Some remarkable changes in the nursing workforce have occurred over the past few decades. The number of registered nurses (RN) in the workforce has grown by more than 50 percent since 2001, with more than 3.1 million RNs working across the United States in 2015 (Buerhaus, Skinner, Auerbach, & Staiger, 2017a). Across the United States, more RNs are baccalaureate-prepared, surpassing the number of associate-prepared RNs in 2011 (Boivin, 2017), and the number of RNs receiving graduate degrees has almost doubled (Buerhaus et al., 2017a).

Similar changes are happening in Oregon. Since 2010, the number of practicing RNs has increased more than two percent each year. The number of advanced practice registered nurses (APRNs) practicing in Oregon has grown by about six percent each year (Oregon Center for Nursing [OCN], 2019). Additionally, the proportion of baccalaureate-prepared nurses increased from 46 percent in 2012 to more than 51 percent in 2018.

Despite many positive developments within the nursing workforce, researchers warn of challenges which could lead to a nursing shortage, and potentially to a reduction in access to care. Buerhaus, Skinner, Auerbach, and Staiger (2017b) argue the aging population, predicted physician shortages, aging and retirement of RNs, and uncertainty of health care reform pose serious challenges to the nursing workforce by increasing demand for RNs, while threatening the current supply.

Compounding these threats, ample literature exists regarding faculty shortages and limited availability of clinical sites, which inhibit the ability to educate enough nurses to meet this ongoing, and growing, demand. Data from OCN and the Oregon State Board of Nursing (OSBN) suggest Oregon's nursing programs face a faculty shortage. According to a recent study by OCN (2017), of the approximately 720 nurse faculty positions across the state, 472 of these positions were vacated at some point during the three-year study period. This equates to a 21 percent annual turnover rate. Nursing programs across the state are also expressing growing concerns over the impact of a nursing faculty shortage (OCN, 2017).

While there is ample evidence of a nursing faculty shortage in Oregon, there is also recent evidence suggesting this shortage is affecting the ability of Oregon's nursing programs to meet the state's current need for RNs. Data shows Oregon's nursing programs graduated 1,570 students with either an associate degree in nursing (ADN) or a bachelor's degree in nursing (BSN) in 2017 (OSBN, 2018). However, occupational employment projections by the state's employment department indicate this is insufficient to meet demand. The latest projections show that between 2017 and 2027, Oregon will need an additional 26,600 RNs over a 10-year period to fill new jobs due to growth within the industry and replace current RNs who leave their positions (Oregon Employment Department [OED], 2018). The bottom line is the state needs 2,664 new nurses each year to fill vacancies and newly created nursing positions. This indicates Oregon's nursing programs are not producing enough nursing school graduates each year to meet the state's current and projected need, and employers across Oregon must rely on nurses trained in other states.

The purpose of this study is to examine long-term trends in the nursing education pipeline in Oregon. To meet the growing demand of employers for an adequate supply of nurses, nursing programs must graduate enough nursing students to meet projected need. If this demand cannot be met by the current education system, employers will rely on recruiting nurses from other states.   Out-of-state recruitment efforts are counter to the "grow your own" strategy that many employers believe is critical to retaining nurses, especially in rural areas of the state. An examination of changes in nursing education over time is crucial to determining whether demand for nurses can be met by nursing education in Oregon. Additionally, a better understanding of education trends can point nurse leaders towards potential areas for intervention to ensure employers across the state have access to an adequate supply of qualified nursing professionals.

Practical Nursing Programs

Licensed practical nurses (LPNs) provide basic medical care to patients under the direction of registered nurses and licensed independent practitioners. Those with an interest in becoming a Licensed Practical Nurse often complete a year-long practical nursing program prior to being licensed by a state. In Oregon, practical nursing programs are usually housed within a community or technical college. In 2018, there were nine practical nursing programs operating at seven schools. The number of programs within the state has not changed markedly since 2012 (Table 1).

Table 1 | Practical Nursing Programs in Oregon

	2012	2013	2014	2015	2016	2017	2018
PN Program Sites	11	11	11	10	9	11	9
Schools	10	10	9	9	7	8	7
Faculty	101	85	77	62	51	147	113

Source: OSBN, Nursing Program Annual Report, 2012-2018

While the number of programs remained fairly constant over time, data show the number of faculty members varied greatly from one year to the next. However, close examination of original school reports suggests this may be a reporting issue, and these figures likely do not accurately represent the number of faculty teaching in Oregon's practical nursing programs.

Table 2 | Student Enrollment in Practical Nursing Programs

	2012	2013	2014	2015	2016	2017	2018
Enrolled	540	515	442	451	501	548	510
Admitted	569	534	548	453	538	531	528
Graduates	534	425	411	367	329	352	400
Applications Received	854	740	791	709	749	865	768
Acceptance Rate	67%	72%	69%	64%	72%	61%	69%
Budgeted Seats	660	614	576	539	568	545	562

Source: OSBN, Nursing Program Annual Report, 2012-2018

Oregon's practical nursing programs received about 780 applications per year and about 70 percent of applicants were admitted (Table 2). About 500 PN students enrolled in programs yearly. Approximately 400 students graduated each year. School reports showed a 20 percent decrease in the number of budgeted seats between 2012 and 2015. Enrollment showed signs of declining early during the period of study but rebounded somewhat beginning in 2016. The large drop in enrollment seen in 2014 was due to the closing of the largest practical nursing program in the state. Similarly, the number of graduates declined markedly over time, but recently showed signs of increasing.

Table 3 | Percent of Female Students and Graduates - Practical Nursing Programs

	2012	2013	2014	2015	2016	2017	2018
Enrolled	84%	85%	68%	88%	86%	86%	83%
Graduates	84%	84%	84%	84%	88%	89%	86%

Source: OSBN, Nursing Program Annual Report, 2012-2018

While gender diversity (Table 3) among students did not differ from the composition of the licensed LPN workforce, data examining racial/ethnic makeup showed practical nursing students were more diverse than licensed LPNs (Table 4). Enrollment and graduate percentages for Hispanic and black students rose noticeably over the past six years. In 2012, Hispanic students accounted for a little more than five percent of enrolled students. This grew to almost eight percent by 2018. Similarly, Hispanics comprised about three percent of graduates in 2012, but this more than doubled by 2018. The percent of black students enrolled quadrupled and the percent of black graduates tripled over the past seven years. Other racial groups showed little change. While this result appears to suggest practical nursing programs are becoming more diverse, some of this change could be due to reporting issues and a marked decrease in the percent of the students reporting an unknown racial/ethnic identity since 2012.

Table 4 | Race/Ethnicity of Practical Nursing Students

	Enrolled		Graduates	
	2012	2018	2012	2018
Hispanic	5.5%	7.9%	3.0%	6.8%
Native American	1.0%	1.0%	2.0%	1.3%
Asian	4.2%	4.3%	3.3%	3.8%
Pacific Islander	3.0%	12.4%	4.1%	12.3%
Black	1.3%	1.2%	0.7%	0.5%
White	61.1%	56.2%	62.2%	59.0%
More Than 1 Race	0.0%	3.9%	0.0%	2.8%
Unknown	23.8%	13.2%	24.6%	13.8%

Source: OSBN, Nursing Program Annual Report, 2012 & 2018

Students enrolled and graduating from practical nursing programs tend to be in their 20s (Table 5). The age distribution of practical nursing program graduates continued this trend as 50 percent of 2012 graduates and 58 percent of 2018 graduates were 30 years-of-age or younger. Very few practical nursing students and graduates were over the age of 50.

Table 5 | Age of Practical Nursing Students and Graduates

	Enrolled		Graduates	
	2012	2018	2012	2018
≤20	9.5%	2.6%	1.4%	2.1%
21-25	27.4%	32.2%	25.7%	28.6%
26-30	25.1%	24.9%	22.4%	27.6%
31-40	22.6%	26.3%	29.9%	26.3%
41-50	13.0%	11.1%	15.2%	12.0%
51-60	2.1%	2.6%	4.9%	3.4%
>60	0.2%	0.2%	0.5%	0.0%

Source: OSBN, Nursing Program Annual Report, 2012 & 2018

Associate Degree Programs

Prospective registered nurses have a choice when deciding upon their educational path to become a licensed RN in Oregon. One option is an associate degree in nursing offered at community and technical colleges throughout the state. Completion of an ADN degree, including prerequisite classes, takes about three years, and includes classes in nursing theory, nursing practice, as well as clinical instruction.

There are currently 17 ADN nursing programs in Oregon, a number that remained constant over the study period (Table 6).

Table 6 | Associate Degree Nursing Programs in Oregon

	2012	2013	2014	2015	2016	2017	2018
ADN Program Sites	16	17	17	17	17	17	17
Schools	17	17	17	17	17	17	17
Faculty	250	263	233	202	232	212	242

Source: OSBN, Nursing Program Annual Report, 2012-2018

While the number of nursing programs has not changed over time, interest in ADN programs may be declining. The number of budgeted seats decreased over time and could be indicative of shrinking capacity across ADN nursing programs in Oregon (Table 7). Despite early increases in enrollment and graduate numbers, enrollment has declined by 15 percent since 2014 and graduates dropped by 11 percent. Similarly, admissions decreased by 14 percent since 2014. The number of applications received for admittance to ADN programs has declined slightly, although there was a small increase in 2018. It is unclear if this increase is an anomaly or a step in a trend of increasing applications.

Table 7 | Student Enrollment in Associate Degree Nursing Programs

	2012	2013	2014	2015	2016	2017	2018
Enrolled	1393	1416	1454	1412	1245	1238	1230
Admitted	764	801	799	772	673	635	691
Graduates	547	591	641	613	596	583	566
Applications Received	3894	3788	3290	2738	2970	2852	3129
Acceptance Rate	20%	21%	24%	28%	23%	22%	22%
Budgeted Seats	776	818	797	778	707	628	731

Source: OSBN, Nursing Program Annual Report, 2012-2018

An examination of demographic variables of ADN nursing program students indicates ADN students were slightly more diverse than licensed RNs. In 2018, about 86 percent of licensed RNs were female. Collectively, ADN programs had a slightly higher percentage of males (Table 8).

Table 8 | Percent of Female Students and Graduates - Associate Degree Nursing Programs

	2012	2013	2014	2015	2016	2017	2018
Enrolled	80%	70%	73%	82%	83%	81%	81%
Graduates	80%	82%	79%	83%	83%	83%	81%

Source: OSBN, Nursing Program Annual Report, 2012-2018

Data also suggest the student body enrolled in ADN nursing programs are becoming more racially diverse (Table 9). When comparing race/ethnicity from 2012 and 2018, the proportion of white students and graduates declined while the proportion of Hispanic students increased. However, the increase in the unknown race category may mask small changes in race/ethnicity distribution in 2018. This is especially true when examining the racial composition of ADN program graduates because the proportion of students reporting an unknown race/ethnicity increased from seven percent in 2012 to about 20 percent in 2018.

Table 9 │ Race/Ethnicity of Associate Degree Nursing Students

	Enrolled		Graduates	
	2012	2018	2012	2018
Hispanic	3.9%	5.6%	4.0%	4.8%
Native American	1.5%	0.9%	1.4%	1.1%
Asian	3.7%	2.6%	4.2%	2.1%
Pacific Islander	1.5%	1.4%	0.7%	1.1%
Black	1.0%	0.8%	1.4%	0.7%
White	72.6%	68.3%	81.2%	67.9%
More Than 1 Race	0.0%	2.2%	0.0%	2.3%
Unknown	15.8%	18.2%	7.1%	20.0%

Source: OSBN, Nursing Program Annual Report, 2012 & 2018

The 2018 student body was slightly younger (Table 10). In 2012, about 47 percent of enrolled students were age 30 or younger, while about 53 percent were 31 years-of-age or older. In 2018, 56 percent were age 30 or younger and 44 percent were 31 or older. This same pattern emerges when examining the age distribution of ADN graduates. It is encouraging to see a younger student body enrolled in and graduating from ADN programs as it increases the number of younger RNs entering the workforce. It is possible the older cohort observed in 2012 was due to effects of the economic downturn of 2007-2008, as more older students enrolled in nursing schools.

Table 10 │ Age of Associate Degree Nursing Students and Graduates

	Enrolled		Graduates	
	2012	2018	2012	2018
≤20	3.3%	2.5%	1.7%	2.7%
21-25	19.5%	25.0%	20.2%	22.5%
26-30	24.6%	28.2%	25.2%	28.7%
31-40	34.6%	33.4%	34.0%	35.1%
41-50	15.0%	9.3%	14.5%	10.1%
51-60	2.9%	1.6%	4.4%	0.8%
>60	0.2%	0.0%	0.0%	0.0%

Source: OSBN, Nursing Program Annual Report, 2012 & 2018

Bachelor's Degree Programs

Another path to becoming a registered nurse is to enroll in a four-year college or university to earn a Bachelor of Science in Nursing degree. A traditional BSN program takes about 4 years to complete. In Oregon, there are six schools that confer BSN degrees. One school, Oregon Health and Sciences University (OHSU), operates programs at five campuses across the state, which is why the number of BSN programs is more than double the number of schools (Table 11).

Table 11 | Bachelor's Degree Nursing Programs in Oregon

	2012	2013	2014	2015	2016	2017	2018
BSN Program Sites	13	13	13	13	13	14	13
Schools	6	6	6	6	6	6	6
Faculty	406	376	381	426	412	387	371

Source: OSBN, Nursing Program Annual Report, 2012-2018

During the period studied, BSN programs grew (Table 12). The number of applications for BSN programs increased by 11 percent from 2012 to 2018. BSN programs responded, increasing their annual capacity. The number of budgeted seats increased 28 percent since 2012. Enrollment, the number of students admitted, and the number of students graduating also increased from 2012 to 2018.

Table 12 | Student Enrollment in Bachelor's Degree Nursing Programs

	2012	2013	2014	2015	2016	2017	2018
Enrolled	1,939	2,015	1,965	2,083	2,043	2,167	2,150
Admitted	847	879	931	901	866	996	1,083
Graduates	742	805	773	747	807	883	789
Applications Received	4,661	4,752	4,189	4,583	4,453	4,915	5,178
Acceptance Rate	18%	18%	22%	20%	19%	20%	21%
Budgeted Seats	834	891	844	832	932	1,138	1,066

Source: OSBN, Nursing Program Annual Report, 2012-2018

When examining the gender mix of BSN students and graduates, it is clear these students mirror the gender composition of the licensed workforce in Oregon (Table 13). While the proportion of males in the licensed RN workforce slowly increased (about two percent points since 2012), there is little indication the gender mix of the BSN student body is changing over time.

Table 13 | Percent of Female Students and Graduates - Bachelor's Degree Nursing Programs

	2012	2013	2014	2015	2016	2017	2018
Enrolled	85%	85%	85%	86%	86%	85%	86%
Graduates	85%	84%	84%	85%	85%	84%	85%

Source: OSBN, Nursing Program Annual Report, 2012-2018

While the gender mix among BSN students remained constant, it is clear the BSN student body became more diverse over time, and was more diverse than the 2018 licensed RN workforce. In 2018, about 70 percent of licensed RNs were white, three percent were Hispanic, and four percent were Asian. Within BSN programs, Hispanic and Asian students were present in higher proportions than the workforce and made gains in the student population compared to the distribution in 2012 (Table 14). This is promising as the current workforce is less diverse than the population of Oregon. Increases in the diversity of nursing students may accelerate the diversity of the workforce over time.

Table 14 | Race/Ethnicity of Bachelor's Degree Nursing Students

	Enrolled		Graduates	
	2012	2018	2012	2018
Hispanic	6.9%	12.0%	4.9%	10.3%
Native American	1.2%	0.7%	1.6%	1.9%
Asian	6.9%	10.5%	7.4%	7.9%
Pacific Islander	1.4%	1.3%	1.6%	0.8%
Black	0.8%	0.8%	1.1%	0.6%
White	77.1%	66.6%	74.3%	69.1%
More Than 1 Race	0.0%	5.6%	0.0%	5.9%
Unknown	5.6%	2.5%	9.1%	3.4%

Source: OSBN, Nursing Program Annual Report, 2012 & 2018

Students enrolled in BSN programs were markedly younger than those enrolled in ADN programs (Table 10 and 15 for direct comparisons). In 2018, 82 percent of BSN enrollees were 30 years-of-age or younger, while only 56 percent of ADN students were in this age range. Also, the BSN student body was younger in 2018 than they were in 2012, 82 percent and 73 percent, respectively. A similar trend was observed for graduates from BSN programs. About three-quarters (74 percent) of students graduated before their 31st birthday, compared to 54 percent for ADN program graduates. Additionally, BSN program graduates who graduated in 2018 were younger than BSN program students graduating in 2012 where 65 percent graduated prior to their 31st birthday. This is consistent with previous reporting (OCN, 2018a) showing a markedly younger RN workforce than in previous years.

Table 15 | Age of Bachelor's Degree Nursing Students and Graduates

	Enrolled		Graduates	
	2012	2018	2012	2018
≤20	23.1%	28.5%	0.2%	0.1%
21-25	31.7%	40.6%	41.2%	54.8%
26-30	18.2%	13.2%	23.8%	19.0%
31-40	18.1%	13.3%	22.5%	19.4%
41-50	7.4%	4.0%	8.9%	5.2%
51-60	1.5%	0.6%	3.4%	1.5%
>60	0.0%	0.0%	0.0%	0.0%

Source: OSBN, Nursing Program Annual Report, 2012 & 2018

Optional Pathways to Baccalaureate Degrees

Students not interested in a traditional 4-year baccalaureate degree have alternative options available to them. Students with a bachelor's degree in a different field may enroll in an accelerated bachelor's degree program, which takes about 16 months to complete.

Students enrolled in ADN programs at many community colleges across Oregon have an opportunity to obtain a BSN through the Oregon Consortium of Nursing Education (OCNE), a partnership between 11 community colleges and OHSU School of Nursing. Nursing students at partner community colleges learn from a shared curriculum and, upon completion, have the option to pursue their baccalaureate degree at OHSU School of Nursing without having to relocate to a new campus.

There are many other RN-to-BSN programs in Oregon, where ADN-educated RNs may obtain a BSN degree. None of these programs are included in this study because they are post-licensure education programs, and the data related to these programs is incomplete.

80/20: Are We There Yet?

During In 2010, the National Academy of Medicine (formerly the Institute of Medicine) set a nation-wide goal of 80 percent of all RNs holding a BSN by the year 2020. While the percent of RNs holding a BSN has increased over the past few years, it is clear the Academy's goal will not be met in Oregon. In 2018, 51 percent of licensed RNs held a BSN and 57 percent held a BSN or higher degree (Table 16). This represents a seven percent point increase since 2012, when the rate was 44 percent. Conversely, the percent of RNs with an ADN declined to 37 percent over this same period. This is markedly down from the 46 percent of RNs holding an ADN in 2012. Table 16 shows the highest level of educational attainment between 2012 and 2018.

**Table 16** | Highest Educational Attainment for RNs, 2012-2018

	2012	2014	2016	2018
Less than ADN	6%	5%	5%	6%
ADN	46%	43%	41%	37%
BSN	44%	45%	48%	51%
Master's or Higher	4%	6%	6%	6%
BSN or higher	48%	51%	54%	57%

Source: OHA, Public Use Nursing Workforce Data File, 2012-2018

If Oregon will not meet the National Academy of Medicine's goal of 80 percent of RNs holding a BSN by 2020, when will it be met? This is a surprisingly complex question as there are many factors that can affect growth of BSN-educated nurses, including limited access to BSN programs, employer demand for nurses, and the large influx of RNs educated and licensed in other states.

If current trends continue, it is estimated that Oregon will meet the National Academy of Medicine's goal by 2038 (Figure 1). This projection was created using a stock-flow model as described by Spetz (2018). The projection assumed factors influencing nursing education today will persist into the future, the number of seats in ADN and BSN programs continues to change at current rates, graduation rates remain stable over time, access to nursing programs does not change in a significant way, and employer demand for BSN-educated nurses does not increase. As can be seen, the rate of change over time is constant and reflects observed biannual change since 2012. That is, growth is linear, and the rate of change does not accelerate or decelerate over time.

Figure 1 │ Projected Percent of RNs Holding an ADN, BSN, or Higher Degree
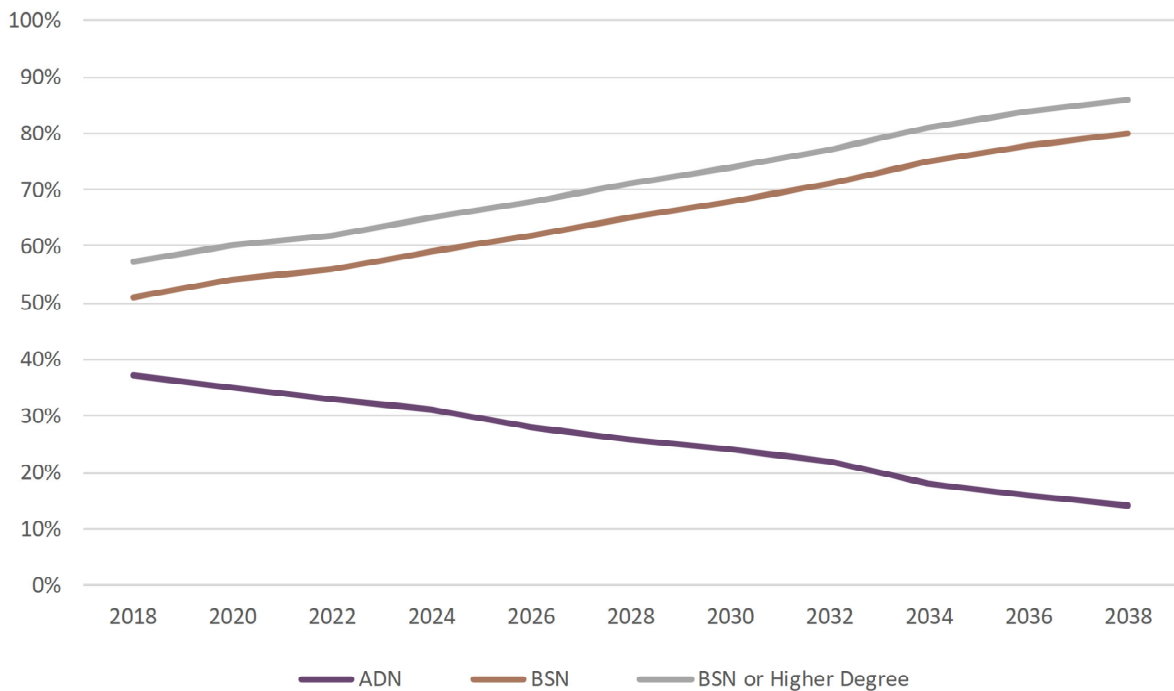
The projection above is based on a guiding assumption that the nursing education environment, workforce composition, and employer demands will not markedly change over time. However, systemic change in any of these factors could increase the rate of change in the proportion of BSN-educated RNs. For instance, if employers begin to demand greater numbers of RNs with a BSN, then it is likely that nursing education institutions would respond by expanding capacity at schools offering baccalaureate degrees. There is some evidence the increased demand may have already begun. Data show 57 percent of RNs employed in a hospital setting hold a BSN, while 34 percent hold an ADN. Conversely, most RNs employed in long term care and home health/hospice settings hold an ADN, 55 percent and 50 percent respectively (Table 17). However, this dichotomy may simply reflect the needs of certain healthcare sectors where RNs are employed. In long-term care and home health/hospice settings, where turnover rates are high and recruiting and hiring RNs is difficult, educational consideration may be secondary to having employees able to provide care (OCN, 2018b). However, it could be an early indication that employers, especially hospitals, are responding to research showing BSN-educated RNs have better patient outcomes (Aiken, Clarke, Cheung, Sloane, & Silber, 2003; Blegen, Goode, Park, Vaughn, & Spetz, 2013; National Academy of Medicine, 2010).

Table 17 │ Highest Educational Attainment by Practice Setting

	Less Than ADN	ADN	BSN	Graduate
Office	6.5%	38.9%	49.1%	5.6%
Hospital	3.7%	34.3%	57.3%	4.7%
Ambulatory Care	6.5%	45.0%	46.0%	2.4%
Long Term Care	9.2%	54.9%	33.4%	2.5%
Home Health / Hospice	5.0%	50.2%	40.6%	4.2%
Public / Community Health	6.5%	29.5%	56.9%	7.1%
Public Policy / Education	7.1%	36.6%	43.0%	13.3%

Source: OHA, Public Use Nursing Workforce Data File, 2018

Graduate Degree Programs

BSN-educated nurses wanting to become an advanced practice registered nurse must obtain a graduate degree in nursing. However, prospective APRNs and current RNs who want an advanced degree in nursing have limited options within the state of Oregon (Table 18). Currently there are two schools offering graduate degrees in nursing, and both are in Portland. In 2016, two schools offered a Master of Science Degree in Nursing (MSN). One school ended the MSN program in 2016, and the second school ended their MSN program in 2018. Currently, MSN degrees are available only through on-line programs or programs offered in other states.

Two schools currently offer doctorate programs, and candidates can select between a Doctor of Nursing Practice (DNP) or a Doctor of Philosophy degree (PhD) in nursing. The analysis for graduate programs only includes three years of data because of inconsistency in the data for prior years. Due to the small number of students enrolled, any change in enrollment or available seats will be magnified when comparing figures year-over-year.

Table 18 | Graduate Degree Nursing Programs in Oregon

	Master's			Doctorate		
	2016	2017	2018	2016	2017	2018
Graduate Program Sites	7	6	6	3	3	3
Schools	2	1	1	2	2	2
Faculty	54	49	49	31	27	35

Source: OSBN, Nursing Program Annual Report, 2016-2018

Enrollment in Oregon's graduate nursing programs appears relatively stable over the three years examined in this study (Table 19). The number of students graduating from these programs also appeared stable over time, with MSN programs graduating about 62 students per year and doctoral program graduating 46 students on average.

Table 19 | Student Enrollment in Graduate Degree Nursing Programs

	Master's			Doctorate		
	2016	2017	2018	2016	2017	2018
Enrolled	148	144	136	99	100	84
Admitted	62	55	72	45	23	37
Graduates	65	62	59	49	44	46
Applications Received	214	223	233	69	53	72
Acceptance Rate	29%	25%	31%	65%	43%	51%
Budgeted Seats	84	61	182	53	29	43

Source: OSBN, Nursing Program Annual Report, 2016-2018

The gender mix of enrollees and graduating students mirrored the gender mix of registered nurses and APRNs, excluding certified registered nurse anesthetists (Table 20). It does appear more women are enrolling and graduating from MSN programs over time.

Table 20 | Percent of Female Students and Graduates - Graduate Degree Nursing Programs

	Master's			Doctorate		
	2016	2017	2018	2016	2017	2018
Enrolled	78%	83%	88%	85%	83%	86%
Graduates	74%	84%	93%	90%	75%	78%

Source: OSBN, Nursing Program Annual Report, 2016-2018

Of all the nursing education programs examined, graduate nursing programs were the least diverse, with whites and Hispanics accounting for more than 80 percent of enrollment and graduating students (see Table 21). Asian students and those of more than one race accounted for six to seven percent of MSN program students and graduates. Graduate programs were generally less diverse than the licensed RN workforce and more in-line with the racial/ethnic makeup of APRNs.

Table 21 │ Race/Ethnicity of Graduate Degree Nursing Students

	Enrolled		Graduates	
	Master's	Doctoral	Master's	Doctoral
Hispanic	6.6%	6.0%	8.5%	6.5%
Native American	0.0%	2.4%	0.0%	0.0%
Asian	5.9%	1.2%	6.8%	0.0%
Pacific Islander	0.7%	4.8%	0.0%	0.0%
Black	0.0%	0.0%	0.0%	2.2%
White	76.5%	82.1%	76.3%	87.0%
More Than 1 Race	5.1%	1.2%	6.8%	0.0%
Unknown	5.1%	2.4%	1.7%	4.3%

Source: OSBN, Nursing Program Annual Report, 2018

Naturally, the age distribution of students enrolled in nursing graduate programs tended to be older than other students (Table 22). More than 52 percent of master's students and 83 percent of doctoral students were over the age of 30. This is consistent with findings from the Council of Graduate Schools' analysis of US Department of Education data showing the average age of a graduate student in the US was 33 years (Council of Graduate Schools, 2009). The age distribution of graduates in both degree programs was very similar to the distribution of enrollees.

Table 22 │ Age of Graduate Degree Nursing Students and Graduates

	Enrolled		Graduates	
	Master's	Doctoral	Master's	Doctoral
≤20	0.0%	0.0%	0.0%	0.0%
21-25	5.1%	1.2%	1.7%	0.0%
26-30	41.9%	15.5%	40.7%	15.2%
31-40	39.7%	41.7%	44.1%	45.7%
41-50	11.8%	31.0%	13.6%	30.4%
51-60	1.5%	8.3%	0.0%	6.5%
>60	0.0%	2.4%	0.0%	2.2%

Source: OSBN, Nursing Program Annual Report, 2018

Conclusions

As the need for nurses increases due to the aging of the population, potential shortages of physicians, and a growing population, data suggest Oregon's nursing programs will not be able to keep pace with the growing demand. Growth in the practical nursing programs has remained relatively flat over time, while ADN nursing programs show signs of contracting slightly, especially in recent years. This does not bode well for the "grow your own" future of nursing within the state. Due to the demonstrated maldistribution of nurses within Oregon (OCN, 2019), employers in rural communities across the state already face difficulties in recruiting and retaining an adequate supply of nurses, as do some practice settings (i.e., long-term care facilities), even in urban areas. The observed decline in nursing programs that primarily fill these jobs (i.e., local ADN programs) will add to the difficulties currently faced by employers.

Of all the programs examined, only BSN nursing programs demonstrated any consistent growth. In fact, the proportion of BSN-prepared RNs increased steadily over the past seven years and is currently at 51 percent of the RN workforce (Table 16). However, the observed rate of increase is not enough for Oregon to meet the National Academy of Medicine's goal of 80 percent of licensed RNs to hold a BSN by the year 2020. The analysis presented indicates the 80 percent goal will not be achieved until 2038. If the demand for BSN-prepared RNs increases, employers, nurse educators, and state and local health officials must develop strategies to increase capacity at baccalaureate institutions.

Despite recent reports showing strong growth of licensed nurses in Oregon, data suggest this growth is due, in part, to nurses migrating to Oregon from other parts of the country (OCN, 2019). This corresponds with employment department data showing the future demand of nurses far outstrips the current capacity of Oregon's nursing education programs (OED, 2018; OSBN, 2018). If employers want to fully embrace a "grow your own" strategy, there must be intentional effort by employers, nurse educators, and nursing leadership to adopt measures to increase the capacity of nursing education throughout Oregon. Otherwise, employers may be faced with the necessity of relying on nurses educated in other states.

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Report Author

Richard Allgeyer, PhD

Report Contributors

Devon Berry, PhD, RN

Jana Bitton, MPA

Kelley Ilic, BA

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