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Role of Community and Technical Colleges in Producing Nursing Graduates: Rethinking the Pipeline for Guided Pathways

Introduction

Nursing education prepares future nurses at several levels and offers a number of paths. All of this is in the midst of change for how future nurses are prepared. Though it is still possible to enter the nursing profession with a Licensed Practical Nursing Certificate (LPN) or an Associate's Degree in Nursing (ADN), it is becoming increasingly necessary to get a Bachelor of Science in Nursing (BSN) in order to be assured of continued employment. To this end, the Governor-appointed a Healthcare Council that studies and makes recommendations on preparation in multiple health fields. As noted in the workforce board's 2015 Annual Report, the Institute of Medicine's report, (*The Future of Nursing: Leading Change, Advancing Health*) called for 80 percent of nurses to have a bachelor's degree by 2020. The report noted that some facilities may prefer hiring bachelor's degree nurses to achieve Magnet status, which is awarded to institutions by having a high level of nurses with bachelor's degrees or above.¹

The Associate in Applied Science-T Nursing Degree prepares students to take the National Council Licensure Examination for Registered Nurses (NCLEX-RN). This degree includes both nursing prerequisites and the nursing coursework (the Nursing Program). The Nursing Program portion is six quarters or two years after acceptance. Throughout the paper we refer to this degree program as the ADN program. Historically, Washington State's two-year colleges have played a significant role for graduating well-prepared LPN and ADN for entry-level positions as well as providing opportunities for a progression to the BSN.

A Licensed Practical Nurse (LPN) is able to recognize and meet the basic needs of the client while providing nursing care under the direction and supervision of a registered nurse or licensed physician in routine nursing situations. Certificate programs prepare students who complete the first year ADN courses and some additional coursework to take the National Council Licensure Examination for Practical Nursing (NCLEX-PN). Many colleges on their websites will identify

¹ See Health Workforce Council 2015 Annual Report, prepared on their behalf by the Workforce Education and Training Board <http://wtb.wa.gov/Documents/2015HealthWorkforceCouncilReport-Final.pdf>



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their LPN as a first rung on their nursing pathway. Some even include it as a pre-requisite for admittance into their degree program.

Another pathway, the Associate in Pre-Nursing Direct Transfer Agreement/ Major Related Program provides prerequisite coursework to prepare students to apply to a BSN university program as a transfer student where they take their nursing coursework and earn a BSN before taking the NCLEX-RN. Receiving the Pre-Nursing DTA/MPR does not guarantee admission to a competitive BSN program at the university.

Most recently, the two-year and four-year colleges and the universities agreed upon a new nursing pathway specifically intended to meet the call for more BSN level nursing graduates. The newest Associate in Nursing DTA/MPR transfers to the following institutions: Heritage University, Pacific Lutheran University, St. Martin’s University, Seattle Pacific, UW Bothell, UW Seattle, WSU, WWU, and Western Governor’s University. The degree is also intended to prepare students for licensure as a registered nurse as well as entry into a Bachelor of Science in Nursing completion degree. This degree was specifically created to reduce time to BSN completion with three years at a community/technical college and one year at a university.

Finally, in addition to the above paths, at least two community colleges have begun to offer Bachelor of Science in Nursing degrees as options for their ADN to BSN pathways. The first part of this paper describes the award history for these programs over the past five years, the students who earn these awards and their post-graduation outcomes for employment and transfer. The second part of the paper looks at another important issue that is beginning to gain colleges’ attention as they focus on increasing postsecondary attainment and completions through initiatives like Guided Pathways. Every year, nursing education attracts thousands of aspiring applicants. However, the program has limited and highly competitive acceptance. What is the attrition for aspiring students? What are the implications for these students’ college retention and completion?

Key Findings

Part 1: Findings for Program History

- Between academic years 2013 and 2016 community and technical colleges have increased graduates for their
- Pre-nursing and BSN degree programs under two-year colleges baccalaureate offerings. These increases are largely due to more colleges offering the programs.
- In 2016, 29 colleges graduated 1,695 students from their Associate of Applied Science-Transfer (ADN) program. The number of graduates is down slightly (7 percent) from five years previously.
- 16 colleges graduated 567 LPNs in 2016, which is a 39 percent decrease from five years prior.



- Keeping in mind that nursing is a female dominant field, employment for females was measured in 2015 for ADN and LPN graduates. ADN graduates earned an annualized \$57,400. Ninety percent of graduates were employed full-time. LPN earned an annualized \$40,100 with 88 percent working full-time. In comparison, female degree graduates in all other fields had annualized income for \$28,800 with 77 percent employed full-time.
- Restricting the comparison again to just females, 22 percent of Pre-nursing DTA graduates transferred to a four-year institution in the following year. This compares to 45 percent that transfer after the standard DTA.
- The relatively new BSN degrees appear to be important in particular for African American students moving from their ADN to a BSN. They are 14 percent of graduates.
- Overall, the Pre-nursing DTA/MRP program graduates are the most diverse students – 43 percent students of color. This award has the highest percentage of Asian students among graduates. Second to this is the new nursing DTA degree.
- The certificate for LPN has the most under-represented graduates – 25 percent Alaskan/Native American, Black/African American, Hispanic/Latino, Hawaiian/Pacific islander. Under-represented groups include students of color other than Asians, who typically have lower rates of post-secondary attainment reported in the census.
- ADN graduates have the fewest under-represented students – 14 percent.

Part 2: Findings for the ADN Program Pipeline

- Nursing draws women to college. One in four females enrolled for professional-technical education aspires to be a nurse. This represents 3,300 students in the two cohorts that are combined and analyzed in this report.
- Only a very small portion of students aspiring to be nurses will actually advance to the limited acceptance ADN program.
- Focusing entirely on first-time ever students the majority of whom have at most a high school education, just six percent were accepted into the program within five years after they entered college.
- A majority of students (60 percent) who come and aspire to be nurses will be gone from college within five years without a credential of any kind.
- In terms of likelihood, an aspiring nursing student is ten times more likely to leave college within their first five years with no attainment as they are to be accepted into the nursing program. This means that for every 100 students accepted into the program each year, 1,000 other students started with aspirations, but left college with no credential.
- The lost opportunity falls hardest on under-represented students who have even greater likelihood of leaving college if their initial goal to be a nurse does not work out. They are anywhere from 20 to 60 percent more likely to leave college than are Asian or white students.



Discussion of Findings

Part 1 of this paper presents the case for successful graduates from nursing programs. Colleges speak about nursing as a flagship program that prepares trained and educated nurses who go into the workforce for well-paying, middle class jobs. A brief survey of colleges' websites shows the program's success in graduating students with class graduation rates of 90 and even 100 percent. Earnings for graduates are strong, in fact so strong that they can inflate overall graduates' earnings when results are not disaggregated by program. This is particularly true for female students. These results go to students who have successfully been accepted to the program.

Part 2 of this paper reveals the double edged sword related to nursing programs and suggests how colleges work with students as they enter the pipeline could also be a bellwether in efforts to improve overall college attainment. The focus on college completion argues forcefully for open admissions colleges to go beyond access as the single-most important mission. If this is the case, student failure to complete can no longer be justified as the student's burden or that they have a right to try and fail. In the case of nursing, which is a limited acceptance program to begin with, it becomes important for colleges to think in new ways for the majority of students who aspire to enter a program than can possibly be accommodated by it (and for that matter for which there is a labor market demand).

The fact is that if all of these students met the nursing program pre-requisites with perfect 4.0 GPAs, they could still not all be accepted because of limited space. What is it that attracts all of these students to want to be nurses? To what extent could other paths meet or perhaps even better satisfy their long-term goals? These are challenging questions. The archetype of a nurse is well established. The prospects for employment and earnings are clearly demonstrated. Furthermore for females, the earnings difference with all other female-dominant fields is too large to ignore. For other programs to improve their potential earnings they may have to identify clear pathways from Associate degree to Baccalaureate. They will also have to re-examine college math and English, for earlier ways to get students college ready for this pathway to truly be accessible.

Guided Pathways proposes meta-majors for students as they enter college. If students cannot declare a program intent then a default meta-major is recommended to help them identify a goal. Nursing reveals, however, that there is also a large group of students who seemingly have a goal, but that they are also in need of clarifying their plans and weighing suitable alternatives. Those who don't are at a significant risk to drop out. Reducing this loss would be a clear demonstration of systemic change. The manner in which colleges reduce it may also be a strong indication of how far-reaching the changes they make are extending.

The analysis showed two first-year college courses that are the most prevalent for all students aspiring to nursing – general psychology and English 101. Colleges are thinking in terms of gate keeper courses and for many in planning those courses most of their attention is on the hurdles presented. In the case of nursing (and perhaps more broadly), it may be helpful to not just think

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of gatekeeper hurdles, but to also think of particular courses that can be helpful to students in self-assessing their goals and guiding them to pathway alternatives and options.

Finally, both parts one and two of this paper suggest that reviewing and re-thinking the nursing program pipeline is critical for students of color. These students are under-represented in nursing degree graduates and over-represented in the group that aspires to the program and end up simply leaving college because they have not developed a viable alternative plan. Measuring the outcomes for this group will demonstrate that effective changes have been made in this bellwether program.

Part 1. Nursing Awards for the Five Most Recent Years

Table 1 shows the most recent five-year history for nursing education awards ranging from LPN one-year certificates to RN to BSN applied degrees. Growth in awards for both the BSN and Pre-Nursing Associate degrees is due to more colleges offering the program over the five-year period. Colleges offering Pre-nursing degrees increased from 17 to 22 over the period; BSN colleges increased from one to two colleges. The drop in LPN certificates is largely due to the decrease in the number of colleges offering the award, from 20 colleges in 2011-12 to 16 colleges in 2015-16. This decline in program offerings coincides with industry trends that lessened the need for this shorter level of training and education in the workforce. The number of colleges offering the AS_T degree also decreased, but just by one college from 30 to 29, perhaps explaining some of the decrease, but not all.

Table 1: Nursing graduates by degree type

	2011-12	2012-13	2013-14	2014-15	2015-16	5 Year Change	Colleges Making Awards 2015-16
Applied Baccalaureate Degree (BSN)	27	31	28	38	44	63%	2
Associate in Pre-Nursing – DTA/MRP	308	416	455	466	490	59%	22
Associate in Nursing - DTA/MRP	0	0	0	0	24		1
Associate in Applied Science-T Nursing Degree	1,818	1,708	1,895	1,751	1,695	-7%	29
Certificate Licensed Practical Nurse	932	1,002	791	747	567	-39%	16

What are the characteristics of students receiving awards in nursing education?

Tables 2 through 5 describe the demographic characteristics of graduates for age, sex, race and ethnicity, prior level of education to start nursing, and socio-economic status.

Table 2 describes median age at graduation and sex. Nursing graduates are overwhelmingly female as this remains a female dominant field of study. The median age for graduates of the different nursing certificate or degree programs conforms to where they may be on the LPN to RN to BSN nursing path. BSN graduates who have reached the end of this pathway (assuming they go no further) are the oldest. Associate in Nursing DTA and Degree Nursing graduates are about 30 years. Licensed Practical Nurses who on average require one year less nursing education are one year younger. Pre-nursing graduates are basically just starting on the path, not yet in a nursing program. They are the youngest.

Table 2: Median age and sex of nursing graduates by degree type

	Median Age at Graduation	% Female
Applied Baccalaureate Degree	33 Yrs	91%
Associate in Pre-Nursing – DTA/MRP	24 Yrs	84%
Associate in Nursing – DTA/MRP	31 Yrs	86%
Associate in Applied Science-T Nursing Degree	30 Yrs	84%
Certificate Licensed Practical Nurse	29 Yrs	86%

Table 3 displays the race/ethnicity for graduates. Students are counted in any race they report. Hispanics of any race are counted once. The relatively new BSN degrees offered by community colleges appear to be important in particular for African American students moving from their ADN to a BSN. Overall, the Pre-nursing DTA/MRP program graduates the most diverse students – 43 percent students of color. This award has the highest percentage of Asian students among graduates. Second to this is the new nursing DTA degree. Taken together these two programs on the nursing path suggest very strong interest in pursuing a BSN degree via transfer to a four-year institution. The certificate for LPN has the most under-represented graduates – 25 percent Alaskan/Native American, Black/African American, Hispanic/Latino, Hawaiian/Pacific islander. Under-represented groups include students of color other than Asians who typically have lower rates of post-secondary attainment reported in the census. ADN graduates have the fewest under-represented students – 14 percent.

Table 3: Race and ethnicity of nursing graduates by degree type

	Alaskan/ Native American	Black/ African American	Asian	Hispanic /Latino	Hawaiian/ Pacific Is.	White
Applied Baccalaureate Degree (Reporting N=37)	0%	14%	5%	11%	0%	73%
Associate in Pre-Nursing – DTA/MRP (Reporting N=415)	2%	9%	20%	11%	2%	57%
Associate in Nursing - DTA/MRP (Reporting N=20)	5%	10%	15%	5%	0%	70%
Associate in Applied Science-T Nursing Degree (Reporting N=1557)	2%	5%	11%	7%	1%	75%
Certificate Licensed Practical Nurse (Reporting N=530)	2%	7%	11%	15%	1%	65%

Table 4 presents students’ prior level education before nursing. Other than BSN students this is as reported at time of college admission. BAS programs by definition require an Associate degree. Except for the Associate in Pre-Nursing DTA/MRP, the preponderance of graduates entered with at least some college and as many as three in ten had at least another Associate degree before nursing.

Table 4: Prior education level of nursing graduates by degree type

	Associates or Higher	Some Post HS, No Degree	HS or Equiv	Less Than HS	Running Start
Applied Baccalaureate Degree (Reporting N=37)	100%				
Associate in Pre-Nursing – DTA/MRP (Reporting N=415)	4%	29%	58%	8%	1%
Associate in Nursing - DTA/MRP (Reporting N=22)	36%	36%	27%	0%	0%
Associate in Applied Science-T Nursing Degree (Reporting N=1404)	30%	33%	33%	4%	0%
Certificate Licensed Practical Nurse (Reporting N=494)	25%	32%	38%	6%	0%

What is the employment and earnings for ADN graduates in their first year?

SBCTC matches students to employment wage records to determine post-college employment and earnings. This section determines 2015-16 employment and earnings for students who



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graduated in 2014-15. For comparison purposes we compare ADN and LPN graduates to students in all other programs who earned workforce degrees and certificates. Because nursing is a female dominant field, we have restricted the comparison group to females only.

Figure 1 describes female workforce students who graduated college in 2014-15. Only graduates are shown. One thousand three hundred and thirty (1,330) Associate Degree Nursing students graduated. They were 14 percent of all female graduates.

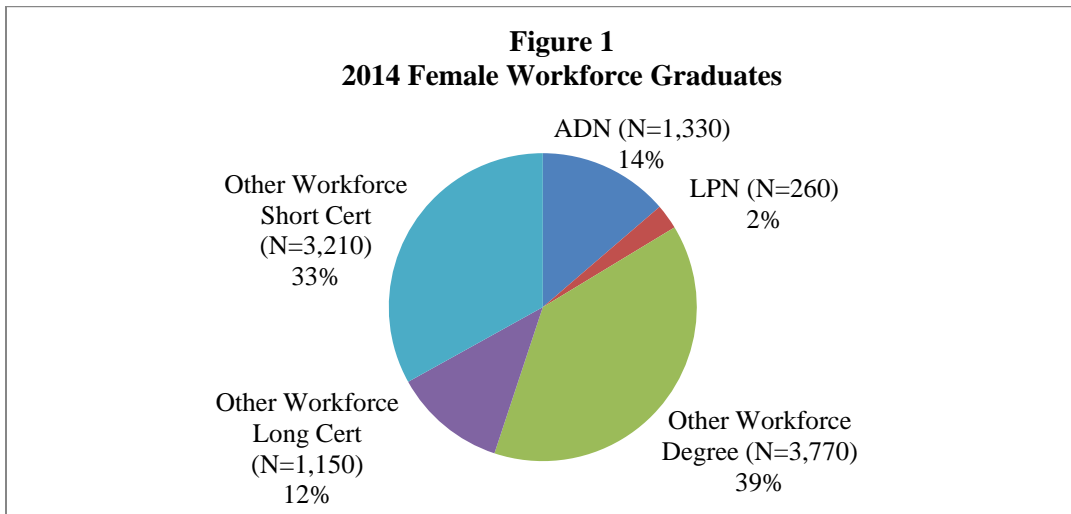
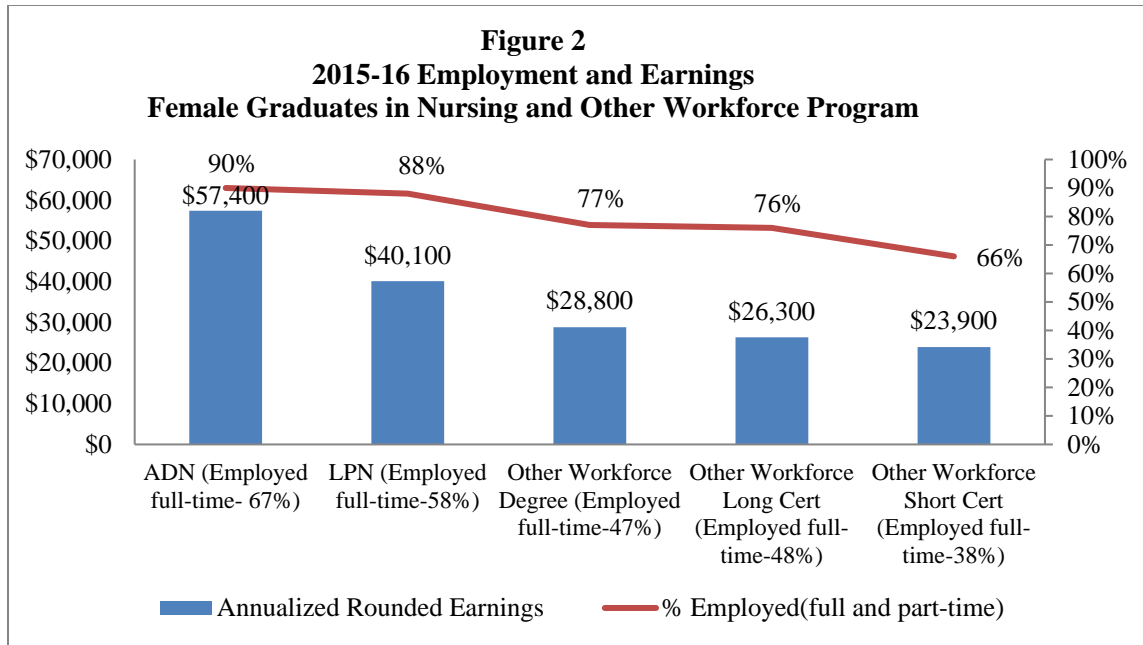


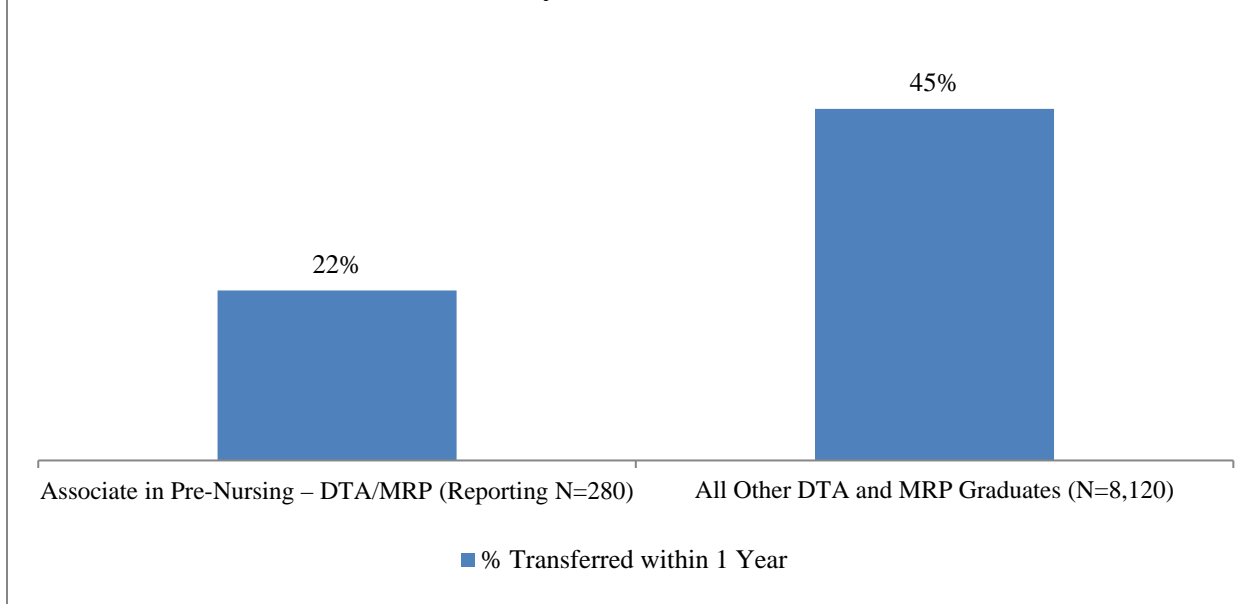
Figure 2 describes employment and earnings in 2015-16 for females who graduated from workforce programs during the prior year. The line in the chart shows the overall employment rate. Ninety percent of ADN graduates went to work the next year. Sixty-seven percent shown in the legend in (parenthesis) were employed full-time. First-year earnings for all employed was \$57,400. ADN graduates have the highest earnings and full time employment compared to all other graduates. LPN also has higher earnings and strong employment with over half at full-time. Short certificates have the lowest earnings and lowest employment rate.



What is the transfer rate for Associate in Pre-Nursing Degree graduates?

This degree was specifically designed for students to complete their pre-requisites and transfer to a 4-year institution for their professional nursing education. Figure 3 shows the transfer rate for students who earned degrees in 2014-15. Transfer is defined as enrollment in a public or private 4-year institution any time in 2015-16. The source is the National Student Clearinghouse. Comparisons are made to other transfer degree recipients – again restricting the comparison to female graduates only. Pre-nursing graduates are substantially less likely to transfer to a 4-year than are all other DTA/MRP degree graduates.

Figure 3
4-Year Transfer Rates
Pre-Nursing and All Other DTA Degrees
Female Graduates Only % Transferred within 1 Year



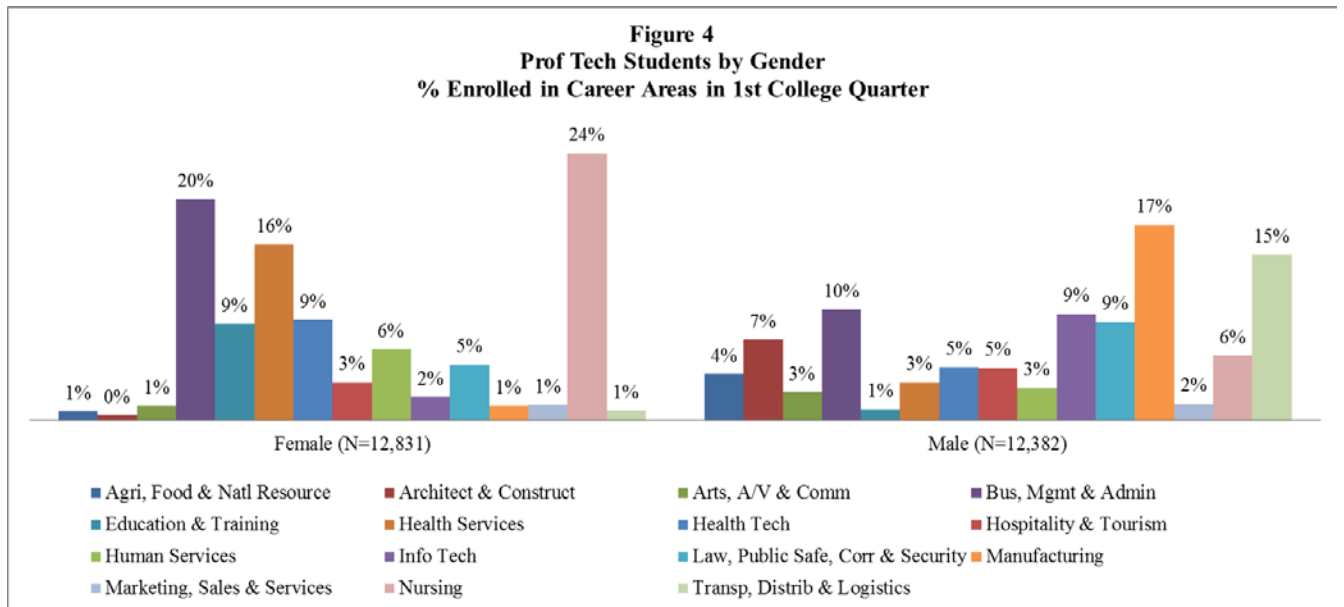
Part 2: The Student Pipeline to the ADN Degree

The ADN has been the main two-year college vehicle for preparing RN nurses for work. Recognizing that the ADN to BSN pathway is undergoing change, it still is helpful to examine the pipeline of students who come to two-year colleges to start the path, get on the path and then earn their ADN. This section describes students who started two-year college in calendar years 2011 and 2012. We follow students for up to four years afterwards or 200 percent of normal time to completion (2 years). We acknowledge that this length of time while suited to most students may truncate nursing student success because of the lengthy pre-requisites a student must take in order to enter the program. However, for pipeline purposes, this period allows us to study after four years how many students have earned their degree, another degree, are still enrolled in nursing or another program, or have left college and the college system entirely.

The nursing pipeline – Which students start with aspirations to be nurses? Who enters the program and succeeds in becoming a nurse?

Nursing is an important program for Washington, our two-year colleges and our students. Nursing is a particularly important area of interest for women. Nurses are well known in popular culture through movies, TV and other media. Most all are familiar with what a nurse does. As shown in previous sections, it provides a middle-class income and stable, full-time employment.

In this analysis we begin with 59,300 first-time ² college students. Forty-three percent of these students (25,400) are enrolled in professional-technical programs. Nursing and business administration are the two largest areas of study for all students, each attracting about 15 percent of prof-tech headcount enrollments (about 3,800 students)³. As noted above, nursing is a female-dominant field. About 80% of first time enrollments in this path were female (3,000 students). Looking at just females, nearly one in four (24 percent) enrolled with an initial interest in nursing.

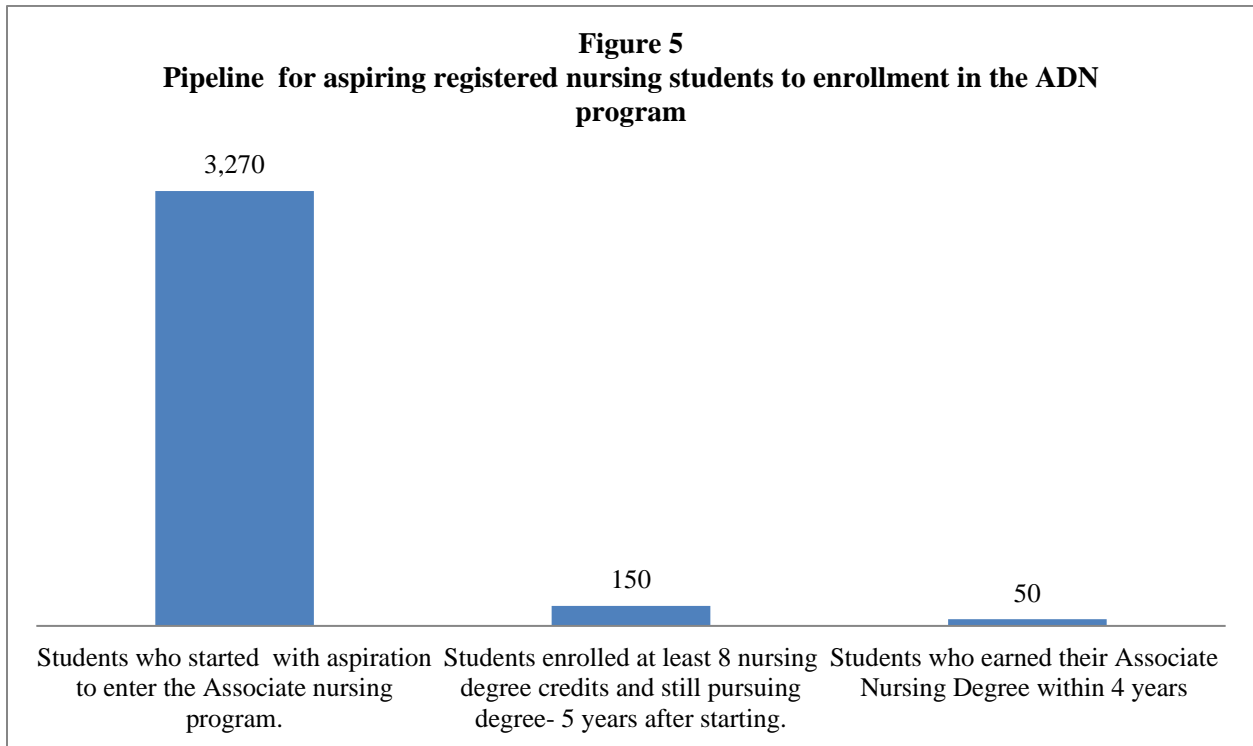


² The data source for this portion of the paper is a new database and dashboard metrics created for the state’s Guided Pathways Initiative. The metrics are aimed toward 200% of time graduation (4 years). First-time is defined as a new to the system student and prior education less than an Associate degree. We also include returning-to-college and transfer-in students with less than 10 college credits earned. International students are excluded. Students in this section started college in calendar years 2010 and 2011.

³ Only students with a known nursing or pre-nursing program CIP or program code are included in this cohort to start. We are probably excluding some students who were initially coded as transfer with a still undeclared intent.

How many aspiring nursing students are selected for the Associate Nursing Degree program?

Figure 5 describes the nursing pipeline for the limited acceptance Associate Nursing Degree program. The pipeline starts with nearly 3,300 aspiring-to-be registered nurses. (The other 500 students started with LPN goals.) We define proof of entrance into the nursing program as attempting at least eight nursing course credits within the nursing degree within four years after the student first started college. Just 150 (five percent) students were accepted to nursing four years after they started college. This grows just slightly to six percent (190 students) within five years. Fifty of those accepted were able to earn their nursing degree within four years in the time period captured for this report. Another 21 students who met our nursing program credit threshold for enrollment in the program changed goals and earned transfer degrees, including several Pre-nursing degrees. A previous analysis suggests it takes between five to six elapsed years from their start in pre-requisites for the bulk of students who are accepted to earn their nursing degree. These are the program successes for colleges.

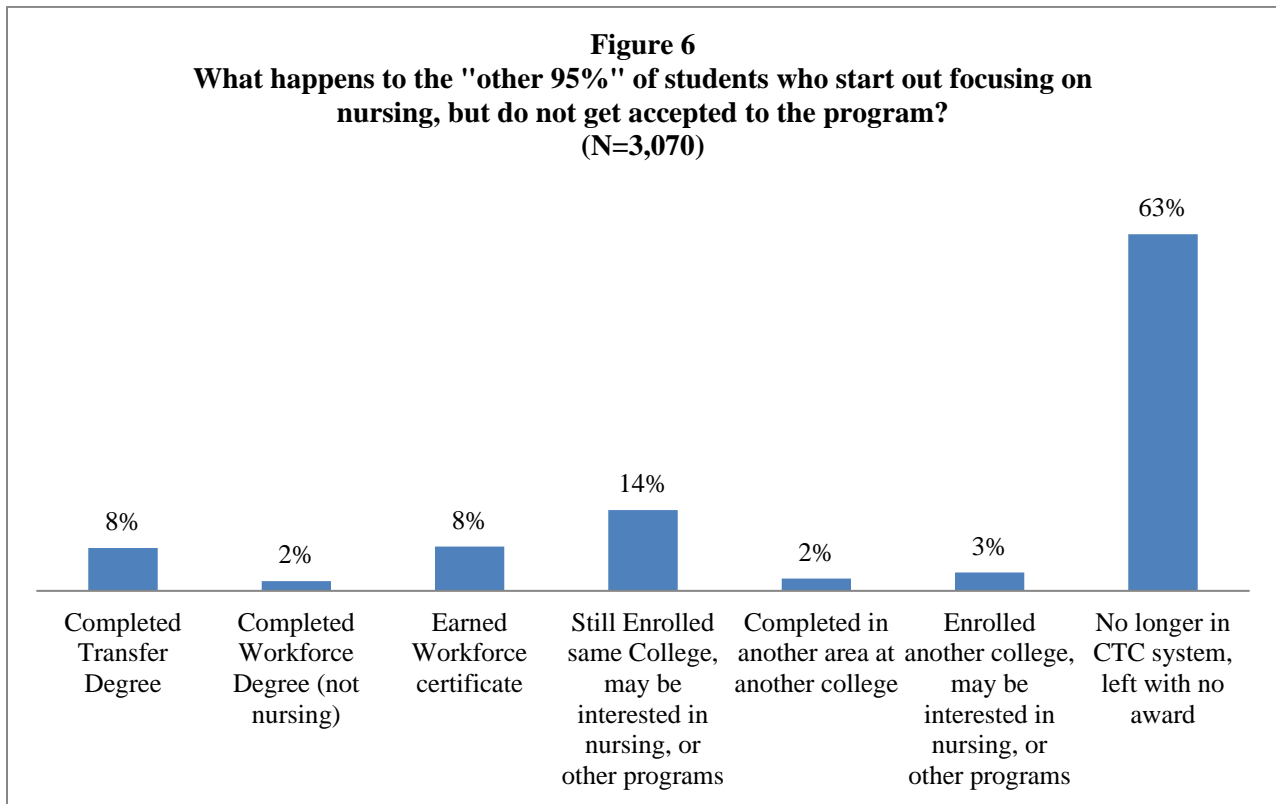


What happens to all of the students who started with an aspiration to earn a nursing degree?

Figure 6 summarizes the variety of outcomes for the 95 percent of aspiring nurses who do not get into the program. More than one third of students (N=1,130) has largely changed their plans and shifted their goals. This included 20 percent that completed another award in the same or a different college, with half (10 percent) that earned a degree for transfer or in another workforce

area. Some of these transfer students may still be interested in nursing after they transfer. Another eight percent earned a certificate; however, many of these certificates are nursing assistant that were most likely earned in hopes of presenting a stronger candidacy for acceptance into the program. Two percent earned awards at another college. Seventeen (17) percent were enrolled in their fifth elapsed year. Some may still be pursuing their nursing aspiration, albeit none of these students are enrolled in nursing.

Nearly two-thirds (63 percent) of the group (N=1,940) are simply gone from college at the end of the period.



What is the race and ethnicity of students who leave college after failing to make it into the nursing program versus those who do enroll in the program?

Figure 7 describes students reporting race and ethnicity. Students are counted for each race they report. Hispanic is of any race. Under-represented students are less likely to be successful in reaching their aspirational goal to enter nursing than are white and Asian students.

Figure 7
Race and Ethnicity of Students Accepted into ADN Program versus
Those Not Accepted, Left College and No Longer Enrolled

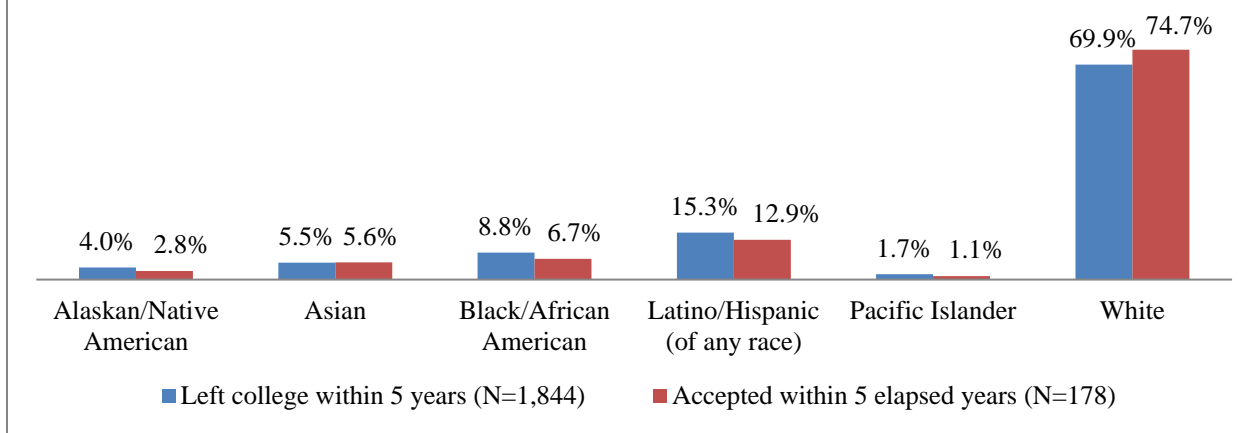


Table 5 further illustrates the challenges that arise for under-represented students expressing the likelihood they will enroll in nursing versus leaving college entirely, not having met any attainment goal. Both groups are compared to the entire group of students who started with a goal to earn an Associate Degree-Nursing for their percentage share. Likelihood is based upon a comparison of shares.

Acceptance into the program is challenging for every student. Just five percent of students get accepted within four years and six percent within five. Comparing this to starting students that left college the likelihood is 10:1 for all students. White and Asian students are both at 10:1. Likelihood of simply leaving early versus acceptance into the program is .2 to .6 times higher for under-represented students.

Table 5: Nursing program outcomes by race and ethnicity

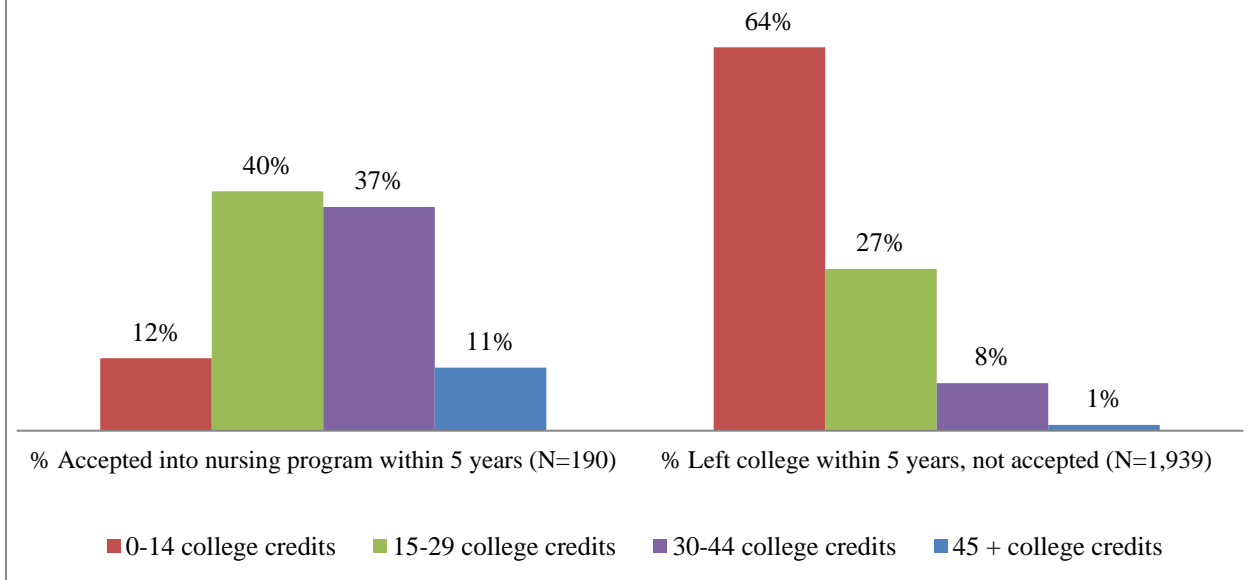
Aspiring Students	% Accepted into nursing program within 5 years	% Left college within 5 years, not accepted	Likelihood of leaving versus acceptance
Alaskan/Native American (N=107)	5%	68%	15 to 1
Asian (N=204)	5%	50%	10 to 1
Black/African American (N=255)	5%	64%	14 to 1
Latino/Hispanic of any race (N=469)	5%	60%	12 to 1
Pacific Islander (N=50)	4%	64%	16 to 1
White (N=2,141)	6%	60%	10 to 1
All students reporting race/ethnicity (N=3,083)	6%	60%	10 to 1

Milestones along the Way for Students Accepted into the Nursing Program

In order to measure early progress towards improving completions, the Washington Guided Pathways Initiative created milestones for accruing college credits and completing college math and English. Attainment of these milestones is measured for students at the end of their first and second years.

Figure 8 again compares students accepted into the nursing program with those who were not accepted and are no longer enrolled within five years. The chart shows a clear difference in earning college credit in the first year. Students who were accepted into the nursing program within five years after they started clearly accrued more college credits in their first year. In fact 11 percent completed at least one year of college work. Just 12 percent completed 0-14 college credits, less than one quarter. Conversely, nearly two-thirds (64 percent) of those who were not accepted and left college, left with less than one quarter of college credits earned. This suggests they quickly stopped attending after an initial attempt to enter the nursing program.

Figure 8
Furthest College Credit Milestone Reached in 1st Year of College



Commonly attempted 1st year college courses

The nursing program requires a rigorous group of pre-requisites for biology, psychology, nutrition, chemistry and math. The two most commonly attempted pre-requisites are English 101 and psychology 100. The former is attempted by more than half of all aspiring nursing students in their first year. The latter is attempted by nearly half. A significant portion of students who were never accepted and left college also attempted these courses in their first year.

Figure 9
% of students attempting English 101 and Psychology 100 in their 1st year

