health system reforms must be implemented through a coordinated program of care rather than through competing systems of services.

The control of infectious diseases and the recognition of the value of preventive care have dramatically changed the health care needs of children. Infectious diseases such as pneumonia and influenza accounted for about 25% of deaths of children from 1 through 5 years of age in 1950; by 1976, they accounted for less than 10%.¹ Infant mortality rates in the United States dropped from 47 per 1,000 live births in 1940 to less than 10 in 1990. Postneonatal mortality rates (deaths to infants 28 days to 1 year old) dropped during the same period from 18.3 to 3.7 per 1,000 live births.² (See the article by Racine, Joyce, and Grossman in this journal issue.)

New problems—including injuries, the effects of environmental toxins, family violence, homelessness, and disorders of development—increasingly define health care issues for children today. Injuries have emerged as the major cause of childhood mortality, morbidity, and disability.^{3,4} Changing patterns of illness among adolescents have focused attention on tasks of healthy development, including the promotion of physical fitness and healthy sexual behaviors, and the prevention of injury, substance abuse, unwanted pregnancy, sexually transmitted disease, and violence, as reflected in homicide, suicide, and major trauma. (See the article by Starfield in this journal issue.)

Changing health care needs have led to changes in patterns of outpatient and inpatient hospital utilization. Physician and nursing services delivered in physicians' private offices, hospital outpatient departments, and clinics are increasingly preventive. In addition to routine immunizations, these services include behavioral counseling, parent education, and health promotion guidance to families. Rates of inpatient hospital care have declined, as have lengths of stay, indicating both the changing patterns of illness and also greater use of ambulatory settings for the treatment of many acute and chronic health conditions.^{5,6} New technologies frequently play an important role when a child is hospitalized and when sophisticated care in the home and other nonhospital settings is needed.⁷

***Changing health care needs
have led to changes in patterns
of outpatient and inpatient
hospital utilization.***

Other important trends in the past 2 decades include the growth of consumerism, increased survival of children with severe long-term illnesses, greater use of legislation and regulatory mechanisms to improve child health, and higher rates of childhood poverty. Consumerism has led to greater interest in self-care and care by parents. Parents and family members provide significant amounts of care for minor illnesses without direct contact with health providers. Children provide more of their own care as they mature, and the few data available suggest extensive treatment with over-the-counter medication.^{8,9} The family also has a major role in prevention, especially in promoting home safety, seat belt and bicycle helmet use, a healthy diet, and exercise.

Government programs and specific legislation to protect children have major impacts on the health of American children and on the service delivery system. Since the mid-1960s, Medicaid has become the

major source of health insurance for poor children. (See the article by Hill in this journal issue.) Other federal and state programs, including maternal and child health programs and community health centers, provide access to primary health care services.^{10,11} Further efforts to protect children's health include legislation that requires packaging designed to prevent poisoning,¹² flame retardant sleepwear,¹³ and automobile passenger restraints for children.¹⁴ Other health promotion efforts for children include the fluoridation of water and the federal vaccine program. Media campaigns linked to housing codes have led to lower water heater temperatures and decreased risks of childhood hot water scalds.¹⁵

The long-term survival of children with chronic illnesses and physical disabilities, some of whom have associated developmental disabilities, has greatly improved,¹⁶ and these changing rates affect the organization and provision of health services for children. Poverty among children may offset many of the advances in child health care, however. Poverty is associated with increasing rates of poor health and childhood disability¹⁷ (see the article by Starfield in this journal issue) as well as greater use of more expensive health care services, especially inpatient hospital and emergency room care.¹⁸

In this paper, we have three objectives: (1) to identify risks to health and other factors that define the need for health care services among children and adolescents; (2) to document service utilization patterns in relation to these needs and barriers to services; and (3) to argue that future efforts to improve the health of children and adolescents must focus on community-level outcomes and include multidisciplinary models of care.

Risks to Health and the Need for Services

Use of health services among children and adolescents is determined by a complex interaction among patterns of illness, protocols for preventive health care, features of third-party reimbursement plans, and factors that facilitate or create barriers to care.

Infants, Preschool, and School-age Children

Most childhood illnesses are self-limited, that is, they typically improve whether or not they are treated. The purposes of surveillance and treatment of these conditions are (1) to decrease pain and discomfort; (2) to decrease the impact of minor illnesses on daily life (such as school or child care attendance and interruption of parental routine, including work) by decreasing the severity of symptoms or the length of illness; (3) to minimize consequences or complica-

tions of illness (such as the treatment of streptococcal infections to prevent rheumatic fever); and (4) to identify the relatively rare serious condition among the much larger number of minor illnesses.

The health care needs of children are not defined by the patterns of injury and disease conditions alone. New morbidity conditions—including behavior disorders, disorders of development, adjustment problems in adolescence, psychosocial issues related to chronic illness, family violence, and abuse, and exposure to environmental hazards¹⁹ such as lead—may also respond to medical care.²⁰ Figure 1 provides estimates of the relative prevalence of several of these conditions.

To some degree, changing utilization patterns of personal health services reflect this changing morbidity, although these changes may be poorly described in studies of child health services utilization. (See the article by Starfield in this journal issue.) Many physicians have had

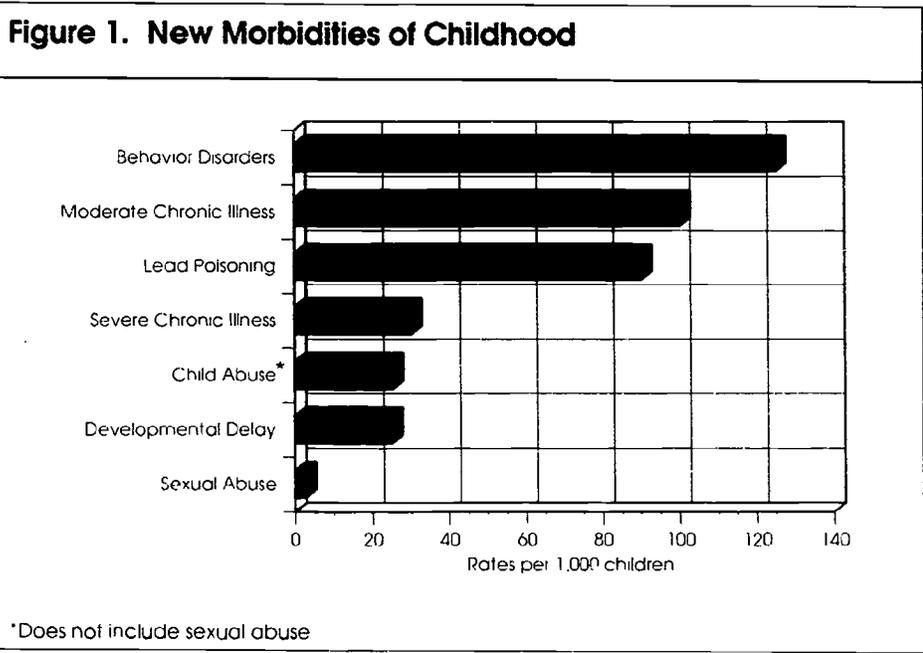
little training in these new areas, such as in responding to the more than 1 million children nationwide who experience abuse or neglect.²¹ The current limited reimbursement for care of some of these conditions also discourages practitioners from using these labels to define the reasons for visits with the result that their true prevalence is underestimated. Current efforts to expand coding mechanisms for childhood behavioral and developmental conditions may positively affect identification and reimbursement.^{22,23}

Routine programs of screening have become an integral part of the delivery of child health services. Since 1961, when screening for phenylketonuria (PKU) began, the availability of simple screening procedures for the detection of inborn errors of metabolism in the neonatal period has resulted in a decrease in the number of infants suffering the adverse effects of preventable conditions. Screening for PKU and congenital hypothyroidism is routinely conducted in all 50 states and the District of Columbia. Approximately 4,500 cases of diseases that can lead to death or mental retardation are detected each year through the use of newborn screening.²⁴

Routine preventive health care can be scheduled at intervals corresponding to the recommended immunizations against diphtheria, pertussis, and tetanus (DPT); poliomyelitis; hemophilus influenza; and measles, mumps, and rubella (MMR). Immunization against hepatitis B has recently been added to recommendations. Beyond immunizations, children may also be screened for specific illnesses or health conditions, including lead intoxication, hearing and visual problems, scoliosis, tuberculosis, and iron deficiency anemia.²⁵ Also recommended are targeted screening for sickle cell disease and for hypercholesterolemia. In addition, pediatric practice is an appropriate setting for assessing risks of developmental, behavioral, and educational problems, and for searching for problems in the family, such as parental depression, substance abuse, physical and sexual abuse, or smoking.

Content of Well-child Care

The content of well-child care can be assessed in two broad areas: reducing child mortality and morbidity, and promoting optimum growth and development.²⁶ The goal of reducing child mortality and morbidity includes disease detection through the physical examination and other



Source: U.S. Department of Health and Human Services. *Healthy People 2000 National Health Promotion and Disease Prevention Objectives*. Washington, DC: U.S. Government Printing Office (DHHS PHS 91-50212), 1991; Newacheck, P.W., and Starfield, B. Morbidity and Use of Ambulatory Care Services Among Poor and Non-poor Children. *American Journal of Public Health* (1988) 78:927-33.

screening mechanisms and disease prevention through immunization. Despite a substantial literature which shows that few physical abnormalities are discovered during the routine well-child physical examination,^{24,26,27} this aspect of well-child care continues to occupy the bulk of time in physician visits.²⁸

The Committee on Practice and Ambulatory Medicine of the American Academy of Pediatrics (AAP) currently recommends six well-child visits during the first year of life, six visits over the next 4 years, and visits every other year to age 20. In addition, the AAP recommends one maternal prenatal visit to a pediatrician for anticipatory guidance (for example, what to expect regarding sleep and crying patterns and how to cope with them) and to collect the pertinent medical and family history.²⁹ (See the article by Racine, Joyce, and Grossman in this journal issue.) The guidelines recommend taking a history and measurements (height, weight, head circumference through the first year of life, and blood pressure after age 3), as well as developmental and behavioral assessments, physical examination, and anticipatory guidance (including counseling on feeding and sleeping habits, accident prevention and safety, behavior, and sex education). A typical well-child visit lasts 10 to 12 minutes and may include laboratory work and other health screening measures.²⁸

Observation of physician-patient interactions in private pediatric practices has found that anticipatory guidance ac-

counted for 8.4% of the total time spent during well-child care visits. The time spent on anticipatory guidance varied from 1½ minutes per visit with parents of children under 5 months of age to 7 seconds with adolescent patients.²⁸ Increased utilization of pediatric nurse practitioners may be a cost-effective way to increase the educational component of well-child care. Research suggests that nurse practitioners provide parent education that is comparable to that provided by pediatricians, but their visits are longer because they tend to discuss developmental and behavioral issues in greater depth and to give parents more opportunity to talk.³⁰

Immunization and promotion of preventive health behaviors are the major rationales for well-child care. Immunization against childhood infectious diseases is the single most effective and cost-effective intervention available to reduce morbidity and mortality.²⁴ Other preventive interventions, however, are less well addressed in well-child care. Only 4 seconds of the well-child visit, on average, are devoted to injury prevention, even though injuries are the leading cause of death and disability in childhood.²⁸

The second broad area of well-child care—promoting optimum growth and development—encompasses counseling about mother-child interaction, developmental advice, and parenting advice. The goals of this component of pediatric practice are poorly defined. De facto, pediatricians find themselves giving psychosocial guidance, offering advice on emotional disorders, and counseling for problems in family relationships and child behavior.³¹ Although the effectiveness of such clinical interventions has not been adequately studied, there is a substantial professional and parental consensus about their importance.

In general, counseling and advice in pediatric practice is based upon the clinical guidelines developed through expert committees. These guidelines represent state-of-the-art advice from the best available clinical experience and the shared cumulative experience of clinicians and academicians. They lack a strong empirical base because no randomized clinical trials have been carried out to evaluate the efficacy of pediatric counseling interventions in improving the health status of children. We believe, however, that the absence of a strong empirical research



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base in this area of child health care does not necessarily lead to the conclusion that these activities are not worthwhile, as was prematurely concluded by the Office of Technology Assessment in 1989. Further research is needed to evaluate both the recommended guidelines and the care that is actually being provided.

All the benefits of well-child care have not been clearly articulated. In addition to helping prevent premature death or serious illness, well-child care may offer support and reassurance for families and provide a "medical home" for parents if their child develops an acute illness. The medical home promotes continuity of care and provides the physician with baseline measures of the child's health status before the onset of illness.³² Identifying serious conditions is sometimes complex: fever and irritability in a very young child usually indicate a minor viral illness, but they may indicate a far more severe and life-threatening disease, such as meningitis or sepsis. As with much else in medical care, demonstrated efficacy of treatment for many common childhood illnesses is either limited or lacking.³³

Sources and Utilization of Health Care for Children

Health services for children are available from several sources. For most children, a community-based physician (usually a pediatrician or family practitioner) provides most care, including preventive services (immunizations and anticipatory guidance) and care for most common illnesses. Although the majority of community-based pediatric care is supported through some form of fee-for-service payment, increasing numbers of children receive care through prepaid programs, mainly health maintenance organizations (HMOs). (See the article by Sheils and Wolfe in this journal issue.)

Other important sources of general pediatric care are community health centers and public health departments. Community health centers may integrate general health services with different combinations of community preventive services, linking, for example, Women, Infants, and Children (WIC) nutrition programs, social services, and mental health programs, among others. Community health centers usually serve high-risk communities with high rates of poverty and environmental and social risks affecting child health. Medical services provided in health centers

are supported by third-party payers (mostly public, through Medicaid), by fees collected from patients (frequently on a sliding scale pegged to income), and by direct service grants (especially through the federal community health centers program).

Coordination among preventive and treatment services may be substantial in some places, absent in others.

In some communities, a full range of preventive and treatment services is readily available. Other communities may lack major components or have major access barriers to immunizations or other services. Coordination among preventive and treatment services may be substantial in some places, absent in others. In most European countries some form of community-based preventive or general health care is available to all residents, regardless of social or economic status.³⁴ Many U.S. communities lack similar services, and children thereby either go without services or receive them in settings designed for other purposes, such as hospital emergency rooms.

Most private health insurance programs cover illness care for children, but many do not cover the costs of preventive services such as immunizations. HMOs, which incorporate both insurance and organizational functions, typically do cover the costs of preventive care for children. Medicaid, the main public insurance program for low-income children, also pays for preventive care, including immunizations. Variations in public financing also affect children's access to preventive health care. To receive immunizations in traditional fee-for-service practice settings, parents usually pay directly for the service. In some communities, public health departments offer free immunization clinics.³⁵ Other communities lack the budgets to provide such services to many children who need them. In some parts of the country, especially the rural South, health departments provide a broader range of general child health services, including both preventive and treatment services, either free of charge or on a sliding-fee scale.³⁵ Nonfinancial barriers such as culture or geography may, however, also limit access.

especially in community health centers. (See the articles by Sheils and Wolfe, Hill, and Klerman in this journal issue.)

The data on utilization of preventive services by young children are disturbing. Using data from the 1987 National Medical Expenditure Survey (NMES), Lefkowitz and Short found that a significant proportion of 2-year-old children did not receive preventive health care.³⁶ Twenty-five percent of Medicaid children, 30% of uninsured children, and 20% of insured children had not had a preventive health care visit during the previous year. When examining the rate of preventive visits by racial and/or ethnic groups, Lefkowitz and Short found that 20% of white children had received no preventive health care visits, whereas 33.4% of black children and 33.0% of Hispanic children had made no preventive visits to a health care provider.

Data from the 1989 National Health Interview Survey (NHIS) indicate that, on average, children 0 to 5 years of age have about 4.1 physician visits annually, and children 5 to 17 years of age have 2.2 visits per year. When telephone and hospital physician contacts are included in the number

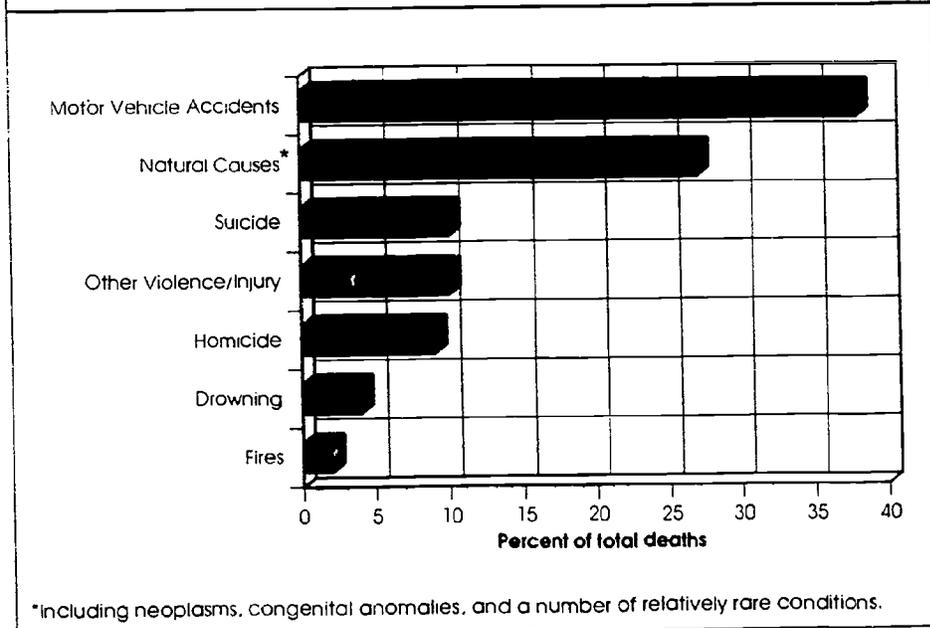
of physician contacts, these figures increase to 5.8 and 3.1 contacts per year, respectively.³⁷

Visits vary by family income, race, and insurance status. Children under 18 years of age whose family yearly income is under \$10,000 have 2.3 office visits per year (or 3.6 total contacts), whereas children whose annual family income is between \$10,000 and \$19,999 have 2.1 office visits per year (or 3.3 total contacts).³⁷ This difference serves as an illustration that the near-poor (the most likely to be uninsured) have fewer health care visits than do the poor, who have Medicaid to pay for their health care. Monheit and Cunningham in this journal issue provide a detailed analysis that confirms the relationship between insurance status and the utilization of medical services by children. White children under age 18 make 3.0 office visits (4.2 total contacts), whereas black children in the same age category make 1.6 office visits (2.5 total contacts).³⁷

Hospital Services

Rates of hospitalization and lengths of hospital stay have declined for both children and adults over the past decade.

Figure 2. Major Causes of Adolescent (10-19 Years Old) Mortality, 1985



Source: Fingerhut, L., and Kleinman, J. Trends and Current Status in Childhood Mortality, U.S., 1900-1985. *Vital and Health Statistics*, Series 3, No. 26 (DHHS Pub No. 89-1410), Hyattsville, MD: National Center for Health Statistics, 1989

Approximately 2.4 million children under age 15 years were hospitalized in 1990, representing a decline of about 29% from 1984.⁵ Children utilize a relatively small proportion of total acute hospital care (less than 8% of total hospital discharges). Data from the 1990 National Hospital Discharge Survey indicate an overall average of 0.21 hospital days per child per year.

The number of children in hospitals with chronic health conditions rather than acute ones has been increasing. Recent estimates at specialty hospitals suggest that about 70% of all childhood admissions currently are for chronic conditions.³⁸ Major advances in medical and surgical technology have led to the survival of a greater number of severely ill children. Technological advances, especially miniaturization of complex equipment, have also increasingly allowed technology-dependent children to receive care in home and community settings.

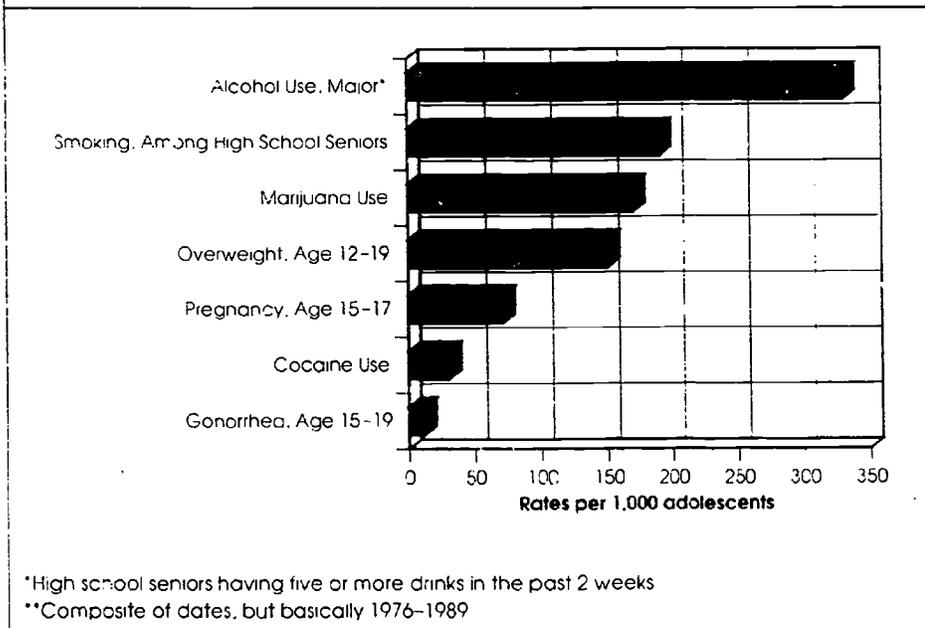
Recent studies have demonstrated sizeable variations in rates of hospitalization for children.¹⁸ Children residing in Boston, Massachusetts, for example, have about three times the risk of hospitaliza-

tion for medical problems as do children in Rochester, New York. These communities have similar medical resources, as indicated by per capita physician and hospital bed rates, but the Boston population is poorer than that of Rochester. Because poverty increases children's risks of hospitalization, variations in poverty levels among communities may explain some but not all of the variations in rates of hospitalization. Other causes likely include the availability and types of community-based general health services for nonpoor children and physician practice style. Children who lack regular community-based physician care are more likely to use emergency rooms³⁹ and are more likely to be admitted to the hospital when they do.

Adolescents

Adolescents, 10 through 19 years old, represent the only segment of the U.S. population in which mortality rates have not declined rapidly during the past 2 decades.³ The major causes of mortality during adolescence are motor vehicle accidents (38%), natural causes (27%), suicide (10%), other violence and injuries

Figure 3. Estimated Prevalence of Adolescent (10-19 Years Old) Health Problems**



Source: U.S. Department of Health and Human Services, *Healthy People 2000 National Health Promotion and Disease Prevention Objectives*. Washington, DC: U.S. Government Printing Office (DHHS PHS 91-50212), 1991.

(10%), homicide (9%), drowning (4%), and fires (2%)³ (see figure 2). Half of the motor vehicle accidents that result in the death of an adolescent involve alcohol.⁴⁰ Thus, 73% of the deaths that occur between the ages of 10 and 19 years can be attributed to intentional and unintentional injuries and violence. Many of the behaviors that lead to these deaths can be targets of prevention and intervention activities by the health care system, the community, and individual health care providers.

Seventy-three percent of the deaths that occur between the ages of 10 and 19 years can be attributed to intentional and unintentional injuries and violence.

Goals for adolescent health go well beyond the prevention of violence and injury to include developing healthy behaviors related to sexuality, physical fitness, and dietary habits, and preventing substance abuse. Issues related to sexuality include prevention of unwanted teenage pregnancy (and the subsequent choices regarding parenting, adoption, or abortion if pregnancy does occur) and sexually transmitted diseases, including HIV infection (see figure 3). To have an impact, education regarding these issues should start prior to adolescence, when children are beginning to think about these behaviors.

Addressing the health care needs of adolescents may necessitate modification of some sectors of the health care system to accommodate their special circumstances. (See the article by Klerman in this journal issue.) Barriers to the effective use of traditional health care services by adolescents include discomfort with traditional health care settings, lack of insurance coverage or money to cover the cost of care,⁴¹ parental consent requirements for some services, lack of office hours that do not conflict with school hours, and the inability or refusal of some adolescents to comply with the recommended medical treatment or follow-up.⁴² Many adolescents either do not use medical services or, when they do, receive little help for their special problems. Physicians may represent parent-surrogate authority figures for many adolescents, affecting adolescents' comfort in medical settings. In addition, a greater need for privacy—a

normal part of adolescent development—makes issues of sexuality, drug and alcohol use, cigarette smoking, and other behaviors that expose them to health risks difficult to disclose to health care providers. Finally, many physicians remain uncomfortable or unskilled in addressing these issues with their adolescent patients.⁴³ As a result, adolescents between the ages of 10 and 18 make only 1.6 visits to an office-based physician each year. White adolescents make 1.7 visits, compared with 0.9 visits made by black adolescents.⁴⁴ With this limited number of contacts, traditional health care providers may have little impact on many problems experienced by adolescents.

Moreover, adolescents are not a homogeneous population. Among the adolescents at highest risk for poor health outcomes are homeless and runaway youths. Up to one million youths run away from home each year.⁴⁵ Among homeless and runaway youths, 48% are depressed, 46% have substance abuse problems, 31% have been victims of physical abuse, 21% sexual abuse, 58% have school-related problems, and 9% have engaged in sexual activity (prostitution) to survive on the streets.⁴⁶ Yet, despite the high-risk emotional and behavioral profile of this population, access to and utilization of health services are low because many of the same barriers that limit effective use of health services by adolescents living in intact families present even more formidable obstacles to homeless and runaway youth.⁴⁷

Integrating Services in the Community

Even where an effective intervention such as immunization exists to protect the health of children, the traditional organization of health care services has failed to assure the availability of the intervention to all children. In addition, traditional practice patterns may be inadequate to protect children and adolescents from broader risks, such as exposure to injuries. These observations lead us to support an expanded approach to child health care that integrates the roles of the office- and clinic-based pediatric practitioners with community-based child health practitioners. Similarly, responsive preventive care for adolescents may require a departure from traditional models.

Infants, Preschool, and School-age Children

Multidisciplinary models of care may be needed to improve the health status of all children. Such models already exist in most Western European countries.^{34,48} This concept can be demonstrated by examining the coordinated responses of public and private health providers at the community level which are necessary to achieve recommended levels of immunization by 2 years of age and to protect school-age children from the risk of injury.

Immunizations

The United States has an enviable record of achieving very high levels of immunization of school-age children. All states require that a child receive a basic set of immunizations as a condition of school entry, and, as a result, U.S. immunization rates for school-age children are generally higher than those of most other industrialized countries.⁴⁹ Nonetheless, data from the 1985 national immunization survey (the most recent source of national data on immunization status) showed that, among children 1 to 4 years old, 21.2% were not immunized against measles, 24.3% were inadequately protected against polio, and 13% were inadequately protected against diphtheria, pertussis, and tetanus.⁵⁰ By 1990, the proportion of low-income, inner city children fully immunized against all the vaccine-preventable diseases by age 2 years was estimated to have fallen to less than 50%.⁵¹ As a result of low and declining levels of immunizations during the 1980s, epidemics of measles occurred in 1989 and 1990, with 18,193 and 27,672 cases reported in those years.⁵¹ Nearly half of these cases (48.1%) occurred in children less than 5 years of age. More than one third of the children in the age group who contracted measles in 1990 were eligible for vaccinations but had not been vaccinated.

Moreover, the United States failed to meet a key immunization objective for the year 1990: that by 2 years of age, 90% of children would be immunized against the major childhood diseases, particularly measles.⁴⁹ Thus, for the single most accepted and cost-effective component of well-child care—routine immunization—the health care system has failed to achieve national objectives, failed to maintain the professionally recommended immunization schedule, and

failed to protect young children from the threat of disease.

Immunization coverage of a population is a function of three interlocking domains: (1) health-seeking behavior on the part of parents of young children, (2) barriers to care, and (3) provider practices that inhibit appropriate immunization.⁵² Each of these domains appears to contribute to the failure to assure adequate immunization levels, although their relative contributions are not known.

Poor children are less likely to be immunized because they receive less preventive health care overall, stemming, in part, from negative family attitudes toward health care, disbelief in susceptibility to disease, or a feeling of powerlessness to prevent disease.⁵³ Marks and colleagues found that low maternal education was a risk factor, implying that a clear understanding of immunization as an effective protection against disease was lacking in these mothers.⁵⁴

The U.S. health care system is not equally accessible to all children. Dutton has linked low utilization among the poor to access barriers.⁵⁵ (See the article by Klerman in this journal issue.) In the face of financial barriers to appropriate immunization, many families now seek care from publicly subsidized maternal and child health centers, community health centers, or county health departments. Unfortunately, users of these facilities often face inadequate supplies of vaccine, inconvenient hours and locations, and long waiting times.⁵⁵



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Overall, however, variation in office and clinic practices among primary and preventive health care providers may be the most important component of the failure of the health care system to assure adequate immunization coverage. Studies

Variation in office and clinic practices among primary and preventive health care providers may be the most important component of the failure of the health care system to assure adequate immunization coverage.

by the Centers for Disease Control of recent measles outbreaks in Puerto Rico, Miami, and Los Angeles found that one third of children who had failed to receive a measles, mumps, and rubella (MMR) vaccination had actually presented themselves for preventive care at the appropriate time, but their providers had missed opportunities to immunize them.⁵⁶ These observations are consistent with earlier research.^{56,57} In addition, the use of multiple providers, which reduces the continuity of care, decreases the likelihood of adequate immunization.⁵⁸ Finally, lack of knowledge among some physicians about scheduling, contraindications, proper vaccine storage, and potential complications may be associated with lower rates of immunization among children.⁵⁹

A successful community-based immunization program must include an accessible system of comprehensive primary health care, coordination between pediatric and public health practitioners, community surveillance of immunization status, an interactive information system containing the immunization status of each child that is accessible to all providers, and incentives to families to seek preventive health services for immunization beginning by the second month of life. Efforts to link adequate immunization to child care entry or to participation in benefit programs like WIC or Aid to Families with Dependent Children (AFDC) have also been recommended.⁵⁵

Injury Prevention

The major threats to the health of children 5 to 14 years of age are pedestrian, motor vehicle occupant, bicycle-related, and recreational and sports-related injuries. In 1988, 4,990 children 5 to 14 years

old died of injuries, 837 as pedestrians, and 940 as motor vehicle occupants.⁶⁰ Sports-related injuries were estimated to account for more than 90,000 inpatient admissions and 2.5 million emergency room visits in 1985.^{4,61}

Although child health care providers have often been in the forefront of community efforts to protect children (witness the role of Dr. Robert Saunders of Murfreesboro, Tennessee, in advocating for the nation's first child passenger safety legislation in 1978), they have generally relied upon office-based anticipatory guidance as their method for influencing child safety, with mixed results.⁶² Despite efforts by the AAP to promote a comprehensive program of office-based injury counseling, The Injury Prevention Program (TIPP), relatively few pediatricians actively use the program, and few alternatives are available. Studies are currently under way to explain the failure of pediatricians to use TIPP.⁶³

Bicycle safety is an area in which child health care providers must join efforts with public health and other community-based agencies to address childhood injury successfully. There is now good evidence that safety helmets reduce the risk of brain injuries in falls from bicycles by as much as 85%,⁶⁴ yet fewer than 10% of bicycle riders of all ages wear helmets.⁶⁵ One recent study found convincing evidence that a low-cost classroom intervention succeeded in promoting helmet use among elementary school pupils.⁶⁶ Unfortunately, several controlled studies of bicycle helmet promotion in physicians' offices and emergency rooms have not demonstrated successes.^{67,68} As Runyan and Runyan concluded, physicians must not abandon their efforts to educate families about these risks, but must, in addition, join community-wide efforts to promote safety through legislation, regulations, school-based educational efforts, and improved environmental efforts.⁶⁹ Health care professionals at all levels must find opportunities to build community coalitions involving medical care providers, school officials, parents, and public health agencies.

Adolescents

For many adolescents, the current system that delivers care through private physician practices, community health centers, and adolescent health programs works well. Rates of serious illness among

adolescents are low, and the tasks of adolescent health care typically focus on prevention and encouragement of healthy life-styles. Effective programs for adolescents help them to develop self-care skills, encourage exercise and appropriate diet, and decrease major risks to health such as smoking, alcohol use, and other substance abuse. Further preventive care typically includes preparing adolescents for healthy sexual activity and teaching them methods of early identification of disease, such as through breast or testicular self-examination.

Alternative programs have been developed in response to the difficulties some adolescents have in accessing health care. These programs include specific clinics for adolescents in areas where they often congregate (such as shopping malls) and school-based clinics that are available during and after school hours. (An analysis of school-based clinics appeared in the Spring 1992 issue of *The Future of Children*.) Further, health services are needed for hard-to-reach adolescents, such as homeless, runaway, and incarcerated youth.⁷⁰ Unfortunately, few adolescents have access to services that are especially designed to meet their health care needs. School-based clinics exist in fewer than 200 of the 16,000 school districts nationwide.⁷¹

An evaluation of the impact of 23 school-based clinics on access to health care for adolescents from low-income households found that many of those enrolled in the clinics were previously medically underserved.⁷¹ Twenty-one percent had no regular source of medical care, 58% were self-pay (likely to be uninsured), and 21% had made no health care visits in the past 2 years. These clinics provided comprehensive services. Of the primary reasons for visits to these clinics, 26% were for acute injury and illness, 21% for mental health, and 12% for other categories including reproductive health care, physical exams, immunizations, and hearing and vision screening. Alcohol and drug abuse services constituted only 1% of the primary reasons for a visit.

Community and public support has been highly variable for these services, in part reflecting the controversy over providing contraceptive devices—including condoms and prescriptions—in school settings. The emphasis on the family planning role of school-based clinics conceals the fact that 80% of the main reasons for

visits to these clinics concerned issues other than family planning.⁴⁷ European countries provide universally available community-based preventive services, which provide many preventive services to adolescents.⁷² Similar forms of preventive care are not available in most communities in the United States.

The high-risk behaviors engaged in by some adolescents cannot be addressed solely or sufficiently by the health care system. A multifaceted intervention approach that is available, accessible, and affordable is needed to address the needs of adolescents. Increasing numbers of specialists in adolescent medicine may also help to focus attention on the development of new interventions to improve adolescent health.

Children with Special Needs: The Case of Chronic Illness

Some children's health problems make special demands upon children's health services. These conditions include chronic or catastrophic illness, major trauma, developmental disabilities, and children at environmental and social risk. We focus here on the example of childhood chronic illness as it illustrates the implications of these categories of special need.

Between 10% and 30% of all U.S. children have some kind of chronic health impairment, although the large majority of these conditions are mild and have little impact on children's daily activities or



utilization of health services.^{73,74} About 10% of children with chronic illnesses, or perhaps 2 million children nationwide, have severe conditions that require extensive health services. (See the article by Starfield in this journal issue.) Of this group, only asthma and common (and usually less severe) forms of congenital heart disease occur with any great frequency. As figure 4 indicates, other individual conditions—such as leukemia, arthritis, diabetes, cystic fibrosis, epilepsy, and kidney failure—are rare. Estimates of the utilization of services by this population vary, but they generally suggest that the approximately 2% of children with severe illnesses use at least 25% of the child health dollar.⁷⁵ This figure represents, in part, the higher-than-average utilization of inpatient hospital care by this group of children. (See the article by Lewit and Monheit in this journal issue.)

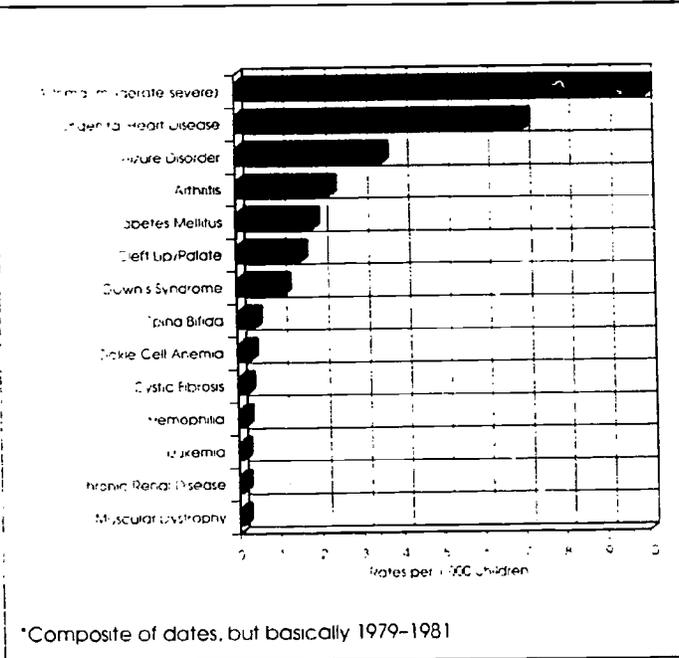
Although a common view is that many children with severe chronic illnesses die in childhood, current estimates of survival suggest that at least 90% of children, even with very severe long-term illnesses, survive to young adulthood.¹⁶ These rates reflect

a dramatic change in the past quarter century, brought about by major improvements in medical and surgical technologies and in the distribution and availability of sophisticated medical care. Indeed, these remarkable survival rates reflect some of the important successes of U.S. health care. Thus, where until relatively recently the emphasis was on improving survival rates, the emphasis now is on improving the quality of life for the large majority of chronically ill children who survive to become young adults, most of whom can participate as active members in most aspects of adult life.

AIDS creates challenges for households and health services similar to those from other chronic illnesses, with some important distinctions. First, AIDS in children is highly concentrated in poor and minority families.⁷⁶ The disease had by 1988 become the first and second leading cause of death among Hispanic and African-American children, respectively, ages 1 through 4 in New York State.⁷⁷ Second, it carries a very high fatality rate, with few infected children currently expected to survive to adulthood. Third, its main mode of acquisition (congenitally from infected mothers) means that other family members (especially mothers) may also be ill and therefore unable to care for their children. By late 1991 it was estimated that 10% of all pediatric hospital beds were occupied by children with AIDS.⁷⁸ Currently affecting fewer than 1 in 20,000 children, AIDS will likely increase in prevalence, and treatment advances will likely improve survival rates among infected children. These trends, if realized, will probably increase the demands placed on the health care system for services for children with AIDS and for those infected with HIV.

Families provide substantial care for children with special health needs. Studies by Breslau and colleagues indicate that mothers spent significantly increased time at home caring for children with chronic illness and were less likely to be employed outside the home.⁷⁹ The children in these studies were mainly ones with moderately severe illnesses. In recent years, many children with much more severe illnesses, including many dependent on major technologies, such as respirators or intravenous or tube feedings, have received care at home. Many of these children require extensive nursing care, monitoring, and the use of complicated equipment.

Figure 4. Estimated Prevalence of Childhood Chronic Illnesses*



Source: Gortmaker, S.L., and Sappenfield, W. Chronic Childhood Disorders: Prevalence and Impact. *Pediatric Clinics of North America* (1984) 31:3-18

often around-the-clock. This move toward increased home care is the result of several factors: the desire of most families to take more responsibility for the care of their own severely ill children and to have these children at home with the family, the growth of technologies allowing more miniaturization, and efforts at cost containment that encourage home care as a less expensive alternative to continuing in-hospital care.⁷

Technological advances, especially in genetics, are changing the preventive issues related to chronic health conditions.⁸⁰ Two main genetic interventions exist: the ability to predict before conception the risk of conceiving a fetus with a given genetic disorder and the identification of an affected fetus early in pregnancy. Most recent advances in genetic technologies provide increasingly sensitive ways of defining the specific genetic defect, allowing earlier and much more exact determination of risk or disease. In addition, the detection of a fetal anomaly may now lead to termination of pregnancy or to other options, including a change in the timing or in the mode of delivery, or in prenatal treatment. Prenatal treatments include intrauterine surgery,^{81,82} transfusions,⁸³ and delivery of medications to increase fetal survival rates and enhance peri- and postnatal development. Detection of a fetal anomaly may also allow the parents to be better prepared to deal with the special medical and other needs of an afflicted infant after birth.

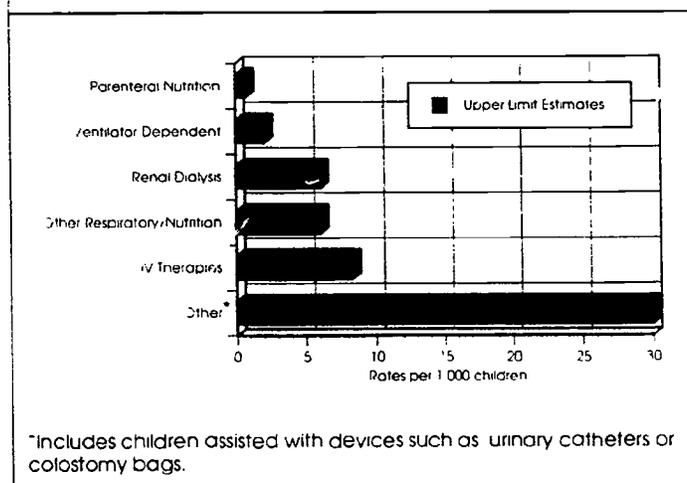
Other recently developed technologies improve the lives of these children after they are born. There have been dramatic improvements in surgical techniques for the management of congenital heart disease, greatly improved medications for the treatment of leukemia and other childhood cancers, and therapeutic advances in the management of children with cystic fibrosis to lengthen their life spans. Children who are dependent on ventilators or who receive long-term intravenous feedings at home are examples of beneficiaries of other technological advances. Office of Technology Assessment estimates (figure 5) are that 20,000 to 30,000 U.S. children may require home care with significant technology dependence.⁸⁴ Recent research suggests that the cost of home care can be exceptionally high, for some children well over \$100,000 per year. However, such costs are still lower than those typically associated with

hospital care. Although some of these cost differences reflect true savings, many primarily reflect cost shifting from hospitals or insurers to parents.⁷

Children who survive with long-term chronic illness face risks of secondary disability, as well as higher risks of mental health problems and educational dysfunction.^{85,86} Multiple studies document that compared with apparently healthy children, children with long-term illnesses carry about twice the risk of having significant behavioral or psychiatric problems.^{74,87} Most studies find that, with the exception of conditions that affect the central nervous system, all chronic illnesses whether severe or not seem to produce approximately the same increase in this risk. Children with chronic central nervous system conditions appear to have up to five times the risk of having significant behavioral or psychiatric problems as children without apparent illness.⁸⁸

Chronic illness also significantly affects a child's ability to participate in regular education activities.⁸⁹ Many developmental disabilities create the need for special education services that take into account the effect of the developmental problem on the child's ability to learn. Most chronic illnesses, however, create no direct impact on the child's ability to learn, although excessive fatigue and the effects of medi-

Figure 5. Children Dependent on Technology, Population Estimates



Source: Multiple data sources (mainly 1985-86), documented in U.S. Congress, Office of Technology Assessment, *Technology-dependent Children: Hospital vs. Home Care*. Washington DC: U.S. Government Printing Office(OTA-TM-H-38), May 1987.

cation may affect the child's cognitive abilities.⁹⁰ More commonly, the child faces frequent absences because of medical or surgical care or because of exacerbations of conditions such as asthma or arthritis. Many years ago, when the issue for these children was planning for premature death, schooling was considered relatively unimportant; today, with most children surviving to adulthood, there is a great need to improve educational opportunities and to diminish the effects of illness or its treatment on the child's participation in school.⁹¹

Federal and state Title V Maternal and Child Health programs for children with special health care needs typically provide services for lower-income children with chronic illness, though services vary greatly from state to state.

Most children with chronic illness have some public or private insurance for usual medical, surgical, and hospital care, but they often lack coverage for needed comprehensive and long-term care services. A recent Supreme Court ruling has led to expanded childhood eligibility for Supplemental Security Income and its associated Medicaid coverage, and poor children with disability may now find access to public insurance easier.⁹² Even for the large number of children insured through traditional employer-based family health insurance programs, many needed services have been unavailable or are not covered. Preexisting conditions clauses in insurance contracts may exclude chronic conditions, and specialized long-term care may not be included in the benefit package. (See the article by Sheils and Wolfe in this journal issue.)

Federal and state Title V Maternal and Child Health programs for children with special health care needs typically provide services for lower-income children with chronic illness, though services vary greatly from state to state.⁹³ Some programs support hospitalization for children without other insurance, others fund specialized clinics for specific conditions, and others apply resources to coordination of services or to regionalized programs of care involving several medical and non-medical disciplines. (See the article by Hill in this journal issue.)

Chronically ill children and their families need attention from a wide variety of health and related providers. They need specialized medical and surgical services, high-quality general health services (which they may lack more than do able-bodied children), specialized nursing services, social services, preventive mental health services, and specialized educational planning. Further, many need certain specific therapies, such as nutrition, respiratory therapy, and occupational and physical therapy. Given the variety of services many of these families use, they would probably find that care-coordination services, although often unavailable, would be very beneficial.

Optimal care for these children and their families would provide most services in or near their home communities while less frequently required specialized and technically advanced care of the child's medical problems could be provided through centralized specialty medical centers.^{73,94}

Regionalized service networks may be necessary to forge the links between community-based services and centralized specialty services which are necessary to improve the delivery of comprehensive care to children with chronic illnesses. Traditional health insurance programs which pay primarily for medical care services may not pay for the other services that families with chronically ill children need. Already financially strapped families may have to pay for these services out-of-pocket or do without them. In addition, traditional health insurance plans may not support the organization and maintenance of regional multidisciplinary programs. The development and maintenance of these programs may require significant expenditures and responsibility from other, usually public health, sources. In some states, the Title V programs have taken primary responsibility for developing and implementing a multidisciplinary approach to health care.⁹⁵

Conclusions and Recommendations

The evidence suggests that neither the traditional personal health service delivery system nor the public health system alone can effectively provide all the health services children need. Collaboration between public health and personal health service providers is essential to assure adequate

immunizations, prevent childhood injuries, ensure adolescents access to responsive preventive care, and provide a full range of specialty and comprehensive services to children with chronic illnesses and their families.

Most other industrialized countries employ a community-based system available to all residents regardless of income to link their personal health services and public health systems. The structures of such programs vary widely, from health visitors in Great Britain⁹⁶ to community health centers in Norway⁹⁷ to well-child conferences in France.⁹⁸ Nevertheless, all of these countries provide a mechanism to address issues such as assuring and monitoring immunization levels, providing community education about injury prevention or aspects of adolescent sexuality, and helping to identify children with special health needs and to coordinate multidisciplinary care for them and their families. A similar system of community-based health care monitoring and coordination would greatly help the United States meet the health care needs of children.

Accordingly, we make the following five recommendations:

1. Develop community-based preventive care programs in all parts of the country. The forms and structures of preventive care programs may vary among communities, depending on resources and community needs, but all communities should have access to preventive services that screen and identify children and adolescents with health risks, help families gain access to needed health services, provide community health education, and assure high levels of illness prevention, especially through immunizations.

2. Extend current traditional primary care capabilities to provide satisfactory care for the health problems that children face, such as threats to development, chronic illness, and sexual and physical abuse. These changes will require improved professional school and in-service training for health providers and systems of reimbursement that assure equity between more procedurally oriented sickness care and the services needed to address new morbidity concerns.

3. Assure access to primary care services through such mechanisms as expansion of community health centers, both in number and in breadth of services. For many communities, especially those with large numbers of poor and disenfranchised households,

multidisciplinary community health centers are the preferred mechanism for providing child and adolescent health services. Yet, many communities lack needed health centers. Furthermore, funding limitations in recent years have curtailed many multidisciplinary outreach programs and limited many programs to providing only office-based medical and nursing services. Community health centers need the resources to provide the range of services and outreach activities to meet community health needs effectively. Maternal and child health agencies need to assure that the systems of community health centers, county health departments, and private practitioners provide full coverage to all children and youth.

4. Enhance public health activities. The roles and responsibilities of public health agencies need clarification and support. At a minimum they should include identifying and monitoring child and adolescent health needs and services; setting and enforcing standards of care; implementing and maintaining systems of care, such as perinatal service programs and regional programs for children with special health care needs; developing community health education programs; preventing or eliminating environmental hazards such as lead; and providing certain direct services, such as immunization programs.

5. Expand specialized adolescent health programs. Although many adolescents receive adequate services through current community-based primary care programs, many others do not. Services should be developed in nontraditional settings for adolescents who lack services or for whom services are inappropriate for their needs. Programs should emphasize preventive care and provide comprehensive services rather than focus narrowly on issues such as sexuality or substance use. Two main efforts should be the expansion of school-based health programs and of programs in alternative settings where adolescents congregate. Although what works well for adolescents has not been clearly documented, it seems most important to provide multifaceted services in multiple, varied sites.

These five recommendations should be implemented through a coordinated program of care rather than through five (or more) competing systems of services. To achieve child and adolescent health goals, public health efforts must link with community-based preventive and primary care

programs. The need is to link public and private systems of care to meet the health care needs of children and adolescents.

The authors acknowledge the helpful comments of Drs. Birt Harvey and Moses Grossman on an earlier version of this paper.

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Health Care Resources for Children and Pregnant Women

Janet D. Perloff

Abstract

The author of this paper reviews evidence about the health care resources currently available to children and pregnant women in the United States. The data reveal that the overall supply of physicians has grown steadily in recent years. However, as a result of factors such as physicians' preferences for metropolitan practice locations, rising malpractice premiums, and physicians' reluctance to accept Medicaid patients, the increase in supply has not improved access for many underserved women and children. At the same time, there has been a significant decline in the number of organized settings—hospital clinics, public health clinics, and migrant and community health centers—on which many of the underserved rely. Further, the capacity of remaining facilities has been greatly diminished by reductions in support for public programs. Even if the supply of health care resources is adequate to meet the needs of most women and children, the persistent maldistribution of maternal and child health care providers will continue to pose a serious threat to health care access for the women and children at greatest risk for adverse pregnancy outcomes and morbidity and mortality during childhood.

Policy strategies suggested to maintain and improve the availability of maternal and child health resources include: bolstering the supply of family physicians; reducing the problems related to medical professional liability; supporting the National Health Service Corps (NHSC) scholarship and loan repayment programs; increasing participation of physicians in serving Medicaid-eligible women and children; developing systematic data to evaluate the supply of maternal and child health care available in organized settings; and enhancing the capacity of organized settings to meet the needs of underserved children and pregnant women.

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During the past decade, strides have been taken toward lowering financial barriers to the health care needed by children and pregnant women. Private third-party payers have begun to cover more of the costs of children's preventive and primary care, and Medicaid financing is available not only for the care of poor children and pregnant women but also for many women and children living in families with incomes above the federal poverty level. As financial barriers to care are lowered, problems in the supply and distribution of health care resources become more important than ever before.

This paper reviews evidence about health care resources currently available to children and pregnant women in the United States and concludes that, while the supply and distribution of these resources may be adequate to meet the needs of most women and children, those who are black, poor, and/or residents of rural and inner city communities remain underserved. The problem of maldistribution of maternal and child health care resources is not new; however, data reviewed here demonstrate that the dimensions of this problem have changed in recent years. The overall supply of physicians (and the supply of medical and surgical subspecialists, in particular) has grown; but as a result of factors such as physicians' preferences for metropolitan practice locations, rising malpractice premiums, and physicians' reluctance to accept Medicaid patients, this increase in supply has not necessarily meant improved access for underserved women and children. At the same time, data reviewed here document that there have been significant declines in the supply of the organized settings on which many of the underserved rely—hospital clinics, public health clinics, and migrant and community health centers—and that the capacity of remaining facilities has been greatly diminished by reductions in support for various public programs. The available evidence suggests that, to the extent that maldistribution of maternal and child health care persists, it will pose a serious threat to the usefulness of third-party coverage in enabling access to health care for the very women and children who are at greatest risk for adverse pregnancy outcomes and morbidity and mortality during childhood.

Health Care Resources for Pregnant Women

The Supply, Distribution, and Accessibility of Maternity Care

Physicians and Certified Nurse Midwives Most maternity care in the United States is provided by obstetrician-gynecologists, family physicians and general practitioners, and certified nurse midwives. Factors influencing the supply, distribution, and accessibility of these health professionals figure prominently in women's access to maternity care. These factors include (1) the tendency for these professionals to locate in metropolitan areas, (2) the high cost of medical liability insurance for these providers and physicians' perceptions about the risks of being sued by obstetric

patients, and (3) the reluctance of these professionals to serve Medicaid patients.

Obstetrician-Gynecologists According to the American Medical Association Masterfile, the most complete source of information about the supply of physicians, there were 31,364 obstetrician-gynecologists in the United States in 1986. The supply of obstetrician-gynecologists is growing, and the future is likely to bring increasing competition for patients. Projections indicate that the population of obstetrician-gynecologists will grow to a total of 40,000 to 44,600 by the year 2000.¹² Using an adjusted needs-based model developed in 1980 by the Graduate Medical Education National Advisory Committee (GMENAC)—a quasi-governmental body charged with making recommendations



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for the future organization and financing of graduate medical education—Abt Associates estimated that there was a nationwide surplus of nearly 10,000 obstetrician-gynecologists in 1990 and predicted that this surplus would grow to nearly 16,000 by the year 2000.²

Despite their generous numbers, obstetrician-gynecologists are significantly maldistributed relative to the population. First, they are overwhelmingly located in metropolitan areas. Nonmetropolitan counties have approximately one-fifth as many obstetrician-gynecologists per capita as metropolitan counties,³ and a substantial number of nonmetropolitan counties have no obstetrician-gynecologist at all.⁴⁻⁷ Because more obstetrician-gynecologists locate in metropolitan areas, and because fewer family physicians practice obstetrics, lack of accessible obstetrical services in rural areas has become a matter of great concern.

Second, within metropolitan areas private office-based obstetrician-gynecologists tend to locate in central business districts or in higher-income and suburban residential communities. In 1986, about two thirds of the obstetrician-gynecologists practicing in Chicago's residential areas practiced in the most prosperous communities while only 2% practiced in the most severely distressed inner city communities. The ratio of obstetrician-gynecologists to the population was nearly four times greater in the most prosperous communities than in inner city areas.⁸ Differentials such as these are compensated for, in part, by the maternity care provided by hospital outpatient clinics and other clinic settings, but access to obstetrical

care for inner city residents continues to be problematic.^{9,8}

The geographic maldistribution of obstetrician-gynecologists is compounded by two additional factors. First, the high cost of medical malpractice insurance and perceptions about the risks of being sued have caused a substantial proportion of obstetrician-gynecologists to drop the obstetrical portion of their practices and to curtail the delivery of maternity care to high-risk women.^{1,9-13} Second, many obstetrician-gynecologists decline to accept patients whose care is paid for through Medicaid.^{6,8,12,14} As a result of these factors, although obstetrician-gynecologists are in relatively generous supply, their services often are inaccessible, particularly to low-income women and those at high risk for adverse pregnancy outcomes.

Family Physicians and General Practitioners. The nation's roughly 68,000 general and family physicians, 28,000 of whom are board-certified in family practice, are an important source of obstetrical care. When compared with obstetrician-gynecologists, general practitioners and family practice physicians are more evenly distributed across counties of all types and sizes.³ Because of the malpractice crisis, however, many of these physicians discontinued the practice of obstetrics in the late 1980s.^{1,9-13} Thus, while general practitioners and family physicians currently provide an estimated two thirds of all private obstetrical care in rural areas, it has been estimated that only 35% of rural general practitioners and family physicians currently offer obstetrical services.⁵ A number of sources indicate that general practitioners and family physicians are somewhat more likely than obstetrician-gynecologists to participate in Medicaid and, as a result, these physicians may be somewhat more accessible to low-income pregnant women.^{15,16}

Certified Nurse-Midwives. Certified nurse midwives (CNMs) are registered nurses who have received special training in midwifery and who have been certified by the American College of Nurse-Midwives. At the present time only about 2,600 CNMs practice in the United States, but they are slowly growing in number. It is estimated that 200 to 250 new CNMs are certified each year,¹⁶ and from 1975 to 1988 the proportion of births attended by CNMs increased from 0.9% to 3.4%.¹⁷ Eighty-seven percent of midwife-attended births

occurred in a hospital in 1988, and the women served by midwives practicing in hospitals are increasingly poor and minority mothers.¹⁷

Despite numerous studies documenting the high quality of care provided by CNMs,^{17,18} economic, interprofessional, and medical liability factors have hampered practice of the full range of CNM services and the growth of the profession. Until recently, only limited third-party coverage was available for CNM services. Some improvements in reimbursement for CNM services provided under public programs resulted from federal legislation passed during the 1980s.¹⁹ In addition, many states have statutes and regulations restricting the scope of nursing practice. Even where third-party payment is available and the scope of permissible nursing practice is broad, resistance from the medical profession sometimes results in the inability of CNMs to obtain admitting privileges at local hospitals.¹⁹ Finally, CNMs have experienced problems obtaining malpractice insurance, have had to pay malpractice premiums representing a sizeable and growing proportion of their salaries, and, as a result of liability problems, have sometimes lost hospital privileges and opportunities for collaborative practice with physicians.¹⁶

Office-based and Organized Prenatal Care Settings

Although a great many women receive their prenatal care in private physicians' offices, low-income women and women without any third-party coverage frequently obtain prenatal care in "organized settings" such as hospital outpatient departments, community and migrant health centers, public health department clinics, and other clinic settings. It is estimated that approximately 20% of women receive their obstetrical care from these organized settings,⁵ and national surveys confirm that these sources are particularly important to poor women and for young, unmarried, black, or Hispanic women.²⁰

There is evidence that the demand for maternity care from organized settings is growing but that the supply of care in these settings is becoming increasingly inadequate. An Institute of Medicine (IOM) review of evidence about capacity in local health departments and hospitals conducted during the mid-1980s found excessively long waiting times to obtain prenatal care appointments and other indicators of

inadequate capacity. Comprehensive national and state data about capacity in organized settings are not available, but the IOM report concluded that "in some communities the capacity of the clinic systems relied on by low-income women is so limited that prompt care is not always available and that in some additional areas care is unavailable altogether."²⁰

There is evidence that the demand for maternity care from organized settings is growing but that the supply of care in these settings is becoming increasingly inadequate.

hospital outpatient departments. The nation's 5,871 nonfederal, short-term general hospitals—particularly its 1,784 public hospitals and 160 academic medical centers—are an important source of prenatal care for low-income and minority women and for those residing in underserved communities. Demand for these services is thought to be increasing, although national data on the supply and distribution of outpatient prenatal care services and on trends in patient load are not available.²⁰

One important factor affecting the supply of hospital-based maternity care has been recent hospital closures. Between 1980 and 1989 a total of 508 hospitals closed;²¹ many of these were in rural areas and most were small and underutilized.²²

The impact of hospital closures on access to care in general and to prenatal care in particular remains unclear. Some appraisals conclude that closures do not seem to have hampered access to emergency and acute care while others disagree. Such generalizations may obscure the actual impact of individual hospital closures, however, because this depends on characteristics and circumstances of the hospital and the community it served.²² For example, a significant proportion of hospital closures since 1980 have included public sector facilities vital to the prenatal care of women who are poor, nonwhite, lack health insurance, and/or live in underserved areas.²³ Public hospital closings significantly reduce access to care for the uninsured population residing in the communities served by these facilities.²⁴ A large proportion of this

population is comprised of women seeking prenatal care.

Public Health Clinics State and local health departments play an important role in provision of prenatal care. A 1986 survey of 46 state health agencies indicated that, while states vary considerably in their health assurance activities, prenatal care was among the few personal health services provided by all 46 agencies.²⁵ The broad reach of these public health activities and their positive impact on access to prenatal care in some localities are suggested by a recent survey which identified 2,306 local prenatal care sites funded by state health agencies: 2,017 were operated directly by health departments, and 289 were operated by other agencies.²⁶

Because of low salaries, undesirable location, and unfavorable working conditions, community health centers often have considerable difficulty attracting and retaining physician personnel.

Although a large number of prenatal care clinics are operated by local health departments, significant gaps exist in this delivery system. A 1986 survey of state agencies receiving funds from the federal Title V Maternal and Child Health Block Grant indicated that 48 of the 51 agencies offered at least some prenatal care. However, only 13 agencies indicated that prenatal care was available on a statewide basis; most states imposed income and risk status eligibility criteria, and only one state reported that funding levels were adequate to meet the needs of its target population.²⁷ (For further discussion of government-funded direct care providers, see the article by Hill in this journal issue.)

Community and Migrant Health Centers Community and migrant health centers are also important sources of prenatal care. Community health centers provide basic preventive and primary care in federally designated medically underserved areas, and migrant health centers provide similar services to migrant and seasonal agricultural workers and their families. In 1987 there were 567 community health centers providing prenatal care to between 150,000 and 225,000 women;²⁸ an additional 118 migrant health centers

also provide prenatal care. It has been estimated that 28.6% of all community and migrant health center users are women of childbearing age.²⁹

Capacity in community and migrant health centers was greatly reduced in the early 1980s. Like other maternity care providers, many health centers had to devote an increasing proportion of their budgets to medical liability insurance premiums and, in some instances, cuts in services resulted.¹⁶ Capacity was also reduced when a significant number of centers lost their funding and others experienced substantial reductions in their core operating grants.¹⁵

Because of low salaries, undesirable location, and unfavorable working conditions, community health centers often have considerable difficulty attracting and retaining physician personnel. During the 1970s and 1980s, the National Health Service Corps (NHSC)—a program offering scholarships and loans for the educational expenses of health professionals in exchange for a period of service in an underserved community—had been a very important source of primary care physicians for community health centers. In 1989, for example, the NHSC supplied nearly one half of the physicians working in community and migrant health centers. However, field strength of the NHSC diminished rapidly over the 1980s. As a result, the General Accounting Office reported that there were 800 vacancies in community and migrant health centers which had to be filled in order to reach full staffing of about 2,700 physicians in 1990.³⁰

The Supply and Distribution of Labor and Delivery Services

Hospitals

Ninety-nine percent of U.S. births take place in hospitals,¹⁶ and general trends in the hospital sector have therefore had an important impact on the supply and distribution of labor and delivery services. During the 1980s, in part as a result of the closure of a significant number of small, rural, and public hospitals, labor and delivery services were somewhat redistributed across hospitals. The total number of hospital obstetric beds—most of which are in private, not-for-profit hospitals—increased, while the number of obstetric beds in public hospitals decreased. Although the full impact of this redistribution of obstetric beds on access to labor

and delivery services is not known. Klerman and Scholle note that the decrease in public obstetric beds will have its biggest impact on access to labor and delivery services for the poor who rely disproportionately on these facilities.¹⁶

Although most short-term general hospitals offer labor and delivery services, the scope of the services offered varies considerably. For example, only 65% of hospitals responding to the American Hospital Association's 1989 Annual Survey of Hospitals reported having birthing rooms, only 39.1% reported offering reproductive health services, and only 9.4% reported offering genetic counseling and screening.²¹

Neonatal Intensive Care

Neonatal intensive care units (NICUs) provide the high technology equipment and services and the highly trained staff needed to care for the seriously ill infant. One important influence on the supply and distribution of neonatal intensive care has been the attempt on the part of the medical profession to regionalize perinatal services. Regionalization differentiates levels of perinatal services and attempts to avoid costly duplication and inefficient use of the most technologically sophisticated professionals and services. (See discussion of regionalization in the Racine, Joyce, and Grossman article in this journal issue.) Routine care for normal infants (Level I care) and Level II care for moderately to seriously ill infants can be found in hospitals throughout the country, but the most technologically sophisticated Level III or Level IV care is primarily located in children's hospitals and in urban teaching hospitals with large high-risk delivery services. Although Level III nurseries typically treat sicker infants providing a high intensity of care and a great diversity of specialists, the distinction between Level II and Level III facilities may become blurred because their equipment and staffing tend to be similar.³¹

As reported by Racine, Joyce, and Grossman in this journal issue, the number of NICU beds has increased rapidly in recent years while the cost of NICU care (as reported by Lewit and Monheit in this journal issue) has exploded. Explicit criteria have not been developed to judge the adequacy of the nation's supply of NICU beds so it is not possible to determine whether the current supply of NICUs is appropriate or whether their distribution

and organization into regional networks is adequate to provide for the needs of the population.

Health Care Resources for Children

The Supply and Distribution of Child Health Care Providers

Physicians and Pediatric Nurse Practitioners

In 1987, physicians' offices were the usual source of care for 86% of children under 19.³² Private office-based pediatricians and family physicians are the major providers of children's preventive and primary care, and they account for almost 90% of the physicians treating children.³³ There are significant differences in the current and predicted supply and distribution of pediatricians and family physicians, however, and these patterns are described more fully below.

Pediatricians. Excellent access to health care, especially primary care, is experienced by many children—especially children under 6 years of age—and is due in part to a generous supply of pediatricians,



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which has been growing at a rate much faster than the U.S. population of children. Between 1970 and 1985 the population of pediatricians grew by 89% to a total of 35,617 pediatricians, while the number of children under 10 years of age increased by only 21%.³⁴

The question of whether the nation is, in fact, producing too many pediatricians has been the subject of considerable debate. In 1980, GMENAC predicted a surplus of 5,000 pediatricians in the United States by 1990, although this report ultimately concluded that supply and demand for pediatric services would be nearly in balance by 1990.³⁵ Abt Associates' recently published revision of GMENAC's earlier forecasts predicts a surplus of 7,000 pediatricians in 1990 and a surplus of nearly 13,000 pediatricians by the year 2000. The American Academy of Pediatrics (AAP) takes exception with many of Abt's assumptions, arguing in part that Abt has substantially overestimated the role of pediatric nurse practitioners in caring for children and substantially underestimated the birth rate. As a result, the Academy "thoroughly disagrees with those projections."^{36,37}

The apparently generous supply of pediatricians masks the equally apparent geographic maldistribution of pediatricians.

Whether or not there is a surplus of pediatricians, and whether the outcomes of such a surplus should be considered either positive or negative, it seems apparent that the child-to-pediatrician ratio will continue to decline in coming years. Data from the Bureau of Health Professions indicate that nationally the number of children per pediatrician declined from 3,098 in 1970 to 2,082 in 1983 and is projected to drop to 1,254 in 2000, a ratio of less than half as many children per pediatrician as in 1970.³⁴ The fact that family physicians also provide a significant portion of children's health care compounds this trend. Defining the number of child health physicians to include all pediatricians plus one-fourth the number of general practitioners/family physicians

(as has been recommended by the AAP), the ratio of children to child health physician declined from 1,590 in 1970 to 1,414 in 1983 and is projected to decline to 913 in 2000.³⁴ It is worth noting that the AAP's rule of thumb is that an area is underserved if there are more than 2,500 children per child health physician.³⁸

The apparently generous supply of pediatricians masks the equally apparent geographic maldistribution of pediatricians. While pediatrics is a primary care specialty dedicated to the care of children, there is considerable agreement—even within the medical profession—that the geographic distribution of pediatricians does not match that of U.S. children.^{34,37} While 29% of all U.S. children lived in nonmetropolitan areas in 1981, only 11% of pediatricians practiced in these areas; in the same year only 37% of children lived in metropolitan areas, while 57% of pediatricians practiced there.³⁴

Within metropolitan areas pediatricians also are maldistributed, favoring locations close to major pediatric hospital centers or in relatively prosperous residential communities. In Chicago in 1987, for example, there were almost twice as many children per office-based pediatrician in inner city residential areas as in the most prosperous areas and 60% more children per child health provider in the poorest areas than in the best served residential areas. While care available from inner city hospitals and clinics offsets some of these disparities, the average children-to-pediatrician ratios in Chicago's inner city communities (5,887) were more than twice the AAP's underservice standard of 2,500 children per pediatrician. Significant levels of underservice are observed even after the inclusion in the ratio of one quarter of the family physicians practicing in Chicago's inner city communities.¹⁵

Access problems caused by the geographic maldistribution of pediatricians are exacerbated by the unwillingness of some pediatricians to serve children whose care is paid for by Medicaid. Low Medicaid payments are frequently cited as a prime factor in low pediatrician participation in Medicaid, although this participation is higher than in any other specialty except for family practice. Recent federal and state initiatives have begun to raise these payment levels.^{15,39-41} Because of the fundamental geographic maldistribution of pediatricians, however, in-

creases in Medicaid reimbursement are unlikely to improve access for all Medicaid-eligible children. Higher reimbursement levels are likely to improve access for near-poor children living in areas richly supplied with physicians, but they will have little effect on the availability of office-based care for poorer and sicker children residing in inner cities.¹⁵

More important, perhaps, the geographic distribution of family physicians closely mirrors that of children.

The supply and distribution of family physicians also contributes significantly to the excellent access to health care experienced by most children. Following a decline in the supply of general practitioners/family physicians between 1963 and 1975, GME/NAC predicted in 1980 that the supply of this type of physician would increase between 1978 and 1990. Increases were indeed observed such that the supply of family physicians is currently judged to be roughly in balance with the needs of the U.S. population and is predicted to continue to be so through the year 2000.² Others have projected, however, that over the next 15 years the supply of family physicians will grow much more slowly than both the overall physician population and the U.S. population and, as a result, the demand for the services of family physicians may well exceed the supply.^{9, 12}

Family physicians are an extremely important source of medical care for children living in nonmetropolitan areas. Family physicians receive training in a broad range of medical care and are therefore well-suited to serve patients drawn from all age groups. This flexibility in patient base makes it more feasible for family physicians to maintain economically viable medical practices in less densely populated communities. Indeed, when compared with other primary care physicians, family physicians are by far the most evenly distributed across all county types and sizes, although few can be found in the nation's most sparsely populated rural counties.³

More important, perhaps, the geographic distribution of family physicians closely mirrors that of children. As a result,

"in 1981, 60% of children in nonmetropolitan areas had a general/family practitioner as their regular physician, compared with only 18% of children in those areas who had a regular relationship with a pediatrician."³¹

Even within metropolitan areas, family physicians tend to be broadly dispersed across residential communities when compared with pediatricians. In addition, the Medicaid participation of family physicians tends to be higher than that of pediatricians. This fact, combined with their greater willingness to practice in inner city and rural communities, makes family physicians an extremely important resource for low-income and minority children.¹⁵

Pediatric Nurse Practitioners. Pediatric nurse practitioners (PNPs) provide care for both healthy and chronically ill infants and children, and have particular expertise in growth, development, and physical assessment. Currently there are approximately 6,000 PNPs in the United States, a number that has been relatively constant for the past decade. Prior to 1992, certification of PNPs was limited to licensed registered nurses with additional special training for this expanded role; beginning in 1992, certification of PNPs will require a master's degree in nursing.¹³

Historically, most pediatric nurse practitioners have worked in hospital-based and community-based clinics in inner city communities, and only a small proportion of nurse practitioners has practiced in rural areas.^{14, 15} Because of their limited numbers, pediatric nurse practitioners are currently estimated to supply no more than 5% to 15% of pediatric care.¹⁶

There is considerable evidence about the efficacy and cost-effectiveness of the nurse practitioner role in a wide variety of settings—from hospital outpatient departments and public health clinics to health maintenance organizations—and in conjunction with the care of many different special populations and problems.^{16–18} However, historically, complex economic and legal factors constrained growth in the supply of nurse practitioners, inhibited their diffusion into underserved areas, and limited the scope of their practice. These factors included the inability to obtain direct reimbursement for services, the costliness of medical liability insurance, and interstate variation in the permissible scope of practice (including, particularly, the authority to prescribe). Some of these

barriers to PNP practice were lowered in the late 1980s and the early 1990s, including a new provision for direct reimbursement of PNPs by Medicaid,⁴⁹ and these changes may result in an increased supply and a broadened distribution of PNPs in the coming years.

Office-based and Organized Primary Care Settings

There is widespread agreement that the majority of children in this country have excellent access to primary care. Substantial numbers of children are underserved, however, including children who reside in inner cities and rural areas and children who are poor or black. In 1988, for example, 90% of U.S. children had a usual source of routine care, but 15% of poor children had no usual source of care.⁵⁰

Data from the 1987 National Medical Expenditure Survey (NMES) indicate that, overall, children's access to health care continues to be excellent. Preliminary NMES data indicate that 92% of children under 6 years of age and 87% of children between the ages of 6 and 18 years have a usual source of care. Eighty-four percent

of children under 6 and 87% of children ages 6 to 18 are reported to travel less than 30 minutes to their usual source of care. Eighty-six percent of children with a usual source of care rely on physicians' offices, while 5% rely on hospital outpatient departments and emergency rooms and 8% rely on other nonhospital facilities such as health centers, company clinics, school clinics, and walk-in clinics.³²

Cross-tabulations of NMES data by age, ethnic and racial background, family income, and place of residence have not yet been published, but these data can be expected to highlight children who continue to be among the structurally underserved—that is, low-income and minority children, adolescents, and inner city and rural children. Monheit and Cunningham in this journal issue use data from the NMES to examine the effect of health insurance coverage on the presence of a usual source of medical care. They report that children lacking health insurance were less likely to have a usual source of care than were children with either private or public insurance coverage (Monheit and Cunningham table 2). Earlier data suggest that many low-income children have little access to office-based care and are among those relying on organized settings, including hospital emergency rooms, as their regular source of care.⁵¹⁻⁵³

is often outpatient clinics and emergency rooms. The dependence of some children on hospital outpatient clinics and emergency rooms for preventive and primary care has long been cited as one of the greatest shortcomings of the health care system serving children. Care in these settings is thought to lack the continuity and comprehensiveness which should characterize children's health care, and it also is regarded as unnecessarily expensive. Reliance on these settings is more common among minority children, those who are poor, those who lack health insurance, and those living in underserved communities. Preliminary data from the 1987 NMES—although not focused specifically on children—indicate that blacks and Hispanics with a usual source of care were more than twice as likely as whites to go to hospital outpatient departments and emergency rooms or health centers and other nonhospital facilities as their usual source of care. For 15.8% of blacks, a hospital outpatient department or emergency room was the site of their usual source of care, compared with 9.9% of Hispanics



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and 4.4% of whites.³² Poor children also are more likely to be taken to emergency rooms. Data from the 1987 National Health Interview Survey indicate that 11% of visits made by poor children were to emergency rooms as compared with only 4% of visits by nonpoor children.⁵⁴

There are few data with which to describe the supply and distribution of hospital outpatient department and emergency room facilities serving children or with which to judge the adequacy of the capacity in these settings. Much as is true for pregnant women, while empirical evidence is lacking, hospital closures—particularly the closure of public hospitals—have had an important impact on access to preventive and primary care for the children relying on these settings.

Local Health Department and Community Health Centers. Local health department clinics and other facilities receiving Title V Maternal and Child Health Block Grant funds are an important resource for children, but their focus is primarily limited to preventive care and few states are able to offer services on a statewide basis. (For more information about these providers, see the article by Hill in this journal issue.) A 1986 survey of Title V maternal and child health agencies found that, while 46 of 51 state agencies have pediatric outpatient programs, only 13 states offer these services on a statewide basis and no state provides either comprehensive services or services for at least some acute care needs on a statewide basis. All of the agencies offering pediatric outpatient services offered well-child care, but only 11 states reported furnishing any acute care services to children. Nineteen agencies relied exclusively on the local health departments for the provision of pediatric outpatient care, but 32 states made use of private providers, community health centers, and other clinics.²⁷

It has been estimated that 36% of all migrant and community health center patients are children under the age of 14;²⁹ however, little systematic evidence is available with which to judge the adequacy of the capacity in these settings. Much as is true for pregnant women, the cutoff of funds to many centers in the early 1980s left service gaps in many communities, and the difficulties that the remaining centers experience in attracting physicians limit their capacity.

Schools. At the present time, school-based health services are a limited but potentially important preventive and primary care resource for children. Compelling arguments have been made with regard to the efficiency, effectiveness, and equity of school-based health services, and most of the disagreement about school-based services seems to center on exactly how much primary care should be provided in the schools.⁵⁵ (See the Spring 1992 issue of *The Future of Children* for an in-depth analysis of school-linked services.)

Comprehensive school-based clinics, although limited in number, are thought to be a promising strategy for reaching adolescents. . .

Both funding sources and levels of investment in school health services vary greatly from state to state. Little information is available on the supply of school health services, although great variation in the supply is evident in pupil-to-nurse ratios: in 1985–86 the average pupil-to-nurse ratio was 2,473 to 1 for all districts, but this number varied across districts from 1,156 to 1 to 4,903 to 1.⁵⁵

Comprehensive school-based clinics, although limited in number, are thought to be a promising strategy for reaching adolescents and, in particular, for improving opportunities for adolescents to avoid unintended pregnancies. In 1987 there were 85 clinics affiliated with junior high or high schools throughout the country. Such clinics are usually staffed by nurse practitioners, clinic aides, part-time physicians, social workers, nutritionists, and other professionals.⁵⁰

The Supply and Distribution of Physicians Providing Specialized Care to Children

Although the predominant health care need among children is for primary care, the services of various specialists and subspecialists are also of great importance to the health of children. It is therefore important to consider the supply and distribution of specialty and subspecialty physicians serving children and to consider the adequacy of the supply of highly specialized care relative to the supply of primary care.



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Data from the U.S. Bureau of Health Professions indicate that in 1986 there were 60,700 medical specialists serving all age groups in the U.S. and that the numbers are rapidly increasing; the overall number of medical specialists is projected to increase by 63% between 1986 and 2000 and by 91% between 1986 and 2020.⁵⁶ This aggregate trend masks differences among the pediatric medical subspecialties, however. For example, the supply of pediatric allergists is expected to decline by 21% between 1986 and 2000, while the supply of pediatric cardiologists is projected to increase by 11%. Other pediatric subspecialists (a category which includes adolescent medicine, genetics, neonatal medicine, pediatric neurology, pediatric endocrinology, child psychiatry, pediatric pulmonology, pediatric hematology-oncology, pediatric immunology, pediatric infectious diseases, pediatric gastroenterology, and pediatric nephrology) are projected to increase by 54% between 1986 and 2000 and by 86% between 1986 and 2020.⁵⁶ The trends also do not take into account the amount of time pediatric subspecialists, who are mostly full-time academic faculty (in contrast to many adult subspecialists), spend in research and educational activities.

Data with which to evaluate the adequacy of the current supply and distribu-

tion of specific pediatric specialists and subspecialists are not available. However, data from the U.S. Bureau of Health Professions shed some light on overall trends.⁵⁶ These data indicate that, while the overall supply of physicians is increasing rapidly and the total number of physicians required in 2000 will exceed requirements by 50,101 physicians, the excess of supply over requirements is far greater for specialists (32,020) than for generalist physicians (general/family medicine, general internal medicine and general pediatrics) (17,990). As noted elsewhere in this paper, the abundant supply of specialists and subspecialists serving children has greatly improved access to specialized care for acutely and chronically ill children. However, the imbalance in the projected excess of providers of general and specialty care services raises important questions about what directions future policy should take with regard to the training of different types of physicians.

The Supply and Distribution of Hospital Care for Acutely and Chronically Ill Children

Most children never require hospitalization; but some children, especially those with chronic and disabling conditions, require multiple and sometimes prolonged hospital stays. The access of children requiring inpatient and/or specialized hospital outpatient care has undoubtedly been affected by the same broad trends in the health care system described elsewhere in this paper—that is, hospital closures, mergers, and acquisitions which have reduced the supply of care, particularly from small, rural and public hospitals—although research is lacking on the impact of these trends on children. In urban areas children often have many inpatient and specialized outpatient resources available to them, including the highly specialized services of children's hospitals, although recent public hospital closures have undoubtedly limited choices available to low-income families. Choices available to most rural children are undoubtedly much more limited and may entail travel over considerable distances.

Because a great many of the children requiring acute care in hospitals have been injured, trends in the supply and distribution of emergency and trauma care—especially care tailored to meet the special characteristics and needs of children—have particularly important

implications for this group. The American Hospital Association notes that during the 1980s, the number of hospitals equipped to handle emergencies on a 24-hour basis increased, but despite this encouraging trend, the availability of specialized trauma care diminished.²¹ This unfortunate trend is attributed to the high costs of operating trauma centers which, together with the burden of the uninsured and low payments from Medicaid, have forced many hospitals to close their trauma centers. Even among the 154 children's hospitals described in a recent report, only 41 facilities have a certified pediatric trauma center.⁵⁷

Services for Children with Chronic and Disabling Conditions

When compared with other children, the nation's 3.3 million children with chronic and disabling conditions require a great many medical and nonmedical services. They make more physician visits, require more hospitalizations, and are more likely to have multiple sources of health care.⁵⁸ According to Perrin and Ireys, the past 2 decades have seen great improvements in the supply and distribution of the highly specialized medical care needed by children with chronic and disabling conditions—particularly in urban areas—and it is now primarily chronically ill children living in rural areas for whom access to services is the most problematic.⁵⁹

As noted above, the number of highly specialized physicians has been increasing rapidly in recent years. While increases in the numbers of specialists and subspecialists in urban areas remedied many of the supply problems that formerly impeded access to care for chronically ill children, the medical care of chronically ill children continues to be characterized by a great deal of confusion and fragmentation. Chronically ill children tend to have multiple providers, collaboration and coordination among these providers is often lacking, and the preventive and primary care needs of these children are often overlooked.⁵⁹⁻⁶¹ In addition, whereas access to specialized medical care from office-based physicians and hospital outpatient clinics may be excellent in many urban areas, the availability of the wide array of nonmedical services needed by chronically ill children tends to be much more variable in both urban and rural communities.⁵⁹

Conclusions

The foregoing review reaffirms a longstanding paradox in the health care system serving the nation's children and pregnant women: some communities and populations enjoy an embarrassment of riches of health care resources, while others remain underserved. And the very women and children who are most woefully underserved also are among those at greatest risk for low birth weight births, infant deaths, and morbidity and mortality during childhood.

While the maldistribution of many maternal and child health care resources is not new, the foregoing review suggests that some of the dimensions of the problem of maldistribution have changed in recent years. In the private office-based sector, the supply of family physicians has grown, bringing greatly improved access to primary care particularly for children in nonmetropolitan areas. The supply of pediatricians and pediatric subspecialists also has grown, although because of their

Physicians' reluctance to participate in Medicaid has also contributed to the difficulties that many women and children experience in obtaining needed care.

continuing maldistribution relative to children, these increases have not benefitted many children who remain underserved—especially chronically ill children residing in rural areas. The rising costs of medical liability insurance made what was a serious problem—the geographic maldistribution of obstetrician-gynecologists—significantly worse by impairing the ability of family physicians, certified nurse midwives, and even some obstetricians and gynecologists to provide maternity services to pregnant women who are otherwise underserved. And the continuing problem of physicians' reluctance to participate in Medicaid has also contributed to the difficulties that many women and children experience in obtaining needed care. Some of the most dramatic changes have occurred in the supply and distribution of health care resources in the institutional sector, including closures of many hospitals and community health centers, reductions in core funding of many community

health centers and local public health clinics, and budget reductions in many of the categorical and block grant health service programs which have traditionally been offered to women and children in these settings.

The foregoing review suggests some policy strategies that seem particularly important to efforts to maintain and improve upon the present configuration of maternal and child health care resources in the coming years:

1. Continue efforts to bolster the supply of family physicians. Because family physicians are able to maintain viable practices in nonmetropolitan and other underserved areas and are apparently willing to practice in these communities and to participate in Medicaid, the maintenance of a generous supply of these physicians represents an especially important resource for children and pregnant women. The foregoing review suggests some disagreement about whether the future supply of family physicians will be adequate to meet the demand for their services. The vital importance of family physicians to underserved populations suggests that the Council on Graduate Medical Education would do well to conclude its deliberations with recommendations for future health professional supply which err on the side of producing too many family physicians rather than too few.

2. Adopt strategies to lessen the problems that medical professional liability issues pose for all maternity care providers. A number of promising strategies for addressing this problem have been proposed by the Institute of Medicine.⁵ While a review of these strategies is beyond the scope of this paper, the evidence presented here makes clear the distortions in the supply of maternity care providers which have resulted from the medical professional liability problem. Resolution of this problem would free up considerable capacity for the provision of maternity care services by family physicians and certified nurse midwives as well as provide needed relief from the costs of malpractice insurance for organized settings.

3. Continue support for the National Health Service Corps (NHSC) scholarship and loan repayment programs. Some rural and inner city communities will always have difficulty attracting and retaining physicians. However, the NHSC has had demonstrable effectiveness in filling some of

these gaps. Although this program was very nearly eliminated in the early 1980s, in the face of the negative effects cutbacks were having in underserved areas, it was reinstated by Congress in 1990.²² This action has slowed the rate of decline in the numbers of physicians in the NHSC pipeline. Because of its important role in placing primary care physicians in underserved communities, continued and expanded support for this program will be an important factor in future access to maternal and child health care.

Members of the NHSC are particularly important in the staffing of migrant and community health centers. Because these centers are supported by public resources and are targeted for underserved communities, it is especially important that they be able to function at their maximum capacity. Because in the short run, federal budget constraints may mitigate against significant expansions of the NHSC, it may be worthwhile to create special incentives for physicians and other health professionals to fulfill NHSC service obligations through work in migrant and community health centers.

4. Continue efforts to ensure the fullest possible participation of physicians in serving Medicaid-eligible women and children. The most universally accepted strategy for accomplishing this is to ensure adequate Medicaid reimbursement levels. The federal Omnibus Budget Reconciliation Act (OBRA) of 1989 required that states document and ensure the adequacy of their Medicaid pediatric and obstetric fees, and a number of states have recently instituted fee increases. At the same time, the limitations of Medicaid reimbursement increases for improving access to maternal and child health services should be recognized: empirical evidence suggests it is unlikely that reimbursement increases will be of sufficient magnitude to encourage physicians to locate in underserved areas,⁸ and in these communities—where maternal and child health care needs are also greatest—other policy strategies to expand the supply of services will be needed if access is to be improved (see recommendation 6, below).

5. Develop systematic data with which to describe and evaluate the adequacy of the supply of maternal and child health care available in organized settings. Utilization data from national surveys make it evident that a great many women and children depend

on the resources of hospital clinics, public health clinics, migrant and community health centers, and school-based health services. Yet, with the exception of the occasional special-purpose survey,²⁷ relatively little information is available to assist planners and policymakers in making judgments about whether the supply is adequate to meet the growing demand for care in various organized settings and to evaluate the impact of capacity shortfalls on utilization and health status. Available information suggests that in many communities the capacity in these settings is inadequate, but systematic information describing the magnitude of these problems, collected on a periodic basis, would improve both our understanding of this situation and the likelihood that the federal government's scarce discretionary resources will be committed to addressing this problem.

6. Enhance the capacity of organized settings to meet the needs of underserved children and pregnant women. Even in the absence of systematic data, the foregoing review suggests the need for capacity-building in organized settings. The clinics of public hospitals and academic medical centers, public health clinics, community and migrant health centers, and schools represent a considerable foundation of institutions upon which to expand the preventive and primary care capacity in underserved communities. Some have argued against expanding organized settings on the basis that it will displace private office-based care, but care from organized settings has been found to expand the overall availability of care rather than displacing care from private physicians.^{62,63} Others have argued against expanding organized settings because it will create a "two-tiered system" of health care, but Williams and Miller make a compelling case that this stance oversimplifies and ultimately dodges the very complex question of how best and most feasibly to meet the needs of the underserved.⁶⁴

In recent years the financial pressures experienced by many organized settings have made capacity-building very difficult: many of the public health programs financing care in these settings were reduced or eliminated during the 1980s, and increases in others failed to keep pace with medical care price inflation;^{15,65} Medicaid reimbursements frequently failed to cover costs; malpractice premiums and other practice costs rose and the

numbers of medically indigent patients seeking service increased.

There are a number of vehicles for providing organized settings with the resources they need to expand their capacity. The most direct approach to building capacity in community and migrant health centers is to expand the core operating grants which currently comprise nearly half of their funding.²² Alternatively, grant programs can be developed specifically for capacity-building purposes. For example, in 1989, the federal Department of Health and Human Services awarded \$22 million to help community and migrant health centers recruit new personnel and retain NIISC physicians past their period of obligation.²² Other similar initiatives would be helpful to efforts to better meet the preventive and primary care needs of the underserved.

A more indirect but nonetheless helpful approach would be to enhance the Medicaid reimbursement levels paid for care provided in organized settings. While Medicaid reimbursement can only be used to pay for services, increased payment levels would relieve some of the fiscal pressures faced by these institutions and help them maintain viability. The OBRA's of 1989 and 1990 took important steps in this direction by requiring that state Medicaid programs reimburse community health centers and other look-alike federally qualified health centers on the basis of 100% of the costs of providing care.¹⁵ While community health centers will benefit from this new policy direction, the full impact of this policy change on the institutions serving children and pregnant women will depend on whether federal regulations (not yet published) enable hospital outpatient and local public health clinics to obtain the look-alike designation and its associated cost-based reimbursement.

The preceding list of policy strategies confirms what one might have suspected—that is, that it will not be possible to improve the supply and distribution of preventive and primary care for children and pregnant women without additional resources. Moreover, unless the health service delivery programs presently serving women and children are funded at the level of medical care price inflation, additional erosion

in the capacity of organized settings is likely to occur in the future.

In an era of tight federal and state budget constraints, prospects for redressing persistent imbalances in maternal and child health care resources are limited, and there is even some degree of likelihood that these imbalances will be allowed to worsen. Unlike health and welfare entitlement programs (such as Medicaid) for which appropriations are open-ended, many of the programs that fund health care in organized settings are discretionary programs for which budget allocations are made each year. As a result, these programs

are very vulnerable to limited growth, reduction, or elimination during periods of tight budget constraints. The budget rules established by the Budget Enforcement Act of 1990 will make it very difficult to increase funding for the National Health Service Corps, the Maternal and Child Health Block Grant, or community and migrant health centers because these increases will need to be offset by cuts in military, international, or domestic discretionary spending—cuts which a number of onlookers agree may be politically difficult to achieve.^{15,65}

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Expenditures on Health Care for Children and Pregnant Women

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Abstract

The chronic health care crisis in the United States is primarily the result of rising health care costs and of a system that leaves millions of children and pregnant women without health insurance, with restricted access to health care, and at risk for poor health. A better understanding of the current system is key to any reform effort. The authors analyze estimates of annual expenditures on medical care services for children covering the period from conception through age 18 years, including expenditures on pregnancy and delivery. They focus their attention on the distribution of health care expenditures by type of service and source of payment, on how expenditures differ for children of different ages and for adults, and on the rate of growth in expenditures on health care for children.

The authors suggest that, because there has been a decline in the relative share of expenditures accounted for by children, efforts to expand third-party financing of their health care will be less likely to overwhelm the system than would efforts to expand coverage to other groups. Families who are especially in need of extended health care coverage are those of children with major illnesses who are exposed to catastrophic costs. Efforts at cost containment should be focused on the costs of pregnancy and newborn care, areas in which expenditures have grown extremely rapidly in recent years. Finally, the authors conclude that, if expansion of health insurance coverage for children in the near term should be incremental, expanded coverage for children 3 to 12 years old would probably have the smallest budgetary impact of any expansion in access to care.

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Rising health care costs, which have thwarted both public and private efforts to slow their growth, are at the heart of the chronic crisis of the U.S. health care system.¹ These rising costs consume ever greater portions of the budgets of governments, businesses, and households, leaving fewer resources for other activities. Attempts to deal with the burden of rising health care costs have left millions of Americans without health insurance or with insurance that is seriously inadequate.

Children and pregnant women have not escaped the fallout from the rapid increase in health care costs. Despite recent expansion of government programs (see the Hill article in this journal issue), more than 1 in

The views of this paper are those of the authors, and no official endorsement by the Agency for Health Care Policy and Research or the Department of Health and Human Services is intended or should be inferred.

5 children were without health insurance at some time during 1991. As documented by Monheit and Cunningham in this issue, children without health insurance use less preventive care and less care for acute illness. Presumably their health suffers as a consequence of this reduced utilization. Legislation has been introduced at the federal level and in several states to extend health insurance coverage to more children, and public opinion polls indicate that the public is sympathetic to the health care needs of children. Yet there appears to be a reluctance to commit resources to new health care programs in an era of general fiscal austerity. Given the inexorable rise in health care costs, concerns about the wisdom of expanding health care financing without either bringing costs under control or addressing what many feel are the inefficiencies of the current system appear justified.

A better understanding of the current system, however, is key to any effort to reform health care financing for children and pregnant women. Generalizations drawn from the observations of the health care system as a whole may not be totally applicable to children, especially at the level of detail necessary for effective policymaking.² Accordingly, this article presents estimates of annual expenditures on medical care services for children covering the period from conception through age 18 years including expenditures on pregnancy and delivery. Among the questions addressed are: How are these health care expenditures distributed among different types of health services and different sources of payment? Is the level and mix of

In this era of heightened cost-consciousness, knowledge about the nature of U.S. expenditures on health care for children is vital for those who would improve children's health.

medical care expenditures different for children of different ages and different for children as compared to adults? Are these differences great enough so that an incremental approach to health care financing reform which focuses initially on children makes sense? What about the rate of growth in expenditures on health care for children? Is it as rapid as the rate of growth in aggregate health care expenditures? Is it driven by similar forces, so that developing effective cost control strategies will have to be an integral feature of any effort to expand children's access to health care services?

To be sure, a description of where we are today and some of the trends that got us here will not be sufficient to point the way to effective reforms, and some of the information presented may raise as many questions as are answered. Still, it appears that, in this era of heightened cost-consciousness, knowledge about the nature of U.S. expenditures on health care for children is vital for those who would improve children's health.

Sources of Data

The 1987 National Medical Expenditure Survey (NMES) Household Survey is the

primary source of the expenditure estimates provided in this report.³ With a total sample of about 35,000 individuals in 14,000 households, this survey is designed

to provide estimates of the health status, use of health services, expenditures, sources of payment, and insurance coverage of the U.S. civilian population for the calendar year 1987. Each family in the survey sample was interviewed five times during 1987 and 1988 to obtain detailed, accurate information about each family member's health and health care utilization during 1987. To verify and supplement the information provided by the household respondents, separate surveys were performed on the medical care and health insurance providers of the households in the sample.⁴ Special tabulations of individual NMES data on the utilization, cost, and source of payment for health care aggregated by age groups are the basis of the estimates reported in this article.⁵

Baseline data for explorations of trends in health care costs over the 10-year period 1977-1987 are obtained from the 1977 National Medical Care Expenditure Survey (NMCES). Similar in design to the 1987 NMES, the 1977 NMCES also supplemented multiple interviews of individuals in 14,000 households with information from health care providers, employers, and insurance companies to provide a comprehensive statistical picture of how health care services were used and paid for by the U.S. noninstitutionalized population in 1977.⁶

Both the NMCES and the NMES tabulations used in this analysis follow the NMCES procedure of not treating the stays of newborns delivered in hospitals as separate admissions unless the infant remained in the hospital beyond the day on which the mother was discharged.⁷ Thus, in the NMES data, the costs associated with uncomplicated births (typically those in which the infant is discharged at the same time as the mother) are attributed to the mother, and the costs of complicated births (those where the infant remains in the hospital after the mother is discharged) are attributed to the infant and tabulated in the cost of medical care for children less than 2 years old. Because we could not obtain specific data on expenditures for all pregnancies in both the NMCES and NMES, our estimates of the costs of pregnancy are constructed from a variety of data sources and reported in a separate section.⁸

In the analysis that follows, we use the 1987 NMES to analyze health care expenditures for children by type of service, age

of child, and sources of payment. We also compare expenditures on children's health care with expenditures on health care for adults and examine the source of growth in expenditures on children's health between 1977 and 1987. We then turn to a separate analysis of expenditures for pregnancy and infant health care.

Personal Health Care Expenditures

Modified personal health care expenditures (MPHCE) as used in this report include expenditures on hospital care, services of physicians, dentists, and other health professionals; prescription drugs; and other personal health care services and products (eyeglasses, hearing aids, and other medical equipment).⁹ For children ages 0 to 18 years, MPHCE expenditures totaled \$49.8 billion in 1987 (see table 1). (Detailed tabulations of expenditure patterns by age, type of service, and source of payment are presented in appendix tables A1-A4.) Per capita expenditures (mean expenditures per child) were \$737 and varied considerably by the age of the child.

As shown in table 1, for each age group, aggregate expenditures are the product of the population of the group, the proportion of the population with expenditures on medical care, and the mean expenditure for those with expenses. Although there are more than three times as many children in the 3- to 12-year-old age group as in the 0- to 2-year-old age group, aggregate expenditures for the 0- to 2-year-olds were 12% greater. This difference primarily reflects the fact that mean expenditures among 0- to 2-year-olds were more than three times as large as mean expenditures among 3- to 12-year-olds. Mean expenditures for adolescents (ages 13 to 18) were almost twice as large as mean expenditures for 3- to 12-year-olds but about two-thirds the level of mean expenditures on 0- to 2-year-olds. We explore some of the sources of these age-specific differences below.

In the aggregate, children 0 to 18 years of age constituted 28.2% of the noninstitutionalized population in 1987 but accounted for only 13.7% of modified personal health care expenditures. Per capita MPHCE for children was only 59% as large as adult per capita expenditures. Per capita expenditures of adults 19 to 64 years of age were slightly less than those of young children (ages 0 to 2) but substantially greater than per capita expenditures

of children age 3 to 18. Per capita expenditures among the elderly (those at least 65 years of age) were, at \$4,276, almost six times those of children. The elderly, as a group, consumed a disproportionate share of health care; although they accounted for 11.8% of the noninstitutionalized population in 1987, their expenditures accounted for 33.2% of the expenditures on personal health care by the noninstitutionalized population.¹⁰

Expenditures by Type of Service

For children 0 to 18 years of age, hospital services, both in- and outpatient, accounted for the largest share of modified personal health spending—\$24.3 billion in 1987, representing 48.7% of all expenditures (figure 1). Expenditures on physician services for children, both ambulatory and inpatient care, amounted to \$11 billion in 1987 while dental care expenditures totaled \$8.2 billion. Lesser amounts (\$2.4 billion) were spent on non-physician ambulatory care (including services rendered by home health agencies, optometrists, chiropractors, and podiatrists, among others), \$2.1 billion on prescription drugs, and \$1.3 billion on a miscellany of other personal health services including eyeglasses, hearing aids, other medical supplies and equipment, and similar items.

MPHCE by Age of Child

The distribution of expenditures among the different types of services varied considerably according to the age of the child (figure 2). Among children 0 to 2 years old, inpatient hospital care accounted for almost 60% of all expenditures, and inpatient care by physicians accounted for another 17%. The high concentration of expenditures on inpatient services in this age group represents principally the care of sick newborns. Ambulatory care in physicians' offices and in hospital clinics and emergency rooms accounts for most of the rest of expenditures (18%) in this group.

In contrast, expenditures on ambulatory care account for a high proportion of MPHCE for those 3 to 12 years old. Expenditures for inpatient hospital care (21%) and physician services (4%) account for only 25% of expenditures in this age group, while ambulatory care, about equally divided between care in physicians' offices and hospital outpatient departments, accounts for almost 36% of all expenditures. For this age group, dental care at 22% of MPHCE is the largest single category of expense of those detailed in figure 2. Prescription drugs and nonphysician ambulatory care are also important sources of expenditures. The relatively small proportion of

Table 1. Modified Personal Health Care Expenditures by Age, NMES 1987

Age Group (years)	Total MPHCE* (billions)	Total Population (millions)	Percent of Population with Expenditures	Per Capita Expenditures	Expenditures per Individual with Expenditures
All children (0 to 18)	\$49.8	68	83	\$737	\$893
0 to 2	16.8**	11	92	1,524**	1,660**
3 to 12	14.9	35	81	426	525
13 to 18	18.2	22	80	843	1,053
Adults					
19 to 64	193.2	144	83	1,347	1,616
65+	121.0	28	94	4,276	4,566

* Modified personal health care expenditures (MPHCE) equal expenditures on hospital care, services of physicians, dentists, and other health care professionals, prescription drugs, and other personal health care services and products including eyeglasses, hearing aids, and other medical equipment

** Excludes expenditures associated with the initial newborn hospitalization of infants discharged at the same time as their mothers. These expenditures are attributed to the mother in the NMES. When estimates of these expenditures from table 2 are included in total MPHCE estimates for the 0- to 2-year-old group, total expenditures for this age group increase to \$19.0 billion and per capita expenditures increase to \$1,727

Source: Agency for Health Care Policy and Research, 1987 National Medical Expenditure Survey - Child Health Questionnaire and Household Survey

expenditures for hospital care in this age group is probably responsible for the low per capita expenditures reported for 3- to 12-year-olds (table 1).

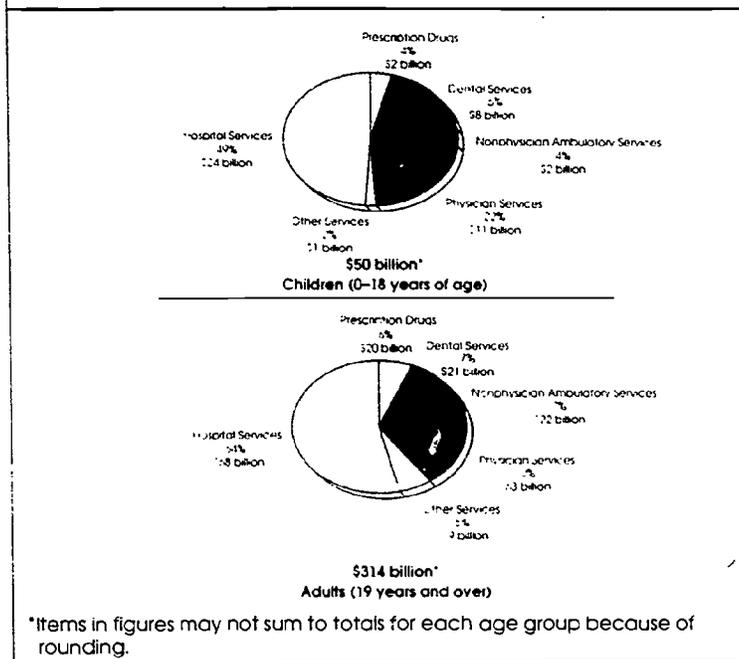
As per capita costs increase among those 13 to 18 years of age relative to those 3 to 12 years old, so does the proportion of expenditures which goes to inpatient hospital care (29%) and inpatient physician care (7%). The higher per capita expenditures for inpatient care for 13- to 18-year-olds is in part attributable to pregnancy-related costs. In 1987, there were approximately 320,000 live births to girls less than 19 years old.¹¹ Based on the estimates of the mean cost of pregnancy-related health care services, we estimate that these births accounted for almost \$1.24 billion in hospital-related obstetrical charges and almost \$190 million in expenditures for inpatient care of healthy newborns.¹² Together these expenditures amounted to \$70 per 13- to 18-year-old. Although a considerable amount, expenditures on pregnancy account for only about 30% of the difference between 13- to 18-year-olds and 3- to 12-year-olds in per capita expenditures for care in the hospital.

A hypothesis which requires further investigation is that the relatively high incidence of trauma associated with accidental injuries and violence in the 13- to 18-year-old group accounts for much of the increase in expenditures on their hospitalization. (See the article by Perrin, Gayer, and Lawrence in this journal issue.) In addition, as is true for 3- to 12-year-olds, 13- to 18-year-olds incur large expenditures for dental care. On average, 13- to 18-year-olds spend one and a half times as much on dental care as they do on ambulatory physician and ambulatory hospital care combined.

Comparison of Children's MPHCE with Adult Health Care Expenditures

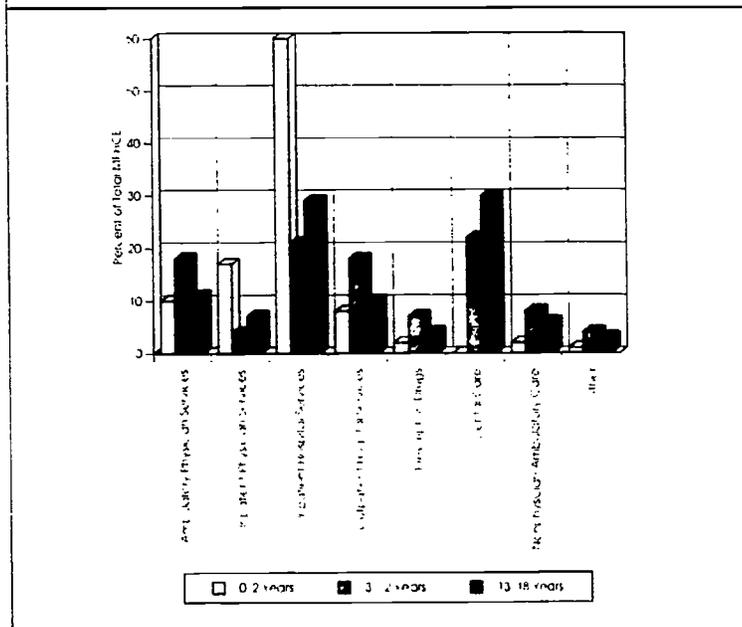
The distribution of MPHCE by type of service for adults (19 years and older) is also presented in figure 1. A somewhat larger proportion of adult than child health care expenditures go to hospital care (54% versus 49%), while a somewhat higher proportion of children's expenditures go to physicians as compared with adults (22% versus 20%). These small differences between children and adults in the proportion of modified personal health expenditures that go to physicians and hospitals are almost entirely a result of

Figure 1. Health Care Expenditures by Type of Service and Age, NMES 1987



Source: Agency for Health Care Policy and Research, 1987 National Medical Expenditure Survey - Household Survey

Figure 2. Distribution of Health Care Expenditures for Children of Different Ages by Type of Service, NMES 1987



Source: Agency for Health Care Policy and Research, 1987 National Medical Expenditure Survey - Household Survey

the increase in inpatient hospital care by those 65 years of age and over. The shares of health expenditures going to physicians (22%) and hospitals (50%) among adults 19 to 64 years (not shown) are almost identical to the relative shares of expenditures on these types of services in the health care expenditures of children. Perhaps the most striking difference in the health care expenditure patterns of adults as compared to those of children is the much larger share of dental care expenditures in the health care budget of children. The most extreme difference exists between children ages 6 to 18, for whom dental care represents almost 30% of expenditures, and those 65 years of age and older (not shown), for whom dental care represents less than 3% of expenditures.

Sources of Payment for Children's Health Care

In 1987, approximately two thirds of total modified personal health care expenditures for children were paid for by third-party payers, private health insurance and government programs (figure 3). Direct patient payments (typically by adult family members for children) including insurance co-payments and deductibles, as well as out-of-pocket payments for uninsured services, financed 27% of expenditures on children's health care. Other private sources, including philanthropy and services provided free from provider (uncompensated care), accounted for the remaining 6%.

Hospital Care

The share of health care expenditures funded by third parties varied considerably by type of service. For hospital care, which accounted for almost 49% (\$24.3 billion) of expenditures for children, third-party payments accounted for 81% of all expenditures in 1987 (table A1). Out-of-pocket expenditures financed about 11% of hospital care for this group. As compared with inpatient care, a somewhat higher percent of outpatient hospital care was paid for out-of-pocket (15% versus 10%). The proportion of hospital care paid for by government programs (about 33%) differed little by type of service.

Physician Services

On a per capita basis, out-of-pocket expenditures for physician services totaled about \$53 (table A1). Altogether, more than 32% of the \$11 billion expended on phy-

sician services for children 0 to 18 years old was paid for directly out-of-pocket. This was three times the proportion of hospital services paid for out-of-pocket. Moreover, the proportion of physician charges paid directly by families for their children varied considerably with the kind of service: almost 43% of charges for ambulatory physician services were paid out-of-pocket as compared with 19% of charges for inpatient care.

Private insurance paid for approximately 41% of physician services regardless of where the service was delivered, but there was considerable difference in the proportion of these services financed by public programs. Public programs paid for 37% of inpatient physician expenditures; 9% of these expenditures were financed by Medicaid and 28% by other public programs (including state and local programs and hospitals which provide services directly and the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS—the health insurance program for dependents of military personnel). In contrast, public programs paid for only 15% of expenditures for ambulatory physician visits: 11% was paid by Medicaid, and more than 3% was paid by other public programs.

Nonphysician Ambulatory Care

Families spent \$788 million out-of-pocket for nonphysician ambulatory care (home health care, optometric care, and the like) for children in 1987. This amount represented almost 3% of all expenditures on these services. Out-of-pocket payments financed a smaller proportion of nonphysician ambulatory services (33%) as compared with ambulatory physician services (43%) because a larger proportion of expenditures on nonphysician services were paid for by Medicaid and other government programs (16% and 10%, respectively, of expenditures on nonphysician services versus 11% and 3% of expenditures on ambulatory physician services).

Prescription Drugs and Dental Care

Out-of-pocket payments accounted for more than 50% of all expenditures on prescription drugs and dental care for children in 1987. However, there were considerable differences in the distribution of sources of payment for these services among the other payers. Private health insurance paid more than 37% of expenditures on dental care but only 28% of expenditures on prescription medica-

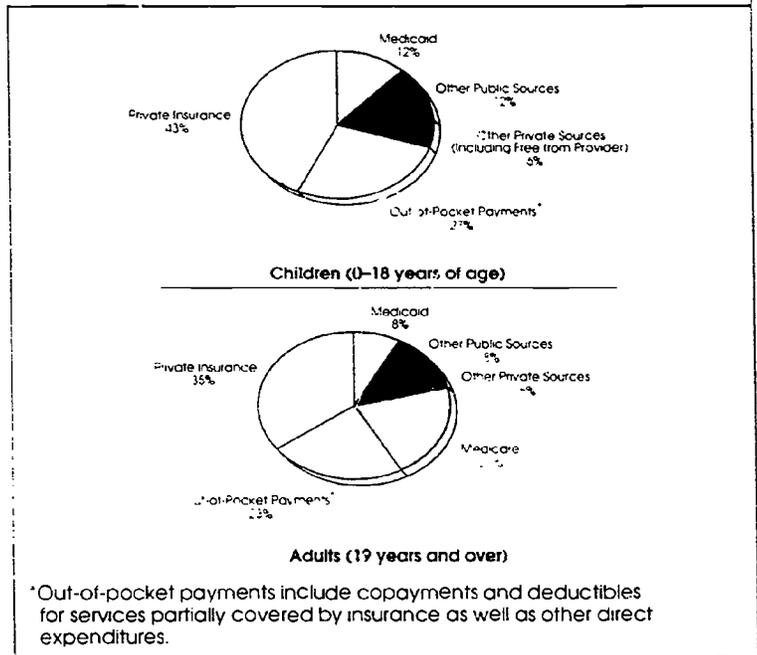
tions. Public programs paid more than 14% of prescription drug costs but less than 5% of dental expenditures. On a per capita basis, annual expenditures on dental care for children are large, \$129 or 17.5% of all modified personal health care expenditures. Because almost 53% of dental care expenditures are paid out-of-pocket, out-of-pocket expenditures on dental care (\$68 per child per year) are the largest service-specific component of direct family expenditures on health for children, accounting for more than one third of all out-of-pocket expenditures for children's health care. Out-of-pocket expenditures on dental care were 28% larger than out-of-pocket expenditures for physician care and 71% greater than out-of-pocket expenditures on hospital care.

Variation in Source of Payment Among Children of Different Ages

There is considerable variation in the distribution of sources of payment for children's health care according to the age of the child (figure 4 and tables A2-A4). The proportion of health care expenditures financed out-of-pocket is twice as large for children 13 to 18 years old (34%) as it is for 0- to 2-year-olds (17%). Conversely, Medicaid and other public programs paid for 42% of health care costs in the 0- to 2-year-old age group, but for only 12% of the expenses of those 13 to 18 years old. The distribution of expenditures for 3- to 12-year-old children among the various payers generally falls between the distributions for older and younger groups with the exception that Medicaid accounts for a slightly higher proportion of expenditures in this group than it does in the 0- to 2-year-old age group.

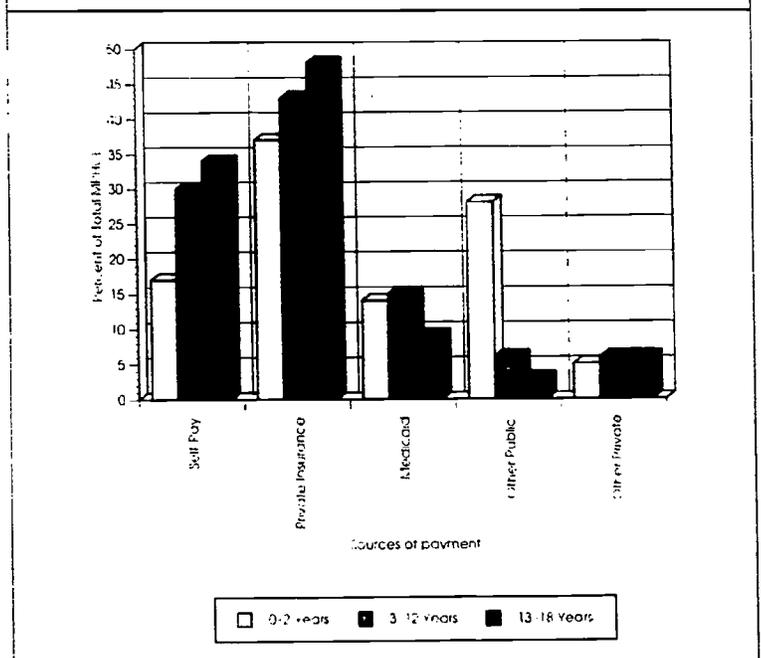
Variation in the sources of payment for health care by age reflect (1) variation in the sources of payment for different health care services and (2) age-specific differences in the utilization of different health care services. For example, for all children 0 to 18 years old, government programs pay for more than 33% of expenditures on hospital care, but less than 5% of expenditures on dental care. Expenditures for hospital care account for almost 68% of all expenditures for 0- to 2-year-olds but only 39% of expenditures for 13- to 18-year-olds, while dental care accounts for 30% of expenditures for 13- to 18-year-olds but is not a factor in expenditures for 0- to 2-year-olds. Thus, government programs pay for a larger proportion

Figure 3. Expenditures on Health Care for Children and Adults by Source of Payment, NMES 1987



Source: Agency for Health Care Policy and Research, 1987 National Medical Expenditure Survey - Household Survey

Figure 4. Distribution of Payment for Children's Health Care by Age, NMES 1987



Source: Agency for Health Care Policy and Research, 1987 National Medical Expenditure Survey - Household Survey

of the total health care expenditures for 0- to 2-year-olds than for 13- to 18-year-olds. Similarly, government programs that target particular age groups, such as the 1989 expansion of Medicaid eligibility for children under 6 years old (see the Hill article in this journal issue) will affect health care providers differently depending on the utilization of different health care services by children of different ages.

Differences in Sources of Payment Between Children and Adults

The distribution of sources of payment for health care services for adults (19 years and older) differs from the distribution of sources of payment for children in several ways (figure 3). Approximately 37% of adult modified personal health care expenditures are paid for by government programs including the 21% of expenditures financed by Medicare.¹³ The balance of public expenditures is divided almost equally between Medicaid and other public programs. Including Medicare, public programs paid for 62% of expenditures for those 65 and over (not shown). For those 19 to 64 years old, the 22% share of MPHCE paid for by public programs is shared approximately equally by Medicaid and other public programs with almost 4% of funding coming from Medicare. While

Five percent of the population of children (0 to 18 years old) accounted for more than 59% of all MPHCE in 1987.

the proportion of MPHCE for 19- to 64-year-olds financed through public programs was quite similar to the proportion of children's health care financed publicly, the \$42 billion public expenditure on adults 19 to 64 years old was almost 3.5 times the size of aggregate public expenditures on children in 1987. In the aggregate, expenditures on modified personal health care for adults are more than five times as great as expenditures on children. Because the share of adult health care financed by public programs is much greater than the share of children's health care financed by public programs, public expenditures on adult health care (\$116.7 billion) were almost 10 times as great as the public expenditures on children's health care (\$12.2 billion).

Within the population aged 0 to 18 years, the proportion of health care expenditures financed by public programs tends to fall and the proportion financed privately, both out-of-pocket and through private insurance, tends to rise with advancing age (figure 4). This tendency is reversed after early adulthood with the result that the proportion of health care expenditures paid directly out-of-pocket is highest for school-age children, teenagers, and young adults (not shown). It is not unreasonable to speculate that policies designed to increase access by expanding health insurance coverage could substantially increase the utilization and cost of health care in these age groups.

Burden of Children's Health Care Expenditures

Analysis of the distribution of medical care expenditures among the various sources of payment for services can conceal the magnitude of the financial burden some families face in trying to pay for their children's medical care. Each year a small proportion of the population accounts for the majority of health care costs. Five percent of the population of children (0 to 18 years old) accounted for more than 59% of all MPHCE in 1987. One percent of the child population accounts for 37% of MPHCE. These statistics also suggest that little is spent on health care for the majority of the population of children. These patterns of health care expenditures being concentrated among a small percent of the population hold also among the elderly in the United States and in other countries.¹⁴ Given per capita MPHCE of \$737 for children in 1987, these ratios imply that per capita expenditures for the most costly 1% of the child population averaged \$27,502 in 1987. MPHCE averaged \$8,641 for the most costly 5% of the population and only \$316 for the least costly 95%. (For a discussion of the uneven distribution of morbidity among the child population from a different perspective, see the articles by Starfield and by Perrin, Guyer, and Lawrence in this journal issue.)

The concentration of health care outlays can have an enormous financial impact on a family, even on those with fairly typical health insurance having various cost-sharing features. For example, among children who were hospitalized in 1987, out-of-pocket expenditures for inpatient physician services averaged \$349. In addi-

tion, mean out-of-pocket expenditures for inpatient hospital care were \$502 for children who incurred hospital expenses in 1987. Overall, for children hospitalized in 1987, out-of-pocket expenditures for hospital and physician care while in the hospital exceeded \$850 on average compared with a mean expenditure of only \$89 when out-of-pocket expenditures on inpatient care were averaged over all children.¹⁵

The concentration of medical outlays also provides an incentive for private insurance companies and employers to identify children likely to be heavy users of medical care. If they can identify potentially expensive patients or medical conditions in advance, payers may be able to reduce their exposure to the financial risk of paying for health care for these expensive patients.¹ (See the article by Sheils and Wolfe in this journal issue.)

Growth in Expenditures

Rapidly rising health care costs have precipitated a health care financing crisis for the nation. In this section, we compare baseline data from the 1977 NMCES with expenditure data from the 1987 NMES to explore changes in medical care spending for children and adults between 1977 and 1987. During this 10-year period, aggregate modified personal health care expenditures for children (unadjusted for inflation) increased by 234%, from \$14.9 billion in 1977 to \$49.8 billion in 1987. Per

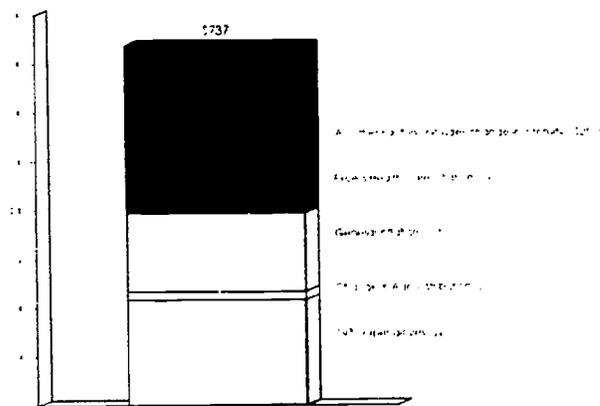
capita expenditures on children increased by a slightly more rapid 240%, from \$217 in 1977 to \$737 in 1987. The rate of increase in aggregate expenditures was slightly less than the rate of increase in per capita expenditures because the population of children declined by 1.2 million (1.7%) over the decade.

In contrast, per capita expenditures for adults ages 19 to 64 increased by only 158% during the same period, but the population aged 19 to 64 years grew by 22.5 million or 18.5%. Accordingly, aggregate expenditures on the noninstitutionalized population 19 to 64 years old grew by 207% from 1977 to 1987.

Aggregate MPHCE of the noninstitutionalized population 65 years of age and older grew even more rapidly, by 383%, from \$25 billion in 1977 to \$121 billion in 1987. The high rate of growth in this age group resulted from the combination of rapid growth (281%) in per capita expenditures, from \$1,124 in 1977 to \$4,277 in 1987, and an increase in population of 6 million, or 27%.

Overall, per capita expenditures on children increased 20% more rapidly than per capita expenditures on adults; however, because the number of children declined slightly while the number of adults increased by 28.5 million, children's MPHCE declined to 13.7% of total expenditures in 1987 from 14.5% in 1977.

Figure 5. Factors Accounting for Growth in Per Capita Expenditures for Health Care for Children, 1977 to 1987



Source: Agency for Health Care Policy and Research, 1977 National Medical Care Expenditure Survey - Household Survey; Agency for Health Care Policy and Research, 1987 National Medical Expenditure Survey - Household Survey.

Sources of Growth in Children's Health Care Expenditures

It is useful to examine separately factors that contribute to growth in health care costs. Although such analyses may not explain why costs increase, they can help in assessing the relative contributions of the various factors which fuel growth. A frequently performed analysis allocates the change in health care expenditures among four factors: general price inflation, industry-specific price inflation, population growth, and all other factors.^{3,16}

The results of decomposing the growth in per capita MPHCE for children between 1977 and 1987 are presented in figure 5. General and medical price inflation have been found to account for a substantial part of the growth in personal health care expenditures for the general population.³ They appear to account for almost half of the overall increase in per capita expenditures for children between 1977 and 1987. In addition, an increase of almost 4 percentage points in the proportion of children in the 0- to 2-year-old age group—the group with the highest per capita expenditures—resulted in a 3% increase in per capita expenditures for children 0 to 18 years old.

Once price and population changes are explicitly represented, the "all other factors" in this analysis is a measure of the increase in the average "intensity" of health care services delivered on a per child basis (more health services per child). This residual term, which also includes measurement error, accounted for 48% of the increase in MPHCE for children during the 1977-1987 period.

Further analyses indicate that increased expenditures on both inpatient and outpatient hospital services accounted for more than 75% of the increase in the resource intensity of children's MPHCE. Per capita expenditures on hospital care for children increased by 379% between 1977 and 1987, while per capita expenditures on all other personal health care services for children increased by 167%. Hospital expenditures increased most rapidly for those 0 to 2 years old, by more than 650% between 1977 and 1987. As a result of this rapid growth, the proportion of hospital expenditures accounted for by this age group grew to 47% of all expenditures on hospital care for children in 1987 from 29% in 1977. Overall, close to

40% of the increase in intensity of all medical care for children of all ages over the period was the result of an increase in the intensity of hospital care for children in the 0- to 2-year-old age group.

It is tempting to speculate that increased expenditures for this age group reflected the rapid rate of technological advance in the care of high-risk, very low birth weight babies in neonatal intensive care units and the proliferation of these units throughout the hospital system. (See the Racine, Joyce, and Grossman article in this journal issue.) The increase in the level of real medical care services received by these infants and young children may also reflect the increased health care needs of high-risk infants who survive the neonatal period. At this point in time, however, we do not have access to NMES data at a level of detail which would allow investigation of this conjecture.

Expenditures for Pregnancy and Infant Medical Care

Medical care during pregnancy, childbirth, and infancy (the first year of life) not only has a significant impact on the health and survival of young children, but also is a major source of health care expenditures. However, despite several surveys that examine pregnancy and childbirth specifically¹⁷ and others that detail health care expenditures generally, an overall expenditures data set from which a comprehensive estimate of the costs of pregnancy and infant care can be calculated is not available. Accordingly, we follow the lead of several previous investigators¹⁸ in drawing on data from a variety of sources—some large national surveys, some smaller specialized studies—to obtain estimates of both the volume of services provided to pregnant women and infants in 1987 and the prices of these various services. All prices and quantities presented are for 1987 unless otherwise stated. The estimates are detailed in tables 2 and 3. The sources, methods, and assumptions underlying these estimates are presented either in the text or in notes to the tables to enable the reader to assess the quality of the estimates and place them within the context of the other analyses presented in this article.

Table 2. Estimated Expenditures on Health Care for Infants, 1987

Type of Expenditure	Number of Infants (thousands)	Average Cost	Total Cost (millions)
Normal newborn care^a			
Hospitals	3,007	\$609	\$1,831
Physicians*	3,007	134	401
Other infant care (including NICU and rehospitalizations)^b			
Hospitalizations			
Hospitals	939	7,107	6,671
Physicians	740	3,421	2,531
Ambulatory care			
Hospital clinics and ERs	747	544	407
Physicians	3,068	179	551
Nonphysician ambulatory care	683	162	111
Drugs, dental, other**	3,865	36	138
Total expenditures on infant care	3,865	\$3,271	\$12,641

*Includes a pediatrician's visit for all infants and circumcision charge for 50% of all infants.

**Total population in less than 1-year-old age group and per capita charges for indicated services.

Sources:

^aMinor, A.F. *The cost of maternity care and childbirth in the United States, 1989*. Health Insurance Association of America, research bulletin, HIAA, December 1989.

^bAgency for Health Care Policy and Research. 1987 National Medical Expenditure Survey - Child Health Questionnaire and Household Survey.

Medical Care for Infants

Estimated health care expenditures for children in their first year of life totaled \$12.6 billion, or \$3,271 per infant in 1987 (table 2). Approximately 18% of the total was spent on care in the hospital for normal newborns. Another 72% was spent for the initial hospitalization and inpatient physician care of newborns suffering some complication of birth and for the care of infants requiring rehospitalization during their first year of life. Only 10% of the total, or \$312 per child, was spent on health care not requiring hospitalization, including well-child and preventive care.

Approximately 80% to 85% of newborns are discharged from the hospital with their mothers after a routine nursery stay and normal well-infant care.¹⁹ Because information on the cost of care for these "normal" infants was not tabulated separately in the 1987 NMES data used elsewhere in this report, we use estimates of the mean cost of care for these infants developed by the Health Insurance

Association of America.^{20,21} In 1987, the mean hospital charge for these infants was \$609, and well-infant pediatric care cost \$134 on average.

Information on expenditures for infants born with some complication which resulted in their being discharged at a time other than that at which their mothers were discharged is available in the 1987 NMES. Information on expenditures for all infants after their initial hospitalization is also available in the 1987 NMES, although for this analysis it is not possible to distinguish between expenditures on the initial hospitalizations for infants with complications and expenditures on rehospitalizations. Details of these costs are presented in table 2 as are estimates of total costs which are the sum of total expenditure estimates from NMES and the extraneous estimates of expenditures on normal newborns.

When estimated expenditures on normal infant care—\$2.2 billion from table 2—are added to the estimate of total

Table 3. Estimated Expenditures on Obstetrical Care, 1987

Type of Expenditure	Number (thousands)	Average Cost	Total Costs (millions)
LIVE BIRTHS			
Hospital charges			
Normal delivery	2,821	\$1,766	\$4,982
Cesarean delivery	953	3,460	3,297
Professional charges			
Normal delivery	2,723	1,313	3,575
Cesarean delivery	953	1,806	1,721
Midwife	98	874	86
Out of hospital delivery charges (Including practitioners' fees)	19	1,840	35
Prenatal Tests^a			
Electronic fetal monitoring	2,842	57	162
Amniocentesis	198	148	29
Ultrasound	3,001	287	861
ALL LIVE BIRTHS	3,809^b	3,872	14,748
MISCARRIAGES AND STILLBIRTHS^c	802	527	424
ALL OBSTETRICAL CARE	4,611	\$3,290	\$15,172

^a Estimates of the frequency of performance of electronic monitoring and ultrasound are based on data reported in Moore, Jr., M., Jeng, L.L., Kaczmarek, R.G., and Placek, P.J. Use of diagnostic imaging procedures and fetal monitoring devices in the care of pregnant women. *Public Health Reports* (September-October 1990) 105.5:471-75. Estimates of the frequency of amniocentesis are from preliminary tabulations of the 1987-1988 National Maternal and Infant Health Survey provided by Stella Yu, ScD of the National Center for Health Statistics.

Estimates of the costs of electronic fetal monitoring and amniocentesis are from A.F. Minor. Estimates of the costs of ultrasound are based on data reported in Hillman, B.J., Joseph, C.A., Mabry, M.R., et al. Frequency and costs of diagnostic imaging in office practice: A comparison of self-referring and radiologist-referring physicians. *New England Journal of Medicine* (December 1990) 323.23:1604-1608. The cost per pregnancy reported in the table is the weighted average of charges per pregnancy for patients tested by either self-referring obstetricians and family practitioners or radiologists in 1986 to 1988 where the weights are the share of procedures performed by each specialty.

^b Includes 16,000 births where place of birth is unknown. National Center for Health Statistics. *Advance Report of Final Natality Statistics* (June 29, 1989) 38.3:24.

^c See text and note 23 for discussion of procedures followed and data used to estimate cost of miscarriages and stillbirths

Sources: Minor, A.F. *The cost of maternity care and childbirth in the United States, 1989*. Health Insurance Association of America, research bulletin, HIAA, December 1989, except as noted.

MPHCE for all children and for those 0 to 2 years old (table 1), total MPHCE for children is increased to \$52.0 billion and MPHCE for those 0 to 2 years old is increased to \$19.0 billion. Despite the fact that infants accounted for less than 6% of the population of children, expenditures on health care for infants accounted for almost 25% of aggregate health care expenditures on all children 0 to 18 years old

in 1987. On a per capita basis, health care expenditures on infants (less than 1 year old) were greater than those of any other age group except those 65 years of age and older.

Obstetrical Care

Using data from several sources (table 3), we estimate that total charges for obstetrical care in 1987 were \$15.2 billion or

\$3,983 per live birth. Obstetrical care includes prenatal, delivery, and postnatal care for pregnant women including those whose pregnancies terminate spontaneously in a miscarriage or stillbirth but not contraception, abortion, or infertility services. Hospital charges for delivery account for 54% of expenditures on obstetrical care; professional fees (including those of midwives), about 35% of costs, and the balance is largely expenditures for separately billed tests and diagnostic services.

Almost 99% of births in 1987 occurred in hospitals with a small number occurring in free-standing birthing centers. Mean hospital charges were \$1,766 for a normal delivery. Total charges including practitioners' fees at free-standing birthing centers for a normal delivery with a 1-day stay were about 33% less than hospital charges for the same service, but only 19,047 births occurred in such centers in 1987. Hospital charges averaged \$3,460 for a cesarean delivery. The number of cesarean deliveries has increased steadily in the United States since 1980, and they accounted for more than 25% of deliveries in 1987.²⁰ A cesarean delivery adds about two thirds to the cost of obstetrical care because of longer hospital stays for both mother and baby, increased physicians' fees, and higher hospital charges for labor and delivery rooms, anesthesia, and various ancillary services, including laboratory and supplies.²¹

Both the hospital and the physician's charges used in the estimates are based on data collected by the HIAA.²² The mean charge for a complete package of obstetrical care including prenatal visits, the physician's services at a normal delivery, and one postpartum visit was \$1,313. A complete package of care from a midwife costs \$874 on average for a normal delivery, and physicians' fees for complete care including a cesarean delivery are about one-third higher than the charge for complete care with a normal delivery.

A variety of relatively new but nonetheless frequently performed diagnostic procedures add to the cost of pregnancy. These tests include amniocentesis to detect chromosomal abnormalities, electronic monitoring of the fetal heart rate during labor, ultrasound imaging to monitor the developing fetus, and fetal oxytocin stress testing to evaluate fetal response to uterine contractions. As reported in table 3, information on the costs and frequency

of performance of a number of these expensive diagnostic procedures is available from several sources. We have not, however, been able to obtain an estimate of the frequency of performance of oxytocin stress tests which we estimate to have cost \$71 each in 1987.²⁰ Accordingly, we have not included the cost of that test in our estimates.

Expenditures on Miscarriages and Stillbirths

Data from the National Survey of Family Growth¹⁷ indicate that approximately 17.3% of pregnancies terminate spontaneously in stillbirths and miscarriages which can sometimes be as costly as live births. Applying this proportion to the 3,809,394 live births for 1987 suggests that there were 802,000 miscarriages and stillbirths in that year. Following Fuchs and Perreault,¹⁸ we assume that stillbirths occurring after 28 weeks of pregnancy are as costly on average as live births, that stillbirths occurring between 20 and 28 weeks cost 75% as much as live births, and that miscarriages prior to 20 weeks result in a physician charge equal to one-third the fee for a normal delivery. Our estimate of the relative proportion of miscarriages and stillbirths which occurred at different stages of pregnancy are reflected in the average cost estimate reported in table 3. Accordingly, the total cost of spontaneous pregnancy termination in 1987 is estimated to have been \$527 million.²³

Comparison with Previous Estimates of Expenditures on Obstetrical Care

Our estimate of total obstetrical care expenditures—\$15.2 billion in 1987—is approximately 85% higher than the estimate of \$8.2 billion reported by Fuchs and Perreault for 1982.^{18,24} The increase in the number of live births (128,000) can account for only 4% of the increase in total costs over the 5-year period. In addition, the increase in the frequency of cesarean deliveries to 25% of live births in 1987 from almost 18% in 1982 appears to have increased total obstetrical costs by more than one-half billion dollars or 3.4% in 1987.

It appears, therefore, that the differences in average cost figures we used for 1987 as compared to the Fuchs and Perreault estimates for 1982 account for most of the difference in the estimates of total obstetrical costs. One reason for a difference in the average cost figures may be a change in the procedure the Health Insurance Association of America (HIAA) followed in estimating mean hospital costs

from responses to its survey of the cost of hospital care for maternity and newborns.²⁵ We estimate, however, that this change in reporting only increased reported hospital costs by 2% for normal deliveries and 3% for cesarean deliveries over what would have been reported under the previous methodology.

Compared to other age groups, children's health care will in the aggregate be more affordable. Therefore, efforts to expand access to health care for children by expanding third-party financing will be less likely to overwhelm the system than will similar efforts targeted to other groups.

Another reason for the substantial increase in the cost of obstetric services between 1982 and 1987 is the increase in physician fees. Physician fees in general increased rapidly between 1982 and 1987—by over 40% as measured by the physician component of the Consumer Price Index.²⁶ Increases in the cost of medical malpractice insurance appear to have been a factor in the general increase in physician fees between 1982 and 1987 and an important factor in the escalation in obstetrical fees. In 1987, mean malpractice insurance premiums for obstetricians were over \$37,000, an increase of 238% over the 5-year period.²⁰

The substantial increase in malpractice insurance costs does not appear, by itself, to account for the near doubling of physician fees for obstetrical services. Even under the extreme assumptions that the premium cost increase was incurred by all practicing obstetrician-gynecologists and that these specialists accounted for all obstetrical care, the increased cost of malpractice insurance of slightly under \$170 per pregnancy would account for less than a quarter of the increase in physician fees over the 5-year period.²⁷

Summary and Conclusions

Our estimates show that expenditures on modified personal health care for children amounted to \$49.8 billion in 1987, only 13.7% of expenditures on personal health care for the entire noninstitution-

alized population in that year. Moreover, the data show that, although per capita expenditures on health care for children increased 20% more rapidly than per capita expenditures for adults, the share of MPHCE that went to children declined by almost one percentage point between 1977 and 1987 because of a fairly substantial increase in the adult population and a slight decline in the number of children. The proportion of health care expenditures going to children's health care is likely to continue to decline as the dynamics of demographic change cause children's share of total population to decline from 26% in 1989 to a projected 22% in 2010, while the share of the population accounted for by those at least 65 years old (the group with the highest per capita MPHCE) is projected to increase from 12.5% to 13.9% over the same period.²⁶ For those concerned about the problems of financing health care for children, the decline in the relative share of expenditures accounted for by children means that, compared to other age groups, children's health care will in the aggregate be more affordable. Therefore, efforts to expand access to health care for children by expanding third-party financing will be less likely to overwhelm the system than will similar efforts targeted to other groups.

Knowledge that expenditures on health care for children are relatively modest on average should not engender a false sense of complacency regarding the financial burden children's health care presents for some families. The data indicate that a small number of families face very high levels of expenditure for health care for their children each year. It is likely, but not documented in the data analyzed here, that for many, high levels of expenditure are the result of chronic conditions which may persist over many years, creating a severe financial burden on families. (See the article by Perrin, Guyer, and Lawrence in this journal issue.)

The very skewed nature of the distribution of children's health care expenditures means that efforts to expand health insurance coverage for children by offering limited coverage for low intensity, ambulatory care for prevention and limited acute illness will, by itself, leave most families exposed to the catastrophic costs of serious illness. Moreover, the high concentration of expenditures creates incentives for traditional insurance companies and

employers who self-insure to identify children who are likely to be heavy users of care in order to invoke procedures which may reduce the insurer's responsibility for their high health care expenditures. Although special government programs exist to underwrite the extraordinary medical care expenditures of some children with major illnesses, coverage is far from comprehensive and costs may mount rapidly for a family with a moderately ill child who is not enrolled in these special programs.²⁸ Effective reform of health care financing will require that true health insurance benefits be available for children when needed to help underwrite the costs of infrequent but expensive illnesses.

For those concerned with cost containment, special attention needs to be paid to the costs of pregnancy and newborn care. In 1987, expenditures on infants (less than 1 year old) accounted for more than 24% of children's MPHCE despite the fact that infants make up less than 6% of the population of children. Equally sobering is our estimate that obstetrical care, a crucial factor in the health of infants and young children, cost an additional \$15.2 billion in 1987. Altogether, expenditures on pregnant women and infants consumed more than 40% of combined expenditures on obstetrical and child health care for the noninstitutionalized population in 1987. Moreover, expenditures in this area have grown extremely rapidly in recent years.

A comparison of our 1987 estimates with estimates for 1982 suggests that the costs of obstetrical care increased by 88% and of infant care by 95% over the 5-year period as the result of a combination of factors including a very substantial increase in physician charges for obstetrical services and a substantial increase in the resource intensity of hospital care for newborns with complications.²⁹ Additional research is needed to better understand the factors behind the dynamic increase in

expenditures on both obstetric and infant care. Even before these inquiries are completed, however, aggressive implementation of known cost-effective strategies to deliver care to pregnant women and infants appears warranted.

Because of its budgetary implications, any expansion of health insurance coverage for children in the near term may be incremental. Our analysis suggests that expanded coverage for children 3 to 12 years old, whose per capita MPHCE (\$426) is the lowest among all population groups, would probably have the smallest budgetary impact of any expansion in access to care. Even if a universal health insurance system had been made mandatory in 1987, health care expenditures would have expanded only modestly for the 8 million children 3 to 12 years of age who were uninsured at some time during that year. We estimate that health care expenditures for this age group would have totaled only \$16.4 billion, or \$1.1 billion more than actual expenditures.³⁰ Consequently, expanded insurance coverage for this age group has the potential to improve their access to health care with minimal budgetary impact. At the same time, it would relieve the families of such children from the uncertain financial burden and stress associated with expenditures for children's health care.

We wish to thank Victor Fuchs, Michael Grossman, Daniel Walden, Doris Lefkowitz, Richard Behrman, Deanna Gomby, Carol Larson, and Patricia Shiono for their helpful comments during various stages of this analysis. Comments received during a seminar at Stanford University School of Medicine are also gratefully acknowledged. Unpublished data necessary to estimate the costs of pregnancy and childbirth were provided by A.F. Minor of HIAA and S. Yu of NCHS. Don Hoban and Mikyung Park provided skillful statistical support. Holly Ernst helped with manuscript preparation. The usual caveats apply.

Appendix Tables begin on page 110.

Table A1. Modified Personal Health Care Expenditures for 0- to 18-year-olds: Aggregate and Per Capita Expenditures and Percent Distribution, by Type of Expenditure and Source of Funds for Calendar Year 1987. (Total population 67.7 million 0- to 18-year-olds.)

Type of Expenditure	Total Expenditures (Billion \$)	Source of Funds						
		Private				Government		
		All Private Funds	Out-of- Pocket	Private Insurance	Other	All Public Funds	Medicaid	Other
		percent distribution						
Total	\$49.8	75.5	26.9	42.6	5.9	24.5	12.3	12.2
Hospital	24.3	66.7	10.9	47.7	8.1	33.3	16.2	17.1
Inpatient	18.4	67.3	9.5	49.3	8.5	32.7	16.1	16.6
Ambulatory	5.9	64.8	15.3	43.0	6.6	35.2	16.5	18.7
Physicians	11.0	75.7	32.3	40.6	2.7	24.3	10.2	14.1
Inpatient	4.7	62.6	18.7	40.5	3.4	37.4	9.0	28.4
Ambulatory	6.2	85.5	42.7	40.7	2.1	14.5	11.1	3.3
Nonphysician Ambulatory	2.4	74.7	32.7	37.5	4.6	25.3	15.7	9.5
Prescription Drugs	2.1	85.7	57.5	27.5	0.7	14.3	11.3	3.0
Dental Services	8.7	95.4	52.9	36.5	6.0	4.6	3.5	1.1
Other	1.3	88.9	45.3	39.2	4.4	11.1	10.1	1.0
	Total Per Capita Expenditures	per capita expenditures (1987 \$)						
Total	\$737	\$557	\$199	\$314	\$44	\$181	\$90	\$90
Hospital	359	240	39	171	29	120	58	61
Inpatient	272	183	26	134	23	89	44	45
Ambulatory	87	56	13	37	6	31	14	16
Physicians	163	123	53	66	4	40	17	23
Inpatient	70	44	13	28	2	26	6	20
Ambulatory	92	79	39	38	2	13	10	3
Nonphysician Ambulatory	36	27	12	13	2	9	6	3
Prescription Drugs	32	27	18	9	0	5	4	1
Dental Services	129	123	68	47	8	6	4	1
Other	19	17	9	8	1	2	2	0

Note: Items in tables may not sum to totals because of rounding.

Source: Agency for Health Care Policy and Research, 1987 National Medical Expenditure Survey - Household Survey.

Table A2. Modified Personal Health Care Expenditures for 0- to 2-year-olds: Aggregate and Per Capita Expenditures and Percent Distribution, by Type of Expenditure and Source of Funds for Calendar Year 1987. (Total population 11.0 million 0- to 2-year-olds.)

Type of Expenditure	Total Expenditures (Billion \$)	Source of Funds						
		Private				Government		
		All Private Funds	Out-of- Pocket	Private Insurance	Other	All Public Funds	Medicaid	Other
		percent distribution						
Total	\$16.8	58.4	16.8	36.5	5.1	41.6	13.7	27.9
Hospital	11.4	56.3	10.1	39.5	6.8	43.7	15.3	28.4
Inpatient	10.0	57.4	9.4	41.2	6.8	42.6	14.8	27.8
Ambulatory	1.4	48.6	14.7	27.1	6.8	51.4	19.1	32.3
Physicians	4.5	61.7	30.3	30.0	1.4	38.3	9.3	29.1
Inpatient	2.9	49.6	23.1	25.1	1.4	50.4	7.9	42.5
Ambulatory	1.7	82.3	42.5	38.2	1.5	17.7	11.5	6.2
Nonphysician Ambulatory	0.3	53.5	20.3	29.1	4.1	46.5	16.8	29.7
Prescription Drugs	0.3	80.8	54.9	25.6	0.3	19.2	13.7	5.5
Dental Services	0.0	80.7	36.0	33.5	11.2	19.3	6.8	12.6
Other	0.2	73.2	25.7	44.6	2.9	26.8	23.7	3.1
	Total Per Capita Expenditures	per capita expenditures (1987 \$)						
Total	\$1,521	\$888	\$255	\$555	\$78	\$632	\$209	\$424
Hospital	1,037	584	105	409	70	453	159	294
Inpatient	910	522	86	375	61	387	134	253
Ambulatory	127	62	19	34	9	65	25	41
Physicians	411	253	124	123	6	158	38	120
Inpatient	259	129	60	65	4	131	21	110
Ambulatory	152	125	64	58	2	27	17	9
Nonphysician Ambulatory	26	14	5	8	1	12	4	8
Prescription Drugs	30	24	17	8	0	6	4	2
Dental Services	2	2	1	1	0	0	0	0
Other	15	11	4	7	0	4	3	0

Note: Items in tables may not sum to totals because of rounding.

Source: Agency for Health Care Policy and Research, 1987 National Medical Expenditure Survey - Household Survey.

Table A3. Modified Personal Health Care Expenditures for 3- to 12-year-olds: Aggregate and Per Capita Expenditures and Percent Distribution, by Type of Expenditure and Source of Funds for Calendar Year 1987. (Total population 35.0 million 3- to 12-year-olds.)

Type of Expenditure	Total Expenditures (Billion \$)	Source of Funds						
		Private				Government		
		All Private Funds	Out-of- Pocket	Private Insurance	Other	All Public Funds	Medicaid	Other
		percent distribution						
Total	\$14.8	79.4	29.7	43.3	6.4	20.6	15.1	5.5
Hospital	5.8	70.9	10.8	50.3	9.7	29.1	20.3	8.8
Inpatient	3.1	76.1	7.7	56.1	12.2	23.9	21.6	2.4
Ambulatory	2.7	64.9	14.4	43.6	6.9	35.1	18.9	16.2
Physicians	3.2	82.4	35.9	43.1	3.4	17.6	14.0	3.6
Inpatient	0.6	73.6	11.1	49.1	13.4	26.4	19.6	6.8
Ambulatory	2.6	84.3	41.1	41.9	1.3	15.7	12.8	2.9
Nonphysician Ambulatory	1.1	67.2	30.9	31.7	4.5	32.8	24.0	8.8
Prescription Drugs	1.0	84.9	55.8	28.8	0.3	15.1	12.5	2.7
Dental Services	3.2	92.7	47.9	38.9	5.9	7.3	5.1	2.2
Other	0.6	88.6	37.5	45.6	5.5	11.4	10.5	0.9
		per capita expenditures (1987 \$)						
Total	\$424	\$337	\$126	\$184	\$27	\$87	\$64	\$23
Hospital	165	117	18	83	16	48	34	14
Inpatient	89	67	7	50	11	21	19	2
Ambulatory	76	49	11	33	5	27	15	12
Physicians	91	75	33	39	3	16	13	3
Inpatient	16	12	2	8	2	4	3	1
Ambulatory	75	63	31	31	1	12	10	2
Nonphysician Ambulatory	32	22	10	10	1	11	8	3
Prescription Drugs	28	24	16	8	0	4	4	1
Dental Services	92	85	44	36	5	7	5	2
Other	17	15	6	8	1	2	2	0

Note: Items in tables may not sum to totals because of rounding.

Source: Agency for Health Care Policy and Research, 1987 National Medical Expenditure Survey - Household Survey.

Table A4. Modified Personal Health Care Expenditures for 13- to 18-year-olds: Aggregate and Per Capita Expenditures and Percent Distribution, by Type of Expenditure and Source of Funds for Calendar Year 1987. (Total population 21.6 million 13- to 18-year-olds.)

Type of Expenditure	Total Expenditures (Billion \$)	Source of Funds						
		Private				Government		
		All Private Funds	Out-of- Pocket	Private Insurance	Other	All Public Funds	Medicaid	Other
		percent distribution						
Total	\$18.2	88.0	34.0	47.7	6.3	12.0	8.6	3.4
Hospital	7.1	80.1	12.3	59.0	8.8	19.9	14.3	5.7
Inpatient	5.3	81.0	10.7	60.6	9.7	19.0	15.4	3.6
Ambulatory	1.8	77.3	16.9	54.3	6.1	22.7	10.9	11.8
Physicians	3.3	88.4	31.8	53.0	3.7	11.6	7.9	3.7
Inpatient	1.3	86.2	12.3	70.2	3.7	13.8	6.8	7.0
Ambulatory	2.0	90.0	45.0	41.3	3.7	10.0	8.6	1.4
Nonphysician Ambulatory	1.0	89.4	38.3	46.4	4.7	10.6	6.1	4.5
Prescription Drugs	0.8	88.7	60.6	26.8	1.3	11.3	8.9	2.4
Dental Services	5.5	97.1	55.9	35.1	6.1	2.9	2.5	0.4
Other	0.6	93.9	59.5	30.8	3.6	6.1	5.6	0.5
		per capita expenditures (1987 \$)						
Total	\$844	\$743	\$287	\$403	\$54	\$101	\$73	\$28
Hospital	328	263	40	193	29	65	47	19
Inpatient	244	197	26	148	24	46	38	9
Ambulatory	84	65	14	46	5	19	9	10
Physicians	152	134	48	81	6	18	12	6
Inpatient	61	53	8	43	2	9	4	4
Ambulatory	91	81	41	37	3	9	8	1
Nonphysician Ambulatory	46	41	18	21	2	5	3	2
Prescription Drugs	37	33	23	10	0	4	3	1
Dental Services	255	248	143	89	16	7	6	1
Other	26	24	15	8	1	2	1	0

Note: Items in tables may not sum to totals because of rounding.

Source: Agency for Health Care Policy and Research, 1987 National Medical Expenditure Survey - Household Survey.

1. Aaron, H.J. *Serious and unstable condition: Financing America's health care*. Washington, DC: The Brookings Institution, 1991.
2. Waldo, D.R., Sonnefeld, S.T., McKusick, D.R., and Arnett III, R.A. Health expenditures by age group, 1977 and 1987. *Health Care Financing Review* (Summer 1989) 10.4:111-20; also, Fisher, C.R. Differences by age group in health care spending. *Health Care Financing Review* (Spring 1980) 1.4:65-90.
3. The usual source of data for the published annual estimates of the cost of health care in the United States is the National Health Accounts (NHA). Maintained by the Office of the Actuary of the Health Care Financing Administration, the NHA constitutes a framework in which data from a number of different sources are combined to construct estimates of aggregate U.S. health care spending. Because NHA data are based largely on provider reports of total revenue, the NHA is not ordinarily used to make estimates of health care expenditures for children or other demographic subgroups of the population. The NHA has been used however to analyze expenditure levels and trends for the 65-years-and-older population and by Waldo and others (see note no. 2, above) for crude estimates of expenditures for three age groups. Office of National Cost Estimates. National health expenditures, 1988. *Health Care Financing Review* (Summer 1990):1-41; Office of National Cost Estimates. Revisions to the National Health Accounts and methodology. *Health Care Financing Review* (Summer 1990) 7.4:42-54.
4. A detailed description of the NMES Household Survey is contained in Edwards, W., and Berlin, M. *Questionnaires and data collection methods for the Household Survey and the Survey of American Indians and Alaska Natives* (DHHS Publication No. PHS-89-3450), National Medical Expenditure Survey Methods 2, National Center for Health Services Research and Health Care Technology Assessment, Rockville, MD: Public Health Service, September 1989.
5. National health care expenditures were estimated to total \$492.5 billion in 1987. This total includes cost items not measured in the NMES, such as research and construction, government public health activities and private administrative expenses, nursing home care, and nonprescription drugs. Expenditures on these items exceeded \$115 billion in 1987. Lazenby, H.C., and Letsch, S.W. National Health Expenditures, 1989. *Health Care Financing Review* (Winter 1990) 12.2:1-26.
6. Detailed information on the design and data collection instruments of the 1977 National Medical Care Expenditure Survey is contained in Bonham, G.S. and Corder, L.S. *NMCES household interview instruments: Instruments and procedures 1* (DHHS Publication No. PHS-81-3280), National Health Care Expenditure Study, National Center for Health Services Research and Health Care Technology Assessment, Rockville, MD: Public Health Service, April 1981.
7. At the time of this analysis, NMES data files, which reported on the hospital costs of newborns who were discharged with their mothers, were not available to us. In addition, following the NMCES coding procedures in the NMES facilitated the analysis of the growth in expenditures between 1977 and 1987.
8. Because the NMCES and NMES Household Surveys do not include nursing home and other institutionalized populations, they provide representative estimates of aggregate personal health care expenditures for the civilian, noninstitutionalized population. This is not a significant problem for estimates developed for children as expenditures for nursing home care are less than 2% of total expenditures for those under 19 years of age. In contrast, nursing home care accounted for more than 20% of personal health care expenditures among those over 65 years of age. (See Waldo and others in note no. 2, above.)
9. The NMES is designed to measure both service utilization and expenditures. Hence, services provided through many special programs such as maternal and child health and crippled children's programs are included. WIC and other programs which provide services not traditionally defined as health care are not included. Also, because information about utilization is obtained from parents, services such as routine screenings in schools, which parents may not be aware of, are probably underreported. Also excluded are nursing home care, nonprescription drugs, and expenditures on newborn care when the specific costs of the care of the infant could not be disaggregated from the total cost of the delivery.
10. The elderly are the primary users of nursing home care, the largest category of health care expenditures not included in MPHCE. Accordingly, the share of personal health care expenditures, including nursing home care, attributable to the elderly probably exceeds 40% of all personal health care expenditures in the United States. See references in note no. 3, above.

11. National Center for Health Statistics. *Advance Report of Final Natality Statistics, 1987*. Monthly vital statistics report. Washington, DC: U.S. Government Printing Office, supplement (June 29, 1989) 38,3:1-47.
12. In the NMES data used in the analysis, expenditures on hospital care for "healthy" newborns discharged with their mothers are attributed to health care expenditures for the mother. Calculations based on our estimates of the cost of care for normal newborns (table 2) suggest that this increased estimates of expenditures in the 13- to 18-year-old group by at most \$190 million or 1%.
13. The Medicare program was the most significant factor in differentiating the distribution of sources of payment for adult health services from the distribution for children. An entitlement enjoyed by most of the population 65 years of age and older, Medicare accounted for more than 48% of MPHCE for this age group. Even for those 19 to 64 years of age, Medicare accounted for 4% of expenditures, principally through special Medicare programs directed toward the permanently disabled and those with end stage renal disease.
14. Berk, M.L., Monheit, A.C., and Hagan, M.M. How the U.S. spent its health care dollar: 1929-1980. *Health Affairs* (Fall 1988):47-60.
15. Information on expenditures for specific health care services by children who used those services is available from the authors.
16. The following procedures are used to identify various components of the growth in per capita MPHCE for children over the 1977-1987 period: (1) the medical care price inflation component of growth is measured by a fixed-weight price index where the weights are the relative proportions of 1977 children's MPHCE expenditures attributable to hospital care, physician care, dental care, nonphysician ambulatory care, prescription drugs, and other personal health care services. Price changes for each service category are measured by service-specific components of the Consumer Price Index for all services except hospital care and by the HCFA hospital input price index for hospital care (see Office of National Cost Estimates, Summer 1990, in note no. 3, above); (2) general price inflation is measured by the GNP fixed-weight price index. Using this GNP deflator, it is possible to remove the effects of general inflation from the MPHCE price index, leaving a measure of "excess" medical care price inflation; (3) information from the 1977 NMES on age-group-specific expenditures per capita and population size are used to measure the increase in expenditures that may have resulted from a change in the age distribution within the child population.
17. Public Health Service, Centers for Disease Control, National Center for Health Statistics. *Vital and health statistics: Health aspects of pregnancy and childbirth, U.S., 1982*. Data from the National Survey of Family Growth, Series 23, No. 16. Hyattsville, MD: U.S. Department of Health and Human Services (DHHS/PHS-89), 1989. Keppel, K.G., Heuser, R.L., Placek, P.G., et al. National Center for Health Statistics. *Methods and Response Characteristics, 1980 National Natality and Fetal Mortality Survey*. Vital and Health Statistics, Series 2, No. 100. Washington, DC: U.S. Government Printing Office (DHHS/PHS-861374), September 1986. Placek, P.G. 1980 National Natality and Fetal Mortality Survey: Survey Methods Used and Public Health Service Agency Participation. *Public Health Reports* (1984) 99:111-16.
18. Fuchs, V.R., and Perreault, L. Expenditures for reproduction-related health care. *Journal of the American Medical Association* (1986) 255,1:76-81; also, Alan Guttmacher Institute. *The Financing of Maternity Care in the U.S.* New York, 1989.
19. We assume in our analysis that 80% of infants are discharged with their mothers based on the data from several major national surveys reported in Gold, R.B., Kenney, A.M., and Singh, S. *Financing maternity care in the U.S.* New York: Alan Guttmacher Institute, 1987. Information on the precise number of infants discharged with their mothers is not readily available because separate billing records are not typically maintained for infants. Moreover, even the condition of an infant at birth may not be a totally reliable indicator of its status as maternal hospital stays may in practice be lengthened to correspond better to the stay of a sicker infant, and healthy infants delivered by cesarean section may have longer than average hospital stays while waiting for their mothers to be discharged.
20. Minor, A.F. *The cost of maternity care and childbirth in the U.S., 1989*. Health Insurance Association of America, research bulletin. Washington, DC: HIAA, December 1989.
21. Previous estimates of the cost of obstetrical care by Fuchs and Perreault (see note no. 18, above) and by the Alan Guttmacher Institute (*Blessed events and the bottom line: Financing maternity care in the U.S.* New York: Alan Guttmacher Institute, 1987) include a separate line item in their estimates to reflect charges for anesthesia. These charges are now included in the hospital charges reported by HIAA (personal correspondence with A.F. Minor).

22. The HIAA estimated costs for 1989. To obtain estimates for 1987 we have deflated these 1989 estimates by appropriate components of the Medical Care Price Index from *Health Care Financing Review* (Winter 1990) 12,2:157.
23. Because most states do not require the reporting of miscarriages which occur prior to 20 weeks gestation, miscarriages are substantially underreported. To obtain the average cost of a miscarriage, stillbirth, we use information on the number of spontaneous pregnancy terminations between 20 and 28 weeks, and after 28 weeks gestation as reported in Public Health Service, Centers for Disease Control, National Center for Health Statistics. *Vital Statistics of the U.S., 1987: Volume II—Mortality, Part A*. Hyattsville, MD: U.S. Department of Health and Human Services, 1990. We assume that miscarriages not accounted for in the Vital Statistics occurred prior to 20 weeks gestation. We do not count, however, miscarriages which occur very soon after conception. They are not likely to be recognized and therefore require no treatment. Wilcox, A.J., Weinberg, C.R., O'Connor, J.F., et al. Incidence of early loss of pregnancy. *New England Journal of Medicine* (1988) 319:189-94.
24. Researchers at the Alan Guttmacher Institute (see note no. 22, above) estimated that almost \$16 billion was spent for maternity care of mothers and newborns in 1985. This included \$4.7 billion on physician care and laboratory procedures for both mothers and infants, \$6.3 billion on hospital care for mothers, and \$5 billion on hospital care for newborns. These estimates are appropriately mid-range between those of Fuchs and Perreault and those presented in the text. Comparing the estimates for 1982 and 1985 with each other and with those for 1989 does suggest an acceleration in the rate of increase in costs between 1985 and 1987.
25. In reporting estimates of mean hospital costs, data from hospitals in the 1989 HIAA survey were weighted by the number of births in each hospital. Thus in determining average costs each birth counts equally, but charges reported by large institutions carry more weight than those reported by small institutions. In calculating mean costs from previous surveys, each hospital's charges received the same weight regardless of the number of births. Because births in larger hospitals tend to be more expensive than births in smaller hospitals, this change in the method of calculating average costs will increase reported 1989 costs as compared with reported costs in 1982 and 1985. This methodologic change should, however, have little impact on reported physician fees, which are obtained from a different data base.
26. U.S. Bureau of the Census. *Statistical Abstract of the U.S.: 1991*. Washington, DC: U.S. Government Printing Office, 1991.
27. It is likely, however, that concern for malpractice litigation has increased the costs of maternity care indirectly by encouraging the practice of "defensive" medicine resulting in an increase in the frequency of prenatal testing and imaging procedures and cesarean deliveries. There is also evidence to suggest that concerns regarding malpractice litigation and increases in the cost of malpractice insurance led to a reduction in the number of physicians delivering obstetrical services. This reduction in the supply of physicians could have led to an increase in fees for maternity services.
28. Kolata, S. New insurance practice: Dividing sick from well. *New York Times*, March 4, 1992, at A1.
29. Of course, the primary reason expenditures on obstetrical care, childbirth, and infancy are so high is because infants, on average, are more vulnerable (less healthy) than older children and adolescents. Therefore, one would expect that per capita health care expenditures on infants would exceed expenditures on older children. Yet it appears that in recent years growth in expenditures on health care for infants and pregnant women has far outstripped improvements in their health status (see the article by Racine, Jovee, and Grossman in this journal issue).
30. We assume that expenditures on health care will increase by about 67% for those uninsured all year and by 33% for those insured for part of the year. These estimates are based on data presented by Monheit and Cunningham in this journal issue which suggest that, compared with children insured all year, those insured part of the year have 25% fewer ambulatory health care contacts per year and those uninsured all year have 40% fewer contacts. They are also consistent with the observation that on average the uninsured consume about 60% as much medical care as the insured. Paulk, M.V., Danzon, P., Feldstein, P., and Hoff, J. A plan for "responsible national health insurance." *Health Affairs* (Spring 1991) 10:5-25.

The Role of Private Health Insurance in Children's Health Care

John F. Sheils
Patrice R. Wolfe

Abstract

Private health insurance is the primary means of financing health care for America's children and pregnant women. Most coverage is provided under employer plans. Access to private health care coverage, however, is threatened by the increasing cost of health care, cost shifting by providers, and insurance marketing practices that tend to deny coverage to high-risk individuals. These pressures have already led to an increase in the number of uninsured children and pregnant women.

This paper provides an overview of the private health insurance market with a focus on recent trends. The effects of self-funding arrangements by employers and of various cost-control arrangements—including managed care plans, patient cost-sharing provisions, and employee premium contributions—are examined for their potential impact on children and pregnant women. Policies that might expand health insurance coverage for children, including a universal health insurance plan, and health insurance market reforms, are explored. Alternative strategies for enhancing universal health insurance coverage for children include mandatory employer-based insurance programs, a program of tax credits to underwrite individual insurance plans, and a single-payer government program financed through the tax system. The authors conclude that efforts should be made to preserve the current private health insurance system by reducing cost shifting from public programs, guaranteeing the availability of coverage to all groups, and controlling costs by means of competition, managed care, and perhaps global spending limits. Such comprehensive reforms might be necessary merely to preserve private insurance coverage for a majority of America's children and pregnant women.

Private insurance is the primary source of funding for health care for children and pregnant women in the United States. The March 1990 Current Population Survey (CPS) reports that about 63% of all children are covered as dependents under employer health insurance plans and another 10% are covered under individually purchased non-group insurance. About 60% of pregnant women are covered under employer plans, either as employees or as dependent spouses, and about 6% have non-group coverage.¹

The extent of private insurance coverage for children declined during the 1980s largely because of an increase in health care costs, a

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decline in employment associated with the 1982 recession, and a shift in employment to the services sector where health coverage is less extensive than in most other industries.² The percent of children with employer-based insurance declined from 66% in 1980 to 63% in 1990. Moreover, cost sharing for dependent coverage—in the form of deductibles, premium contributions, and the like—has increased. There has also been a trend toward reduced coverage for benefits of particular importance to children such as dental care and treatment for mental health and substance abuse problems. Although many employers have expanded coverage for certain cost-effective services such as prenatal care and have introduced case management programs for chronically ill children, the general trend has been in the direction of reduced coverage for children. Moreover, many families with chronically ill children are finding it increasingly difficult to obtain private health insurance because of insurer enrollment practices intended to reduce the insurer's exposure to payments for high-cost illnesses.

Despite these disturbing trends, there are many opportunities for expanding coverage for children through private insurance. About 80% of the 8.5 million children without health insurance are dependents of employed persons. This statistic suggests that expansion of employer-based coverage could greatly reduce the number of uninsured children. In fact, the American Academy of Pediatrics (AAP) has proposed requiring all employers to cover dependent children of employees even if they do not now provide health insurance for employees.³

In this paper we review the principles of private health insurance. We examine evidence of trends in private health insurance coverage for children including the number of children with coverage, types of benefits provided, and cost-sharing requirements. We discuss subtle features of the market for private insurance that have restricted the availability of coverage for some chronically ill children. We also discuss initiatives that would expand health insurance coverage for children and establish a minimum standard of coverage for all children.

An Overview of Private Health Insurance

The variety of private health insurance products available today is overwhelming. The options range from traditional indemnity plans that provide only cash payment for a limited menu of medical services to medical care service plans that offer a wide range of services for enrollees. In this environment, the major challenge is to determine which product best addresses both the purchaser's financial constraints and the consumer's health care needs. The choice is further complicated by the fact

that the purchasers (typically large employers) and the consumers (typically employees and their dependents) may have different criteria for judging the adequacy of an insurance plan.

This section presents and defines some of the fundamental concepts of health insurance that affect an employer's or individual's choice of health benefits plan. It also provides an overview of the types of private insurance products available to pregnant women and children. We focus on group rather than individual insurance products. The individual insurance market accounts for approximately 10% of total premiums sold in the United States.⁴

The purpose of health insurance is to minimize the risk of financial catastrophe that often results from unexpectedly large losses or expenditures by pooling the experiences of a large number of people. In general, large employer groups can predict with reasonable accuracy what their health care expenses will be during a particular year. Although it may be difficult to predict precisely how many people will incur large expenses and how much each person's illness will cost, a group can spread the resulting expenses among a large number of people, thereby creating an average expense that varies far less than an individual's expense. This concept, known as risk pooling, allows a large employer to estimate fairly accurately the cost of offering health care insurance to its employees.⁵ Similarly, insurance companies pool the risk of numerous small groups and individuals to predict their overall expenses.

Fully Insured Arrangements

Traditional private health insurance is based on a contractual arrangement between a purchaser (either an employer or an individual) and an insurer where the purchaser agrees to pay the insurer a predetermined amount (the premium) per covered member per time period (typically a month) in return for full assurance that all approved expenditures will be paid by the insurer.⁶ In other words, the purchaser is not at risk if expenses exceed the total premium amount. In 1989, American employers and employees spent \$36.9 billion on fully insured group health insurance premiums.⁷

Under plans of this type, the insurer is fully responsible for all covered health care expenditures. The insurer's goal, therefore, is to set premiums so that they cover the expected claims payout for the covered population plus a margin for profit, overhead expenses, and reserves to cover unexpectedly large claims.

Self-funding Arrangements

Although insurance companies traditionally performed the risk pooling function for employers and individuals, employers have in recent years increasingly pursued self-funding as an alternative method for financing their health care plans. The percent of medium and large employers who self-funded grew from 19% in 1979 to 66% in 1988.⁸ In self-funded plans, the employer assumes all risk for health expendi-



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tures and contracts with a third-party administrator or insurer to handle claims processing and other administrative functions related to the plan.

Self-funding has many advantages for the employer. First, the Employee Retirement Income Security Act (ERISA) of 1974 preempts states from regulating self-insured plans. Thus, employers who opt for self-funded plans can avoid paying for those state-mandated benefits that they do not want to cover. Second, employers can avoid insurance premium taxes. Third, for an employer that perceives its employees to be healthier, on average, than other comparable employers, self-funding provides the opportunity to pay for health care based on the group's own experience, rather than paying an insurance premium that reflects the experience of a larger and sicker employer community. The primary drawback to self-funding is the increased risk of large losses as a result of unexpectedly high medical claims.

Employers can reduce their exposure to this hazard by purchasing insurance specifically to cover extraordinarily large expenditures. For example, in a minimum premium plan, the purchaser assumes full responsibility for health care expenditures up to a certain threshold. Beyond that threshold, an insurance company takes over or shares in the payment of all additional claims. Minimum premium plans are often good options for employers that find it economical to self-fund but do not have the financial resources to pay for unexpected high-dollar cases such as low birth weight infants with multiple complications.

Managed Care Arrangements

Although the primary purpose of health insurance is to minimize the individual risk of financial catastrophe as a result of unexpected large expenditures for health care, increased attention is being focused on using health care financing systems to control costs and to improve the quality of care. This approach has led to the development of a variety of managed care organizations which combine features of health insurance with a variety of incentive and regulatory devices in an attempt to maximize the value of health benefits for a limited expenditure.

Health maintenance organizations (HMOs) are a form of managed care organization which uses financial incentives to limit excessive or inappropriate utilization of health care services. HMOs are reimbursed on a capitated basis; they receive a set payment amount per enrolled member per month, regardless of the

Increased attention is being focused on using health care financing systems to control costs and to improve the quality of care.

member's level of service utilization. As a result, an HMO (or in certain models, the HMO member physician) is at risk for health care expenditures above a specific threshold. This transfer of a portion of the financial risk from the insurer to the provider of health care services is known as risk sharing and creates incentives for HMO physicians to limit utilization of expensive health care services. Today, there are a number of alternative HMO organizational structures. The prototype HMO is the closed-panel prepaid group practice plan (or staff model) in which a large multispecialty group practice contracts to provide all of the care for HMO-enrolled patients using the HMO's hospital exclusively. The physicians are typically salaried but share in the profit of the plan at the end of the year. Enrollees are entitled only to services of plan physicians and plan hospitals.

Another form of HMO, the Independent Practice Association (IPA), represents a melding of HMO features with traditional fee for service. Typically, IPA physicians are not all part of the same

group, and IPA physicians may serve non-HMO patients or patients enrolled in a variety of different HMOs and other health plans. IPA physicians and IPA hospitals are commonly paid on a fee-for-service basis with part of the physicians' fees held back as a reserve against high costs. Because the IPA is a collection of independent practitioners rather than a centralized group, control over physician behaviors is weaker in an IPA than in a staff model HMO.

Although HMOs have traditionally limited enrollees to the services of plan providers, several plans have recently added point-of-service options to their basic package. Under a point-of-service plan, enrollees may choose to obtain indemnity reimbursement for out-of-plan medical care; however, such out-of-plan care is subject to cost sharing which results in its being more expensive than care from plan providers.

In another type of managed care arrangement, the preferred provider organization (PPO), or its more restrictive counterpart, the exclusive provider organization (EPO), utilization review controls are used to manage costs. In addition, PPOs and EPOs use their group buying power to negotiate fee discounts from participating physicians and hospitals, and then pass these discounts on to their enrollees in the form of reduced premiums or reduced cost sharing. In a PPO, enrollees may be charged a penalty for using nonparticipating providers. In an EPO, enrollees have no coverage at all for services provided by a nonparticipating provider. In HMOs, benefits are also restricted to services obtained from participating providers except in limited emergency situations. Among the controls used by these managed care organizations to regulate costs are prior authorization for inpatient admissions and other high-cost services and retrospective claims profiling to determine whether a physician's practice pattern is dramatically different from that of his or her peers. These utilization controls provide managed care organizations with the ability to deny payment for services considered inappropriate or to remove providers from the PPO/EPO network.

An increasingly popular feature of managed care systems is case management. Case management can be implemented in both HMO and PPO or-

ganizations and even with traditional indemnity insurance plans. Under case management, a case manager coordinates health care from a variety of providers for individuals with complex and lengthy or chronic illnesses. Case management can be used to facilitate cost-effective care which integrates health care with the total needs (developmental, educational, and environmental) of a child or a pregnant woman. It can facilitate home placement and reduce overall costs. As advocates for an insurer, however, case managers can also be used to deter utilization of expensive services.

The effectiveness of managed care programs in reducing costs varies with the type of managed care plan. A Rand Corporation study of prepaid health plans indicates that expenditures in an HMO can be as much as 25% lower than in conventional health plans.⁹ The more loosely arranged plans such as PPOs show little, if any, overall savings because of their organizational structure. An A. Foster Higgins survey indicates that some utilization review programs save up to 4% on total medical plan costs.¹⁰ Some studies of selected programs indicate that every dollar spent on utilization management results in a reduction in claims of \$4 to \$9; however, other studies indicate that these programs are barely cost-effective.¹¹

While empirical evidence is limited, it is widely believed that managed care is most effective in modifying medical practice when network providers serve exclusively those covered under the plan (as happens in the HMO staff model) and when patients obtain their care exclusively through the network. There is some expectation that the potential for cost savings under managed care will grow as medical effectiveness and outcomes research are further developed to yield cost-effective practice guidelines which can be disseminated through managed care networks.

Cost Sharing Arrangements

Insurance products also vary greatly in how they require employees and their families to share health care costs with the employer. Employee cost sharing takes many forms, including premium contributions, deductibles, and coinsurance. While employee cost sharing traditionally has not been a central feature in most employer-financed insurance plans (especially those that are union-negotiated), it

is becoming more popular, in part because of increasing pressure to control health expenditures.

About 45% of employees contribute to the cost of their health insurance premiums.¹² For health insurance plans that require a premium contribution, employees typically pay, on a pretax basis, a percentage of the monthly premium amount. The average employee contribution is 21% of the monthly premium.¹³ Under some plans the contribution rate varies by type of policy and may be less for an individual than for a family. Premium contributions are more common for HMOs, in which 54% of enrollees pay a contribution, than they are for non-HMO plans, in which 41% of enrollees pay a contribution.¹⁴

Deductibles are common features in non-HMO insurance plans, but vary enormously in how they are structured. In 97% of fully insured plans, the insured individual must satisfy an aggregate annual deductible amount for medical expenses. Common deductibles for individual coverage are \$100 and \$200; for family coverage typical deductibles are \$300 or \$400 per family per year.¹⁵ Once the insured person or family has incurred and paid for health care expenses equal to the deductible amount, the insurer assumes responsibility for the majority of health expenditures.

Case management can be used to facilitate cost-effective care which integrates health care with the total needs (developmental, educational, and environmental) of a child or a pregnant woman.

Some managed care plans attempt to use the deductible to direct covered individuals to hospitals and physicians with whom the managed care plan has a financial arrangement. For example, many PPOs, EPOs, and point-of-service plans have two sets of deductible rates, one for in-network providers with whom the plan has a contractual agreement and one for out-of-network providers. Typically, these plans use out-of-network deductibles that are much higher than the in-network deductibles in an effort to persuade beneficiaries to use providers who are part of the network.

In many non-HMO insurance plans, the beneficiary and the plan share the covered expenses according to a predetermined ratio. Ordinarily, the plan pays for 80% of covered expenses (once the beneficiary has exceeded the deductible amount, if there is one), and the beneficiary pays for the remaining 20%. The 20% is the beneficiary's coinsurance rate. As with the deductible, the coinsurance rate is often lowered to provide an incentive to change beneficiary behavior. For example, 41% of employers waive the coinsurance rate on outpatient surgery to persuade their employees to avoid costly hospital stays.¹⁵ Many managed care plans raise the coinsurance rate for out-of-network service use to induce beneficiaries to use in-network providers. In some instances the arrangement may be 10% coinsurance for in-network use versus 30% coinsurance for out-of-network use.

Factors influencing the choice of insurance plan include the benefits offered, the cost of the plan, and the freedom to choose providers.

Some fairly comprehensive plans impose a nominal charge (for example, \$1 to \$5) each time a service is used. Although a form of cost sharing, these co-payments are primarily intended to discourage excessive and frivolous utilization of health care services.

Factors Influencing the Choice of Insurance Plan

In employer-based health insurance, the employee may typically be presented with numerous health insurance offerings and must choose from among them. In individually purchased insurance, the choices are usually more limited, for reasons discussed below. Regardless of the type of insurance, the consumer must somehow rank each choice relative to the others and pick the best one for him or her. Factors influencing the choice of insurance plan include the benefits offered, the cost of the plan, and the freedom to choose providers.

Covered Benefits

Maternity and well-child care benefits are particularly important to consumers of

childbearing age. Maternity benefits are mandated by state law in 48 states and are included in more than 95% of employer-sponsored group policies underwritten by commercial insurance companies.¹⁶ Covered services for a normal pregnancy usually include a specified number of prenatal visits, diagnostic tests such as ultrasound, delivery, postpartum care, and an initial inpatient well-baby visit.

Some employers concerned about the cost of high-risk pregnancies provide additional benefits to encourage prenatal care. For example, Florida Steel Corporation, through its medical plan carrier, Aetna Health Plans, offers a Healthy Beginnings program. Free diaper service for 90 days is provided after the baby is delivered to encourage pregnant employees and pregnant spouses of employees to register for prenatal care. Women enrolled in the program are monitored on a regular basis by the insurance company's nurse consultant who records each woman's vital statistics (including weight gain and blood pressure), answers questions, and provides needed assistance. The nurse coordinates all efforts with the patients' obstetricians. The program also includes an educational component that provides the women with maternity-related information, including diet and exercise suggestions.¹⁷

Well-child care consists of monitoring a child's physical and mental development and of providing routine preventive services. Covered benefits usually include a specified number of physician visits before a child reaches a certain age, routine laboratory services, and immunizations. Some insurers consider immunizations to be a separate benefit. As shown in table 1, coverage for well-child care is far more common in HMOs than in traditional insurance plans and PPOs, making HMOs a popular choice for parents with small children.

Coverage of preventive diagnostic services is also an increasingly important benefit as employers become aware of the significant role played by preventive care in containing costs. The growing popularity of wellness programs has likely added to this trend. Most corporate wellness programs focus on weight reduction, smoking cessation, stress management, and fitness maintenance.

Cost

A consumer's choice of insurance product is also greatly influenced by cost. Many

Table 1. Percentage of Health Insurance Plans Covering Well-child Care and Preventive Diagnostic Services in 1989

Services	Traditional Indemnity Plans	Preferred Provider Organizations	IPA Model Health Maintenance Organizations	Staff Model Health Maintenance Organizations
Well-child care	50	62	98	99
Preventive diagnostics	67	71	94	100

Source: Health Insurance Association of America. *Source Book of Health Insurance Data, 1990*. Washington, DC: HIAA, 1990, p. 33.

factors influence the cost of a private health insurance plan, including the comprehensiveness of the benefits package and the degree to which cost containment programs are used. From the insurer's perspective, a major factor influencing the cost of insurance is the "riskiness" of the group or individual to be covered. Many insurers attempt to exclude high-cost groups and individuals from coverage or design policies to protect the insurer from the consequences of high-cost illness.

Preexisting condition limitations are frequently used to protect the insurer from high-cost illnesses by excluding from coverage for a specified period (often 6 to 12 months) medical care required to treat a condition that was diagnosed and/or treated prior to the commencement of coverage. By covering only new conditions, the insurer can reduce costs and offer a lower premium. These limitations have serious implications for pregnant women and infants. Because pregnancy is typically considered to be a preexisting condition, women who become insured after they have become pregnant or during a waiting period before their insurance becomes effective may find it difficult to obtain reimbursement for the costs of the pregnancy.

Trends in Private Insurance Coverage for Children

Although private health insurance remains the primary source of health insurance for children and pregnant women in the United States, the percentage of children with private coverage declined throughout the 1980s. The erosion in coverage can be traced to the rising cost of health insurance and the growth in insurer risk selection practices that

severely restrict the availability of insurance to persons with a history of medical conditions. Moreover, the rising cost of health care has caused many employers to reduce the range of benefits provided and to require additional employee cost sharing in the form of increased deductibles and premium contributions. These trends in private insurance coverage are discussed below.

Trends in Coverage

The March 1990 Current Population Survey (CPS) data indicate that about 74% of all children have private insurance coverage. Nearly two thirds of all children (63%) are covered as dependents under a working parent's employer health plan (table 2). Another 11% of all children are covered under individually purchased non-group insurance plans. In addition, about 27% of all pregnant women are covered as employees under an employer health plan. About 33% are covered as dependents under their spouses' employer health plans, and another 6% are covered under individually purchased non-group insurance plans. Overall, about 60% of pregnant women have employer-sponsored coverage.

The percentage of children with employer health insurance declined from 66% in 1980 to 62% in 1986; however, the percentage with employer insurance increased to 63% by 1990. Although there are differences in the way insurance coverage is measured across surveys, these trends are generally consistent with other survey data.¹⁸ For example, in this journal issue Monheit and Cunningham report that the percentage of children with private health insurance coverage throughout the year declined from 71% in 1977 to 63% in 1987.

The decline in the percentage of children covered under employer plans

during the early 1980s coincided with the 1982-1983 recession. The unemployment rate rose from 7% in 1980 to 9.5% by 1983, resulting in a widespread loss of employer coverage. The percent covered did not increase, however, as the economy recovered because many of the jobs created after 1983 were in service industries where many employers do not offer insurance and/or contribute little to the cost of dependent coverage.¹ It is likely that the proportion of children without health insurance coverage increased recently because of the recession of 1990-1992.

Employer Health Care Costs

U.S. business health spending as a percent of total employee compensation increased from 2.0% in 1965 to 7.1% by 1990 (table 3). The increase in employer costs in the past decade has been accel-

erated by cost shifting. Uninsured persons often cannot pay for the care they receive, which creates an uncompensated care burden for providers, typically hospitals that provide charity care. These providers attempt to shift the costs of uncompensated care onto other payers in the form of higher provider charges. Also, in recent years, government programs such as Medicare and Medicaid have reduced their reimbursement rates below the cost of providing care.¹⁹ This reduction creates reimbursement shortfalls which providers attempt to recover by shifting costs to private payers. Cost shifting for uncompensated and undercompensated care has increased in recent years as a result of increases in the number of uninsured persons and increasingly aggressive cost containment efforts in public programs.¹⁹ Ironically, the practice of cost

Table 2. Sources of Insurance Coverage for Children and Pregnant Women in 1989

Sources of Insurance*	Children (percent)	Pregnant women (percent)
Employer coverage		
On own job	0.1	26.5
As a dependent	63.0	33.1
Non-group coverage	10.5	5.7
Public programs	19.6	25.4
Uninsured	13.2	14.4
*Percentages do not add to 100% because individuals may have coverage from more than one source.		
**The CPS does not report pregnancy status. This survey identifies pregnant women as female parents of a child born in the prior year; therefore, it excludes females whose pregnancy does not go full term.		

Source: Lewin-ICF analysis of the March 1990 Current Population Survey (CPS) Data.

Table 3. Business Faces Increasing Health Insurance Costs

Year	U.S. Business Health Spending as a Percent of	
	Gross Private Domestic Product	Total Employee Compensation
1965	1.0	2.0
1980	2.7	4.9
1990	3.9	7.1

Source: *Health Care Financing Review* (Winter 1991) vol. 3, no. 2. Baltimore, MD: U.S. Department of Health and Human Services, 1991, p. 88

shifting may be causing increases in uncompensated and undercompensated care by further reducing the affordability of private insurance.

In response to rising health care costs, many employers have attempted to control spending through a variety of managed care strategies. Industry data show that HMO enrollment has grown steadily during the past decade.²⁰ In 1988, about 19% of persons insured by benefit plans of firms with 100 or more employees were enrolled in HMOs and approximately 7% were enrolled in selective contracting plans (PPOs and EPOs).²¹ In addition, 91% of employer plans surveyed by A. Foster Higgins have some form of utilization review program.²² For example, 73% of insurers require precertification for selective hospital admissions, and about half require concurrent review of hospital admissions. Despite these efforts to contain costs, however, many employers have found it necessary to reassess the level of coverage provided.

Covered Services

The traditional role of private insurance was to cover costs associated with acute illnesses, not costs associated with services designed to prevent illness. Rapidly rising health care costs have led many employers to broaden that focus. Pregnant women have been a popular target of managed care programs because expenses related to childbirth are the largest single component of a typical employee group's health care costs and may range from 10% to 49% of total expenditures.²³ Employers and insurers now offer services that were rarely covered under traditional insurance plans, including free obstetrical visits, behavior modification classes for smoking cessation and weight loss, preconception health risk appraisals, and extensive prenatal and postpartum educational materials and classes.²⁴ One employer estimates that its pregnancy health benefits management program saved almost \$500,000 in its first year by reducing the frequency of low birth weight babies.²⁵

Young children are also a popular target for specialized programs such as case management. For example, a midwestern HMO is implementing a case management program designed to help children with chronic asthma. The program was designed in response to the fact that asthma was the number one reason for school absenteeism in the area and a



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major source of HMO expenditures. In concert with the school nurse, primary care physician, a social worker, the parents, and a combination of other professionals, the pediatric asthma case manager works with the child to help him or her accept the responsibilities associated with asthma treatment. The goal is to keep the child in school and out of the emergency room or hospital inpatient setting.²⁵

Another increasingly popular program involves using so-called Centers of Excellence. Centers of Excellence are facilities identified by insurers as high quality, cost-effective providers of specialty care. For example, children's hospitals are often designated as Centers of Excellence for the provision of specialized pediatric care. All cases for specific types of care are then sent to the Center of Excellence for treatment. Currently, the most popular types of Centers of Excellence are those specializing in organ transplants and rehabilitation services.

While many of the trends in children's coverage are positive, coverage for certain services of particular importance to children has declined in recent years. An annual survey of medium and large firms conducted by the Bureau of Labor Statistics (BLS) indicates that the percentage of persons with dental coverage declined from 77% in 1984 to 66% in 1989.²⁶ The BLS data also indicate that the percentage of participants in plans with limitations on the number of days of inpatient coverage increased from 43% in 1982 to 77% in 1989. In

addition, although 97% of all participants were covered for inpatient substance abuse detoxification (detoxification is generally considered medically necessary and is usually covered), only 68% were covered for inpatient substance abuse rehabilitation and only 61% were covered for outpatient treatment.

Thirty-two percent of workers were required to pay 40% or more of family premium costs. According to a Wyatt Company survey, the average employee contribution for family coverage increased from \$435 in 1986 to \$605 in 1989.

Current trends in substance abuse coverage for dependents raise important questions for the future of health in America. A recent survey of business executives by Northwestern National Life Insurance Company indicates that 45% of those surveyed plan to restrict or eliminate coverage for substance abuse treatment in the next decade.²⁷ The survey reveals that business executives consider substance abuse to be the fastest growing component of their health care bill. Substance abuse treatment costs have proven to be difficult to predict, resulting in serious budgeting problems for employers. Moreover, substance abuse is widely perceived to be a self-inflicted problem whose treatment is less worthy of coverage than other health care services. The concern over adolescent substance abuse treatment costs is so great that 28% of the Northwestern respondents want to tie employee health insurance premiums to their dependents' age and sex. The survey also indicates that 27% of the respondents are considering prescreening family members before extending coverage for substance abuse treatment.²⁷

Patient Cost Sharing

Employers have also responded to rising health care costs by increasing patient deductibles and coinsurance for covered health services. In a 1986 survey, employers indicated that increases in patient deductibles were the most effective method for containing costs.²⁸ The Foster Higgins survey of employer plans indicates that the deductibles for 79% of these plans were raised between 1985 and 1988. The per-

centage of plans with a deductible of \$150 or more increased from 40% in 1986 to 47% in 1988.²⁹

While deductibles have increased, many plans have implemented limits on total annual patient cost sharing ranging from \$1,000 to \$10,000 per family. In a BLS survey of medium and large firms sponsoring health insurance, the percentage of employees covered by plans with maximum cost-sharing limits increased from about 20% in 1979 to about 82% in 1988.³⁰ Approximately 7 of 10 participants in health plans had an average maximum cost-sharing limit of less than \$1,500, and only 10% of participants had a cost-sharing limit greater than \$1,500. Only 3 years earlier, 90% of participants had cost-sharing limits greater than \$2,000.

Employee Premium Contributions

Many employers require that employees pay a portion of the premium for family coverage. BLS data indicate that the portion of employees whose health care premiums were wholly paid by their employer declined from 72% in 1980 to 61% in 1989.³⁰ A 1986 survey of employers indicates that the average employee contribution for family coverage was equal to 29% of the total premium compared with an average contribution of 14% of the premium for single coverage. In fact, 32% of workers were required to pay 40% or more of family premium costs.²⁸ According to a Wyatt Company survey, the average employee contribution for family coverage increased from \$435 in 1986 to \$605 in 1989.²⁷

The trend toward increased contributions for employee coverage may cause many workers to decline dependent coverage which could result in an increase in the number of uninsured children. For example, about 13.9% (1.2 million) of all uninsured children have a parent with employer health insurance on his or her job even though nearly all employer health plans have a dependent coverage option.³¹ Although little is known about this group, these may be children of workers who were unable to afford the dependent coverage premium. The affordability of dependent coverage is an important concern in view of a Congressional Research Service (CRS) analysis which suggests that the most dramatic trend in sources of health insurance between 1979 and 1986 has been the decline in the percent of persons under 65 covered as a

dependent by another family member (34.3% in 1979 to 31.4% in 1986).³²

Insurance Rating and Availability

Perhaps the most disconcerting trend in our health care financing system has been the erosion of insurance as a means of pooling risk. In effect, we are rapidly moving to an insurance system that is willing to insure only healthy individuals. In the early days of the health insurance industry, all individuals paid a uniform community-rated premium. Community rating pools the cost of all health services provided in a given region across all community members and sets a single uniform premium for all insured individuals. Under a community-rated system, people who use lesser amounts of health care effectively subsidize the cost of care provided to sicker individuals who use more services. However, if one takes the long view, community rating assures that when healthy individuals become ill they will receive needed health services while paying no greater premium than other members of the community.

Community rating was brought to an end by competition among insurance companies. The typical marketing strategy for an insurer is to attract business by offering competitive premiums to only the healthiest groups and limiting the insurer's exposure by refusing to cover health conditions that were present before the policy was issued. Renewal premiums are adjusted based upon experience so that premiums increase if the health status of the group declines. In today's system, most individuals pay a premium that reflects their health status and typical expenditure patterns rather than the overall average cost of health care in their community.

Furthermore, insurers often engage in a practice known as medical underwriting which analyzes health characteristics of individual group members to identify potentially high-risk individuals. Underwriting occurs primarily in the small group and individual insurance markets with the result that selected people are denied coverage through this process. To date, medical underwriting has been used infrequently by larger employers who are typically self-funded and/or can effectively pool risk to reduce their exposure to large losses.

The demise of community rating has worked to the benefit of some and to the detriment of others. Healthier individuals

benefit from this change because they pay a premium that is often substantially lower than what they would have paid under a community-rated system. However, medical underwriting has greatly increased premiums for sicker individuals and, in many instances, has left uninsured those most in need of health coverage. Moreover, as healthier people become sick, they often face dramatic increases in premiums and may ultimately find themselves uninsured.

Insurer risk selection practices can have a dramatic impact on families with chronically ill children. Many parents find that they cannot change jobs without losing coverage for these children because of preexisting condition limitations. In some small groups, the presence of a single chronically ill child can so increase premiums that the employer may terminate coverage. Moreover, as these chronically ill children reach adulthood, they are no longer eligible for coverage as dependents under their parents' employer plans and may not be able to obtain insurance on their own.

The Impact of Benefit Packages on Costs and on Children's Health Status

Using deductibles and coinsurance to increase patient cost sharing is an effective means of reducing employer health plan costs. Cost sharing reduces health benefits costs to the employer in two ways. First, it reduces the share of an individual's total health spending which is paid for by the plan. Second, cost sharing creates an in-



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centive for individuals to moderate their use of health services, resulting in an overall reduction in utilization.

Many observers are concerned that reduced utilization of certain services by children and pregnant women could result in a general decline in health status for many of America's children. In response to this concern, many of the health reform proposals now before Congress would eliminate cost sharing for well-child and prenatal care to encourage use of these services.^{33,34} Fortunately for policymakers, there is a body of research documenting the impact of cost sharing on the health status of children.

Research Design

The most authoritative research done on cost sharing is based upon data from the Health Insurance Experiment (HIE). The HIE was a federally funded study of the effect of different levels of patient cost sharing on health care use and health status conducted during the 1970s. Families were randomly selected from six sites chosen to represent the four census regions and urban and rural areas.

Approximately 2,000 families were then randomly enrolled for 3 to 5 years in one of 14 different insurance plans with differing levels of cost sharing, and information about their health services utilization, costs, and health status was collected. Approximately one third of enrollees were assigned to a plan with no deductibles or coinsurance. The remainder were assigned to plans with varying degrees of cost sharing. While cost-sharing requirements differed across plans, all individuals were covered for an identical package of services including ambulatory and hospital care, preventive services, prescription drugs, and all dental services.

A critical feature of the HIE is that it was a *randomized controlled trial* in which families were randomly assigned to health plans rather than permitted to select their health coverage. This feature is important for evaluation purposes because individuals often select health plans that suit their expected or desired pattern of utilization. By randomly assigning individuals to plans, the observed differences in utilization that result from plan design can be distinguished from the effects of health status or individual preference.

Cost Sharing and Service Utilization

The HIE demonstrated that patient cost sharing results in an overall reduction in utilization of health services for children. In general, hospital expenditures varied little among children insured with varying levels of cost sharing. However, for office-based care, both annual costs and the number of episodes of care provided for children with cost sharing were about 30% below those with no cost sharing.³⁵ The fact that office-based utilization and charges decreased by nearly equal amounts suggests that cost sharing did not cause families to seek care from lower priced physicians. Thus, the major impact of cost sharing appears to be on the number of episodes of care received rather than on the price of that care once received.

The HIE provides important insights into the cost of eliminating cost sharing for children's preventive services.

The HIE data also indicate that utilization of preventive services was not disproportionately affected by cost sharing. In fact, these data indicated that cost sharing reduced utilization of preventive services among children less than it reduced utilization for acute and chronic care episodes.³⁶ Thus, the HIE does not support the widely held notion that preventive care is more discretionary than other care and is therefore more sensitive to cost sharing.

The HIE provides important insights into the cost of eliminating cost sharing for children's preventive services. These data indicate that eliminating cost sharing for these services would result in a 30% increase in preventive services utilization; however, this overall increase in private health insurance costs for children is likely to be less than 5% because preventive services represent less than 15% of children's health expenditures.

While the HIE provides the most definitive data on the impact of cost sharing, these data are not strictly applicable to all of the policy initiatives under consideration today. For example, these data are more than a decade old and do not reflect the dramatic changes in medical practice patterns that have occurred since that

time. Specifically, the data do not reflect the general trend toward reduced inpatient utilization and increased use of outpatient treatments. Moreover, the HIE reflects the impact of overall family deductibles as well as individual deductibles. Thus, the utilization response under child-only health policies could differ from the HIE experience.

Impact on Health Status

Analysis of the HIE data indicates that the lower utilization associated with cost-sharing plans had no measurable impact on health status.³⁷ The health status of children in the various cost-sharing plans was compared on the basis of two measures: objective physical examinations administered under the HIE and subjective health status reports provided by the individual. Little difference in health status was observed across the various types of cost-sharing plans under either health status measure.

The results of the HIE study must be treated with caution because the data do not include a sufficiently large sample to measure the impact of cost sharing on at-risk children.³⁸ For example, the study indicated that poor children with cost sharing were more than twice as likely to suffer from anemia than poor children with free care. This suggests that cost sharing may have a detrimental impact on health status for children in low-income families.

These results are generally consistent with the results obtained in other studies of service utilization and health status. These studies provide little evidence that additional medical services result in improved health status for children, except for the poor. However, a study by Dutton and Silber of alternative ambulatory care settings with different cost-sharing requirements indicated that small improvements in health status were observed among children that do not face cost sharing.³⁹

Policy Issues Concerning Private Health Coverage for Children

More than 30 health care reform bills have been introduced in Congress. Several other proposals have been developed by insurers, provider groups, and business associations. While some of these proposals would eliminate private insurance and

cover all persons under a single government program, most of these proposals would build upon the existing private insurance system. Nearly all of the proposals that build upon the existing private insurance system would regulate insurance marketing practices so that coverage is available to all regardless of health status. Some plans would provide incentives for employers and/or individuals to purchase private insurance while others would require that all individuals obtain insurance. These proposals typically emphasize access to insurance for children and pregnant women and often stress prenatal and well-child care.

Universal Coverage for Children

The American Academy of Pediatrics (AAP) has proposed to require insurance coverage for all pregnant women and children through the age of 21. The AAP plan would provide a comprehensive benefits package covering preventive services, inpatient care, prescription drugs, developmental disabilities, substance abuse treatment, nutritional supplements, and counseling services related to parental education and child abuse.⁴⁰ The plan also would require physician-directed case



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management programs for chronically ill children to assure coordination of specialty care, compatibility of drug therapies, and identification of families in need of counseling or health education services. The plan would eliminate cost sharing for preventive care to encourage use of periodic health monitoring and screening services.

The AAP plan would require employers to provide insurance to pregnant workers, pregnant spouses of workers, and dependent children of workers. All other children would be covered under a state-administered public program that would supplant the existing Medicaid program for children and pregnant women. The AAP plan also would require that payment rates in the public plan be comparable to those for privately insured individuals to assure that provider payment differentials do not create a second-class system of care for the economically disadvantaged.

The principle that a single tier of care should be available to all regardless of income is reflected in many other health reform plans also. Moreover, the AAP plan reflects a growing sentiment that pregnant women and children should be targeted for an immediate expansion in access to health care.

Health Insurance Market Reform

There is a growing consensus that competition in the insurance market should be regulated to make coverage available to all individuals regardless of health status. The Health Insurance Association of America (HIAA) has proposed a program of market reforms, as has the National Associa-

While individual proposals differ, they are all designed to restore insurance as a means of pooling risk across society. In general, these reforms would require insurers to cover all applicants and guarantee annual renewals of coverage. Exclusions of coverage for preexisting conditions would be severely restricted. Only minimal variations in premiums would be permitted for differences in health status. For example, most proposals would limit the variation in premiums charged by an insurer to within 25% of the average premiums charged by the insurer for all individuals in similar age and sex groups. In most proposals, annual increases in premiums at time of renewal would also be limited to no more than a specified percentage (usually 15%) in excess of the average increase in health care costs for all individuals covered by the insurer. Most proposals also include a reinsurance mechanism that permits insurers to spread the cost of covering high-risk individuals across all insured individuals.

Insurance market reforms would affect children's coverage in several ways. First, children with chronic health conditions would be able to obtain insurance at a group rate. This would be particularly relevant in the sale of child-only policies, but would also affect the availability of dependent coverage for workers in small firms. Chronically ill children also would be able to obtain group-rated insurance as they grow older and are no longer eligible for dependent coverage under a parent's plan. Moreover, many healthy children might obtain insurance if the overall cost of family coverage were reduced for families with high-risk adult members.

While these proposals would restore insurance as a risk-pooling mechanism, they typically stop short of reestablishing a community rating system. Most proposals would permit variations in premiums by age, sex, and geographic region. Premium variations by health status are also permitted subject to premium variation limitations. The purpose of these proposals is to impose a pooling of risk for insured individuals while permitting price competition among insurers.

Although insurance market reforms would reduce health insurance costs for certain individuals, these reforms would do little to change the overall average cost of health care except to the extent that the elimination of underwriting practices re-

Although plans vary in significant ways, they can be classified into three basic approaches: (1) mandated employer responsibility; (2) tax incentive programs; and (3) single payer approaches.

tion of Insurance Commissions. The President's Health Reform Initiative calls for insurance market reform as do several health care bills now before Congress.¹¹ The state of Connecticut recently implemented a program of market reforms, and similar legislation is now pending before several state legislatures including Maryland, California, and Oregon.

duces administrative costs. In fact, average costs could actually increase as high-risk individuals who do not now have insurance obtain coverage and enter the broader private insurance risk pool. Although the pooling of risk implied by these reforms can be expected to reduce premiums for high-risk individuals who now purchase insurance, risk pooling will inevitably result in premium increases for lower-risk individuals who now enjoy favorable premium rates. Thus, a restoration of risk pooling in our insurance system will move us back toward a system where lower-risk individuals subsidize health costs for high-risk cases and may actually increase the overall average cost of health insurance and health care.

Toward Universal Coverage

Most health reform plans are intended to extend coverage to all uninsured persons regardless of age. Although plans vary in significant ways, they can be classified into three basic approaches: (1) mandated employer responsibility; (2) tax incentive programs; and (3) single payer approaches. Although these plans would extend coverage to all children, the benefits provided under these proposals are typically less well tailored to the special needs of children than are child-only plans such as the one proposed by AAP.

Employer Responsibility

In 1988, Sen. Edward Kennedy (D-MA) and Rep. Henry Waxman (D-CA) jointly introduced a bill that would require all employers to cover their workers and their dependents.⁴² Since that time, the authors of the bill have shifted their support to the pay-or-play approach, which gives employers the option of paying a tax and having their workers covered under a public plan in lieu of providing employees with private insurance. However, both the employer mandate and the pay-or-play approach establish that employers are responsible for covering their workers. The pay-or-play approach is now embodied in the Health America Act currently under consideration by Congress.

The Health America Act (S. 1227) specifies a minimum standard benefits package to be provided to all individuals which includes well-child care, prenatal care, and substance abuse treatment. The bill also includes insurance market reforms that are designed to extend coverage to all individuals while substantially restricting variations in premiums resulting from

changes in health status. Indeed, an employer mandate could not be effective unless accompanied by regulations making insurance available to all individuals.

Tax Credit Program

The Heritage Foundation has developed a program that would replace our existing system of employer-based coverage with a requirement that all individuals purchase insurance.⁴³ Employers would be required to convert their current contributions to wages, which would then become taxable to the employee. The increase in tax revenues would be used to finance a tax credit to individuals, which would vary with income and the cost of insurance. This proposal also includes insurance market reforms designed to assure the availability of insurance coverage and limit the variation in premiums by health status.

The purpose of the Heritage Foundation proposal is to make individuals more conscious of the cost of care they consume by requiring that they purchase insurance out of their income. The plan does not specify a minimum benefits package so that individuals would be permitted to delete coverage for selected benefits. This may result in reductions in coverage for important child health services such as preventive care.

Single Payer

Several bills have been introduced which would eliminate private insurance and cover all Americans under Medicare⁴⁴ or cover all Americans under a single government program modeled on the Canadian system.⁴⁵ However, a publicly financed national health insurance plan does not necessarily mean the end of private insurance. For example, the Health USA Act introduced by Sen. J. Robert Kerrey of Nebraska would establish a publicly financed national health insurance program in which individuals choose among insurers competing on the basis of price and quality.³⁴

Cost Containment

The share of our gross national product devoted to health care increased from 9.1% in 1980 to 12.2% by 1990. Yet, despite this dramatic increase in the share of our national wealth devoted to the health sector, the number of persons without health insurance increased by 9 million during this same period.⁴⁶ As costs have risen, fewer and fewer employers and families have been able to afford insurance coverage. Indeed, controlling costs is widely

seen as essential to maintaining even the existing level of insurance coverage.

Cost containment is a central theme of nearly all of the health reform plans now before Congress. However, the proposed methods for controlling costs vary across proposals. The most frequently suggested cost containment strategies are competition in the health care market, managed care, and global budgeting. The first two have been tried in the United States with varying degrees of success. The third, a common feature in countries with national health insurance, is virtually nonexistent in the United States.⁴⁷

Competition

Competition as a means of controlling costs is emphasized in several reform proposals, including the Heritage Foundation plan and the Health USA Act. In a competitive market, there are enough producers of a particular product to allow consumers to shop around and choose the one with the optimal combination of price and quality. The argument is that if one creates an environment in which the consumer (for example, an employer group) chooses to

fundamental problem with the competitive model may be that consumers of health care services may not know enough about their condition and appropriate therapy to shop around for cost-effective, high-quality care.

Managed Care

Many proposals would place greater emphasis on expanded use of managed care and medical practice outcomes research. While there is some evidence that certain managed care programs such as case management do control costs, few comprehensive evaluations of managed care programs have been completed. According to some industry observers, managed care would successfully control costs only if the entire population were enrolled in closed provider networks with a high degree of care management.⁴⁸ Many of the health reform proposals now before Congress would seek to expand managed care. For example, the Health America Act would preempt state laws that restrict the use of HMOs or selective contracting. This bill would also require that HMOs be available to small groups and that managed care plans be available to persons covered under publicly financed health programs. Several bills also propose to organize small employers to negotiate provider discounts.

The effectiveness of managed care could also improve as research on medical outcomes and on medical practice parameters is further expanded. There is a growing body of research on the effectiveness of medical procedures. This research is being used to develop medical practice guidelines for managed care settings to eliminate unnecessary procedures and improve quality. Medical practice guidelines could also help rationalize malpractice awards and reduce the practice of defensive medicine by providing empirically based standards of appropriate care. While there are significant potential benefits to medical outcomes research, it is unclear whether the development of medical practice guidelines will reduce health care costs. For example, for some conditions these guidelines are likely to recommend procedures that could result in net increases in health care costs. Moreover, the potential impact of outcomes research on children's health is difficult to assess because much of the research done to date has focused on the Medicare population.

Though typically thought of as a means of expanding insurance coverage, extensive reforms of the health care system may be needed just to preserve the existing level of private insurance coverage.

use only those producers (for example, hospitals) that sell high-quality, cost-effective products (in this instance, health care), the other producers will either exit the market, reduce their prices, or increase their quality to remain competitive. PPOs employ a competitive market strategy. The PPO contracts with selected hospitals and physicians, often negotiating discounts off current charges, and provides financial incentives for the insured population to use PPO network providers.

One of the problems with the competitive model, however, is that individuals may not find the PPO's financial incentives persuasive if the network does not include their personal physicians or the hospitals to which they refer. A more

Global Budgeting

Global budgeting is the process whereby some portion of total health expenditures is paid according to a prospectively determined (typically negotiated) annual budget. Global budgets are commonly implemented in countries with national health insurance, particularly in the hospital sector, where operating budgets are used also for planning purposes. It is harder to impose budget ceilings on physician services, although West Germany has successfully done so for many years. A recent study by the General Accounting Office (GAO) estimated that global budgets reduced health care spending in real terms by 9% in the hospital sector in France and by 17% in the physician sector in West Germany.⁴⁹

While global budgets appear to be effective in controlling health care costs, there is some evidence that they may lead to non-price rationing of services and shifting of costs from the payers (for example, the federal and regional governments) to the citizens, primarily in the form of the long waits associated with access to many services. Queuing is most common for nonemergency services such as diagnostic tests and elective surgeries. There is little evidence, however, that children are adversely affected by queuing. In fact, infant mortality rates in other developed countries using global budgeting tend to be far lower than those in the United States.⁵⁰

Conclusions

Private health insurance is the primary source of coverage for America's chil-

dren and pregnant women. Access to private health coverage is threatened by the spiraling cost of health care, cost shifting, and insurance marketing practices which tend to deny coverage to high-risk individuals. These pressures threaten to increase the number of uninsured persons and reduce the level of coverage for persons who remain insured. These changes will ultimately result in increased pressure on government programs to care for our nation's uninsured children.

Efforts should be taken to preserve the stability of our private insurance system. Reimbursement under public programs should be sufficient to reduce the cost shifting that is compounding the growth in private insurance costs. Insurance marketing practices should be reformed to guarantee the availability of coverage to all groups by restoring insurance as a means of pooling risk. Aggressive cost containment efforts should also be initiated involving competition, managed care, and possibly global spending limits.

The rising cost of health services threatens to transform health care into a luxury good affordable only by higher-income Americans. This will represent a particular hardship for America's children, a disproportionate share of whom are living below the poverty line. Though typically thought of as a means of expanding insurance coverage, extensive reforms of the health care system may be needed just to preserve the existing level of private insurance coverage.

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The Role of Medicaid and Other Government Programs in Providing Medical Care for Children and Pregnant Women

Ian T. Hill

Abstract

This article provides an overview of the major federal and state health care programs serving children and pregnant women, including Medicaid, the Maternal and Child Health Block Grant Program, the Community and Migrant Health Center Program, and the Special Supplemental Food Program for Women, Infants, and Children. A detailed description of key amendments to the federal Medicaid statute which substantially expanded the number of pregnant women and children eligible for benefits is presented along with a discussion of the creative reforms of eligibility and service delivery systems some states implemented to expand utilization of prenatal care. Early evaluation results indicate that these perinatal reforms appear to be having a positive impact on both infants and pregnant women. An assessment of the possible impact of recent Medicaid expansions on children's access to medical care reveals that progress has been slow. States have not yet undertaken substantial initiatives to improve the accessibility and efficacy of child health programs. The author concludes, however, that creative efforts by a growing number of states give reason to be cautiously optimistic about the prospect of progress in the future.

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The latter half of the 1980s witnessed dramatic expansion in the roles that state and federal governments play in providing and financing perinatal and well-child care in America. Sweeping initiatives were begun that have the potential to commit vastly larger sums of public monies to the support of maternal and child health. Expanding the delivery of prenatal care became a cause that attracted support across the political spectrum, on the grounds that expanded coverage was both a humane course to take and an efficient investment in our nation's future.¹

Yet the manner in which change was achieved—by expanding eligibility for pregnant women and young children under the Medicaid program—has raised a number of questions regarding the appropriate and potential roles of government in serving these populations. Questions that have arisen include the following:

- Is an insurance program like Medicaid the best vehicle to improve the health status of mothers and children?
- Can a program that has such a strong historical link to the public welfare system escape that system's stigma and be fully embraced as a positive public health care program by mothers and families?
- Can families' access to care be improved if the vehicle chosen to accomplish this goal is a financing program that is held in such negative regard by much of the private physician community?
- Would government funds be better spent by increasing support for programs other than Medicaid that directly provide, rather than just finance, prenatal and well-child care?
- Would real access be achieved more expeditiously by targeting dollars to expand the capacity of such public providers as state and local health department clinics and community and migrant health centers?

This article describes the rapid evolution of this country's publicly subsidized systems of health care for pregnant women and children which has taken place during the past 5 years. First, an overview of the various major federal and state programs is provided. Second, a detailed description of the key amendments in the federal Medicaid statute that enabled its expansion is presented along with a discussion of the flexibility utilized by states to implement creative reforms of eligibility and service delivery systems. Also included are early evaluation results which indicate the positive impact that perinatal reforms appear to be having on both the insurance and health status of mothers and infants. Finally, an assessment of the possible impact of recent Medicaid expansions on children's access to medical care is presented.

An Overview of Government Programs Serving Pregnant Women and Children

Many government programs serve disadvantaged pregnant mothers and their children. Some hold these populations as their sole target, while others serve a much

broader population. Some programs are designed to finance care by reimbursing providers for rendering care, while other programs subsidize the direct provision of services. Some programs are fully administered by federal agencies and operate under federal rules, while others share responsibility for management and rule making between federal and state levels of government. Appearing below are brief

descriptions of these programs—their objectives, organization, administration, and financing.

Medicaid

Created in 1965 as Title XIX of the Social Security Act, the Medicaid program has long been the primary public program supporting the provision of health care services to low-income Americans. Today, the program insures an estimated 26 million persons at an annual cost of approximately \$90 billion.²

State Medicaid programs are required to extend to program recipients a rich set of health care benefits, including inpatient and outpatient hospital services, physician services, rural health clinic services, laboratory and x-ray services, skilled nursing facility and home health services for persons over age 21, family planning services and supplies, and nurse-midwife services. States provide for well-child care through their basic Medicaid programs. In addition, under the Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) Program, the federal government mandates that all states provide early and periodic screening, diagnosis, and treatment services to eligible children under age 21.³

Several characteristics set the Medicaid program apart from most public health programs and contribute to its often daunting complexity.

States have the option of adding to this package a broad range of services, including but not limited to prescription drugs; physical, occupational, and speech therapies; case management; hospice, dental, and respiratory care; and services rendered in intermediate care facilities for the mentally retarded. States also have the flexibility to define limits on the coverage of these services; therefore, considerable variation exists among the states in both the range of services covered and the amount of care provided under each category.

Several characteristics set the Medicaid program apart from most public health programs and contribute to its often daunting complexity. These characteristics are as follows:

- Medicaid is jointly administered by the federal and state governments. At the federal level, under the direction of the Health Care Financing Administration, broad regulations dictate the overall structure of the program and its covered services. States, however, retain significant flexibility to establish income eligibility criteria, determine which among a long list of optional services to cover, and set payment rates for providers. This flexibility has resulted in wide variability among state programs with some programs being much more generous than others.

- Medicaid operates as a financing program rather than as a service delivery system. As third-party payers, state programs directly reimburse providers of care upon the submission of a bill for services rendered to an eligible individual. The federal government then pays a percentage of each state's expenditures with the percentage based on the state's per capita income. In no state does the federal government pay less than 50% of program costs. In the poorest states, the federal share can rise to more than 80%.

- Medicaid is theoretically an open-ended entitlement program. Rather than operating within a specified annual budget, it is required to extend all medically necessary services to all persons who qualify. Medicaid administrators can exercise some control over spending by selecting which optional benefits to cover, choosing where to set provider reimbursement rates, instituting medical necessity and utilization reviews, and placing upper limits on the amount, duration, and scope of covered services. The open-ended nature of Medicaid, however, has contributed significantly to its extremely rapid rate of growth in recent years. For example, after adjusting for general inflation, real Medicaid expenditures grew by 34% between 1981 and 1988. Between 1988 and 1990, expenditures grew by 23% and then by 22% in 1991 alone.⁴

- The roots of Medicaid's eligibility rules are linked to those of various public welfare programs. Medicaid was originally created as an additional benefit that persons eligible for welfare would receive along with their cash assistance payment. Specifically, Medicaid was provided to women and children eligible for the Aid to Families with Dependent Children (AFDC) program, and to aged, blind, or disabled individuals receiving Supplement-

tal Security Income (SSI) cash benefits. These categorical links created a program that is not available to every poor person. Rather, it is available to very divergent subsets of the poor. Additionally, this linkage creates a situation whereby a state's political outlook toward welfare assistance has a direct impact on its policies for health care coverage. For example, in Alabama, Medicaid coverage has been limited by very strict eligibility criteria for AFDC. AFDC eligibility criteria limit cash assistance to families with incomes below 15% of the federal poverty level.

Medicaid's specific intent has never been to improve pregnancy outcomes or reduce infant mortality; however, women and children have always been the largest portion of Medicaid recipients (currently approximately 75%). The coverage of preventive, primary, and acute care services—including prenatal, delivery, postpartum, and well-child care—have also always been mandatory components of each state's Medicaid benefit package. Ironically, because of the relatively low costs associated with such care, spending on these services has typically consumed only 25% of total Medicaid expenditures. Long-term care services, required by aged and disabled populations, are responsible for roughly 75% of Medicaid spending.¹

The Maternal and Child Health Block Grant Program

Title V of the Social Security Act, passed in 1935, authorized federal monies to be spent to identify, assess, and serve the health care needs of women and children, particularly those with low incomes or with limited access to care. Grant monies generally were allocated to the states on a formula basis, with states matching the federal allotments with their own funds.

The most important change in the program occurred in 1981 when the Maternal and Child Health (MCH) Block Grant Program was created. Seven separate categorical programs were consolidated to create a single block grant. In return for an overall decrease in federal monies, states were given greater flexibility to determine how to target grant resources and develop service delivery systems.

States have crafted unique and individual MCH programs and, therefore, it is difficult to describe the typical program.



Common traits that are shared across state programs are described below.

- Rather than following a specific formula like Medicaid, state MCH programs contribute roughly \$3 in matching funds for every \$4 in federal funds they receive. In addition, because the program is not an entitlement, state MCH programs must operate within each year's appropriated budget.
- MCH programs typically support the direct delivery of services in public health care settings, either state or locally administered health department clinics. Dollars are used to hire clinical and administrative staff, contract with private physicians to staff public clinics, and purchase medical supplies and equipment, among other things. In nearly all states, the program is divided into two separate components: an MCH program that provides preventive and primary care to families and a children with special health care needs component that provides chronic and long-term care services to disabled children.
- The programs generally adhere to income eligibility limits set at 185% of the federal poverty level.²

While state flexibility is the hallmark of the block grant philosophy, recent amend-

ments to Title V have begun to restrict states' autonomy. The Omnibus Budget Reconciliation Act of 1989 (OBRA-89), for example, contained new requirements that states must spend no more than 10% of program funds on administrative costs, at least 30% for preventive and primary care for children, and at least 30% for services for children with special health care needs. This leaves up to 30% of program dollars for prenatal and maternity care provision.⁶

For federal fiscal year 1992, the MCH Block Grant appropriation was \$650 million.⁷ In sheer size, the program is dwarfed by the Medicaid program in every state. However, in terms of power, these programs often assume a very prominent role in state health departments and exert increasing influence over the shape and direction of states' perinatal and well-child care delivery systems.

The Community and Migrant Health Center Program

Federally funded community and migrant health centers (C/MHCs) receive direct grants from the federal government and operate largely outside the purview of state and local governments. They were established in 1965 as a system through which comprehensive primary care services could be delivered to individuals and families who lack access to health services because of geographic isolation, provider shortages, or financial barriers. To fulfill their mandate, specified in Sections 329 and 330 of the Public Health Service Act, centers must serve areas designated as medically underserved; provide basic primary medical care services plus support

and facilitating services appropriate for the target population; have a governing board the majority of whose members are users of their services; and adjust the cost of services to the patient's ability to pay.⁸

Community health centers have been found to reduce infant deaths by up to 40% in the communities they serve.

Centers have always placed high priority on reducing infant mortality and improving the health of mothers and children. Community health centers have been found to reduce infant deaths by up to 40% in the communities they serve; and in 1987, 1 in 10 low-income infants born in the United States had a mother who received maternity care at a community or migrant health center.⁹

In the late 1980s Congress targeted C/MHCs as one of the vehicles to improve maternal and child health. In 1987, special funds were appropriated to the C/MHC program to conduct a 1-year demonstration project to enhance its capacity to respond to the needs of disadvantaged pregnant women and their infants. The Comprehensive Perinatal Care Program (CPCP) received just over \$20 million, which was targeted to centers located in communities experiencing high rates of infant mortality and inadequate access to prenatal care. Under this initiative, approximately half of the nearly 600 centers across the country received funding during calendar year 1988, which supported the provision of enhanced care to more than 100,000 pregnant women and 41,000 infants.⁹ In 1988, because of the success of the CPCP, Congress made it a permanent part of the C/MHC program and increased funding for the initiative in that and subsequent years.

For federal fiscal year 1991, the appropriation for community and migrant health centers totaled \$530 million. In comparison to Medicaid, the program is a small one. Its impact, however, as a key publicly subsidized primary care delivery system is significant. In 1989, C/MHCs served nearly 6 million individuals. Approximately 1.3 million of those patients were women of childbearing age, and 2.1 million were children under age 15.^{9,10}



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The Special Supplemental Food Program for Women, Infants, and Children

The Special Supplemental Food Program for Women, Infants, and Children (WIC) was created in 1972 as an amendment to the Child Nutrition Act of 1966. Administered by the Department of Agriculture's Food and Nutrition Service, WIC distributes funds to the states to provide supplemental food to low-income pregnant women, nursing mothers, and children diagnosed as being at nutritional risk. WIC also provides nutrition education and enhances access to health care services for those who are eligible for the program.

Although strictly speaking WIC is not a health care program, evaluations have found WIC to be effective in reducing infant mortality, low birth weight, anemia, and other health problems.¹¹⁻¹³ Because participation in WIC significantly reduces the chances of prematurity and low birth weight and the extraordinary costs of neonatal intensive care, the savings can be substantial.¹⁴ A recent study concluded that every dollar spent on WIC for pregnant women saves between \$1.77 and \$3.13 in Medicaid costs for new mothers and their infants during the first 60 days after birth.¹⁵

State Programs

In addition to the programs described above, state and local governments support a plethora of additional health care programs for mothers and children. Such programs are often designed to dovetail with state Medicaid programs. Examples of these programs are the following:

- Washington covers children up to age 18 in families with incomes below 100% of poverty.

- Wisconsin covers children between the ages of 2 and 6 in families with incomes between 133% and 155% of poverty.

By covering the same or similar benefits for families that possess too much income to qualify for Medicaid, or for children who are older than an individual state's upper age limit for Medicaid, these programs attempt to broaden the safety net of coverage using entirely state and/or local monies.

Medicaid and Its New Role as the Primary Vehicle for Expanding Care for Pregnant Women

By 1985, the research literature had demonstrated that lack of health insurance was an important barrier to prenatal care for low-income women.¹⁶ Yet the Medicaid program no longer held the capacity to provide appropriately for these populations because of a steady erosion in eligibility limits, which were tied to income eligibility thresholds for AFDC programs.¹⁷ In response to this problem, the Omnibus Budget Reconciliation Act of 1986 (OBRA-86) allowed states the flexibility to sever the traditional links between Medicaid and AFDC and to establish special income eligibility thresholds above those established for their AFDC programs that could be as high as the federal poverty level for pregnant women, infants, and children up to the age of 5.

In subsequent years, eligibility rules were liberalized further. The Omnibus Budget Reconciliation Act of 1987 (OBRA-87) gave states the additional option of raising income thresholds for pregnant women and infants up to 185% of the poverty level, and to raise poverty-level coverage of older children up to the age of 8. The Medicare Catastrophic Care Amendments (MCCA) of 1988 transformed what had been optional authority into a mandate by requiring states that had not already expanded coverage of pregnant women and infants to the poverty level to do so over a 2-year phase-in period. The Omnibus Budget Reconciliation Act of 1989 (OBRA-89) superseded MCCA's mandate schedule by requiring all states to cover, at minimum, pregnant women

- In Minnesota, the Children's Health Plan provides health insurance for children up to age 18 in families with incomes below 185% of the federal poverty level.

- The Maine Health Program covers children up to age 19 in families with incomes below 125% of poverty (with no restrictions on assets).

- New York's Child Health Plus Program purchases private health insurance for all uninsured children up to age 13 living in families with incomes below 185% of the federal poverty level.

- In Vermont, the Dr. Dynasaur Program covers children under age 7 to 225% of poverty and pregnant women up to 200% of poverty.

and children up to 6 years of age at 133% of poverty, beginning in April 1990. Finally, OBRA-90 called for states to phase in by the year 2001 coverage for all children up to age 19 in families with incomes below 100% of the poverty level.

States Respond Aggressively to New Flexibility

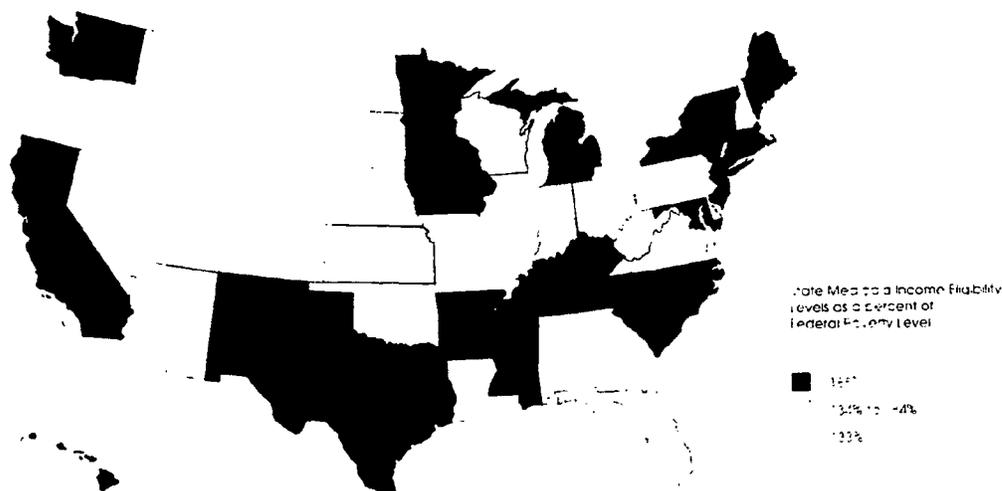
States responded quickly to the passage of the various Medicaid expansion measures. Within 2 years of the initial effective date of OBRA-86, 44 states and the District of Columbia had established coverage at 100% of poverty or higher; eighteen had elected to raise eligibility up to 185% of poverty using OBRA-87 flexibility.¹⁸ The impact of OBRA-89 and OBRA-90 were felt more broadly. As a result, all states are today covering children up to the age of 9 in families with poverty-level incomes or below.¹⁹ Combined, OBRA-89 and OBRA-90 have established a uniform, minimum floor of coverage for pregnant women and children across all states at income levels two to three times higher than those that existed in the average state a mere 4 years earlier. Figure 1 illustrates the status of states' income eligibility thresholds for

pregnant women and children as of January 1992.

Legislative provisions in the various OBRA's opened new doors for states through which financial access to health care could be extended to hundreds of thousands of families. However, by themselves, these actions did nothing to address the broad range of issues and problems confronting publicly funded perinatal programs which more directly prevent women from giving birth to healthier babies. The much more complex and difficult challenges included:

- Making eligibility systems more "user friendly," so that large proportions of eligible women and children could be successfully enrolled in Medicaid;
- Overcoming the general public's negative impression of the Medicaid program, informing women and families of the importance of early and continuous prenatal care, and persuading them to come forward and apply for the new coverage;
- Confronting the severe shortage of obstetrical providers and working to recruit more providers into the system, so that

Figure 1. State Medicaid Income Eligibility Levels for Pregnant Women and Infants, January 1992



Source: National Governor's Association, MCH Update: State Coverage of Pregnant Women and Children—January 1992. Washington, DC: National Governor's Association, January 1992.

women seeking prenatal care could be assured of finding a caregiver; and

- Addressing the quality of care covered under Medicaid and developing strategies to improve the scope, appropriateness, comprehensiveness, and continuity of perinatal services and service delivery systems.

Fortunately, a majority of states have not only expanded eligibility for pregnant women and children, but also used OBRA-86 as a catalyst for more comprehensive reforms aimed at resolving many of the problems outlined above. These efforts required cooperation and collaboration among Medicaid, MCH, WIC, public assistance, and other programs working to improve the accessibility and effectiveness of public perinatal programs.

Streamlining Eligibility for Medicaid

The Medicaid eligibility system, itself, can present a significant barrier to access for pregnant women in the following ways:¹⁷

- The traditional welfare stigma attached to applying for public aid can discourage many women who might need or want prenatal care;

- Medicaid eligibility workers are typically located in county welfare offices, rather than at prenatal care provider sites, which creates an access barrier because applying for the coverage involves a second, separate trip to the welfare office;

- Medicaid application forms, which are often used to determine eligibility for AFDC and many other public programs, are frequently complex and require extensive verification of income and resources; and

- States generally use up to 45 days to finalize their determinations of eligibility, causing a critical 6-week delay in coverage for pregnant women attempting to receive care early in pregnancy.

These factors combine to create a situation whereby many women who apply for assistance are denied because they do not "comply with procedural requirements." Federal AFDC data have consistently shown that approximately 60% of all AFDC application denials result from women not keeping an appointment with an eligibility worker or not providing sufficient documentation of earnings, citizenship, resources, and the like.¹⁷

Since 1986, many states have begun to address these system barriers. Each of the strategies described below required that

state Medicaid and AFDC agencies cooperate closely in designing reforms that meet the dual objectives of facilitating and streamlining access to care while preserving the integrity of the screening process.

The Medicaid eligibility system, itself, can present a significant barrier to access for pregnant women.

Dropping Assets Restrictions

Nearly every state has elected to remove assets restrictions from its eligibility test for pregnant women and children as originally allowed in OBRA-86. By July 1991, 48 states had determined that eliminating such limits would greatly simplify their application processes.²⁰

Allowing Continuous Eligibility

State policies traditionally require AFDC (and thus Medicaid) recipients to reconfirm their eligibility status on a regular basis. Now, however, following a period of experimentation by a number of states, all states are required to guarantee pregnant women continuous eligibility throughout their pregnancies and a 60-day postpartum period, regardless of fluctuations in income.²¹

Granting Presumptive Eligibility

A third option contained in OBRA-86 permitted states to extend temporary, 45-day eligibility to pregnant women who appear to be eligible for Medicaid benefits. This presumptive eligibility provision permits certain providers of prenatal care to perform a simplified income test and, based on its results, grant short-term coverage on the same day. By doing so, these providers also guarantee for themselves Medicaid reimbursement for the services they render. Despite numerous complexities, 26 states had, by January 1992, elected to adopt the option.²²

One drawback of presumptive eligibility, however, is that it still requires women to make a second official contact with the welfare agency to gain full Medicaid eligible status. This has stimulated many states to develop alternative eligibility system reforms that accomplish the same results with fewer complexities.

Outstationing Eligibility Workers

Rather than permitting providers to grant short-term eligibility, many states have

opted to post their own eligibility workers at provider sites that render a high volume of prenatal care services.²⁰ This strategy allows women to access the state's eligibility system directly at a provider site rather than at a county welfare office. OBRA-90 mandated that all states outstation eligibility workers in two particular provider settings: federally qualified health centers (essentially, C/MHCs) and hospitals that serve an especially high volume of Medicaid recipients.

Shortening Application Forms

As of January 1992, 33 states had adopted shortened application forms for pregnant women.²² Given the ability to exclude assets restrictions from eligibility considerations, many states now require only those pieces of information needed to determine maternity-related eligibility. Shorter application forms possess several advantages: they are more easily completed by applicants; they can be processed more swiftly by state agencies, thereby reducing waiting periods; and with less information to verify, they reduce the chance that applicants will be rejected for procedural reasons. In many states, short forms are so simple that state welfare agencies leave blank forms in providers' offices. This allows women either to take the form home and complete the process by mail, or to receive assistance from a provider's administrative staff and complete the application in the caregiver's office.

Vermont's initiative merits special attention. The state elected to expand eligibility for Medicaid to 185% of poverty and developed a one-page form that is used to determine income eligibility for both Medicaid and WIC coverage. This model is being studied closely by many states and during 1991, Ohio had plans to implement a similar form.²⁰

Expediting Maternity-related Applications

Recognizing that the typically long delays inherent in existing eligibility systems jeopardize the timely initiation of prenatal care, 14 states had, by January 1992, developed policies that require eligibility agencies to process maternity-related applications more quickly than applications made by other populations.²² As a result, turnaround times in these states range from 5 to 10 days.

Table 1 illustrates which states have adopted the strategies described above. Most states have combined several strategies for greater impact. For example, a

state that outstations eligibility workers may equip those workers with a shortened form so that the intake of larger numbers of clients can take place during a health department's prenatal clinic hours.

Designing More Effective Outreach and Public Education Campaigns

In addition to revamping Medicaid eligibility procedures for pregnant women, many states have also implemented new outreach initiatives aimed at informing these women of the availability of the new coverage and of the importance of early and continuous prenatal care. These campaigns, coupled with eligibility streamlining strategies, are intended to maximize client enrollment among the thousands of potentially eligible women who have been extended financial access to Medicaid. By combining the financing know-how of Medicaid agencies with the clinical expertise of Maternal and Child Health (MCH) programs, states have taken significant strides in developing more creative and effective outreach campaigns.

Two major challenges inhibiting states' efforts to develop effective outreach programs have been identifying an ongoing source of funding for the campaigns and selecting a strategy that is broad enough to spread its messages to all pregnant women yet targeted enough to reach that subset of the population which is most in need of assistance. In a development that addressed the first of these challenges, the Health Care Financing Administration stated in 1989 that outreach activities could be eligible for federal matching payments at the rate of 50%.²³ And while the second question may never be fully resolved, the multifaceted nature of state perinatal outreach efforts in recent years has attracted a high number of women into care.

Making Effective Use of Mass Media

Realizing that the traditional stigma attached to the receipt of welfare could discourage women from seeking Medicaid, many states have consciously developed program materials with the intention of creating a new image for the program. Utilizing softer, more positive images, bright colors, creative photography, graphic arts, and video, and employing friendlier themes like "Baby Love" (North Carolina), "First Steps" (Washington), "Baby Your Baby" (Utah), and "Beautiful Babies Right from the Start" (District of Columbia), state programs are attempting

Table 1. State Strategies to Streamline the Medicaid Eligibility Process for Pregnant Women, January 1992

States	Dropped Assets Test	Presumptive Eligibility	Shortened Application	Expedited Eligibility	Mail-in Eligibility	Newborn Referral Form
Alabama	X		X	X	X	
Alaska	X			X	X	
Arizona	X	X	X			X
Arkansas						
California						
Colorado	X	X	X		X	
Connecticut	X	X			X	X
Delaware	X	X	X			
DC	X	X	X			X
Florida						
Georgia	X		X	X	X	X
Hawaii	X	X	X		X	X
Idaho	X*	X	X			
Illinois	X		X		X	
Indiana						
Iowa		X	X*			
Kansas	X					
Kentucky	X	X	X		X	X
Louisiana	X	X	X		X	X
Maine						
Maryland	X	X	X		X	X
Massachusetts	X	X	X		X	X
Michigan	X		X	X	X	
Minnesota	X		X		X	
Mississippi						
Missouri	X	X	X			
Montana	X	X				
Nebraska	X	X			X	
Nevada	X					
New Hampshire						
New Jersey	X	X	X			
New Mexico	X	X	X		X	
New York	X	X	X	X		
North Carolina	X	X			X	
North Dakota						
Ohio	X		X	X	X	
Oklahoma	X	X				
Oregon	X	X	X	X		
Pennsylvania	X					X
Rhode Island						X
South Carolina	X		X		X	X
South Dakota	X	X	X		X	X
Tennessee	X*	X	X			
Texas	X	X	X		X	
Utah						
Vermont	X		X	X	X	X
Virginia	X		X	X	X	
Washington	X		X	X	X	
West Virginia	X	X	X	X	X	
Wisconsin	X					
Wyoming						
Number of states adopting strategy	48	26	33	14	23	14

*Future implementation date

Source: National Governors' Association. MCH Update: State Coverage of Pregnant Women and Children—January 1992. Washington, DC: National Governors' Association, January 1992.

to disassociate themselves from their welfare history and alter the public's perception of them. By doing so, they hope to attract many new clients.

More states have taken steps to tap the broadcast media's creative and persuasive talents. Understanding the media's need not only to make a profit and get high audience ratings, but also to earn the public's favor by demonstrating concern about social issues, Utah's MCH and Medicaid programs initiated this trend by en-

listing the involvement of an NBC affiliate station in Salt Lake City in the design and implementation of a multimedia outreach campaign. That station, seeing value in establishing its identity as the one that "cares about moms and kids," donated in-kind support in the form of free air time, art work, materials design, and targeted marketing in return for a relatively small financial fee. In the 3 years since the "Baby Your Baby" campaign was begun, the program achieved a 90% recognition rate

among the state's population, and state evaluation studies have documented its success in drawing women into care.¹⁷

Low provider fees, administrative and programmatic complexity, and problems with Medicaid recipients have been the principal explanations offered for poor provider participation.

Providing Toll-free Hotlines

As a component of their outreach efforts, nearly all states have incorporated toll-free hotlines. Displayed prominently on printed materials as well as in video and radio spots, hotlines provide women with an immediate source for information about where to apply for assistance, where to find prenatal care providers, and general advice and counsel in response to any questions they might have about pregnancy. Hotlines have also played a key role in helping states assess the relative effectiveness of various outreach efforts—telephone operators can ask clients “Where did you hear of this program?”—and in pinpointing which areas of the state seem to be exhibiting the most interest or greatest need. OBRA-89 mandated that all state MCH programs provide or support such telephone access for maternal and child populations because of its demonstrated effectiveness. By December 1990, 40 states had complied with this mandate.²⁴

Supporting Case-finding Programs

Many believe that mass media campaigns do not succeed well in reaching those women most in need—women in remote, rural areas, those living in extreme poverty in inner city ghettos, or women suffering from serious problems such as drug or alcohol dependence. For such groups, more targeted, door-to-door case-finding projects have been employed in a limited number of states and communities. Using either time-limited foundation support or state program administrative dollars, these efforts have typically utilized indigenous community members and/or former welfare recipients to seek out peers in need of prenatal care. Data demonstrating these programs' successes or failures are extremely hard to come by; therefore, many observers question the cost-effectiveness of this extremely staff- and labor-intensive strategy.¹⁷

Building Statewide Community Networks

Building statewide community efforts is an intermediate strategy that may combine the best of both mass media campaigns and door-to-door efforts. Many states have worked to develop a statewide network of community organizations to disseminate information on state services while also serving as a referral link between needy women in the community and Medicaid and MCH programs. North Carolina and Florida have conducted hundreds of orientations with organizations such as churches, United Way agencies, community action programs, Healthy Mothers/Healthy Babies coalitions, women's support groups, minority and youth groups, Head Start programs, legal services groups, victims assistance programs and shelters, migrant councils, child care centers, and food banks that have contact with low-income families.¹⁷ States have distributed program information and materials widely and enlisted the cooperative assistance of these groups to act as referral points.

Increasing Provider Participation

Assuring adequate provider participation has been a general concern for Medicaid programs. As states have begun extending Medicaid coverage to thousands of newly eligible women, they have also confronted a severe shortage of obstetrical care providers. Given the confluence of these two trends, one may question what access has actually been provided to low-income pregnant women if they are unable to find a provider willing to serve them.

Over the years, low provider fees, administrative and programmatic complexity, and problems with Medicaid recipients have been the principal explanations offered for poor provider participation. Today, the rising cost of malpractice insurance and the fear of malpractice suits are additionally cited as factors influencing an obstetrician's decision about whether to accept Medicaid clients. A 1988 survey revealed that 89% of MCH programs and 63% of Medicaid programs were experiencing significant problems in retaining adequate numbers of obstetrical providers in their systems and, as a result, program administrators believed that access for pregnant women was being compromised.²⁵ In response to this trend, states have increasingly implemented multiple strategies both to recruit new

doctors and to retain existing physicians in the system.

Raising Reimbursement

Public programs like Medicaid have a long history of paying providers at rates below those prevailing in the community for private-pay patients. Data from the National Governors' Association for 36 states indicated that, in 1986, the median state Medicaid program paid providers about 44% of the approximate community charge for total obstetrical care. To help offset this problem, nearly one half of the states raised obstetrical fees between 1987 and 1989, some to levels comparable to or even higher than existing private insurance rates.²⁵ In addition, OBRA-89 required states to demonstrate that obstetrical and pediatric fees were sufficient to guarantee that services were available to Medicaid clients to the same extent that they were available to the general population. A provision that defies operationalization, this move has nonetheless succeeded in stimulating more states to raise obstetrical provider fees. Unfortunately, most analysts and state program managers believe that fee increases, by themselves, will not significantly raise the rate of obstetrician participation in Medicaid. Therefore, states are also pursuing additional strategies, such as those described below.²⁶

Simplifying Billing Procedures

An ongoing complaint among physicians is that the complexity and inefficiency of Medicaid claims submission and payment procedures frequently create a real disincentive to participate. To counter these complaints, nearly one fifth of the states have attempted to improve billing procedures. For example, California has instituted a more efficient and logical claims editing system that provides for more prompt payment, special training seminars for providers' staffs on how to fill out Medicaid claims properly, and a toll-free hotline for physicians to call when they have billing questions.²⁵

Using Alternative Providers

Given a shrinking pool of participating physicians, many states are attempting to expand their use of alternative providers such as certified nurse-midwives and nurse practitioners in maternity care programs. More than one half of the states have already implemented such endeavors, either in Medicaid payment policies or in staffing MCH clinics.²⁶

Recruitment and Retention Strategies

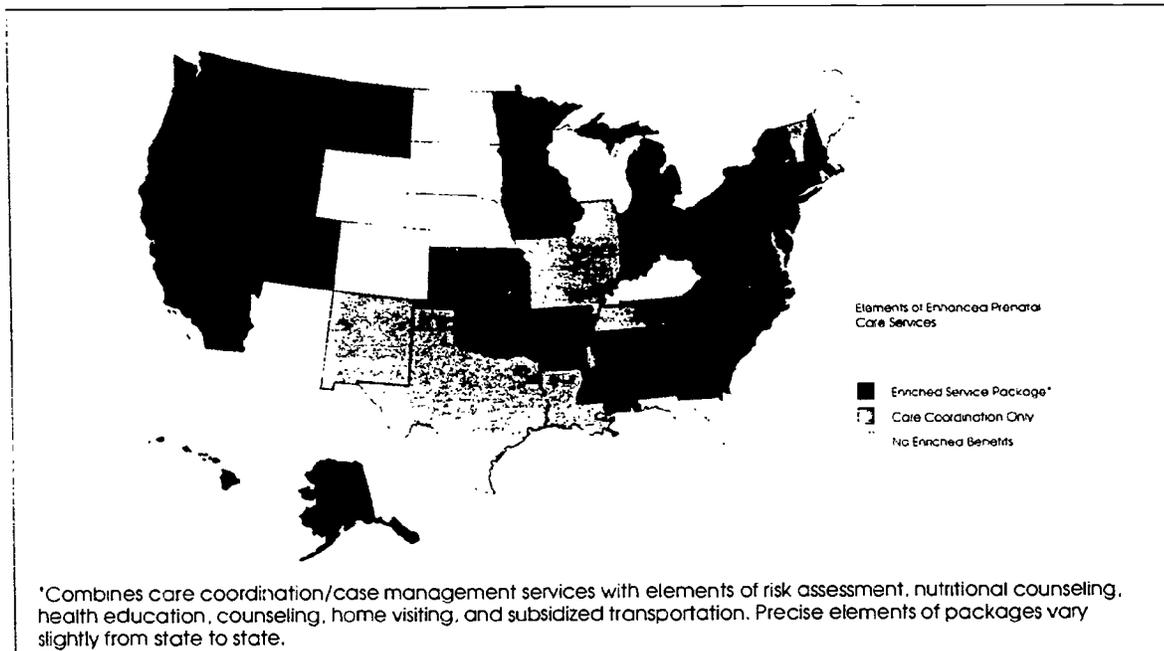
Many states have attempted to build stronger links with medical societies to improve recruitment and retention of obstetrical providers. Some states have been more aggressive. In Minnesota, Title V grant monies have been used to hire nurses who travel around the state to inform private obstetrical providers of the changes made to the Medicaid and MCH programs and to attempt to persuade them to participate. Arkansas has designated personnel within the state Medicaid agency to act as provider liaisons who will respond to specific problems and situations. Washington has developed a computer alert program that notifies the Medicaid agency when a provider drops out of the program, thereby giving the state an opportunity to contact the physician and attempt to resolve whatever problems caused him or her to quit. The same state is currently devising a system that will notify Medicaid when physicians become licensed to practice, permitting the state to contact these providers and attempt to persuade them to enroll. Ohio and North Carolina have developed systems of peer recruitment whereby participating physicians approach their nonparticipating colleagues and attempt to recruit them into Medicaid.²⁰

Today, the rising cost of malpractice insurance and the fear of malpractice suits are additionally cited as factors influencing an obstetrician's decision about whether to accept Medicaid clients.

Addressing Malpractice Concerns

A few states have attempted to address directly the problems associated with malpractice liability and cost. In Florida and Virginia, no-fault liability coverage for newborn birth-related injuries provides payments through a workers' compensation-type system. Participation is voluntary for both physicians and hospitals, who pay fees to support the compensation fund. Missouri adopted a program that uses the state's general liability fund for malpractice claims made against physicians who contract with local health departments to serve indigent women.²⁵ A program in Louisiana will pay up to \$100,000 for any judgment made against a provider whose practice is made up of at least 10% indigent women. North

Figure 2. Status of Medicaid Enhanced Prenatal Benefit Programs by State, January 1992



Source: National Governors' Association. MCH Update: State Coverage of Pregnant Women and Children—January 1992. Washington, DC: National Governors' Association, January 1992.

Carolina is using public funds to subsidize directly a portion of the costs of malpractice insurance premiums for obstetrical providers serving in rural areas under the Rural Obstetrical Access Program.²⁰

Unfortunately, very few data are available to evaluate the ability of any of these efforts to increase provider participation in Medicaid.²⁷ Until further evidence emerges demonstrating the relative effectiveness of these strategies, the lack of provider participation will persist as perhaps the most complex and insoluble problem facing government perinatal programs.

Enhancing the Scope, Quality, and Coordination of Prenatal Care

Improving the health status of mothers and children by reducing rates of infant mortality and low birth weight also requires that attention be paid and reforms be made to the content and quality of medical care. (See the Racine, Joyce, and Grossman paper in this journal issue.) An impressive body of literature (most recently the report produced by the U.S. Public Health Service's Expert

Panel on the Content of Prenatal Care, 1989)²⁸ has suggested that prenatal care should combine nutritional, psychosocial, and educational services with routine and specialized medical care. Most states have recognized the need to develop broader coverage of nonmedical psychosocial support services within the package of prenatal benefits.

As illustrated in figure 2, the aftermath of OBRA-86 has seen 38 states develop progressive programs of comprehensive prenatal care services.²⁹ With Medicaid contributing financing strategies and MCH providing clinical guidance and protocols, these benefit packages represent the cutting edge of prenatal care and are already demonstrating their ability to have a positive impact on the birth outcomes of high-risk women.

Relying predominantly on optional authority contained in the Consolidated Budget Reconciliation Act of 1985 (COBRA), states typically have added a core of new services including care coordination/case management, risk assessment, nutritional counseling, psychosocial

counseling, health education, home visiting, and transportation.

Care Coordination

Care coordination (or case management) is considered by many states as the most critical component of their enhanced packages. In 38 states, it is the glue that holds the delivery system together.²² These services typically consist of determining the various needs of a client by assessing the risk factors she is experiencing; developing a plan of care to address those needs; coordinating referrals of the client to appropriate service providers identified by the plan of care; and monitoring to ensure that those services are received. Care coordinators also assist clients with establishing Medicaid eligibility, perform outreach and community education, and assist families with arranging transportation.²⁹

Risk Assessment

In 38 states, risk assessments are used to help identify the various problems being experienced by a client and to enable providers to plan for and organize the various services she needs.²² Risk assessment can also be used to identify those women with the most pressing need for enhanced care. Most states consider multiple medical and psychosocial risk factors in their assessment instruments and will reimburse providers for the performance of several risk assessments over the course of a pregnancy.³⁰

Nutritional Counseling

Thirty states have added coverage of nutritional counseling and education to their list of Medicaid-reimbursable services.²² State protocols generally highlight the relationship between proper nutrition and good health, special dietary needs during pregnancy, instructions for infant feeding (both breast and bottle), and guidance on weight gain and exercise. A few states specify interventions for women at special nutritional risk, such as those with gestational diabetes mellitus, gastrointestinal or renal disease, or metabolic problems. Most of the states that have added this benefit have also had to specify how best to coordinate enhanced nutritional services with those already being offered and financed under the WIC program.³⁰

Psychosocial Counseling

Psychosocial counseling services, offered in 24 states, attempt to assist women with the numerous stresses that families face

and that can adversely affect birth outcomes, such as inadequate income and/or housing, insufficient food, and unreliable transportation.²² Alcohol and/or drug use, physical abuse, depression, and other social and psychological problems are also treated in most of the 24 states through one-on-one counseling.³⁰

Health Education

Childbearing women need to understand an enormous amount of information regarding the physiology of pregnancy, healthy behaviors during pregnancy, the process of labor and delivery, and the fundamentals of infant care and parenting skills. To provide such information, 30 states have added health education services to their service list.²² While the specific educational curricula vary, many states supplement teachings on these topics with additional guidance on other pregnancy-related issues. States employ both classroom and one-on-one teaching models.³⁰

Home Visiting

Home visiting, a traditional component of American public health models in years past and an integral part of perinatal delivery systems in many western European countries today, has been incorporated into 31 states' prenatal initiatives.²² The service, it is believed, allows providers (typically nurses or social workers) to assess patient needs better and to teach health behaviors more effectively by meeting with women in their own environment. Some states use visiting programs to assist women during the prenatal period, while



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others also emphasize postpartum support of both mother and child.³⁰

Transportation

A few states have tried to meet the transportation needs of pregnant women by having perinatal care coordinators arrange transportation for women to and from their prenatal visits. A few states provide direct financial assistance to clients to help them defray the costs of buses, taxis, and gasoline.³⁰

Results of Early Evaluations of Perinatal Care Reforms

At this time, politicians, policymakers, program managers, and advocates are all eager to know whether federal and state perinatal medical care reforms have improved the health status of mothers, infants, and children and increased pregnant women's use of prenatal care. Unfortunately, it is still too early to determine the impact of the vast majority of initiatives that are under way.

Many reasons exist for the current paucity of both program data and evaluations. For example, complex program changes take time to implement properly at the state and local levels and experience significant delays before accurate and meaningful descriptive data can be produced. Even after bugs are worked out of new programs, the collection of sufficient data measuring changes in utilization or birth outcomes can take several years. The use of certain indicators, such as infant mortality, is inherently problematic both because infant deaths are statistically rare events and because of the lags that occur while annual statistics are compiled. Finally, the fact that data collection practices in the 50 states vary greatly in both approach and quality makes it difficult to develop national indicators of impact.^{31,32}

Policymakers are eager to know whether federal and state perinatal medical care reforms have improved the health status of mothers, infants, and children.

These factors combine to frustrate policymakers who need to decide whether to expand or redirect efforts to improve maternal and child health. These individuals are understandably looking for con-

crete evidence that particular program strategies are either producing desired results or failing to do so.

Fortunately, this situation should improve in the very near future. Nearly 5 years have passed since the implementation of the first Medicaid expansions for pregnant women and children. Both federal and state agencies have begun either sponsoring or conducting program evaluations, and results from these efforts should emerge over the next several years. Two important evaluations have recently come to light that provide critical early insight into the effects of particular program initiatives. These evaluations are briefly summarized below.

- In the spring of 1991, the U.S. General Accounting Office (GAO) reported that states were experiencing early success in enrolling pregnant women into expanded Medicaid programs. Based on case studies in 10 states, the GAO study monitored changes in Medicaid enrollment after implementation of eligibility expansions and measured rates of increase against a projected target estimate of potentially eligible pregnant women in each state. Results indicate that between two thirds and three quarters of potentially eligible women enrolled within 2 years of these states' program expansions—an encouraging rate given the past dismal performance of Medicaid programs in attracting newly eligible populations. While a direct correlation between positive enrollment rates and individual eligibility streamlining efforts was not measured, it was observed that states which had simultaneously implemented presumptive eligibility and dropped assets tests experienced the most rapid growth in enrollment.³³

- North Carolina has released a study illustrating the positive impacts of its Baby Love maternity care coordination program. The program's effect on prenatal care utilization and birth outcomes was assessed by comparing pregnant Medicaid recipients who did and did not receive care coordination services. The state found that women on Medicaid who received maternity care coordination obtained more prenatal care, participated in WIC at higher rates, and received greater amounts of both postpartum care and well-child care for their infants. Women not receiving care coordination were found to deliver low birth weight infants at a rate 21% higher than those

that did. Similarly, rates of very low birth weight infants were 62% higher, and rates of infant mortality were 23% higher for women not receiving care coordination. The study also estimated that, for each \$1.00 the state spent on care coordination, \$2.02 was saved in Medicaid newborn medical costs.³¹

The GAO and North Carolina studies provide policymakers with valuable insight into the positive effects that can be derived from perinatal system reforms. One can only hope that similar evaluations will soon emerge to give policymakers further guidance for future action.

Shifting the Focus to Children

Since 1986, virtually all states have invested significant energy and resources in designing and implementing more effective prenatal care programs. However, laws that expanded Medicaid coverage for poor mothers *and* their children have not stimulated a commensurate level of activity on behalf of children. By 1990, few states had addressed the question of how health care programs for children could be made more effective.

By expanding children's eligibility for Medicaid to 133% of poverty for children under age 6 and to 100% of poverty for children between the ages of 6 and 19, respectively, OBRA-89 and OBRA-90 helped refocus attention on improving access for kids. OBRA-89 also asked states to make sweeping changes to their Medicaid EPSDT programs. Theoretically, EPSDT programs provide comprehensive health care for eligible children by combining screening for health problems with outreach, follow-up care, and case management to ensure that problems identified in screening visits are addressed. In practice, EPSDT programs have been affected by many of the same problems that have reduced Medicaid's effectiveness. As a result, EPSDT services are used by only a minority of eligible children.³⁵ The recent changes attempt to address some of these problems by liberalizing policies relating to the provision of preventive health examinations, the participation of pediatric providers, and the coverage of acute and specialty services.

To determine the extent to which states were undertaking initiatives to improve the accessibility and efficacy of child

health programs, the National Governors' Association (NGA) surveyed state Medicaid and MCH programs in the summer of 1990. Study findings revealed a number of disturbing trends which indicate that progress in this area may come about more slowly than did reforms in perinatal systems.¹⁹ These findings are summarized below.

Improving Children's Access to Care

Improving low-income children's access to care involves more than expanding their eligibility for Medicaid. Families must be made aware of the availability of coverage and of the importance of well-child care; eligibility systems must be structured so that children can be enrolled in a simple and timely manner; and adequate numbers of pediatric providers need to participate in Medicaid so that children will be able to obtain needed care. On each of these scores, however, the NGA survey found that states were struggling with the following persistent problems:

EPSDT programs have been affected by many of the same problems that have reduced Medicaid's effectiveness. As a result, EPSDT services are used by only a minority of eligible children.

- States reported experiencing significant difficulty in enrolling many of the children who had been made eligible under OBRA-89 and OBRA-90. Establishing eligibility for newborns, guaranteeing continuous coverage for infants during their first year of life, and particular requirements that make children's eligibility determinations more complex than those of their mothers were just some of the issues hindering enrollment.
- Outreach, marketing, and public information campaigns specifically targeting children's health issues were not found to be a common component of most states' Medicaid and MCH programs. Instead, the majority of states were still involved with developing and/or managing campaigns aimed at increasing women's use of prenatal care.
- Nearly half the states indicated that they were beginning to experience access problems related to pediatricians' increasing unwillingness to serve Medicaid children. Low fees, delayed payments, and cumber-

some administrative/claims processes were identified as the leading reasons for nonparticipation.

Cause for optimism could also be found in the NGA survey results, however. For example, more states were found to be either implementing or planning efforts to streamline eligibility systems for children. The strategies mentioned above that had proven effective for pregnant women were being tried in an effort to boost children's enrollment rates. Similarly, a handful of states had begun to build upon successful prenatal care outreach campaigns by incorporating a new set of materials and messages encouraging parents to seek out and obtain preventive care for their children. Finally, efforts to recruit pediatric providers were beginning to take shape in a small number of states. While not as significant a crisis as the shortage of obstetrical providers, declining pediatric participation has spurred states to begin raising fees, restructuring payment systems and incentives, and attempting to improve relations with pediatric medical societies. (See the Perloff article in this journal issue for a discussion of the supply of pediatric providers.)

Restructuring Service Delivery Systems for Children

Devising a comprehensive system for meeting the health care needs of children—one that is broad enough to provide every child with preventive well-child services, responsive enough to treat any acute illnesses suffered by a child, and targeted enough to provide special services to those children with chronic health and/or developmental problems—is an incredibly complex task. Accordingly, the NGA survey found that states were struggling to enhance the quality and scope of children's services.¹⁹ Some of the difficulties they encountered were as follows:

- States' approaches to administering their EPSDT programs were found to vary greatly, and this variation seemed to affect their success in providing Medicaid-eligible children with EPSDT comprehensive screening examinations. While federal data show that only 39% of eligible children participate in EPSDT in the average state, participation rates range from as low as 7% in Delaware and Oklahoma to as high as 96% in Arizona.³⁵

- Many states reported that large numbers of pediatricians continue to provide well-child care to Medicaid-eligible children

outside the EPSDT system. This situation leaves states in a tenuous predicament: they have no way of knowing specifically what types and amounts of care are being provided, nor do they have any way of ensuring that child patients of these providers receive the comprehensive care required by the EPSDT program. Rule changes contained in OBRA-89 intended to broaden the number and types of providers eligible to participate in EPSDT have done little but confuse an already difficult situation.

- Children's access under Medicaid to acute, therapeutic, and chronic care services was judged to be inadequate by many states. To improve EPSDT's performance as a treatment program, OBRA-89 required states to cover any and all services needed to treat conditions identified during an EPSDT screen, whether or not those services are covered by their state plans. While this move demanded that states broaden the scope of their programs to include many new services for mentally ill and/or developmentally disabled children (such as inpatient psychiatric care and physical, occupational, and speech therapies), many states are still struggling with how to implement this provision and are concerned about its impact on program costs.

- Most states reported a serious lack of coordination between preventive, acute, and chronic care systems of care for children. These states had neither created formal administrative mechanisms nor designated particular providers of care to ensure that their systems operate in an integrated, coordinated manner.

The NGA survey did identify many states that were creatively designing programs and strategies to resolve these system problems. Slightly less than half of the states reported that their MCH programs had contracted with the state Medicaid agency to manage the EPSDT program, thereby removing most EPSDT-related administrative responsibilities from the state and/or local welfare agencies. These states expressed a much higher level of satisfaction with the ability of their EPSDT programs to effectively inform families of program benefits, identify children's health care needs, locate participating providers, make appointments with providers, and follow up with each family to ensure that needed care was received. A growing number of states were also de-

signing reimbursement incentives to encourage pediatricians to participate in EPSDT rather than continue to render care outside that system. In addition, a small group of states have begun designing and implementing expanded packages of benefits for children, including the coverage of far more comprehensive acute and chronic care services. Finally, nearly half the states have adopted formal systems of case management under Medicaid. In most, children with special health care needs are targeted for this benefit.

While state initiatives to improve the accessibility and effectiveness of children's health care systems are lagging considerably behind those involving prenatal care, creative efforts by a growing number of states give reason to be cautiously optimistic about the prospect of progress in the future. Given states' consistent assignment of priority to initiatives for pregnant women and children, this optimism exists even in spite of the growing fiscal pressures facing many state Medicaid programs.

Conclusions

At the outset of this article, several questions were posed regarding the appropriate and potential roles of Medicaid and other government programs in serving mothers and children. While definitive answers to these questions may never be obtained, certain indications have emerged from the past 5 years of activity.

First, the issue of whether Medicaid was the appropriate program to expand has become almost irrelevant. While this program is not everyone's cup of tea, Medicaid constitutes the only entitlement program currently available through which federal dollars can be funneled into state programs at such generous matching rates. Medicaid offered in 1986, and continues to offer today, the most efficient available means of supporting expansions of coverage for poor and near-poor pregnant women and children.

Just as important is the fact that these Medicaid resources are available to direct service programs. In nearly every state, local health department clinics and community health centers provide services to Medicaid-eligible pregnant women and children and, therefore, can bill that program for reimbursement. Since the Medicaid expansions, many of these public providers have experienced significant difficulty capturing Medicaid revenues given

their unfamiliarity with establishing and operating third-party billing systems. Yet, as these programs adjust their way of doing business, the potential exists for tapping into increased financial support for the delivery of perinatal care and, in turn, for expanding the capacity of public health delivery systems.

The fact that so many states have successfully built ongoing, collaborative relationships between their Medicaid and MCH programs lends further support to the notion that Medicaid expansions may very well work. By assisting Medicaid agencies with the design of enhanced prenatal care benefit packages and with the implementation of these services largely through public delivery systems, MCH programs have had a significant impact on the scope and operations of their counterpart agencies and have helped assure themselves of a source of ongoing financial support. In North Carolina, where efforts on the part of Medicaid and MCH program officials to collaborate on system reform have resulted in the implementation of a true model case management program, benefits are being experienced by mothers in the form of healthier infants.

Perhaps the most insoluble problem still facing public systems of care remains the crisis in access that families confront when private obstetrical providers refuse to serve families covered by Medicaid.

Efforts to streamline and simplify the Medicaid eligibility process have helped to sever the traditional links between Medicaid and the public welfare system. Further, bright, colorful, and positive public outreach campaigns have also lessened the program's welfare image in many states. It appears that these efforts, taken together, are helping Medicaid become a more attractive program. Results from the GAO study provide at least preliminary evidence that potentially eligible mothers-to-be are coming forward to receive assistance.

Perhaps the most insoluble problem still facing public systems of care remains the crisis in access that families confront when private obstetrical providers refuse to serve families covered by Medicaid. Throughout the country, the value of a

Medicaid card is clearly brought into question when so many physicians refuse to accept it as a form of payment. Fear of malpractice liability, dissatisfaction with levels of reimbursement and the inconvenience of claims payment procedures, the belief that Medicaid patients are noncompliant and difficult to serve, and the undying perception that Medicaid is an unresponsive, inflexible system with which to do business continue to dissuade many obstetricians from participating in the program. Until tangible progress can be made in addressing this critical provider shortage, the potential success of the Medicaid expansions will continue to be undermined.

At this time, reasons abound for being optimistic about the ability of federal and state governments to finance and deliver high-quality prenatal and child health care services. Despite severe budget crises, infant mortality reduction remains a high public policy priority, and states continue to move forward with designing and implementing more effective systems of care. And while the health care access problems faced by mothers, children, and families are far from being solved, one can at least take heart in the progress that has occurred in recent years.

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Children Without Health Insurance

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Abstract

Data from two nationally representative household surveys—the 1977 National Medical Care Expenditure Survey (NMCES) and the 1987 National Medical Expenditure Survey (NMES)—are used to examine changes in children's health insurance status over the past decade. The consequences of disparities in children's health insurance status for their use of health services in each of these years and over time is explored. The data demonstrate that children were more likely to lack health insurance in 1987 than in 1977, that in both years children without insurance were at a disadvantage in their use of health services relative to their insured counterparts, and that over time, health service use by uninsured children declined relative to that by children with private or public coverage.

Because of the vulnerable health status of children and the importance of children's health care, the authors assess how the number of uninsured children might be affected by two frequently discussed policy alternatives: mandated employment-related coverage and incremental Medicaid expansions. They conclude that combining an employer mandate with a Medicaid expansion for some children whose parents are ineligible for an employer mandate appears to have the greatest potential for reducing the number of uninsured children.

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The views of this paper are those of the authors, and no official endorsement by the Agency for Health Care Policy and Research or the Department of Health and Human Services is intended or should be inferred.

In a 1991 report describing the welfare of children in the United States, members of the National Commission on Children observed that "perhaps no set of issues moved members of the National Commission more than the wrenching consequences of poor health and limited access to care."¹ As has been well documented, the consequences of limited access to health care manifest themselves through a variety of child health problems at all stages of child development.² Limited prenatal care increases the risk of low birth weight, premature births, and other adverse outcomes, all of which are associated with infant mortality or contribute to developmental disabilities. Because of poor access to preventive health services, fewer than 70% of white children and less than half of black children 1 to 4 years of age received immunizations against common childhood diseases (DPT, polio, measles, mumps, and rubella) in 1985. The proportion of 2-year-olds immunized has declined from

1980 levels and falls short of the goal established by the Surgeon General of the United States of immunizing 90% of all 2-year-old children by 1990.³ Finally, limited access to health care services by school-age and adolescent children may reduce the frequency of periodic health assessments and, therefore, the ability of parents and physicians to monitor the physical growth, weight, and nutrition of children; to screen for possible child abuse and neglect; to detect learning disabilities and potentially debilitating mental health problems; and to provide children with sex education and with education regarding drug and alcohol abuse. (See the article by Perrin, Guyer, and Lawrence in this journal issue.)

By reducing the out-of-pocket costs of health care, private and public health insurance coverage play a critical role in improving children's access to health care services.

By reducing the out-of-pocket costs of health care, private and public health insurance coverage play a critical role in improving children's access to health care services. Depending on the breadth and generosity of coverage, health insurance may enhance access both to preventive care and to services that address acute and chronic health problems. Consequently, concern over disparities in children's use of health services must necessarily focus on their health insurance status.

In this paper, we use data from two nationally representative household surveys, the 1977 National Medical Care Expenditure Survey (NMCES) and the 1987 National Medical Expenditure Survey (NMES), to examine changes in children's health insurance status over the past decade. We also explore the consequences of disparities in children's health insurance status for their use of health services in each of these years and examine how their use of health services has changed over time. NMCES and NMES are particularly well suited for this purpose because each survey contains detailed information about the health care use, expenditures, health insurance coverage, and demographic characteristics of the civilian noninstitutionalized population and because each survey has been designed to produce national estimates of health care use and expenditures.⁴ These data demonstrate that over this period children were more likely to lack health insurance in 1987 than in 1977, that in both years children without insurance were at a disadvantage in their use of health services relative to their insured counterparts, and that over time, health service use by uninsured children declined relative to that of children with private or public coverage.

Children's Health Insurance Status: 1977 and 1987

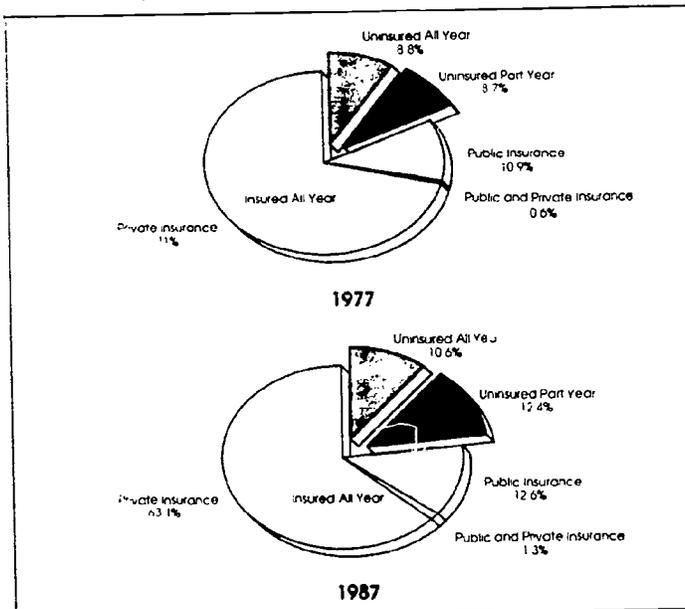
In the decade between 1977 and 1987, the likelihood that a child less than 18 years of age would be covered by private or public health insurance declined sharply. Estimates for the first quarter of 1977 and 1987 indicate that the percent of uninsured children increased by some 40%—from 12.7% to 17.8%—or by 3.1 million children. This increase in the number of uninsured children reflects the decline in the percentage covered by private, largely employment-related coverage, and the fact that fewer children in single-parent households were eligible for public insurance programs such as Medicaid.

As we have discussed elsewhere,⁵ these changes in children's health insurance status reflect a number of social, legislative, and economic influences over the past 2 decades. In 1987, 25% of all children lived in single-parent households compared to 17% in 1977. Their parents were far less likely to receive an offer of employment-related health insurance than were the parents of children in two-parent households.

In fact, 79.1% of children in two-parent households had parents who were offered employment-related coverage compared to 61.8% of those in single-parent households.⁵ During the early 1980s, public health insurance became far less accessible to children whose parents earned small amounts of income for at least two reasons: first, states failed to increase their income eligibility standards for Aid to Families with Dependent Children (AFDC) with the rate of inflation; second, the Omnibus Budget Reconciliation Act of 1981 (OBRA-1981) restricted Medicaid eligibility for children of working parents by limiting the gross income of such families applying for AFDC.⁶ Subsequent expansions of Medicaid, beginning with the Deficit Reduction Act (DEFRA) of 1984 and culminating with OBRA-1990, have either mandated or allowed states to restore or expand coverage to various groups of pregnant women and young children.⁷ (See the article by Hill in this journal issue.)

The decline in the private health insurance coverage of children between 1977 and 1987 reflects the combined impact of increased out-of-pocket premium costs for family coverage, employee earnings and family incomes that have not kept pace with the rate of inflation, and changes in household composition and employment. During the early 1980s, Bureau of Labor Statistics data indicate that monthly employee contributions for family coverage (adjusted for inflation) rose by 31% (from \$25 in 1981 to \$37 per month in 1985) and that the proportion of covered employees required to contribute to their family coverage increased from 51% in 1982 to 65% in 1986.⁸ During this period, employee earnings (also adjusted for inflation) showed little or no growth. For example, between 1977 and 1987 (the decade covered by our study), average weekly earnings (in 1977 dollars) for workers in private, nonagricultural industries declined from \$189 to \$169. Although median family income (in 1989 dollars) increased modestly from \$32,758 in 1977 to \$33,805 in 1987, income fluctuated considerably during this period as the economy entered and emerged from the 1981–1982 recession.⁹ These factors have made it more difficult for families to afford health insurance coverage for all family members. The increasing likelihood that a child would reside in a single-parent household between 1977 and 1987 also reduced the likelihood that a child

Figure 1. Annual Health Insurance Status of Children, 1977 and 1987



Source. Agency for Health Care Policy and Research, 1977 National Medical Care Expenditure Survey - Household Survey; Agency for Health Care Policy and Research, 1987 National Medical Expenditure Survey - Household Survey

would be covered by private, employment-related health insurance.¹⁰

Annual Estimates of Children's Health Insurance Status

To further examine changes in children's health insurance status over this period and to relate this experience to changes in health care utilization, we present annual estimates of children's health insurance status in 1977 and 1987 (see figure 1).¹¹ Overall, the percentage of children insured throughout each year declined from 82.5% in 1977 to 76.9% in 1987, once again reflecting the sharp decrease in all-year private coverage (from 71% to 63%). As a result, the likelihood that a child would lack health insurance at some time during the year increased from 17.5% in 1977 to 23% in 1987.

The decline in private coverage affected children in all age groups and was modestly offset by a small increase in the percent of children covered by Medicaid and other public insurance throughout each year. Among the uninsured, the proportion covered only part of the year grew relative to the proportion uninsured all year so that in 1987 children were somewhat more likely to have their health insurance coverage interrupted or discontinued than in 1977. The decline in all-year private coverage and the increase in the likelihood that a child would be uninsured part of the year affected children 6 to 12 years old somewhat more than other children.

Health Insurance Status of Children by Selected Characteristics

The health care coverage of children described in table 1 and in appendix table A1 is directly related to the characteristics of the families in which they live. Family structure, income, and the employment status of parents are all critical factors in determining the type of coverage children will obtain as well as their risk of being uninsured.

Data for 1987 presented in table 1 indicate that children in two-parent families, especially those families in which both parents are employed all year (45 weeks or more), have the highest rate of private coverage and are less likely to be uninsured than children in other families. Almost 90% of these children have private coverage, and fewer than 5% are uninsured all year. These findings reflect the fact that, in households with two working

parents, the likelihood that at least one parent will be offered employment-related health insurance coverage is increased as is the level of family income necessary to pay for the rising out-of-pocket costs of that coverage. By contrast, children in two-parent families with only one full-year working parent are less likely to have private health insurance and are twice as likely as those with two full-year working parents to be uninsured all or part year. Children in families in which both parents fail to work all year or to obtain employment at all are even less likely to have private insurance and are more likely to be uninsured. More than 50% of children in families where parents worked only part of the year and 40% of children in families where neither parent worked lacked health insurance for all or part of 1987.

The employment circumstances of single parents play a critical role in determining their children's health insurance status.

A growing number of children are raised in single-parent families where the social and economic circumstances are quite different from those of two-parent families. Children in single-parent families have disproportionately higher rates of poverty because of the lower rates of labor force participation among single mothers, the lower wages for those who do work, and the unlikelihood of the presence of another working adult. However, it is important to note that, as was true in two-parent households, the employment circumstances of single parents play a critical role in determining their children's health insurance status. Children in single-parent households in which the parent is employed all year (see table 1) have rates of private coverage (70.8%) which match those of two-parent households with one full-year working parent (73.4%). Moreover, the percentage of children uninsured all or part of the year in single-parent households in which the parent is employed all year is not statistically different from that of two-parent households with one full-year working parent. Children with single parents who fail to work all year or who are not employed have considerably lower rates of private

health insurance coverage. While Medicaid provided an important buffer for these children who might otherwise be uninsured, the likelihood is still high that they will spend some time without health insurance coverage. This is especially true for children of single parents who work only part of the year. Forty percent of children in these families are uninsured all or part of the year.

Family structure and parent's employment are also strongly associated with family income, which itself is a critical factor in the types of health care coverage available to children. For children in families with income below the poverty level, nearly 45% were without coverage for at least part of 1987, including nearly 25%

who did not have coverage all year. In addition, less than one third of poor children had public coverage all year in 1987. By contrast, the vast majority of children from middle- and upper-income families had private insurance and were much less likely to spend any part of 1987 without coverage.

Poverty is strongly correlated with many factors, including education and family size. (See appendix table A1.) In general, the higher the educational attainment of the household head, the more likely the children were to have private insurance coverage and the less likely they were to be uninsured. In fact, rates of children's private coverage ranged from 25% where the head of

Table 1. Health Insurance Status of Children by Selected Characteristics, 1987

	Population (thousands)	Insured All Year*		Uninsured	
		Private	Public	Part Year	All Year
All	63,749	63.0%	13.9%	12.4%	10.6%
Age of child					
0 to 5 years	22,133	59.3	17.3	14.1	9.3
6 to 12 years	23,863	63.8	13.4	12.3	10.5
13 to 17 years	17,753	66.7	10.3	10.5	12.5
Family structure/parents' employment					
Two-parent households					
Both employed all year	16,469	89.3	1.6	4.7	4.4
One employed all year	20,591	73.4	4.5	11.1	11.1
One employed part year	3,859	30.1	15.4	33.7	20.8
Neither parent employed	738	19.0	41.2	22.2	17.6
Single-parent households					
Parent employed all year	6,605	70.8	5.1	11.3	12.8
Parent employed part year	3,799	26.1	33.3	23.6	17.0
Parent not employed	5,374	8.7	69.0	14.3	8.0
Other families	4,577	56.4	19.6	13.7	10.3
Missing	1,737	19.8	33.4	20.3	26.5
Family income in relationship to poverty**					
Poor	13,805	22.9	31.9	21.8	23.3
Other low income	12,983	45.3	21.5	17.9	15.3
Middle income	23,199	80.4	5.4	8.9	5.3
High income	13,762	90.7	3.0	3.7	2.6

*Private insurance category includes persons covered only by private insurance all year; public insurance category includes persons covered all year by public insurance or by a combination of public and private insurance.

**Poor refers to families with income below the federal poverty line; other low income, between the poverty line and 199% of poverty; middle income, between 200% and 399% of poverty; high income, 400% of poverty or more.

Source: Agency for Health Care Policy and Research, 1987 National Medical Expenditure Survey, Child Health Questionnaire and Household Survey.

household had less than 7 years of education to over 90% in households where the head had 16 or more years of education. Higher educational attainment enhances employment prospects and leads to jobs with higher wages and more generous fringe benefits such as health insurance.

Children in large families (six or more children) have a greater likelihood of being poor and uninsured (see appendix table A1). More than 42% of children from large families were without health insurance for all or part of 1987 as compared with around 20% of children from small families (not more than two children). Lower rates of health insurance coverage for children in large families are associated with higher rates of poverty and, therefore, with greater difficulty in paying the additional out-of-pocket costs of private family coverage.

Access to and the Use of Health Services

In this section, we explore how the differences in children's health insurance coverage described above are related to disparities in their access to and use of health care services. We begin by examining the relationship between children's health insurance status and the presence of a usual source of medical care, one frequently used indicator of access to care. For those children with a usual source of care, we also examine the specific type of provider according to the child's insurance status. Next, we examine the relationship between health insurance status and children's use of ambulatory medical care, prescription drugs, and dental care in both 1977 and 1987. Changes in the use of these services over this period are also discussed. Unless otherwise indicated, all differences discussed in the text are statistically significant at the .05 level (two-tailed t-test).

Usual Source of Care

The presence of a usual source of medical care is strongly correlated with ability to obtain access to health care services, level of service use, and satisfaction with care received.¹² It is also an important indicator of continuity of care, which can affect the quality of care through periodic review of the patient's adherence to a specific treatment regimen and the

progress of such treatment.¹² In 1987, children lacking health insurance, especially those uninsured throughout the year, were less likely to have a usual source of care than were those with private or public coverage (see table 2). Slightly more than 75% of children uninsured all year had a usual source of care compared to 90% of those with private or public coverage. Children with part-year insurance coverage were also more likely to have a usual source of care than the all-year uninsured.¹³

Regardless of insurance status, the percentage of children with a usual source of care declines with age, and disparities between insured and uninsured children increase. In the critical early years, however, differences in the percent of children with a usual source of care are the smallest. Close to 90% of all-year and part-year uninsured children ages 0 to 5 have a usual source compared to 94% of privately insured children and 92% of those publicly insured. Thus, along this dimension of potential access to care,¹² inequities by insurance status are minimal. In contrast, among the all-year uninsured, older children (especially adolescents) are far less likely than their insured counterparts to have a usual source of care.

Although having a usual source of care is one indicator of access to health services, differences in the site of care can also affect access through the quality and continuity of care received. For example, care obtained in a physician's office is generally perceived as yielding greater continuity and satisfaction than care obtained in a hospital outpatient setting.¹² Among children with a usual source of care, site of care is related to insurance status. More than 90% of privately insured children with a usual source of care have a physician's office as the source of care. In contrast, approximately 75% of uninsured children and only 65% of publicly insured children have a physician's office as their usual source. The latter finding may reflect the unwillingness of some physicians to accept patients covered by Medicaid and other public programs, given low reimbursement levels relative to other insurers, more extensive paperwork, processing delays, and arbitrary claims denial.¹⁴ As a result, publicly insured children are far more likely than those with private coverage to use hospi-

tal outpatient departments, emergency rooms, or other nonhospital facilities (such as health centers) regularly as sites of care. Finally, note that nearly 20% of children uninsured all year obtain care regularly from other nonhospital sources. For some of these children, this result may be a consequence of the unwillingness of hospitals to treat persons perceived as potential bad debts on either an inpatient or an outpatient basis.

Use of Health Services

Differences in children's health insurance status also have important consequences for their use of health services, both in terms of the likelihood that certain children will obtain particular medical services and also with regard to the actual level of care received. The relationship between insurance status and use of health services is examined in table 3 for all ambulatory medical care. Data for physician contacts, nonphysician contacts, prescription drug use, and dental care are presented in appendix tables A2-A5. These tabulations describe children's use of health services in

1987 by insurance status and age and compare their use to that of a decade earlier. The data in these tables demonstrate that uninsured children are less likely to use these health care services, that these children frequently have lower levels of use when they do obtain care, and that the gap between the use of some of these services according to insurance status widened between 1977 and 1987.¹⁵

Ambulatory Health Care Services

Data for both 1977 and 1987 (table 3) reveal that children with private health insurance throughout 1987 were far more likely to obtain ambulatory health care services¹⁶ than children uninsured all year. More than 80% of privately insured children in 1987 and 75% of these children in 1977 had at least one ambulatory contact, compared to only 60% of the all-year uninsured in each of these years. Particularly striking disparities are also observed for children of specific age groups. More than 90% of children 5 years of age or younger with private insurance obtained ambulatory care com-

Table 2. Children's Health Insurance Status and the Presence of a Usual Source of Care, 1987

Insurance Status and Age	Percent with Usual Source of Care	With Usual Source of Care Percent Distribution		
		Physician's Office	Hospital Outpatient Department/ Emergency Room	Other Nonhospital Facilities*
Total	88.8	85.3	5.7	8.9
Private insurance	91.5	93.0	2.8	4.2
0 to 5 years	94.0	95.1	2.4	2.5
6 to 12 years	92.5	93.2	2.5	4.2
13 to 17 years	88.1	90.8	3.5	5.7
Public insurance	89.7	64.5	14.4	21.1
0 to 5 years	92.0	64.1	12.2	23.6
6 to 12 years	90.0	67.7	13.8	18.5
13 to 17 years	86.3	59.7	18.4	21.9
Uninsured, part year	84.7	75.3	11.0	13.7
0 to 5 years	89.8	81.6	7.3	11.1
6 to 12 years	82.5	70.8	13.0	16.2
13 to 17 years	81.7	73.3	13.1	13.6
Uninsured, all year	76.7	74.3	7.5	18.3
0 to 5 years	88.7	73.0	7.9	19.1
6 to 12 years	75.8	73.2	9.2	17.6
13 to 17 years	69.8	76.6	4.9	18.4

*Other nonhospital facilities include health centers, company industrial clinics, school clinics, walk-in urgent care centers, and patient's home.

Source: Agency for Health Care Policy and Research, 1987 National Medical Expenditure Survey.

pared to only 75% of children uninsured all year. While 75% of children 6 years of age or older with private insurance obtained ambulatory care, a little more than half of those uninsured all year obtained such care.

In 1987, privately insured children were also more likely to use ambulatory health services than were children with public insurance or those uninsured part year. Because in 1977 the differences among these groups were not statistically significant, the increase in the likelihood of ambulatory care use by privately insured children in 1987 represents a gain in access to such care relative to that obtained by publicly insured and part-year uninsured children. It also represents an expansion of their advantage in access to ambulatory care over children uninsured all year.

Privately insured children who used ambulatory care also had more ambulatory contacts than the all-year uninsured: almost two more contacts in 1987 (5.7 contacts to 4.0) and one more contact in

1977 (5.0 to 3.8). These differences were also present when specific age groups were compared. The number of ambulatory contacts by children with public insurance in 1987 and 1977 was comparable to that of children with private insurance (only the oldest children among the former group lost ground to children with private insurance), while the number of ambulatory contacts by children uninsured part year remained relatively constant in both years. Consequently, uninsured children also lost ground to privately and publicly insured children with regard to the number of ambulatory contacts obtained.

Physician and Nonphysician Contacts

Similar patterns are revealed when ambulatory care is disaggregated into physician and nonphysician contacts.¹⁷ Privately insured children were far more likely than those uninsured all or part of the year to obtain a physician contact in both 1977 and 1987 (see appendix table A2), with wide disparities observed for all age groups. Privately insured children were also more likely to obtain physician serv-

Table 3. Children's Health Insurance Status and Use of Ambulatory Health Services, 1987 and 1977

Insurance Status and Age	Percent with Ambulatory Care		Average Number of Ambulatory Care Contacts for Those with Any Contacts	
	1987	1977	1987	1977
Total	76.5	74.7	5.4	4.9
Privately insured	80.4	76.6	5.7	5.0
0 to 5 years	81.2	87.0	6.1	5.9
6 to 12 years	74.9	74.5	5.5	4.5
13 to 17 years	75.5	71.2	5.4	4.7
Publicly insured	75.9	73.3	5.8	4.9
0 to 5 years	84.3	83.7	6.2	5.7
6 to 12 years	69.3	67.9	6.0	4.1
13 to 17 years	69.8	67.1	4.6	4.9
Uninsured part year	71.9	74.9	4.7	4.7
0 to 5 years	79.0	86.2	5.5	5.6
6 to 12 years	65.0	70.0	3.3	3.9
13 to 17 years	51.3	55.3	3.5	3.8
Uninsured all year	59.4	60.9	4.0	3.8
0 to 5 years	76.7	74.1	4.8	5.0
6 to 12 years	52.2	56.2	3.0	3.2
13 to 17 years	51.3	55.3	3.5	3.8

Ambulatory health services include any physician or nonphysician contacts in any medical setting (except as an inpatient) including office visits, telephone contacts, outpatient departments, emergency rooms, and home care visits.

Source: Agency for Health Care Policy and Research, 1987 National Medical Expenditure Survey and 1977 National Medical Care Expenditure Survey.

ices in 1987 than in 1977, while the likelihood of a physician contact over this decade remained the same for publicly insured children and those uninsured all year. While the number of physician contacts was roughly equivalent for privately insured children in both 1977 and 1987, the average number of contacts obtained by publicly insured and children uninsured all or part year actually declined. This decline was concentrated among young children and was especially sharp for the part-year uninsured between 6 and 12 years of age (from 3.5 contacts in 1977 to 2.2 in 1987).

Uninsured children were not able to compensate for their lower levels of ambulatory physician care through an increase in the use of nonphysician services relative to that of insured children. Compared to children uninsured all year, those with private and public coverage were also more likely to use ambulatory nonphysician services in 1987 (see appendix table A3). These groups also experienced a statistically significant increase in this likelihood from their 1977 levels, and increased the average number of nonphysician contacts between 1977 and 1987. In contrast, uninsured children did not increase their probability of using nonphysician care between 1977 and 1987, and the average number of contacts by uninsured children in 1987 was not statistically different from that obtained in 1977.

Prescription Drugs

Prescription drugs are a particularly important aspect of children's access to health services because they are commonly used to treat a variety of both acute childhood illnesses and chronic child health problems such as asthma and allergies. Therefore, it is particularly disturbing to find (see appendix table A4) that, compared to privately insured children in 1987, children uninsured all or part of the year and those covered by public insurance use significantly fewer prescription drugs. Only 34% of children uninsured all year and 45% of those uninsured part year used prescription drugs in 1987 compared to 55% of all privately insured children. Children uninsured all year were also less likely to use prescription drugs than those uninsured part of the year or those with public coverage. Children with public insurance were also less likely than those with private insurance to use prescription drugs, but their likelihood of use was no

different from that of children uninsured part year.

Among children who used prescription drugs in 1987, those with private or public health insurance averaged about one more prescription or refill than those uninsured all year (3.7 prescriptions compared to 2.7). Among the uninsured, average drug use actually declined between 1977 and 1987 (from 3.5 to 2.7 prescriptions per year), with the largest decline occurring for children less than 6 years of age (4.0 prescriptions in 1977 compared to 2.9 in 1987). Because prescription drugs are generally obtained through consultation with a physician, the reduction in prescription drug use by the uninsured may be a reflection of the decline in their access to physician care over this time period.

Dental Care

Dental care has increasingly been recognized as an important aspect of children's general health care. As with the other services reviewed in this section, disparities in the use of dental care appear correlated with children's health insurance status, particularly with regard to the likelihood of use. However, as we have noted earlier,¹⁵ this correlation may reflect disparities in family income between insured and uninsured children since dental benefits are not uniformly held in private health insurance plans.¹⁸ In 1987, children covered by private insurance were 2½ times as likely as those uninsured all year to obtain dental care (57.6% of the former compared to 21.6% of the latter). Although children with public coverage and those uninsured part year were more likely than the all-year uninsured to obtain dental services, the likelihood of use by the former groups also fell considerably below that of the privately insured. Moreover, while the percent of privately insured children using dental care increased between 1977 and 1987 (from 51.7% to 57.6%), that of the all-year uninsured actually declined from 30.1% to just over 20%. The decline for children uninsured part year was not statistically significant. The percentage of publicly insured and part-year uninsured children obtaining care stayed relatively constant. Among those using dental services, the average number of dental visits by privately insured children exceeded that of children with public insurance or those uninsured part year. Differences in the number of dental visits made by privately insured children and

those who were uninsured all year were not statistically significant.

Use of Health Services for Particular Medical Events

The tabulations presented above reveal a general pattern of limited access to and use of health care services by uninsured children compared to their insured counterparts. However, because insured and uninsured children may differ with regard to health status or health care needs, the differences reported above could overstate or understate the actual degree of disparity. Therefore, we examine children's use of health services for particular medical conditions including asthma, ear infections, well-child visits, and immunizations. Although limited in scope, these analyses provide additional evidence that uninsured children are at a disadvantage compared to those with private and public health insurance.

Children's use of physician services for asthma and ear infections (more than two in the past 12 months) are reported in figure 2 for children ages 17 and younger according to their insurance status.¹⁹ Uninsured children with asthma and those with more than two ear infections were far less likely to obtain treatment from a physician than were children with private or public coverage. Less than half of all uninsured children with asthma (49%) saw a physician compared to 65% of those with private insurance and 70% with public coverage. Only two thirds of uninsured children whose parents' reported their having more than two ear infections in a 12-month period saw a physician for care compared to almost 90% of insured children.

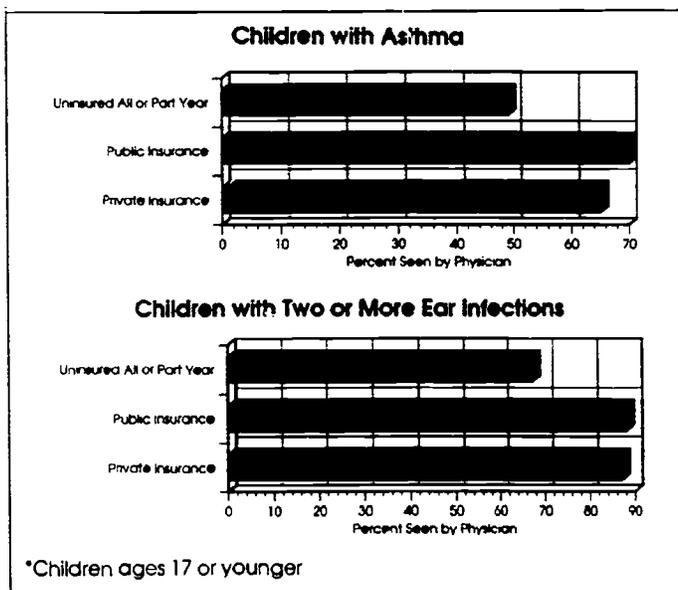
Well-child visits and immunizations for young children are basic components of preventive health care.² Thus it is also troublesome to note that, when these components of children's health care are considered according to their insurance status, service use differences similar to those generally observed appear. Using 1987 NMES data, Lefkowitz and Short²⁰ find that 0- to 2-year-olds uninsured all year are far more likely than those privately insured (all year or part of the year) to lack a well-child visit (35.8% of the former compared to only 20% of the latter). Lefkowitz and Short also compare rates of immunization for young children (those turning 1 or 2 years old in 1987) with the rates recommended by the American Academy of Pediatrics. Although more than 90% of all

such children receive diphtheria, pertussis, and tetanus (DPT) immunizations and 88% receive oral polio vaccinations, immunization rates for uninsured children still fall below those of the privately insured: 95.1% of privately insured children receive DPT injections, and 90.1% receive oral polio immunizations compared to 84.9% and 81.6% of the uninsured, respectively. While less than half of all these young children are immunized for measles, mumps, and rubella, rates of immunization for uninsured children are still below rates for privately insured children.

Efforts to Expand Children's Health Insurance Coverage

Our tabulations document a rise in the proportion of uninsured children between 1977 and 1987. We also find that uninsured children are far less likely to obtain ambulatory medical and other health care services than are children covered by private or public insurance. Moreover, our findings suggest that the disparities between insured and uninsured children in the use of ambulatory

Figure 2. Children's Health, Health Insurance Status, and Use of Physician Services for Specific Conditions, 1987*



*Children ages 17 or younger

Source: Agency for Health Care Policy and Research, 1987 National Medical Care Expenditure Survey: Child Health Questionnaire and Household Survey

health services (including physician and nonphysician ambulatory care), number of prescription drugs obtained, and the probability of obtaining dental services have widened over the past decade.

Recognition of the vulnerable health status of children and the importance and cost-effectiveness of children's health care has been an important factor in building the political consensus necessary to expand access to health services for low-income children and pregnant women during the 1980s.¹⁴ (See the Hill article in this journal issue.) More recently, the OBRA-1990 has mandated that, by the year 2002, states provide Medicaid coverage to all children and pregnant women in families with income below poverty. With regard to private health insurance, numerous proposals have sought to expand such coverage, especially through expanded employment-related coverage or tax credits to population groups that are unlikely to meet Medicaid eligibility standards. In what follows, we provide a brief assessment of how the two most frequently discussed policy alternatives—mandated employment-related coverage and incremental Medicaid expansions—might affect the number of uninsured children.

Mandated Employment-related Coverage

Health insurance obtained through an employment arrangement remains the primary source of insurance for the majority of Americans. Some 75.4% of persons less than age 65 had such coverage in 1987.²¹ Because the working uninsured and their dependents comprise more than three quarters of all uninsured persons, proposals to mandate employment-based coverage are a natural response to the problems associated with lack of coverage. Such a requirement, together with expanded public coverage for those without employment-related insurance, has been endorsed by a majority of members of the National Commission on Children and is an integral part of their proposal for a universal system of health insurance for all uninsured children through age 18 and all uninsured pregnant women.²² How effective might an employer mandate be in reducing the number of uninsured children? Assuming that the mandate would cover employees who work at least 20 hours per week, Monheit and Short²³ estimate that roughly two thirds of the 37 million persons uninsured in the first

quarter of 1987 would obtain coverage. Of these 24.3 million newly insured persons, 30%, or about 7.1 million, would be children less than 18 years of age and would represent almost two thirds of all uninsured children (63.6%).

Such estimates are, however, very sensitive to whether the mandate includes small firms. (Estimates will also vary according to the data sets used and the time frame covered.) For example, if establishments of fewer than 10 employees are exempt from the mandate, Monheit and Short estimate that only 35% of all persons uninsured in the first quarter of 1987 (about 13 million persons) would be affected. Using data from the March 1990 Current Population Survey (CPS), Rodgers estimates that an employer mandate restricted to employees working at least 25 hours per week in firms of more than 10 workers would affect some 17 million persons, or 52.6% of uninsured persons.²⁴ Some 5 million children would be affected, representing 59% of the 8.5 million uninsured children estimated for March 1990.

Expanding Medicaid

The remaining one third of uninsured children not affected by an employer mandate would include those whose parents are not employed, work fewer hours than would be required by the mandate, or work for small firms that might be exempt from an employer mandate. To the extent that such children are in families with income below the federal poverty line, many would have obtained Medicaid coverage under expansions of the program since 1987 or be eligible for Medicaid under OBRA-1990 (which was effective as of July 1991 with full implementation by the year 2002).

Several analysts have estimated the impact of Medicaid expansions on uninsured children. Holahan and Zedlewski estimate that in 1989 expansions in Medicaid resulted in coverage of 72.5% of the 4.9 million poor children under age 5 and 64.7% of 9.6 million poor children between the ages of 6 and 17,²⁵ leaving 15.2% of the former and 20% of the latter uninsured.²⁶ Were Medicaid further expanded to cover all poor children (as in OBRA-1990), an additional 4.9 million children (lacking employer-provided insurance) would be covered. If eligibility were extended up to 200% of poverty, 8.1 million children would be included.²⁷

Rodgers has also simulated the effect of a Medicaid expansion which would include

all persons in families with incomes of less than 100% of poverty and would allow persons in families with incomes between 100% and 200% of poverty to "buy in" to Medicaid on the basis of a sliding scale of contributions. This strategy would greatly expand the size of the Medicaid program (an estimated 39.9 million persons covered under the expanded program compared to 14.6 million without such an expansion) and would result in a dramatic decline in the number of uninsured persons (from 33.4 million to 13.1 million). An expanded Medicaid program would also cover 74% of uninsured children, reducing the number of uninsured children from 8.5 million to 2.3 million.²⁴

Both Holahan and Zedlewski, and Rodgers caution that expanded Medicaid coverage will add greatly to federal and state spending burdens. Holahan and Zedlewski estimate that an additional \$15 billion in financing would be required to enroll persons lacking employment-related insurance in a Medicaid expansion. Were Medicaid extended to such persons with incomes up to 200% of poverty, \$28 billion in additional financing would be required. Rodgers provides similar estimates with federal spending increasing by \$16 billion and state expenditures by \$12 billion.

In sum, either approach taken independently will fail to cover all uninsured children. Estimates of the impact of an

employer mandate suggest that, at best, upwards of 60% of uninsured children would be covered, while a Medicaid expansion requiring coverage of all children below poverty and allowing a "buy in" for those in families with incomes between 100% and 200% of poverty would cover some 73% of uninsured children. Imposing an employer mandate together with a Medicaid expansion that would include some children whose parents are ineligible for the employer mandate would be far more successful. Rodgers estimates that such an approach would extend coverage to as many as 93% of uninsured children. Such a private-public partnership, as has been advocated by the National Commission on Children, would therefore appear to have much potential to reduce the number of uninsured children. Given the trends we have documented above, the failure to take bold initiatives through the private and public sectors may cause uninsured children to continue losing ground to insured children, both in terms of their access to care and in terms of their use of essential and cost-effective health services.

We wish to thank Doris C. Lefkowitz and Daniel C. Walden for their helpful comments during various stages of this analysis. Eugene Lewit and Ted Joyce provided useful comments on an earlier draft. Yimin Nagan of Social and Scientific Systems, Bethesda, Maryland, provided skillful computer programming support.

Appendix Tables

Table A1. Health Insurance Status of Children by Selected Family Characteristics, 1987

	Insured All Year*			Uninsured	
	Population (thousands)	Private	Public	Part Year	All Year
Education of household head					
6 years or less	2,096	25.4%	25.8%	23.0%	25.8%
7 to 9 years	4,190	36.5	22.7	17.1	23.8
10 to 12 years	27,126	59.7	16.0	13.0	11.2
13 to 15 years	12,156	74.4	9.9	11.2	4.6
16 or more years	11,904	90.8	2.0	5.0	2.3
Number of children in family					
2 or fewer	37,844	67.5	10.8	11.8	9.8
3 to 5	22,482	60.2	17.3	12.7	9.7
6 or more	3,423	31.7	26.0	16.8	25.5

*Private insurance category includes persons covered only by private insurance all year; public insurance category includes persons covered all year by public insurance or by a combination of public and private insurance.

Source: Agency for Health Care Policy and Research, 1987 National Medical Expenditure Survey, Child Health Questionnaire and Household Survey

Table A2. Children's Health Insurance Status and Use of Ambulatory Physicians' Services, 1987 and 1977

Insurance Status and Age	Percent with Physician Contact		Average Number of Physician Contacts per User	
	1987	1977	1987	1977
Total	73.1	71.1	4.0	4.3
Privately insured	77.3	72.9	4.3	4.4
0 to 5 years	88.9	84.6	5.2	5.3
6 to 12 years	71.3	70.8	3.7	3.9
13 to 17 years	72.3	66.5	3.8	4.0
Publicly insured	72.6	70.3	4.1	4.5
0 to 5 years	80.2	81.8	4.5	5.2
6 to 12 years	67.3	64.1	3.7	3.8
13 to 17 years	66.1	63.6	3.6	4.2
Uninsured, part year	68.5	71.4	3.4	4.2
0 to 5 years	76.4	84.3	4.2	4.9
6 to 12 years	61.3	65.9	2.2	3.5
13 to 17 years	66.6	60.9	3.6	3.6
Uninsured, all year	54.0	57.0	3.0	3.6
0 to 5 years	71.8	71.6	3.7	4.6
6 to 12 years	46.7	50.3	2.4	2.9
13 to 17 years	45.5	52.3	2.8	3.3

Ambulatory physician services include any physician contacts in any medical setting (except as an inpatient) including office contacts, outpatient departments, emergency rooms, and home care visits.

Source: Agency for Health Care Policy and Research, 1987 National Medical Expenditure Survey and 1977 National Medical Care Expenditure Survey.

Table A3. Children's Health Insurance Status and Use of Ambulatory Nonphysician Services, 1987 and 1977

Insurance Status and Age	Percent with Nonphysician Contact		Average Number of Nonphysician Contacts per User	
	1987	1977	1987	1977
Total	23.2	19.3	5.1	3.0
Privately insured	24.4	20.0	5.1	3.1
0 to 5 years	27.1	21.7	3.2	2.7
6 to 12 years	21.9	18.8	6.8	3.1
13 to 17 years	24.5	19.9	5.5	3.4
Publicly insured	23.5	17.9	6.2	2.6
0 to 5 years	30.4	19.4	5.3	2.5
6 to 12 years	19.2	16.7	8.9	2.2
13 to 17 years	16.7	17.6	--	--
Uninsured, part year	20.9	19.7	5.0	3.0
0 to 5 years	25.8	23.8	--	--
6 to 12 years	16.1	17.3	--	--
13 to 17 years	20.2	17.3	--	--
Uninsured, all year	18.4	14.9	3.5	2.5
0 to 5 years	28.3	18.7	--	--
6 to 12 years	13.4	14.1	--	--
13 to 17 years	14.9	12.6	--	--

Ambulatory nonphysician services include contacts with nonphysician providers in an office or clinic, hospital outpatient department (but not in an emergency room or as an inpatient), by telephone, or at home.

-- means that the cell size was too small to produce reliable estimates.

Source: Agency for Health Care Policy and Research, 1987 National Medical Expenditure Survey and 1977 National Medical Care Expenditure Survey.

Table A4. Children's Health Insurance Status and Use of Prescription Drugs, 1987 and 1977

Insurance Status and Age	Percent Using Prescription Drugs		Average Number of Visits per User	
	1987	1977	1987	1977
Total	50.9	50.7	3.6	3.8
Privately insured	55.1	52.6	3.7	3.9
0 to 5 years	67.6	68.0	3.9	4.5
6 to 12 years	51.6	51.7	3.5	3.7
13 to 17 years	45.7	42.1	3.8	3.5
Publicly insured	49.6	48.7	3.5	3.5
0 to 5 years	55.6	60.6	3.7	2.7
6 to 12 years	46.3	43.5	3.3	3.3
13 to 17 years	42.9	40.0	3.5	3.1
Uninsured, part year	45.2	49.8	3.2	3.6
0 to 5 years	56.9	65.8	3.4	4.0
6 to 12 years	36.3	44.7	2.5	3.2
13 to 17 years	39.8	34.5	3.9	3.2
Uninsured, all year	34.4	38.6	2.7	3.5
0 to 5 years	48.4	53.2	2.9	4.0
6 to 12 years	28.1	34.8	2.3	3.3
13 to 17 years	28.4	31.0	2.9	3.0

Source: Agency for Health Care Policy and Research, 1987 National Medical Expenditure Survey and 1977 National Medical Care Expenditure Survey.

Table A5. Children's Health Insurance Status and Use of Dental Services, 1987 and 1977

Insurance Status and Age	Percent Using Dental Care		Average Number of Visits per User	
	1987	1977	1987	1977
Total	47.1	46.7	3.0	3.4
Privately insured	57.6	51.7	3.2	3.5
3 to 5 years	43.0	27.7	1.7	2.1
6 to 12 years	62.8	56.1	2.8	2.8
13 to 17 years	59.1	56.6	4.3	4.6
Publicly insured	36.9	34.8	2.3	3.0
3 to 5 years	34.3	21.5	2.1	--
6 to 12 years	39.7	39.4	2.4	2.8
13 to 17 years	34.6	36.5	2.3	3.5
Uninsured, part year	31.1	36.3	2.4	2.9
3 to 5 years	18.0	17.5	--	--
6 to 12 years	38.4	40.3	2.3	2.7
13 to 17 years	31.9	43.4	--	3.3
Uninsured, all year	21.6	30.1	2.6	3.2
3 to 5 years	18.5	15.7	--	--
6 to 12 years	25.4	36.1	2.3	2.9
13 to 17 years	18.8	29.6	--	3.6

-- means that the cell size was too small to produce reliable estimates.

Source: Agency for Health Care Policy and Research, 1987 National Medical Expenditure Survey and 1977 National Medical Care Expenditure Survey.

1. U.S. National Commission on Children. *Beyond rhetoric. A new American agenda for children and families: Final report of the National Commission on Children*. Washington, DC: U.S. Government Printing Office, 1991, p.118.
2. For a review and discussion see U.S. Congress, Office of Technology Assessment. *Healthy children: Investing in the future*. Washington, DC: U.S. Government Printing Office (OTA-H-345), February 1988.
3. U.S. Bureau of the Census. *Statistical abstract of the United States: 1988*, 108th ed. Washington, DC: U.S. Government Printing Office, 1987, table 168, p. 106. The percentage of children 5 to 14 years of age immunized exceeded 70% for whites and 60% for nonwhites (with the exception of polio) in 1987. The only significant growth in immunization rates for these children between 1980 and 1985 was for mumps. *The Health of America's Children*. Washington, DC: Children's Defense Fund, 1989, table 2.7, pp. 63, xii.
4. Estimates of children's health insurance status and use of health services in 1987 and 1977 are from the household components of the 1987 NMES and 1977 NMCES, respectively. Estimates are for the noninstitutionalized civilian population and exclude residents of nursing and personal care homes, facilities for the mentally retarded, and prisons. The household components of each survey are year-long panel surveys of the medical care use, expenditures, health insurance coverage, employment, and demographic characteristics of the U.S. civilian noninstitutionalized population. Respondents in each survey were asked about their health insurance status at each interview. Responses to questions regarding health insurance, types of plans held, and sources of coverage were used to classify respondents. The following classification of insurance status was used for this paper: Children (for all categories children are 17 years of age or younger) with private insurance were covered by individual or group insurance for medical or related expenditures, including prepaid health plans such as health maintenance organizations (HMOs), but excluding extra cash coverage (small supplemental payments in the event of hospitalization), medical benefits linked to specific diseases (such as cancer), and casualty benefits. Children with public health insurance were covered by Medicaid, other state and local medical assistance programs, Civilian Health and Medical Program of the Uniformed Services (CHAMPUS), Civilian Health and Medical Program of the Veterans Administration (CHAMPVA), and/or Medicare. Uninsured children had neither private nor public coverage. In each survey, children insured all year were children with private or public insurance at all interviews. Children with private insurance all year were covered only by private insurance in all interviews; those with public insurance all year were covered only by public insurance in all interviews. Children uninsured part of the year had private or public coverage at some but not all household interviews. Children uninsured all year were children with neither private nor public coverage at all household interviews. Children were considered to have used the health care services reported in the text if their parents reported at least one instance of use for the specific services tabulated regardless of whether charges for the services were rendered. A detailed description of the 1987 NMES survey is contained in Edwards, W. and Berlin, M. *Questionnaires and data collection methods for the Household Survey and the Survey of American Indians and Alaska Natives and the National Medical Expenditure Survey methods 2*. National Center for Health Services Research and Health Care Technology Assessment, Rockville, MD: Public Health Service (DHHS/PHS-89-3450), September 1989. Detailed information on the design and data collection instruments for the 1977 NMCES are contained in Bonham, G.S. and Corder, L.S. *NMCES household interview instruments: Instruments and procedures 1*. National Health Care Expenditure Study. National Center for Health Services Research, Rockville, MD: Public Health Service (DHHS/PHS-81-3280), April 1981.
5. Cunningham, P.J., and Monheit, A.C. Insuring the children: A decade of change. *Health Affairs* (Winter 1990): 76-90.
6. OBRA-1981 affected Medicaid enrollment by limiting the gross income of enrollees to 150% of each state's standard of need for AFDC eligibility and limiting various exempted income categories such as child care, work-related expenses, and specified amounts of earned income. See Holahan, J.F., and Cohen, J.W. *Medicaid: The trade-off between cost containment and access to care*. Washington, DC: The Urban Institute Press, 1986. OBRA-1981 has been estimated to have reduced Medicaid enrollment by more than 2 million persons. See Cromwell, J., Hurdle, S., and Wedig, G. Impacts of economic and programmatic changes on Medicaid enrollments. *Review of Economics and Statistics* (May 1986) 68.2:232-40.
7. Beginning with the Deficit Reduction Act (DEFRA) of 1984, Congress has sought to expand Medicaid by allowing or mandating states to expand coverage of pregnant women and young children. DEFRA-1984 mandated Medicaid coverage of all children up to age 5 in households with incomes below AFDC standards and also included pregnant women who would qualify for AFDC once their children were born. The Consolidated Omnibus Budget Reconciliation Act (COBRA) of 1985 eliminated categorical eligibility restrictions for poor

pregnant women by mandating coverage for all pregnant women with incomes of less than the state's AFDC standard even if they were not receiving AFDC benefits. The Omnibus Budget Reconciliation Act (OBRA) of 1986 permitted states to extend coverage to pregnant women and children under 5 years old in families with incomes up to the federal poverty line. OBRA-1987 continued this trend by allowing states to extend Medicaid coverage to pregnant women and infants up to 1 year of age with family incomes up to 185% of the poverty line. States could also cover children less than age 5 with incomes up to the poverty line, and children less than age 8 were to be phased in. Among the provisions retained from the Medicare Catastrophic Coverage Act was the mandated Medicaid coverage of pregnant women and children up to age 1 in families with incomes of less than 100% of poverty. OBRA-1989 mandated Medicaid coverage for pregnant women and children up to age 6 with incomes of less than 133% of poverty, and most recently, OBRA-1990 requires states by 2002 to cover children under age 18 in families earning less than 100% of the poverty line. For a more detailed description of these provisions, see the Hill article in this journal issue.

8. See Jensen, G.A., Morrissey, M.A., and Marcus, J.W. Cost-sharing and the changing pattern of employer-sponsored health benefits. *The Milbank Quarterly* (1987) 65,4:521-50; also, Short, P.F. Trends in employee health benefits. *Health Affairs* (Summer 1988) 7,3:186-98.
9. Data for weekly earnings are from U.S. President, *Economic report of the President 1990*. Washington DC: U.S. Government Printing Office, 1990, table C-44. Data on median family income are from U.S. Bureau of the Census. *Statistical Abstract of the United States: 1991*. 111th ed. Washington, DC: U.S. Government Printing Office, 1990, table 730.
10. The Congressional Research Service has argued that the most dramatic trend in sources of health insurance between 1979 and 1986 has been the decline in the percent of the nonelderly population covered by the employment-related plan of another family member (from 34.3% in 1979 to 31.4% in 1986). See Congressional Research Service. Library of Congress. *Health insurance and the uninsured: Background data and analysis*. May 1988, pp. 110-11, table 4.8.
11. In both the NMES and the NMCES, questions regarding the presence and type of coverage were asked of each person in the household, including children, so that children covered by persons outside the household (for example, by a divorced parent) were considered insured. Each survey also has the capacity to produce alternative estimates of insurance coverage, such as insurance status at a point in time or insurance status during the calendar year. In contrast, frequently quoted estimates of insurance status from the Current Population Survey (CPS) between 1980 and 1987 were derived from questions that did not directly ask about the health insurance status of each individual in the household and did not recognize that persons could obtain coverage from policyholders residing outside the household. Therefore, CPS estimates of the uninsured prior to 1988 may have seriously overstated the number of uninsured children. Comparisons between NMES and CPS estimates of the uninsured population for 1987 are also made difficult because CPS estimates are probably also overstated. These issues make NMES and NMCES estimates more reliable indicators of the health insurance status of children in 1987 and 1977. For a discussion of issues related to CPS estimates of the uninsured population, see Kronick, R. *Adolescent health insurance status: Analyses of trends in coverage and preliminary estimates of the effects of an employer mandate and a Medicaid expansion on the uninsured*. Background paper. Washington, DC: U.S. Congress, Office of Technology Assessment, July 1989, appendices A and B, pp. 49-60; Swartz, K., and Purcell, P.J. Counting uninsured Americans. *Health Affairs* (Winter 1989) 8,4:193-97. NMES estimates of persons uninsured in the first quarter of 1987 and persons uninsured all year are from Short, P.F. *Estimates of the uninsured population, calendar year 1987*. *National Medical Expenditure Survey data summary 2*. Agency for Health Care Policy and Research, Rockville, MD: Public Health Service (DHHS, PHS-90-3469), September 1990. CPS estimates are from the Congressional Research Service, Library of Congress. *Health insurance and the uninsured: Background data and analysis*. Washington, DC: U.S. Government Printing Office, 1988.
12. Aday, L.A., Fleming, G.V., and Andersen, R. *Access to medical care in the U.S.: Who has it, who doesn't*. Chicago: Pluribus Press for the University of Chicago, 1984.
13. Data on usual source of care were obtained from the NMES Access to Care Supplement, which was administered in round 3 of the NMES household survey. Compared to the all-year uninsured, children with part-year coverage may have been more likely to have had a usual source of care if they were insured at round 3 or continued to use the usual source of care established when insured in prior periods.
14. Sardell, A. Child health policy in the U.S.: The paradox of consensus. *Journal of Health Politics, Policy and Law* (Summer 1990) 15,2:271-304.
15. In interpreting the results of tables 3 and A2 through A5, it is important to remember that the measures of insurance in NMES and NMCES data only indicate the presence of private or public coverage. NMES and NMCES household data do not indicate whether specific

- types of services are covered or the generosity of coverage for those services. In addition, some of the observed differences in health services used in these tables are likely to be attributable both to health insurance status and to income because persons with private health insurance are likely to have higher family income than the uninsured (see table 1). The role of income may be more important for services such as dental care which are not uniformly available in private health insurance plans.
16. Ambulatory health care services include any physician or nonphysician contacts in any medical setting (except as an inpatient) including office visits, telephone contacts, outpatient departments, emergency rooms, clinics, and home care visits.
 17. Ambulatory physician services are physician contacts in any medical setting (except as an inpatient), including office visits, telephone contacts, outpatient departments, clinics, emergency rooms, and home care visits. Ambulatory nonphysician services are contacts with nonphysician providers in the above settings except as an inpatient or in an emergency room.
 18. For example, in 1988, 72% of full-time participants in health insurance plans in medium and large establishments had dental benefits. In contrast, 99% of such participants had coverage for physician office visits. See table 7.3 in *EBRI databook on employee benefits*. Washington DC: Employee Benefits Research Institute, 1990. These tabulations are from U.S. Department of Labor, Bureau of Labor Statistics. *Employee benefits in medium and large firms 1988*. Washington, DC: U.S. Government Printing Office, 1988.
 19. The Child Health Questionnaire also asked about other child health conditions, including hay fever and all allergies, frequent headaches, anemia, stammering/stuttering, heart problems, and long-lasting digestive problems. Most of the conditions had insufficient response frequencies to make estimates according to children's health insurance status.
 20. Lefkowitz, D.C., and Short, P.F. *Medicaid eligibility and the use of preventive services by low income children*. Unpublished manuscript presented at the Annual Meeting of the American Public Health Association, Chicago, October 1989.
 21. See Short, P.F., Monheit, A.C., and Beauregard, K. *A profile of uninsured Americans. National Medical Expenditure Survey research findings 1*. National Center for Health Services Research and Health Care Technology Assessment. Rockville, MD: Public Health Service (DHHS/PHS-89-3443). 1989.
 22. See note no. 1. U.S. National Commission on Children, pp. 118 and 138-47, for a detailed discussion of this proposal. The universal plan proposed by the Commission is of the "play or pay" variety and would require all large employers to provide coverage to pregnant employees, to nonworking spouses of employees, and to their dependent children. Small employers would be phased in as insurance market reforms make coverage more affordable for these employers. Employers not providing coverage directly would purchase insurance through a newly established public health plan, with costs set as a percentage of payroll. It is estimated that this plan—which would cover all 8.3 million uninsured children and 433,000 uninsured pregnant women—would cost the federal government \$7.4 billion with employers paying \$8.9 billion in additional benefits, payroll taxes, or both. The net cost of the proposal is estimated to be \$2.7 billion as state and local governments reduce the costs of care for the uninsured and medically indigent by \$2.5 billion, as employers who no longer bear cost shifting because of uncompensated care and low Medicaid reimbursements reduce their costs by \$4.3 billion, and as \$6.8 billion in cost savings are gained by families from increased employer and government contributions to their health care coverage.
 23. Monheit, A.C., and Short, P.F. Mandating health coverage for working Americans. *Health Affairs* (Winter 1989) 8,2:22-38.
 24. Rodgers, J. *Selected options for expanding health insurance coverage*. Congress of the United States. Congressional Budget Office, July 1991.
 25. Holahan, J., and Zedlewski, S. Expanding Medicaid to cover uninsured Americans. *Health Affairs* (Spring 1991):45-61.
 26. The remaining 12.3% of poor children under age 5 and 15.3% of poor children 6 to 17 years of age are covered by other insurance (presumably private insurance and CHAMPUS).
 27. See note no. 25. Holahan and Zedlewski, in which the authors provide a range of estimates according to children's poverty status and insurance status. Their estimates explicitly recognize that expanded Medicaid coverage may include children previously covered by employment-related or other private insurance. The estimate presented in the text includes some children who may have been covered by privately purchased nonemployment-related coverage. See exhibit 3 of their article for the full range of their estimates.

Nonfinancial Barriers to the Receipt of Medical Care

Lorraine V. Klerman

Abstract

Much has been written about financial barriers to health care, but nonfinancial barriers also increase the risk of inadequate health care. Nonfinancial barriers—including legal restrictions, geographic isolation and provider shortages, provider practices and policies, and personal attributes and circumstances—can prevent individuals from obtaining care. Children, adolescents, and women needing family planning or obstetric services are especially vulnerable to these barriers regardless of their ability to purchase care at prevailing market prices. Where individuals face a combination of financial and nonfinancial barriers, access can be severely limited.

The author discusses ways to reduce nonfinancial barriers, including modifying laws and regulations, encouraging providers to locate in underserved areas, making providers more user-friendly, offering specialized services for specified populations, increasing patients' information regarding health care services and health maintenance, changing beliefs and attitudes, and establishing special approaches to care for adolescents. Most nonfinancial barriers can and should be addressed immediately without waiting for total reform of the national health care financing system because they will contribute to the likelihood of inadequate health care even if financial barriers are reduced.

Recent discussions of the problems Americans face in obtaining medical care have focused on financial barriers, particularly the absence of health insurance. But studies of medical care utilization suggest that nonfinancial barriers also make it difficult for individuals—especially children, adolescents, and women needing family planning or obstetric services—to obtain care. Therefore, failure to make provisions for lowering these nonfinancial barriers will lessen the impact of health programs on these very vulnerable populations.¹

Measurement

This review will define nonfinancial barriers as legal, geographic, institutional, or personal factors that make it difficult for children and for women with reproductive health needs to receive medical care

regardless of their ability to purchase such care at prevailing market prices. Nonfinancial barriers may hinder care-seeking among populations that have adequate resources to purchase care, as well as among those that face financial barriers. For the uninsured and inadequately insured par-

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ticularly, nonfinancial barriers increase the risk of inadequate health care. As one study of prenatal care noted, "multiple noneconomic barriers remain after economic barriers are reduced. In other words, removal of financial barriers is necessary, but not sufficient to ensure adequate prenatal care participation among low-income women."²

Direct Measurement of Nonfinancial Barriers

Researchers measure these nonfinancial barriers both directly and indirectly. The direct method is to ask individuals what they perceive as barriers or, alternatively, why they do not seek care for themselves or for their children. Researchers can ask open-ended questions or they can provide a list and ask respondents to choose all of the barriers that seem relevant to them or to rank the listed barriers by their importance. Those who seek care appropriately should be questioned as well as those who do not, in order to better identify factors which are barriers only for those who do not obtain adequate care.

Removal of financial barriers is necessary, but not sufficient to ensure adequate prenatal care participation among low-income women.

An example of this approach is the 1988 Institute of Medicine (IOM) report on prenatal care which concluded that financial barriers, including inadequate or nonexistent insurance and limited personal funds, were the most important obstacles faced by women who received insufficient care.³ Other problems reported by large percentages of this group of women were transportation problems, undervaluation of prenatal care, lack of awareness of pregnancy, and institutional impediments. For women who obtained no prenatal care, financial barriers were again the most cited factor followed by low valuation of prenatal care. Three studies of adolescents' views of prenatal care revealed similar obstacles, but adolescents were more likely to mention fear, shame, ambivalence, and denial as barriers.³

Another way of obtaining information about barriers to care is through focus groups. These are small groups as-

sembled to discuss issues under the guidance of a trained leader. Focus groups are an excellent method for obtaining insights into possible problems and can generate questions for large-scale, hypothesis-testing studies.

Unfortunately, these direct approaches may not elicit a complete list of the barriers to care. Respondents may be unwilling to mention the most important barriers, the list offered may not include the most important barriers, or respondents may consider only a limited range of possibilities.

Indirect Measurement of Nonfinancial Barriers

In addition to asking directly about barriers, researchers can measure barriers indirectly by making inferences based on observation of behavior. One indirect approach is to compare the characteristics of those who use a service with the characteristics of those who do not, or to compare the characteristics of those who use a service more or less adequately, and deduce that the differences between the groups represent barriers. For example, if pregnant women in a county with a practicing obstetrician are more likely to receive prenatal care early than women in counties without one, then the absence of a practicing obstetrician is presumed to be a barrier to prenatal care. A similar method is to examine utilization of services before and after changes in financial or nonfinancial policies. If not done carefully, such intergroup comparison may rely on invalid assumptions, for example, that the users and nonusers are similar in respect to all other relevant variables or that no other important factors have changed.

Institutional studies are another indirect method used to measure nonfinancial barriers to the access of health care. These studies include examination of the geographic distribution of providers to determine the availability of health care services in specific geographic areas. There are also surveys of provider practices and/or policies. Studies that actually observe institutional practices and procedures or the activities of individual practitioners can reveal areas in an institution that create nonfinancial barriers to care. But to use the findings of these institutional studies, it may be necessary to make several assumptions about the relationship between what is observed and the care-seeking behavior of potential patients.



Examples of studies that questioned providers to assess barriers to medical care include the 1987 survey by the American College of Obstetricians and Gynecologists (ACOG). ACOG asked its members to rank 11 possible reasons that might prevent women in their communities from receiving adequate prenatal care. The reasons listed as most important by over a third of the respondents were: pregnant women cannot pay for prenatal care (no insurance or Medicaid); pregnant women do not think prenatal care is necessary; and pregnant women have difficulties with transportation.¹ In contrast, in the early 1980s, local physicians in one New Mexico county informally suggested that lack of motivation or education, rather than financial problems, were the barriers to care in their community. When women who received little or no care were surveyed, they mentioned financial barriers most often. Actual changes in provider policies, development of prenatal clinics, and supplementary funding improved prenatal care use.² The New Mexico experience highlights the importance of addressing access problems from the perspective of the patients as well as from the perspective of the providers.

A Description of Non/financial Barriers

Four types of nonfinancial barriers to medical care for children and for women with reproductive needs will be reviewed:

legal, geographic, institutional, and personal. Some of these barriers are probably more important than others; and some, although formidable, may be overcome by those with sufficient financial, educational, or psychological resources.

Legal Restrictions

Many federal and state laws and regulations create barriers to medical care. Perhaps the most publicized are the legal restrictions related to abortion. Although abortion remains legal under the Supreme Court's *Roe v. Wade* decision, the *Rust v. Sullivan* decision prohibits clinicians in federally financed facilities from discussing the abortion option. Failure to discuss this option can create an obstacle to care. Similar obstacles are created by state laws requiring parental consent or a judicial bypass before a minor can secure an abortion.⁶ States also make obtaining abortions more difficult by imposing waiting periods and requiring counseling sessions.

Some laws may deter women from seeking prenatal care. Examples are laws that require substance-abusing pregnant women to be reported to child protective agencies or that pressure unmarried women to reveal the identity of their infants' fathers to meet child support enforcement guidelines.⁷ Fear of deportation may cause undocumented aliens to forgo their own care or that of their children. Regulations requiring frequent recertification for programs such as

Medicaid and the Special Supplemental Food Program for Women, Infants, and Children (WIC) impose impediments to obtaining these benefits.

Geographic Problems

Geographic barriers include those that are caused by inadequate numbers of providers relative to the population in a specific area and those that result from large distances between patients and providers in rural or nonmetropolitan areas. In addition, certain residential situations, such as homelessness, might be considered to create geographic barriers.

Provider Shortages

Despite the absolute numbers of obstetricians, pediatricians, and family/general practitioners in this country, many children and pregnant women are faced with a shortage of providers in the areas in which they live because these health care providers are not distributed evenly in relation to the population needing their services. This maldistribution is characterized by a high concentration of physicians in metropolitan counties and a scarcity or absence of practitioners in many rural areas. In addition, within metropolitan areas, providers in private practice tend to concentrate in higher-income neighborhoods. This may impose a travel burden on substantial populations of women and children in rural areas and in poorer neighborhoods. (See the article by Perloff in this journal issue.)

Nonmetropolitan Areas

In 1990, approximately 23% of the population, or 56 million people, lived in nonmetropolitan counties. In these areas, specialty care such as high-risk obstetrics and care for the handicapped child may require traveling long distances. Moreover, specialists may not be accessible by public transportation, so that automobile ownership or the ability to borrow a vehicle is essential. While those who live in cities may also find inadequate public transportation a barrier, travel-related problems are most frequently associated with rural areas. According to federal surveys, children in nonmetropolitan areas are less likely to see a physician, and pregnant women in such areas are less likely to initiate care in the first trimester than those in metropolitan areas.^{8,9}

Between 1980 and 1988, 200 rural hospitals closed, a higher rate of closure than among nonrural hospitals. The closing of

rural hospitals and of obstetric units within rural hospitals may have had an adverse effect not only on access, but also on pregnancy outcomes. For example, one study found that women who lived in communities with relatively few obstetric providers in relation to the number of births were less likely to deliver in a local community hospital than were those who

Children in nonmetropolitan areas are less likely to see a physician, and pregnant women in such areas are less likely to initiate care in the first trimester than those in metropolitan areas.

lived in communities with a higher ratio. In addition, women from "high-outflow" communities had a higher proportion of complicated and premature births and remained in the hospital longer.¹⁰ Some analysts, however, believe that rural hospital closings do not invariably affect access because other hospitals are within easy traveling distance,¹¹ and women's use of the closed units may have already declined before they closed.¹²

In recent years there has been a marked reduction in the number of family planning clinics and abortion providers in nonmetropolitan areas. In 1988, 93% of nonmetropolitan counties had no abortion provider.¹³ The Alan Guttmacher Institute also estimated that in 1988, 27% of nonhospital abortion patients traveled at least 50 miles from their homes to reach a clinic; 18%, 50 to 100 miles; and 9%, more than 100 miles.¹⁴

It is difficult to attribute the higher rates of mortality and morbidity among rural as compared to urban children in areas such as postneonatal mortality, injuries, and acute conditions entirely to geographic barriers and the related delays in securing medical care quickly. Rural areas also suffer from higher rates of poverty and lower percentages of families with health insurance. Rural states have more restrictive Aid to Families with Dependent Children (AFDC) programs and are less likely to adopt Medicaid eligibility and service options.¹⁵

Homeless Families

Few pregnant women or families with children are literally without housing. Homelessness for this group usually is defined as no permanent home and means living in a welfare hotel, in a shelter, or doubled up with another family. The number of children who are homeless on any given night is estimated to be between 60,000 and 500,000.¹⁶ Studies have found that homeless pregnant women receive less prenatal care than other poor women.¹⁷ Similarly, homeless children have lower rates of immunization and increased rates of hospital admission, both suggesting problems with obtaining primary health care.¹⁸ Homeless families are also less likely to receive benefits under the WIC program.¹⁹

Being without a permanent home is associated with several specific access barriers. Welfare hotels and shelters are often not located in residential neighborhoods and frequently are in areas characterized by violence and drugs. Fear may make parents and children reluctant to leave their apartments or shelters even to seek medical care. The depression and despair characteristic of homeless families compounds these problems. Also, homeless families may have been relocated from the areas in which they normally sought medical care and have little information about sources of care in their new areas.

Runaway Children

Adolescents who have run away from home or been "thrown out" often develop medical problems including abuse of alcohol and drugs, sexually transmitted diseases, pregnancy, and malnutrition.²⁰ Yet they are unlikely to seek care from traditional medical care providers. In addition to not having funds to pay for care, they are often fearful of being returned to their homes and reluctant to interact with clinicians who may be unsympathetic with their lifestyles. They may not know where to seek care even if they want it.²¹ (See the article by Perrin, Guyer, and Lawrence in this journal issue.)

Institutional Barriers

Included among institutional barriers are the policies, practices, and attitudes of institutions, such as hospitals and health centers, as well as those of clinicians in traditional private practice or in managed care organizations. Unfortunately, the importance of these "softer" barriers is often overlooked. Policymakers must be careful not to confuse institutional with personal

barriers. Some providers complain that women *do not seek* prenatal care, when the reality is that they *are unable to obtain* it. Such providers are "blaming the victim" when the culprit may be the institution itself or some other factor which the providers may control but not recognize.

Provider Policies

Explicit provider policies may create obstacles to the receipt of care. Many such policies are based on the financial status of the patient, such as refusal to accept Medicaid or to use a sliding fee schedule. But the policies of health maintenance organizations (HMOs), preferred provider organizations, and other programs of managed care can reduce access to care despite the absence of financial disincentives. Studies have found that these programs may limit or even deny pediatricians' referrals to subspecialists or inpatient care;²² that in comparison to indemnity insurance plans, they may cover, without deductibles and co-payments, fewer services needed by children with chronic illnesses, such as prescriptions, durable medical equipment, and mental health services;²³ and that they may ignore the benefits to which enrolled Medicaid children are entitled, especially the Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) program.²⁴ Women who have an established relationship with a family planning clinic, perhaps with a family planning nurse within the clinic, when switched to an HMO may be told to seek this type of help from a busy obstetrician. An adolescent may feel more comfortable at a school-based clinic but, if enrolled in a



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managed care program, may not be covered for school-based care. These barriers may result in receipt of substandard care, in delays in obtaining needed medical care, or in no care at all.

Provider policies affect adolescents particularly. Teenagers may not use a provider who will treat them only after informing their parents. State laws usually allow the treatment of sexually transmitted diseases and prenatal care without parental consent, but provider policies about the prescription of contraceptives vary even in the absence of state laws.²⁵

Provider Practices

Many provider barriers, however, are not based on explicit policies. Instead, they are the result of patterns of practice that have been adopted over the years, frequently with little attention to the impact they have on access. Providers seldom recognize how difficult it may be for patients or their parents even to make an appointment. Telephone numbers are often not listed in the words the prospective patient or parent might expect. Under what category should a mother look for health care for her child: pediatrics, primary care, well-child conferences? And under what category should a pregnant woman look for care: prenatal care, maternity, obstetrics, women's clinic? When the correct number is located, the provider may have insufficient phone lines or staff to answer incoming calls. Patients and parents report hearing a continual busy signal or having phones ring for several minutes before being answered. Even if the phone is answered promptly, the caller may be put on hold while a desk clerk takes care of more pressing business. For the individual calling from home, these may be minor annoyances, but they may be major barriers for someone trying to make a private call from work or using a public phone.

A long delay between making an appointment and being seen may discourage care-seeking behavior. Such delays in obtaining care may cause health problems, as for example when teenagers need family planning advice or pregnant women need prenatal care. A long wait at the time of the appointment may make women who must take time from work or who are accompanied by small children less likely to return for care.

The "inappropriate" use of emergency rooms (ERs) is often due to the restricted hours and lack of back-up telephone and

referral systems at community clinics. From the patient's or parents' perspective, ER use may be logical. At many sites it is available 24 hours a day and 7 days a week, the clinicians are well trained, all necessary diagnostic and therapeutic equipment is immediately available, and Medicaid will often pay for transportation costs.²⁶ Medical care experts, however, know the disadvantages of ER use for routine care: lack of continuity of care, neglect of preventive measures, high cost to the institution and to the payer, and possible conflict with true emergencies. Many experts fault the patient or the parent for inappropriate ER

A long delay between making an appointment and being seen may discourage care-seeking behavior.

use, but the real culprit may be the system of primary care. Patients and parents will tend to limit their use of primary care providers as long as little or no attempt is made to explain the disadvantages of the ER and the advantages of having a regular source of primary care and consulting it before using the ER. One study found that children enrolled in a primary care center received a smaller percentage of their health care in an ER than those without a regular source of care.²⁷

The lack of important, nonmedical services also may discourage utilization, while their presence may improve access. Such services include on-site child care, bilingual staff, and assistance with transportation.³

Provider Attitudes

The attitudes of clinicians and their staffs, technicians, receptionists, and others may have a profound effect on willingness to seek care. Negative attitudes toward individual patients or groups of patients defined by condition, race/ethnicity, or economic status can be detected not only in verbal statements but also in the way patients and parents are treated. Clinicians who believe that teenage pregnancy or pregnancy among the unmarried is morally wrong may convey these judgmental attitudes by word and deed. Disrespect for economically deprived patients or for those from racial or ethnic minority groups can be shown by calling them by

their first names without asking if that is their preference or by keeping them waiting for long periods. Leaving inadequate time to answer patients' or parents' questions and a general hurried and hassled atmosphere also convey negative provider attitudes.

Personal Barriers

Personal barriers include factors related to age and race or ethnicity, lack of sufficient correct information, and psychological problems.

Age-related Factors

Infants and children—whether in parental homes, foster care, or institutions—are dependent upon adults for medical care. School clinics are probably the only places where young children can initiate their own care.

While adolescents are capable of initiating care, they are often prevented from taking such action by legal restrictions and transportation difficulties. The problems caused by these factors may be compounded by fear of parental discovery of sexual activity, pregnancy, or sexually transmitted diseases. When the federal government promulgated regulations requiring family planning clinics that received federal funds to inform parents that their children had requested contraceptives, advocates were able to have the rule overturned by citing studies showing that a large proportion of female adolescents would not seek family planning advice if this rule were put into effect. Fear of discovery by parents remains a significant reason why adolescent females postpone obtaining contraceptives.²⁸

An additional problem faced by adolescents is their in-between status. Few feel comfortable in the offices of internists, yet many pediatricians' offices are equally unsuitable because most patients are infants or young children. One survey of suburban general pediatricians found that many were ambivalent about treating adolescents and cited problems with payment, time, lack of knowledge about adolescent health, and adolescents' perception of them as "baby doctors" as reasons for their ambivalence. Few provided anticipatory guidance about sexuality; questioned adolescents about depression, incest, or child abuse; or had the equipment necessary for a gynecological examination.²⁹

Children in Foster Care

In 1989 an estimated 360,000 children were served by state foster care programs.³⁰ Almost all children in foster care are eligible for Medicaid. Yet several studies of foster children have shown that their health status is poor and that their health care is fragmented and inadequate.³¹ Foster children face several barriers to health care in addition to the usual problems with Medicaid coverage. Many were in poor health when they were placed, for example, infants of substance-abusing mothers or physically abused or neglected children. Foster parents may not be informed about the child's right to medical care, may be uninformed about the health care needs of the child in their care, or may be too busy to secure needed health care. Also, children who move frequently from one foster care placement to another usually experience fragmented medical care at best.

Female adolescents in foster care face special problems in obtaining family planning services. Most states do not offer training in adolescent sexuality to foster



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parents or caseworkers.³² Agencies that arrange foster care placements may, for religious or other reasons, not provide information about access to birth control and abortion services.³³ One study found that among 13- to 18-year-old sexually experienced adolescents in the child welfare system, a smaller proportion in foster care than in their own homes had used a contraceptive during their most recent intercourse or had obtained contraceptives from a family planning clinic.³⁴

Juveniles in Custody

A 1987 census found 91,646 juveniles in public and private juvenile detention, correctional, and shelter facilities.³⁵ Because they usually have been placed there by court order, the state is responsible for their care. Family finances or motivational issues cannot explain why many of these children receive inadequate medical care, but several studies have shown that they do.³⁶

Racial and Ethnic Barriers

A variety of health statistics indicate that women and children in certain minority groups—including African-Americans, Hispanics, and American Indians—have more frequent and more severe health problems than the white majority or other minority groups. Some of these differences in health status are due to the larger percentage of these families who have inadequate financial resources and some are due to limited access to care caused by the reluctance of many clinicians to settle in low-income areas. Prejudices against members of minority groups may also contribute.³⁷

Lack of Sufficient and Appropriate Information

Another personal barrier is inadequate information about the need for care. This lack of information may be the result of an inability to speak or read English, functional illiteracy, marginal mental retardation, and not being reached by health education programs. Hispanics have found their access to Medicaid blocked by forms that have not been translated into Spanish³⁸ or the absence of staff to assist Spanish-speaking clients.³⁹ Other non-English-speaking groups, such as recent Asian immigrants, also face this barrier.

Patients with strong ties to other cultures—including some American Indians, Hispanics, and recent Asian immigrants—may find the American medical care system alien to them. This may be a particular problem with regard to preventive care, that is, care unrelated to an episode of illness or an injury. Those from different cultures may not realize the importance of early prenatal care or of the full immunization schedule. They may feel that a pregnant woman need not be seen until after "quickenings" or that infants are fully immunized after the initial shots in the first year of life. They may prefer to use the types of healers typical of their culture. Women may be unwilling to seek reproductive health services from male clinicians.³

Psychological Problems

Although most barriers to care are probably beyond the control of the patient or the parent, patients and their families may contribute directly to inadequate or inappropriate use of health services. The current epidemic of drug use appears to have increased the number of pregnant women who are receiving inadequate prenatal care and the number of young children who are not receiving primary health care, including immunizations. The time required to obtain the drugs, diminished control while under the influence of drugs, and fear of discovery may cause a delay in seeking care or an inadequate number of visits for the women and their young children.⁴⁰

Other psychological barriers include lack of motivation or competition with other activities that appear more important, depression, and fear of medical procedures such as pelvic examinations and shots. One study of prenatal care found that "feeling depressed and not up to going for care" and "needing time and

energy to deal with other problems" were common reasons for seeking prenatal care late or not at all, as was being a substance abuser or holding negative attitudes toward prenatal care.⁴¹ Personal and family problems, depression and not feeling well, unhappiness with the pregnancy, and negative feelings about seeing doctors were associated with poorer prenatal care in another study.²

Combinations of Barriers

Certain population groups and certain services illustrate how these nonfinancial barriers may combine to create significant health problems.

American Indian Families

Health status indicators suggest that the health of American Indian women and children is worse than that of other Americans. The women generally have less adequate prenatal care,^{42,43} and the adolescents use fewer preventive health services.⁴⁴ Health problems and underutilization of health services are probably attributable to many factors including poverty, racism, long travel times to medical care facilities in some of the areas in which American Indians live, inadequate information about the need for medical care, reliance on native healers, and abuse of certain substances, especially alcohol.

Migrant Families

Women and children in migrant worker families also have higher rates of health problems and face significant obstacles to care.⁴⁵ These obstacles include financial barriers (their Medicaid status varies from state to state, and their incomes are usually too low to purchase care out-of-pocket), discrimination, a work schedule that precludes seeking care during the day or on weekdays, lack of familiarity with the medical care facilities in the different communities through which they travel, occasional language problems, and in some areas long distances to facilities and an absence of public transportation.

Immunization

Recent outbreaks of measles and other vaccine-preventable diseases among preschool children have drawn attention to the inability of the American health care system to immunize many young children. (See the Perrin, Guyer, and Lawrence article in this journal issue.) The National Vaccine Advisory Committee has listed four key barriers to immunization:

- missed opportunities for administering vaccines—a child is not immunized during a health care visit because of inappropriate contraindications, failure to assess immunization status, or other provider-related reasons;

- shortfalls in the delivery system—immunizations being available by appointment only, requiring a physical examination prior to immunization, need for a physician referral, inconvenient clinic hours, inappropriate health educational materials, and inefficient immunization record-keeping systems;

- inadequate access to care—absence of routine health care visits; and

- inadequate public awareness and lack of demand for immunizations.⁴⁶

Recent outbreaks of measles and other vaccine-preventable diseases among preschool children have drawn attention to the inability of the American health care system to immunize many young children.

While most children receive initial dosages of vaccine during their first year of life, returning for booster shots or for those vaccines started later is less routine. This pattern suggests a lack of understanding of the need for a full series of shots to protect the child and the absence of a follow-up system to bring into care children who miss shots. Such systems are routine in many western European countries.⁴⁷

Reducing the Barriers

Reducing the nonfinancial barriers to medical care for children and women with reproductive health needs will be difficult, particularly when federal and state interest in health care is focused on health insurance. Nevertheless, it is incumbent on health services researchers, policy analysts, planners, advocates, and clinicians to realize that a broader spectrum of problems must be addressed. A recent publication noted, "This is not to say that financing options are wrong or unimportant, but rather that the basic approach needs to go beyond just giving people an insurance or Medicaid card."⁴⁸

Ways to Reduce Barriers

Research and clinical experience suggest many ways to reduce barriers to the receipt of medical care. (Many of the ideas that follow are described in greater detail in the publications of advocacy and other groups.⁴⁹⁾

Modify Laws and Regulations

Lawmakers should be helped to understand the effect of laws and regulations on patient behavior. For example, rules that seek to reduce fraud and abuse by increasing the frequency with which forms must be completed and the number of items needed on the forms often make obtaining care more difficult and time-consuming. A balance should be struck between the costs of some abuse and the costs of care avoided or delayed. Laws that appear to be promulgated with the intent of reducing access, such as some of the family-planning-related ones, also need to be rethought in terms of the cost-benefit balance.

Reduce Geographic Problems

Geographic problems can be reduced by encouraging clinicians to locate in underserved areas and by establishing clinics in such areas. The federal government attempts to overcome manpower shortages by funding the National Health Service Corps, as well as community and migrant health centers and special programs for the homeless. Sometimes, however, an isolated area may not have enough individu-

Offering several services in one place at one time (co-location) can also reduce travel-related barriers.

als to support a clinician in private practice or a clinic. In these instances, traveling teams of primary care clinicians or specialists, sometimes with specially equipped mobile vans, may reduce obstacles. When the absence of public transportation is the main barrier, agency vans or taxi vouchers may be the answer. Vans are also being used to provide health care to families in welfare hotels in New York City.⁵⁰

Publicly supported medical care programs should determine whether all services are best provided in a centralized site.

Women and children in need of routine care might be seen at storefront facilities that have minimum equipment or even be cared for in their homes by nurses. The centralized and better-equipped facilities could be reserved for those in need of specialists or laboratory and other services.

Offering several services in one place at one time (co-location) can also reduce travel-related barriers. Studies have shown that having WIC programs available where women obtain prenatal care or pediatric care increases the use of those services. Outposting welfare workers to the facilities where women are seeking prenatal or pediatric care reduces the number of trips and the amount of time needed to obtain Medicaid certification. This one-stop shopping concept was incorporated into the 1989 amendments to the Maternal and Child Health Services Block Grant.⁵¹ (See the Hill article in this journal issue.)

Make Providers More User-friendly

Changing provider policies, practices, and attitudes is very difficult, but it can be done. First, someone or some group must become aware that patient behavior is not determined exclusively by psychological factors, but that the institution or the individual provider may also have an effect. With such an awareness may come an interest in determining what or who is making patients less eager to see the provider or to comply with clinician recommendations. A systematic review of policies and procedures may be needed. Interviews with patients or the use of anonymous questionnaires can supply additional information. Accompanying a patient, particularly a first-time patient, through a visit also may yield fresh insights. With such information available, staff meetings become a vehicle for devising new policies and procedures, and for organizing in-service training programs. Patient advocates should, however, expect strong resistance to change.

Some providers of prenatal care have gone through this process. In the early 1970s, a maternity and infant care project required all personnel on their first day of employment to register as new obstetric patients and "to go through the clinic." The clinic directors believed that this experience increased staff awareness of "what a patient's average day involves and underlines the importance of treating patients with respect and courtesy."⁵² The Department of Obstetrics and Gynecology



Courtesy of the National Commission to Prevent Infant Mortality 1992

at a state medical school, seeking ways to increase the percentage of pregnant women who initiated care early, recognized that "deteriorating attitudes" toward patients among clinic personnel was a possible problem. Members of the obstetric faculty were alerted to the problem and told to improve clinicians' attitudes and behavior, and training programs were developed for nurses.⁵³

Offer Specialized Services for Specified Populations

Certain populations cannot be expected to seek care from traditional providers in traditional settings. Runaways and street children are examples. Communities with large populations of street children should consider providing vans or other outreach services to serve them. Adolescents, particularly those in medically underserved areas, may respond well to school-based or school-affiliated clinics. In some schools with these clinics, as many as 85% of the enrolled students use the clinic each year.⁵⁴ Migrant workers need facilities that are accessible and accommodate their working conditions and lifestyles. Some states are experimenting with specialized health programs for foster children.⁵⁵

Increase Patients' Information and Change Beliefs and Attitudes

Providers have found several forms of outreach to be successful in increasing information or changing beliefs and attitudes. In many communities, women can now call hotlines to learn where they can obtain

family planning, maternity, or pediatric services. Home visitors not only convey information, but also may modify beliefs and provide the social support essential to using health care effectively.⁵⁶

Sometimes it is more effective to serve patients within the framework of their cultural beliefs than to try to change them or to ignore them.

Education in provider settings by clinicians or by their staffs is important to patients' understanding of the need to follow health care instructions, including the need for follow-up visits. While mass media campaigns may provide information and modify beliefs and attitudes, their message is more effective when integrated with directed educational efforts in the home, provider facilities, schools, and community organizations.³ Involvement of community members can contribute to the cultural sensitivity and acceptance of educational materials.⁵⁷

Sometimes it is more effective to serve patients within the framework of their cultural beliefs than to try to change them or to ignore them. If women are reluctant to be seen unclothed by men, female physicians or nurses can serve as their primary

clinicians. Clinicians can discuss cultural beliefs with native healers and, unless their practices would have adverse impacts, work with them in providing care.

Special Approaches for Adolescents

The special access problems faced by adolescents have been described in this paper and in greater detail in the Office of Technology Assessment's report on adolescent health.⁵⁸ The report recommended that Congress take steps to improve adolescents' access to appropriate health and related services through five general strategies:

- supporting the development of centers that provide comprehensive and accessible health and related services specifically for adolescents in schools and/or communities;
- improving adolescents' financial access to health services;
- improving adolescents' legal access to health services;
- increasing support for training of health care providers who work with adolescents; and
- empowering adolescents to gain access to health services.⁵⁸

The Society for Adolescent Medicine has published a position paper on access to health care for adolescents suggesting that proposals for improving access be evaluated using the following criteria: availability, visibility, quality, confidentiality, affordability, flexibility, and coordination.⁵⁹

Responsibility for Addressing Problems

The federal government has responsibility for reducing some of these barriers. It has the financial base necessary to improve provider reimbursement and increase the number of public and quasi-public providers. The broad-based mass media educational programs that would raise the level of health education in this country could be initiated by the federal bureaucracy. And changes in federal policies regarding reproductive rights will have an impact on the availability of reproductive health services.

States have a number of ways of reducing barriers. They also can improve provider reimbursement and increase the number of public and quasi-public providers. They regulate Medicaid and private health insurance within broad federal mandates, and with federal assistance,

most fund or operate family planning clinics and other public and quasi-public facilities. Thus, states can establish standards for what services will be provided, where they will be provided, and by whom. State laws regulate abortion and parental consent, again within the framework of federal laws. States operate the foster care programs and institutions for various groups of children. In several states, court orders have been needed to assure that these children receive the care to which they are entitled. Some states mandate the content of health services and/or health education within public schools.

City and county governments also can reduce obstacles. Many operate health care facilities and can modify their policies and practices. Community health education can be targeted very effectively at the local level. Local education authorities often decide what health services will be provided within the schools and what health subjects will be taught.

Professional organizations need to educate their members about the barriers that they, or the facilities in which they are employed, may impose and about their roles in helping to educate patients and potential patients. Professional organizations also can lobby for changes in federal, state, and local policies and practices. Advocacy groups should keep the need for broad-based approaches to barrier reduction before legislators, professionals, and the general public.

Conclusions

At some time almost everyone encounters one or more legal, geographic, institutional, or personal barriers to health care. However, certain populations—for example, the economically deprived, racial and ethnic minorities, those in isolated rural areas, migrants, illegal aliens, homeless families, children in foster care homes or institutions, and runaways—experience these obstacles more often. Certain services also appear to be more affected by barriers to access.

While financial barriers remain the most important obstacles to health care for children and for women with reproductive health needs, other factors play a significant role. It is unlikely that a national health insurance plan will serve all who need care optimally. Obstacles to care created by laws and regulations, the absence of easily available providers, in-

stitutional policies, practices, and the psychosocial problems of those who need care may be reduced but will remain significant. Most of these barriers can and should be addressed immediately, without waiting for a national health insurance proposal. Moreover, any national health plan should include provisions for lowering or eliminating these barriers.

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Teenage Childbearing

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This article examines a frequently discussed indicator related to the U.S. health care system for children and pregnant women: the birthrate for teenage mothers. Pregnancy among teenagers represents a particular challenge to the system. The pregnant teenager, often in many respects a child herself, requires a full complement of prenatal care services to maintain her health during pregnancy and the postpartum period. Adequate prenatal care is also important for the health of her newborn child, who will also have need for medical care following birth.

Assuring adequate medical care for adolescents, pregnant or not, may be problematic for a number of reasons, including adolescents' discomfort with traditional health care settings and inadequate resources to pay for care, parental consent requirements for some services, and physicians who are uncomfortable or unskilled in dealing with adolescent patients. (See the article by Perrin, Guyer, and Lawrence in this journal issue.) Moreover, because 80% of teenagers report that their pregnancies were unintended, the difficulties many teenagers have obtaining family planning services would appear to be a factor in many teenage pregnancies. As a consequence of the difficulty some teens have accessing health care, as well as ambivalent feelings about being pregnant, pregnant teenagers are much less likely than older women to begin prenatal care during the first trimester and to receive an adequate amount of prenatal care. (See the article by Racine, Joyce, and Grossman in this journal issue.)

In part because of inadequate prenatal care, teenage childbearing is associated with a number of undesirable outcomes for both the teenage mothers and their babies. Among the poor outcomes for the infants are increased rates of preterm birth, low birth weight, and death within the first year of life.¹ After infancy, children of teenage mothers are also more likely to have problems in school, score low on IQ tests, and have emotional problems.¹ When they become teenagers, these chil-

dren are also at increased risk of pregnancy.

Teenage mothers are themselves at increased risk of several deleterious health conditions, but these events appear in most instances to be a consequence of the economic and psychosocial factors associated with teenage pregnancy rather than of the biologic factors associated with maternal age per se.¹ Because teenage childbearing tends to interrupt the usual transitional process which prepares teenagers for the responsibilities of adulthood, the adverse economic

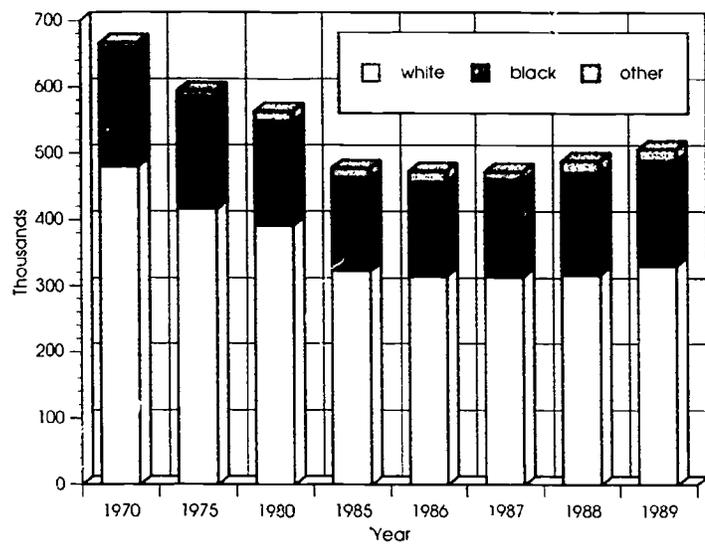
and psychosocial consequences of teenage childbearing can be significant. Women who give birth as teenagers are much less likely to finish either high school or college than women who do not. They are also more likely to be unemployed and to earn less than women who were not teenage mothers when they are working.¹

A 1987 National Research Council report estimated the annual costs for public programs for all families begun when parents were adolescents at \$16.65 billion (1985 costs).²

Figure 1. Births to 15- to 19-Year-Olds by Race of Child, U.S. 1970 to 1989

National birth statistics have been tabulated and reported by the National Center for Health Services Research (NCHS) by a number of characteristics including age, education level, and marital status of mother. Natality statistics are also tabulated by race of child, which is determined by an algorithm based on information reported for both the mother and the father. Beginning with the 1989 data, births are also being tabulated according to race of the mother; but to avoid introducing a bias into intertemporal comparisons, all statistics reported in this note are tabulated on the basis of the race of child algorithm.

Note. 1-year time span except from 1970-1985



- Births to both white and black teenagers declined between 1970 and 1985, remained steady for several years, and began to increase slowly in the late 1980s.
- One reason for the decline in births to teenagers between 1970 and 1985 was a 4% decline in the number of teenage girls between 1970 and 1985. Births rose between 1985 and 1989 despite a continuing decline in the population of teenage girls because of an upturn in the birthrate for teenagers (see figure 2).

Source: National Center for Health Statistics, see note no. 12.

This estimate includes the cost of Aid to Families with Dependent Children (AFDC), Medicaid, and food stamps for these families. It does not, however, include many other costs associated with teenage pregnancy such as the costs of increased morbidity among teenage mothers, increased morbidity and mortality among their children, and the costs of all the other services (social services, special housing and educational services, child protective services and foster care) consumed disproportionately by this group. On one level, this esti-

mate of the additional public costs associated with teenage childbearing can be viewed as a measure of the burden this activity places on the rest of society; but on another level, it is a measure of the negative impact of teenage childbearing on families begun by adolescents and evidence that these effects are sustained for many years.

Measuring Childbearing Among Teenagers

Different statistics are used to measure the level of changes in teenage childbearing.

These statistics are tabulated by age, race/ethnicity, and marital status of the mother.³ Figure 1 presents births to women under age 20 years for the period of 1970 to 1989. Births to teenage mothers declined substantially between 1970 and 1985-86 for both black and white mothers.⁴ Since the mid-1980s, however, births to teenage mothers have increased in the aggregate by almost 10%. These statistics provide a measure of the potential burden on the health care and social service systems which results from the special needs of teenage mothers and

their infants, but offer no insights into reasons for the recent increase in births to teens.

Age-specific Birthrates

The actual number of births to teenage mothers will fluctuate as the teenage population fluctuates, perhaps independently of the actual rate of teenage childbearing. Accordingly, annual age-specific birthrates (births per 1,000 women of specified age by year), an easily measured and fairly sensitive indicator of fertility among women of different ages, is a useful measure of teenage childbearing. Birthrates for women of different ages are presented in figure 2 for the period from 1970 to 1989, the latest year for which data are available.⁵ Birthrates for both white and black 15- to 19-year-olds declined substantially during the 1970s, remained essentially unchanged through the mid-1980s, and began to increase in the late 1980s. Provisional data for the state of California suggest that this rising trend continued through 1990.⁶ As can be seen in the

figure, birthrates for women 20 to 44 years of age followed a similar pattern of decline, stability, and increase during the 1970 to 1989 period. Interestingly, the birthrate for black teens was more than twice the rate for white teens during the entire period, although birthrates for older women in each racial group were similar.

Births to Unmarried Teenagers

Perhaps even more troubling than the recent upturn in the rate of birth to teenage mothers is the marked increase in the rate of birth to unmarried teenage mothers. As shown in figure 3, the birthrate for unmarried black teenagers declined from 1970 to 1983 but has since exceeded 1970 levels. Black teenagers are at higher risk of both pregnancy and out-of-wedlock births than are white teens, but between 1970 and 1989, the birthrate for unmarried white teenagers increased by 152% while the rate for unmarried black teens increased by only 10%.⁷ The increase in the rate of birth to unmarried teens is consistent with the increase in the rate of

birth to unmarried women 20 years of age and older. As a result of this increase in rates of birth for unmarried women, more than two thirds of births to teenagers were to unmarried mothers in 1989 as were 21% of births to older women.⁵ The increase in the proportion of births to unmarried women is cause for concern because out-of-wedlock childbearing is strongly associated with increased risk of low birth weight and infant mortality. (See the article by Racine, Joyce, and Grossman in this journal issue.) In addition, children in single-parent families are much more likely to live in poverty than are children in two-parent families.⁸

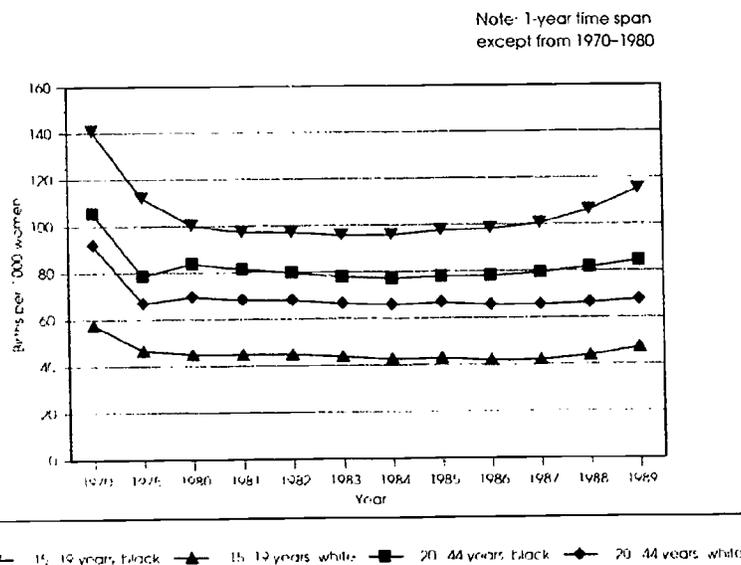
Proximal Causes

Many factors, societal and personal, influence the rate of birth to teenagers, married or not. Most proximally the rate is the result of the interaction of the level of sexual activity and the use of effective contraception among teens and their sexual partners, many of whom are males 20 years of age and older, as well as rates of

Figure 2. Birthrates by Age of Mother and Race of Child, U.S. 1970 to 1989

Annual age-specific birthrates (births per thousand women of a specified age in a given year) are an easily measured indicator of the probability of childbearing among women of different ages.

- For both teenagers and adults (20 to 44 years of age), age-specific birthrates fell in the early- to mid-1970s and tended to remain fairly constant through the mid-1980s. Birthrates apparently began to increase in the late 1980s.
- The birthrate for black teens has been more than twice the birthrate for white teens, but there was much less of a difference between birthrates for white and black women 20 to 44 years of age from 1970 through 1989.



Source: National Center for Health Statistics, see note no. 12; U.S. Bureau of the Census, see notes nos. 14-16

abortion and miscarriage and the propensity to marry either prior to or subsequent to conception. Examination of trends in these proximal factors can aid our understanding of trends in teenage childbearing. For example, data from the National Survey of Family Growth indicate that, especially during the early teen years, black teens are more likely to have had sex before any given birthday than white teens.⁹ These statistics are consistent with the higher rate of childbearing among black teenagers as compared to white teenagers. Moreover, these same data indicate that, between 1970 and 1988, the proportion of females 15 to 19 years of age who had ever had premarital sexual intercourse

increased from 29% to 52%.¹⁰ The increase in the birthrate for unmarried teens is consistent with this increase in the rate of sexual activity among teenagers and the decline in the rate of marriage among teenagers from 30.4% of the population under 20 years old in 1980 to only 18.1% in 1987.⁸

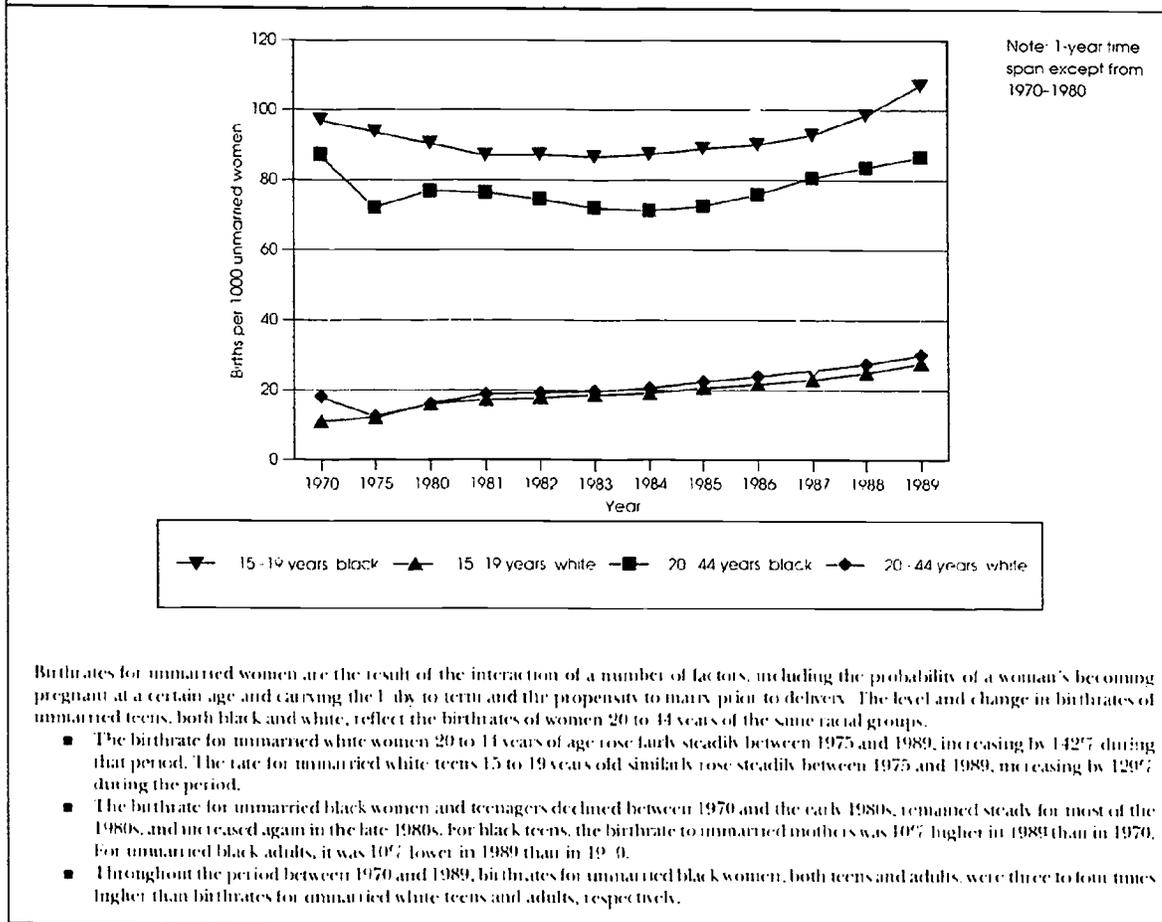
Although suggestive, the changes in these proximal factors do not by themselves explain the recent trends in teenage childbearing. For example, between 1970 and 1985, the proportion of females 15 to 19 years of age who had ever had premarital sexual intercourse increased by more than 50%, yet the teenage birthrate fell by 35%.¹⁰ Between 1985 and 1988, however, as the proportion of fe-

males 15 to 19 years of age who had ever had premarital sex continued to increase, the teenage birthrate grew by 6%. The effects on teenage childbearing of the contentious debate over abortion and recent policy changes which restrict teenage access to abortion and family planning services have yet to be fully analyzed. These events, however, do not appear, at least through 1988, to have been important factors in the upswing in the rate of teenage childbearing.¹¹

Conclusions

The evidence suggests that the rate of childbearing among teens in the United States may be increasing after a decade of stability; moreover, the actual number of births to teenage

Figure 3. Birthrates for Unmarried Women by Race of Child, U.S. 1970 to 1989



Source: National Center for Health Statistics, see note no. 13. U.S. Bureau of the Census, see notes nos. 14-28

mothers also increased in 1988 and 1989 after declining steadily for more than 2 decades. The rate of childbearing among unmarried teens is also steadily increasing. It is not surprising, therefore, that policymakers are paying more attention to teenage pregnancy. To some extent, interest in teenage pregnancy, which predates the recent upswing in birthrates, reflects concern about the substantial increase in out-of-wedlock births in this age group. It also reflects concern that recent

attempts to limit teens' access to family planning services may lead to increases in births in this vulnerable population, although available evidence does not show a decline in contraceptive use among teens.

Ultimately, those concerned with the problems posed by teenage pregnancy will need to address two facts. The first is that the rising trend in childbearing among unmarried teens seems to be mimicking a similar trend among older women and, as such, may be indicative of changes in

society as a whole which may be difficult to address through programs targeted to teenagers alone. The second is that, for many teenagers, pregnancy may be as much a symptom as a cause of both personal and societal problems. Accordingly, it may be necessary to enhance the life options of teenagers to deal effectively with this issue.

Linda Sandham Quinn and Don Hoban assisted in the preparation of this article.

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3. One statistic that is frequently cited is the percent of births to teens or the percent of births to single teens defined as births to teenage mothers (both married and unmarried or just those unmarried) as a percentage of live births to either all women or all unmarried women, respectively. (See, for example: National Center for Health Statistics. Consensus set of health status indicators for the general assessment of community health status—United States. *Morbidity and Mortality Weekly Report* (July 12, 1991) 4:27; also, *Kids count data book: State profiles of child well-being*. Washington, DC: The Center for the Study of Social Policy, 1992.) This statistic is difficult to interpret because it is dependent not only on teenage childbearing, but also on the number of births to women over 20 years of age. Since there are many more women in the over-20-year-old group, even small fluctuations in their fertility may dominate percent-births-to-teens measures and render them insensitive to actual changes in teenage childbearing.
4. Prior to 1989, natality statistics were tabulated by race of child as determined by an algorithm based on information reported for both the father and the mother. Beginning with 1989 data, births are being tabulated by race of mother. In general, this change results in more white births and fewer births to blacks and mothers of other races. In this note, we use only data tabulated on the basis of the race of child algorithms to avoid introducing a bias into the intertemporal comparisons of race-specific birthrates.
5. There were between 10,200 and 11,800 births to girls less than 15 years old in each year between 1970 and 1989. Although these births undoubtedly present major problems for many of the youngsters involved, they represent only about 2% of all births to teenagers. Because of the small numbers and special problems which may be attendant to these births, we do not discuss them in this brief article. National Center for Health Statistics (NCHS). *Advance report of final natality statistics, 1989. Monthly vital statistics report*, vol. 40 no. 8, supplement. Hyattsville, MD: Public Health Service, December 1991.
6. Personal communication from Greg Schiller, California State Department of Health Services.
7. See note no. 5 above, NCHS, 1991. Birth data for the Hispanic population first became available in 1978 and are limited to reports from those states with significant Hispanic populations. Accordingly, statistics for Hispanics are not available at the same level of detail as are statistics for other groups. Available data indicate that in 1989 about 1 in 6 births to Hispanic mothers was to a teenage mother, compared with 1 in 10 births to white mothers and 1 in 4 births to black mothers. Similarly, at 40 per 1,000 births, in 1980, the out-of-wedlock birthrate for Hispanic teens was midway between the rates for black and white teenagers in that year (NCHS, 1991).
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