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ABSTRACT To help government agency representatives and community leaders understand local population trends, particularly in rapid growth situations, this publication outlines a simple framework for analyzing population changes and provides useful criteria that can be applied when considering management and policy alternatives. It is noted that two "population communities" must be considered: the local community of long term residents and the newcomer community. The guide points out some of the ways population information can be used to make informed guesses about social and economic effects of development. Suggestions are included for guiding citizens in responsible public decisionmaking and policymaking so that changes can be systematically managed. The suggested framework for population analysis poses practical growth questions that any rapidly growing community can apply in analyzing its own circumstances. In order not to overwhelm the citizen or planner who may be collecting population information, the framework focuses on priority needs so that only the most useful information is sought. Definitions are included as well as sources of population data and four references. (BRR)
Population Change: Do You Know the Trends in Your Community?

Know Your Population

Population change is one of the most visible signs of growth. The distribution, size, and composition of the population shift, as well as the speed with which the movement occurs, has a major effect on such secondary impacts as social, cultural, political, fiscal, and environmental changes. These in turn place added demands on local government policymakers and planners.

The opening of a mine, for example, may attract workers from surrounding areas. Not only could this increase school enrollment but it could accelerate the demand for housing, public facilities, and services. Newcomers almost always press for improved services such as police and fire protection, medical care, garbage pick-up, snow removal, improved roads, larger schools. More people may generate added community income; however, these consumers may also require special services, expanded business inventories, and improved management capacities. New policies may be needed to regulate the type of growth that occurs.

Community leaders and decisionmakers can anticipate a good many of these changes and related public needs and demands through an understanding of population trends. While population information will not solve the problems of rapid growth, it can help to clarify the facts about present and future community residents. Knowing this, community leaders should find they are better prepared to meet facility and service demands before crises occur.

A small amount of population information can tell a vast amount about a community. With a mini-
Analyzing Population Growth

There are two "population communities" that must be understood: the local setting and the source of impact.¹

The local setting is the local community or long term resident population being affected by the new development. The source of impact is the new project or growth disturbance being introduced into the community—for example, an influx of newcomers who may be commuters, retirees, construction workers, or a combination of these. Until these two population communities are fully integrated, they can be viewed as having different social systems, each composed of a variety of people with varying values, expectations, concerns, and patterns of life.

Population analysis of each of these two groups should include knowledge of the population characteristics and an understanding of the changes occurring in the population over time. This information is essential for knowing what life is like for both the local setting community and the source of impact community. It is also critical for anticipating what life might be like in the future for each, given the possible stresses, unfamiliar experiences, new responsibilities, and personal adjustments that may result when the two groups come together.

The Framework for Analysis

Analysis of community population trends requires information about the structural characteristics of a population and population processes or how a population changes.¹

¹ For a thorough explanation of these and other components of the Growth Impact Assessment and Management Model see Faas and Hollen, 1979.

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**source of impact:**
- new industry
- expanded recreation
- retirement development

**economic changes**

**population changes**

changes in:
- housing demands
- tax structures
- cost of services
- public facility needs
- government regulations
- safety and protection demands
- street, sewer, and sanitation needs
- community cohesion
- individual mental health
- organizational stress
ulation changes over time. Both the characteristics and the processes are equally important to understanding population. Each has an effect on the other; therefore, they should be examined together. For example, if a young labor force including women in their childbearing years moves into a retirement community, the existing age structure of the local setting could be lowered considerably by the birth rates of the newcomers. A shift in age structure alone can have a significant effect on the need for different kinds of educational facilities, health and counseling services, and recreational programs.

Structural characteristics refer to descriptive information about population size, distribution, and composition. For example, a group of new community residents must be understood in terms of how many there are, where they will be locating, and such characteristics as age, sex, cultural background, family type, and so on.

The usefulness of knowing population characteristics cannot be overemphasized. Nationally, newcomers to nonmetropolitan areas tend to be younger and better skilled than long term residents. Newcomers to metropolitan areas seem to include an increasingly high proportion of well-educated, highly trained young adults. Newcomers representing higher socioeconomic classes bring different expectations in such areas as lifestyle, agency and business efficiency, and capital improvements (Lichter, Heaton, and Fuguit 1979).

Population processes include fertility, mortality, and migration. They are as important to population analysis as the foregoing structural characteristics. These causes of population change are both determinants and consequences of population size, distribution, and composition. For example, a particular population grows (or declines) as a result of babies being born into it, people departing through death, people moving in, or people moving out.

The balance that results between births and deaths is the natural increase. The balance that results from immigration and outmigration is net migration.

Table 1. Important elements of structural characteristics and processes of population.

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*Immigration and outmigration refer to migration within a nation. Immigration and emigration refer to migration between nations.*
Consider a community of 1,500 people that grows to
1,500 in 3 years. Although the absolute population
can is not seen as large, the figure represents a 200-per-cent growth rate. A total of 3,000
newcomers descended on a community that originally was only half that large. The growth rate for this
hypothetical community is calculated this way:

\[ \frac{4,500 - 1,500}{1,500} \times 100 \% = 200\% \text{(relative change)} \]

Also examine the size of the newcomer population. It may be difficult to predict exactly how many people may be involved, particularly if they are expected to arrive at different times. Varying numbers of people may come in planning, construction, and operational phases of a new development. Estimates of the newcomer population will not come from census materials. Sometimes they can be obtained from the developer, construction firm, or relevant government agency. It may also be helpful to ask another community that has experienced a similar type of impact. Estimates can only be approximate, given the variety of factors underlying people’s motivation to move to a particular community. One should also be sensitive to obvious overestimates or underestimates of new-resident population that may be provided by private firms with vested interests. Overbuilding facilities for populations that never materialize or failing to plan for growth and, as a result, being faced with boomtown conditions are both good reasons for caution in the use of population projections.

Knowing approximately how many people the source of impact may bring, and when they will come, can assist in planning for additions to schools, sewer and water hookups for projected housing developments, and other capital improvement items. A knowledge of how long the newcomers plan to stay may be extremely valuable in planning for permanent and temporary facilities.

Distribution refers to the geographic location or settlement patterns of the population. A look at the county planner’s map of residential sites can reveal a lot about population density. A visual study of population dispersal should provide a general sense of how housing units are clustered—for example, around a lake, down a valley, on a hillcrest, or adjacent to railroad tracks. If possible, obtain a count of housing units in designated areas to determine housing density. The local housing agency may also be able to assist in identifying “density pockets,” such as those areas where there are a lot of young adults, elderly, or ethnic group residents.

Consider what is known about population distribution in the local community, then apply it to what is known about the newcomer population. The following questions may be helpful:

- **Where are newcomers most likely to live?**
- **What effects will the newcomers’ residential location have on existing settlement patterns?**
- **How will this affect density per housing unit?** For example, will a high number of people share one housing unit or will a high number of people live alone?

Some of these answers may be difficult to anticipate; however, the information may be invaluable later. Several hundred construction-worker families could put considerable strain on existing mobile home parks and apartment complexes. The resulting overcrowding, excessive noise, and sanitation problems—all of which create adverse physical, mental, and environmental conditions.

**Composition** refers to the many personal characteristics represented in the population. A thorough understanding of the individual makeup of the long-term resident population is central to anticipating possible impacts of a newcomer population. There are great many composition characteristics that can be examined; however, it is best to limit the analysis at first. Age and sex are the two composition characteristics most frequently included. They are closely related to numbers of births and deaths, and therefore are essential to understanding population changes.

Knowing the numbers and proportions of people in certain age groups is essential for projecting the need for such things as school additions, new hospital wings, prenatal clinics, and bus services. If the present population is disproportionately elderly, a newcomer population of young families may suggest a need for teenage recreation facilities, improving the maternity ward, or a new wing on the high school. These solutions may not be practical, however, if the newcomer population is only staying for one year. If newcomers are predominantly male construction workers, this may offer income-earning opportunities for retired residents who have large houses with extra living space. The sexual imbalance created by a lot of male construction workers may also put strain on families with teenage children and on community recreation facilities.

Additional composition characteristics that might be examined in both the local setting and the incoming population are cultural groups, family types and sizes, income, education, and occupation. Restrict the analysis to the ones that will answer high-priority questions.

Problems of social integration can be anticipated and prevented by learning more about cultural groups and ethnic backgrounds of present community residents. For example, what are the absolute numbers of Blacks, Hispanics, Native Americans, or Asians compared to Caucasians? If the composition of the newcomer group upsets the usual balance, probably both groups will feel it. Plan systematic ways of easing potential disruption—for example, minority representation on advisory committees, acceptable recreational opportunities, and sources for customary food.

Are there additional political, religious, or status alliances that may be upset by newcomers who are intolerant or oblivious of such affiliations? Community solidarity may be threatened unless planners and leaders find ways to gently merge one group with the other, or to protect those cultural identities that have deep value in the same way, understanding the predominant family types or living arrangements among both long-term residents and newcomers may help to ease potential lifestyle and value differences.
Population processes

Fertility is discussed in terms of crude birth rates and age-specific birth rates. The number of children born affects, and is affected by, many dimensions of society. This factor is reflected in labor force availability, family types, housing requirements, and social service needs. It is tied not only to biology but also to ethnic and religious background, place of residence, income level, and educational attainment. This factor, therefore, must be looked at in relation to both local and incoming population structure.

Crude birth rate is one way of describing births. This measure is included in most census reports. It refers to the yearly number of live births per 1,000 population. It is a general measure of births and may be biased by the sexual balance and age structure of the population. For example, it may show an artificially low measure of fertility where there is a high proportion of men in the community and a shortage of women. Similarly, it may reflect a high birth rate if a high proportion of women in the population is high.

General fertility rate is also used in population reports to measure birth rates. Unlike the crude birth rate, it is sensitive to age and sex composition. It represents the number of births that occur in a year per 1,000 women of child-bearing age (considered to be between 15 and 44 years).

Use a measure of births to determine if there is anything unique about birth rates in your local community. Are the number of births comparable to those of the state and if not why not? Perhaps residents represent high or low proportions of one age or ethnic group. In considering the newcomer population, would you expect their birth rates to be any different than those exhibited by the local community? Birth rates are extremely difficult to predict, especially now among the young adult population. Young adults appear to be postponing their children; however, experts disagree on whether or not this will continue. Irregardless, a community should be able to make an informed guess about future numbers of children to be accommodated. Schools, day care centers, clinics, medical facilities, and social services all require advance planning.

Mortality represents another factor contributing to population growth or decline. Today, there is a tendency for people to live longer. This has obvious effects on population size, particularly if birth rates are high. Likewise, the same trend may affect population composition—in that American women have a longer life expectancy than American men. Without looking at population structure and processes interdependently, one might mistakenly conclude that a high number of deaths implies an unhealthy community, and this may not be true. This emphasizes the importance of studying several pieces of population information to obtain a true picture.

A community needs to know something about deaths among specific age groups—for example, among infants or teenage mothers. It also may be useful to look at deaths attributed to specific causes such as traffic accidents, industrial safety hazards, or seasonal deaths associated with tourism. Past trend information will provide a useful benchmark against which to measure future changes. For example, a rapid population increase may accelerate the number of accidental deaths. Likewise, if birth rates increase and prenatal care is inadequate, there may also be more infant and maternal mortality.

The crude death rate is one measure of deaths used in vital statistics reports. This is the total number of deaths occurring in 1 year per 1,000 people. As with the crude birth rate, it hides information that may be helpful to planners. Age-specific death rates would probably be more useful—for example, infant mortality. The infant mortality figure represents the number of infants dying in their first year of life for every 1,000 live births. Other age-specific death rates are the number of deaths of persons of a certain age per 1,000 persons of that age in the population.

If community data show a high rate of infant deaths or deaths in other age groups (when compared to the state figure), try to determine why the population group has not been surviving. Will continued population growth accelerate the problem? Are emergency medical care resources sufficient? Do newcomers' belief systems about health care...
The local vital records office, hospitals, or doctors may be able to supply numbers of deaths from specific causes. This is an important area to watch as a community experiences a rapid population increase. Roads may not be designed to handle increased traffic. There may be more heavy construction equipment and fewer experienced operators. Play areas for children may not be adequately planned or supervised. There may be a shortage of trained medical personnel and emergency services. The ability of a community to prevent or respond to accidents will be reflected in accidental death rate figures.

Population movement contributes to the size of a community. A population becomes larger as it experiences an influx of migrants, and smaller when its members leave to join another population elsewhere. This immigration and outmigration affects not only the population's size, but also its composition and distribution.

Uhlman and others (1975) provide an illustration of how population movement can affect birth and death rates. In two energy-impacted Wyoming communities, newcomers were not only much younger, but they also had larger households and more children at home than did long-term residents.

Leistritz and others (1978) who studied Northern Great Plains energy development sites point out the potential differences in population composition among the migrants themselves. Operating workers have a greater tendency to be younger, married, and have larger families than construction workers. Construction workers are less likely to bring their families; they commute longer distances than operating workers.

One population movement figure that may be of interest is net migration. This is the net balance between arrivals and departures, or the prevailing balance between in- and outmigration, if departures exceed arrivals. Net migration is considered to be negative. If arrivals exceed departures, then net migration is considered to be positive.

If natural increase is low, as it is in many western states today, a high growth population is the result of two things: retaining the resident population and, at the same time, attracting newcomers from outside. Outmigration must be low and immigration must be high.

While important in assessing population growth, net migration estimates provide little insight into the overall numbers of people moving in or out. Net migration gains and losses are only surface indicators of a much more significant crosscurrent of movement. Net migration only describes the net result of people's moves. It really tells you nothing about the actual numbers of people being added to the community through immigration, or the actual numbers leaving the community through outmigration. For example, a community may gain 300 people through net migration. This figure could hypothetically be the net result of the moves of 2,000 people - 1,100 people moving in and 900 people moving out. If this occurred within a short period of time, this situation could put extreme pressure on a small rural community. An added 200 people might not strain available facilities and services beyond capacity, but the change in people within the community would cause other, more specific problems.

Knowing the gross migration figure will help a community to get a more realistic picture of in- and outmigration. This is the total or aggregate number of immigrants and outmigrants—the sum of all arrivals and departures.

After studying the components of the local community's net migration figure, the following questions might be asked to provide further planning insight:
- Is net migration more affected by immigration or outmigration?
- Is net population change more affected by natural increase (births and deaths) or by actual movement of people in or out?
- Is it possible that some of the long-term residents will move out of the local community in response to new developments?

Growth-related immigration and outmigration may fluctuate in timing of arrivals and departures. This may be the case when commuters are either coming in for shopping or recreation, or when residents are going out for employment. A community should identify possible "pressure points" and attempt to plan ahead to ease strains. For example, winter recreation may be the drawing attraction bringing high numbers of seasonal immigrants. This may precipitate a need for extra facilities and services in one season only. A community experiencing seasonal population growth may have to ask itself how these extra costs can be justified on a year-round basis—or if there is a way to take advantage of them in other seasons, too.

Sources of Information

In your local community or county there are probably a number of readily available sources for population information. Census and vital statistics data that have been systematically collected and compiled will be the most easily accessible source. Normally some of these publications can be found in such places as the county courthouse, county extension office, public health office, public library, or county/district planning office.

Census data are collected by the U.S. Bureau of Census every 10 years, including information on most population structure characteristics and on population processes. Four volumes are published about each state, including statistics about towns, municipalities, counties, and metropolitan areas. Census data on small communities is still somewhat difficult to obtain. Usually, what is available is based on projections from earlier records, although some sampling is done monthly for more reliable annual estimates of population change. The Current Population Reports, the product of this
Summary

This brief overview presents a framework for analyzing population changes in a rapid growth situation. It points out some of the ways agency representatives and local leaders can use population information to make informed guesses about social and economic effects of development. Suggestions are included for guiding citizens in responsible public decision-making and policymaking so that changes can be systematically managed.

Population data is readily available in many communities at minimal cost. Sources of population data are included. In order not to overwhelm the citizen or planner who may be collecting population information, this framework focuses on priority needs so that only the most useful information is sought.

Two "population communities" must be considered: the local community of long-term residents and the newcomer community. The suggested framework for population analysis poses practical growth questions that any rapidly growing community can apply in analyzing its own circumstances.

References

This publication is part of the Coping with Growth series produced by the Western Rural Development Center. Other titles in the series include:
- Evaluating Fiscal Impact Studies: Community Guidelines
- Minimizing Public Costs of Residential Growth
- Coping with Rapid Growth: A Community Perspective
- Citizen Involvement Strategies in Community Growth Issues
- Intergovernmental Coordination and Rapid Community Growth: The Public Policy Process, Its Role in Community Growth
- Economic Multisector: Can a Rural Community Use Them?
- Income Population: Where Will the People Live?
- Growth Impacts on Public Service Expenditures: Some Questions for the Community
- What Does the Impact Statement Say About Economic Impacts?
- Assessing Fiscal Impact of Rural Growth
- Cost Benefit Analysis of Economic Development Programs
- Coping with Rapid Community Growth

Copies may be obtained from the Extension Service at cooperating institutions or from the Western Rural Development Center in Corvallis, Oregon.