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State of the Registered Nurse Workforce as a New Era of Health Reform Emerges

EXECUTIVE SUMMARY

▶ Over the past 15 years, the registered nurse (RN) workforce was challenged by a national nursing shortage that exceeded 100,000 RNs, two economic recessions, and implementation of health reforms beginning in 2010.

▶ At the same time, efforts by private and public entities sought to increase interest in nursing with the result the number of people awarded undergraduate and graduate degrees in nursing grew dramatically from 2003 to present.

▶ RN employment also increased by more than 1 million full-time equivalents with growth occurring more rapidly in hospitals vs. non-hospital settings; RNs with bachelor's and master's degrees earned considerably more than did those with an associate degree.

▶ While recent projections indicate growth in the nursing workforce through 2030 will be large enough to replace more than 1 million RNs who will retire over this period, because growth in the RN workforce will be uneven throughout the country, temporary and local shortages vs. large national shortages are expected.

▶ The nursing profession will need to draw upon its strengths and strong foundation as new health reforms and other challenges bear down on the nursing workforce over the next 15 years.

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DURING THE FIRST 15 years of this century, the registered nurse (RN) workforce in the United States faced many extraordinary changes. As shown in Figure 1, the first half of the new decade began with a very large national shortage of RNs and a brief but sharp economic recession in 2001 (Buerhaus, Staiger, & Auerbach, 2008). Alarmed by projections of even larger shortages developing by 2020 (Buerhaus, Staiger, & Auerbach, 2000), in 2002 Johnson & Johnson launched the *Campaign for Nursing's Future* that sought to bolster the image of the nursing profession and stimulate interest in nursing careers (Johnson & Johnson Services, Inc., 2017). This national undertaking was reinforced by other foundations and organizations starting initiatives of their own aimed at recruiting people into nursing. Additionally, increasing numbers of states established nursing workforce centers to gather data on the nursing workforce and inform policymakers. These developments occurred just as the landmark Institute of Medicine (IOM) report *To Err is Human* (Kohn, Corrigan, & Donaldson, 2000) was igniting a national movement to improve the quality and safety of patient care, particularly in hospitals.
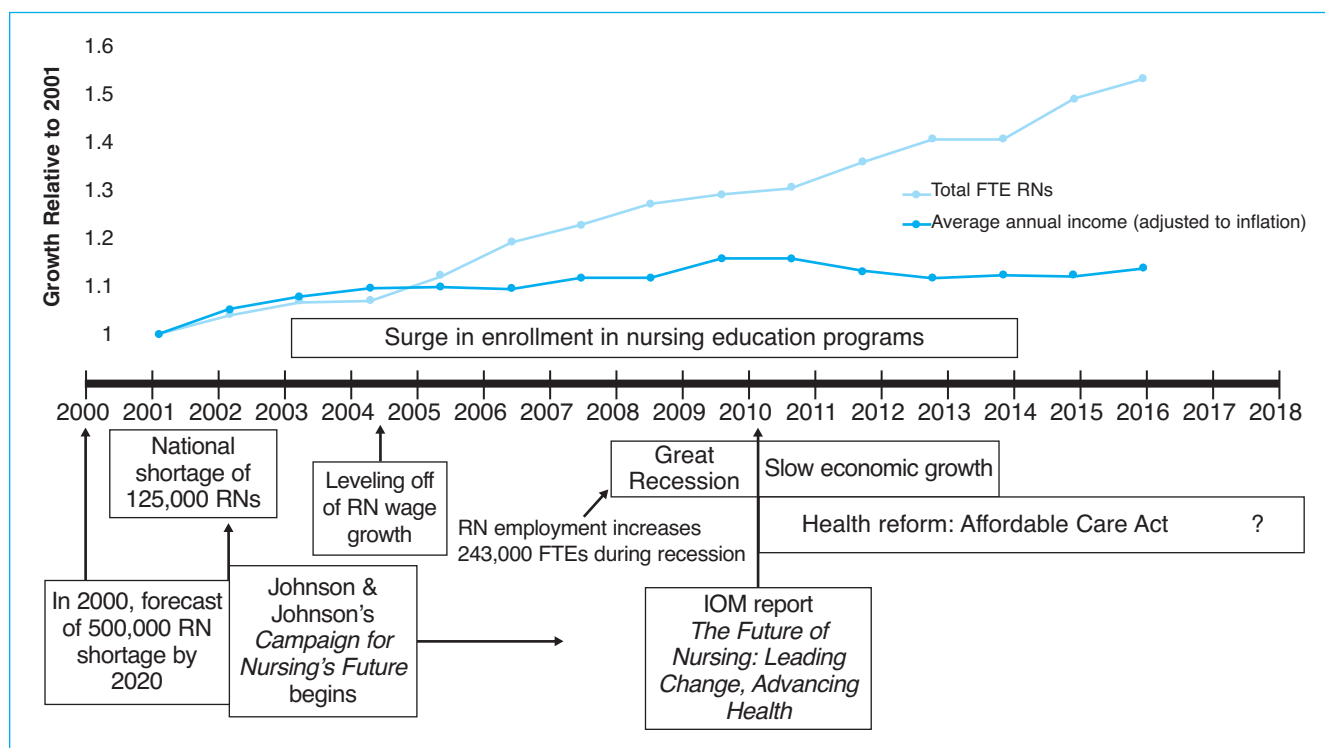
Figure 1.
Major Factors Influencing the Nursing Workforce, 2000-2017

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The Great Recession dominated the latter half of the decade. As millions of Americans lost their jobs, many RNs became the primary income earners in their household. As some RNs rejoined the workforce, others increased their hours worked and took second jobs, others delayed their retirement, and 50,000 RNs left their non-hospital jobs to work in hospitals, RN employment increased in hospitals by nearly one-quarter million full-time equivalents (FTEs) (Buerhaus, Auerbach, & Staiger, 2009). Then, in 2010, the IOM published its report on the *Future of Nursing* which offered a blueprint for how the nursing profession should change to improve the health of the nation, lead changes in healthcare delivery systems, and increase the educational preparation of the nursing workforce.

The pace of change did not let up over the ensuing 6 years. With the passage of the Patient Protection and Affordable Care Act in 2010, healthcare providers began responding to an array of provisions aimed at reforming the nation's healthcare delivery systems that sought to: (a) Improve the efficiency and coordination of healthcare delivery systems by promoting the development of Accountable Care Organizations, Patient-Centered Medical Homes, Nurse-Managed Health Centers, Community Health Centers, and other organizational innovations which would be held accountable for costs and quality; (b) Expand insurance coverage – to a now-estimated 20 million people – through state and federal health insurance exchanges and expansion of state Medicaid programs; (c) Increase the provision of health education and prevention to improve individual and population health; and (d) Begin stripping away volume-based utiliza-tion incentives in the fee-for-ser-vice system in favor of more effi-cient, value-driven care.

These reforms have been accompanied by an emphasis on teamwork, care coordination, inter-professional education, develop-ment of the electronic health record, telemedicine, remodeling of the primary care delivery system, and expanding the use of advanced practice nurses throughout health-care delivery systems. Together with the changes experienced by RNs from 2000-2010, the past 6 years have added to the number and enormity of forces affecting the RN workforce, and with the results of the 2016 presidential and con-gressional elections, even more change is in the offing.

To gain a picture of the state of the nursing workforce as a new era of health reform takes shape, this article presents trends in the demo-graphic characteristics, employ-ment, education, and growth of

the nursing workforce over the period 2001-2015, and summarizes projections of the future supply of RNs through 2030. This retrospective examination of the RN workforce will help stakeholders better understand the current state of the nursing workforce, better anticipate the future, and better prepare for how the RN workforce can overcome new challenges that lie ahead.

Methods

Data for this study come from the American Community Survey (ACS) which is conducted annually by the U.S. Census Bureau (n.d.), and modeled after the long form of the decennial census. In 2000, the sample obtained in the ACS was not large enough to provide the data required to analyze trends in the nursing workforce. However, from 2001 to 2004, the ACS obtained a sample size of roughly 600,000 households and, starting in 2005, the survey increased its sample size to approximately 2 million households. Therefore, our analysis begins in 2001 and extends through 2015, the latest year ACS data are publically available.

The ACS obtains data on demographics and employment for every household member and obtains a response rate of over 90%. In each year from 2001 to 2004, the ACS obtained data on approximately 12,000 RNs, and after expanding its sample in 2005, roughly 30,000 RNs were included each year. In the ACS survey, RNs select their occupation and report their age, income, education level, industry sector, and other demographic information. The ACS data have been used extensively by our team to assess recent trends in the number of young RNs entering the workforce, analyze employment and earnings of RNs, and to forecast the future age and supply of RNs (Auerbach, Buerhaus, & Staiger, 2011; 2014; 2017).

The analysis included RNs between the ages of 21 and 69. RNs were assigned FTE employment status following methods used by the Health Resource and Services Administration (2014) in which 1.0 FTE was equal to the average hours worked among all RNs in the sample working at least 20 hours per week. Each sampled RN's actual hours worked was divided by this average (which amounted to roughly 38 hours per week) to construct estimates of the number of FTEs.

In the ACS, RNs self-report their highest level of education. RNs who reported a bachelor's degree or equivalent 4-year college degree were assigned as having a bachelor's degree in nursing (BSN). Those who reported an associate degree or less than a 4-year bachelor's equivalent were designated as having an associate degree in nursing (ADN). This category likely captures most diploma-educated RNs, who compose a very small and declining proportion of the RN workforce. The ACS also captures RNs who report a graduate degree – a master's, PhD, or a doctor of nursing practice (DNP). In the ACS, respondents were asked to identify the industry in which they were employed. For employment setting, all RNs who did not identify "hospital" as their place of employment were classified as "non-hospital." Respondents were asked to report their income based on their annual salary or hourly wages during the past 12 months. Only those working 30 hours per week or more were included in earnings analyses.

Data on total graduate degrees awarded each year were obtained from the Integrated Postsecondary Education System (IPEDS). IPEDS is a system of interrelated surveys conducted annually by the U.S. Department of Education's National Center for Education Statistics. Information is gathered from every college, university, and technical and vocational institution that participates in the federal student financial aid programs. IPEDS reports completed degrees at each institution by type of education program and award level each year. The IPEDS does not distinguish a BSN that was earned as the nurse's initial nursing degree from a BSN that was completed as part of an RN-to-BSN program in which ADN-degree level nurses can obtain a BSN in a shortened period of time. Data from other sources suggest that in recent years, roughly 20% of awarded BSN degrees are RN-to-BSN programs. Thus, the reported trends do not represent the mix of initial nursing degrees received, but rather the type of degree obtained in each given year.

Results

Characteristics of the RN workforce. The RN workforce in the United States continues to be dominated by women; the percentage of men in the workforce increased from only 9% in 2001 to 12% in 2015 (see Table 1). The racial diversity of the RN workforce increased since 2001, with the overall proportion of RNs who are White decreasing from 82% in 2001 to 76% in 2015. By comparison, the overall composition of the U.S. labor force was 79% White in 2014. The nursing workforce had a larger proportion of Asians (10%) compared to 6% in the U.S. labor force, and a comparable proportion (11%) of Black/African Americans vs. 12% in the larger U.S. labor market. The proportion of Hispanics RNs in the nursing workforce was 7%, significantly less than the 17% of Hispanics in the overall 2014 U.S. labor market (U.S. Department of Labor, 2015).

Employed RNs prepared with at least a BSN education surpassed those with an ADN preparation, a change that reflects the increased enrollment into nursing education programs that began in 2003 (Buerhaus, Auerbach, & Staiger, 2016). In 2015, nurses with a BSN or a graduate degree composed 62% of all FTE RNs in

Table 1.
Demographic Characteristics of Full-Time Equivalent (FTE) Registered Nurse Workforce, 2001-2015

		Year			
		2001	**2005**	**2010**	**2015**
Total FTE RNs		2,085,937	2,339,315	2,721,934	3,187,672
Gender	Male	188,047 (9%)	220,061 (9%)	265,024 (10%)	374,259 (12%)
	Female	1,897,890 (91%)	2,119,254 (91%)	2,456,910 (90%)	2,813,413 (88%)
Race	White	1,700,648 (82%)	1,868,084 (80%)	2,132,181 (78%)	2,415,019 (76%)
	Black/African-American	191,106 (9%)	235,072 (10%)	281,288 (10%)	372,906 (12%)
	Asian	135,697 (7%)	173,595 (7%)	231,764 (9%)	282,418 (9%)
	Other	6,391 (2%)	62,561 (3%)	76,701 (3%)	117,328 (4%)
Ethnicity	Non-Hispanic	2,003,303 (96%)	2,246,817 (96%)	2,577,829 (95%)	2,976,201 (93%)
	Hispanic	82,631 (4%)	92,498 (4%)	144,105 (5%)	211,471 (7%)
Education	Associate	944,395 (45%)	1,043,796 (45%)	1,160,146 (43%)	1,196,934 (38%)
	Baccalaureate	859,911 (41%)	968,822 (41%)	1,206,769 (44%)	1,503,815 (47%)
	Graduate	281,629 (14%)	326,697 (14%)	355,020 (13%)	423,493 (15%)
Employment	Hospital	1,307,476 (63%)	1,431,560 (64%)	1,660,633 (64%)	2,024,485 (64%)
	Non-hospital	778,461 (37%)	794,888 (46%)	950,965 (46%)	1,163,187 (46%)
Age	<35	497,150 (24%)	491,505 (22%)	627,790 (24%)	875,795 (27%)
	35-49	1,020,394 (49%)	969,645 (44%)	991,823 (38%)	1,145,887 (36%)
	50+	568,392 (26%)	765,298 (34%)	991,984 (38%)	1,165,990 (37%)

SOURCE: Author calculations of data from the American Community Survey (2001-2015).
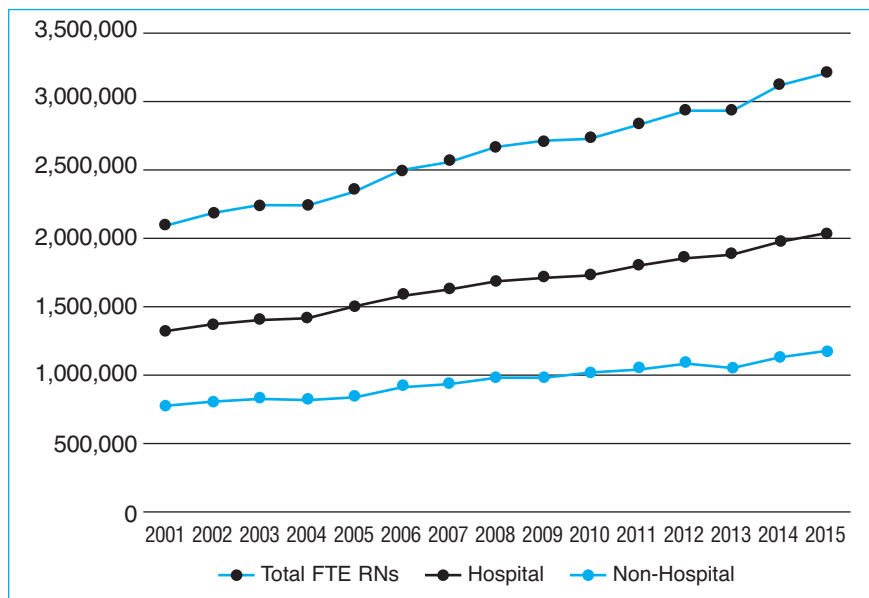
the workforce, an increase from 55% in 2001. Significant changes occurred in the age composition of the professional nursing workforce (see Table 1). As the large number of RNs born in the baby boom generation (1946-1964) aged, the percentage of the total employed workforce age 50-69 increased from 26% in 2001 (765,000) to 37% (1.17 million) in 2015. The proportion of younger RNs (those under age 35) also increased from 24% in 2001 to 27% in 2015, and now totals nearly 900,000 RNs.

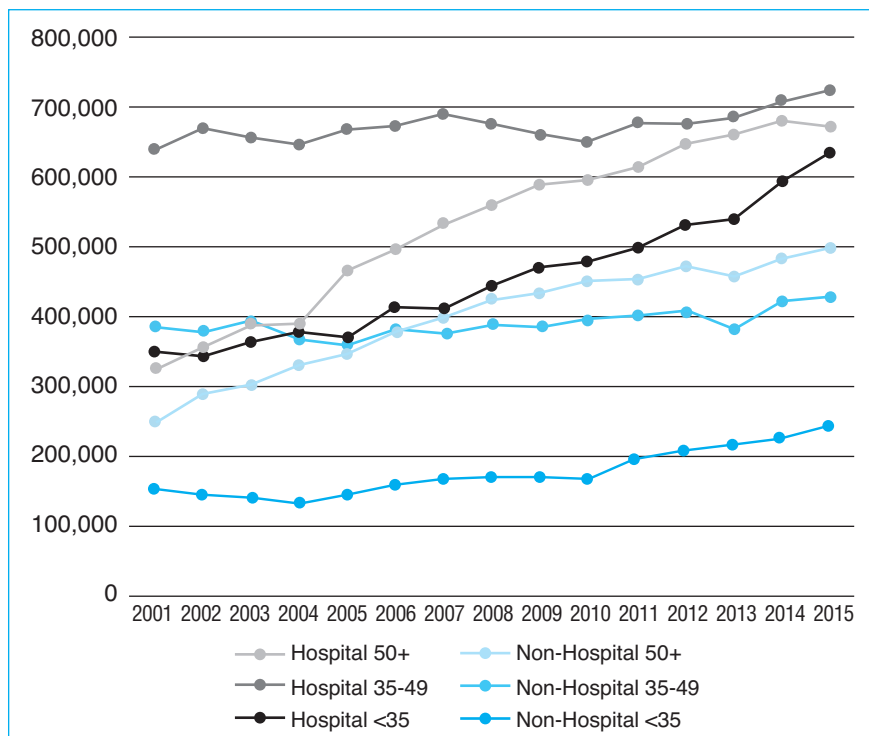*RN employment.* Data in Table 1 and in Figure 2 indicate the total number of FTE RNs grew substantially, increasing from 2.1 million in 2001 to 3.2 million in 2015. This growth is remarkable in light of the various changes affecting healthcare employers and nurses (particularly the Great Recession) during this period (see Figure 1). Surprisingly, the share of the RN

Figure 2.
Total Full-Time Equivalent (FTE) Registered Nurse (RN)
Employment and by Major Employment Setting, 2001-2015.

Figure 3.
Full-Time Equivalent Registered Nurse Employment by Age and
Major Employment Area, 2001-2015.

workforce employed in hospital and non-hospital settings did not changed significantly over this period: FTE RNs employed in hospitals increased slightly from 63% in 2001 to 64% in 2015. This distribution in employment setting contrasts with widespread expectations at the beginning of the new century that the provision of health care, and therefore nursing care, would increasingly be delivered in non-hospital settings.

RN employment by age and by type of education. Figures 3 and 4 separate FTE RN employment into hospital and non-hospital settings by age and education, respectively. In hospital settings, although their rate of growth has not increased appreciably since 2001, middle-aged RNs have consistently been the largest age group of employed RNs through 2015. In contrast, both older RNs and younger age RNs increased in size during the 2000s; the rate of increase was particularly rapid for younger-aged RNs since 2013. In non-hospital settings, FTE RNs age 50 doubled from 250,000 in 2001 to 500,000 in 2015, and are today the largest group of RNs employed in non-hospital settings. As in hospital settings, the size of the middle-aged RN workforce employed in non-hospital settings has not changed appreciably since 2001. Although younger-aged RNs represent the smallest proportion of the non-hospital workforce, their numbers have been increasing, particularly since 2010, and now total approximately 250,000.

Turning to the education of the RN workforce, the number of BSN-prepared RNs working in hospitals has grown markedly over the study period, increasing from 578,000 FTEs in 2001 to 945,000 FTEs in 2015 (see Figure 4). In contrast, the number of RNs prepared with an ADN who are employed by hospitals decreased from a high of 645,000 in 2008 to 629,000 in 2015. Elsewhere, ADN RN employment increased over this period in long-

Figure 4.
Full-Time Equivalent Registered Nurse Employment in Hospital and Non-Hospital Settings by Type of Nursing Degree, 2001-2015
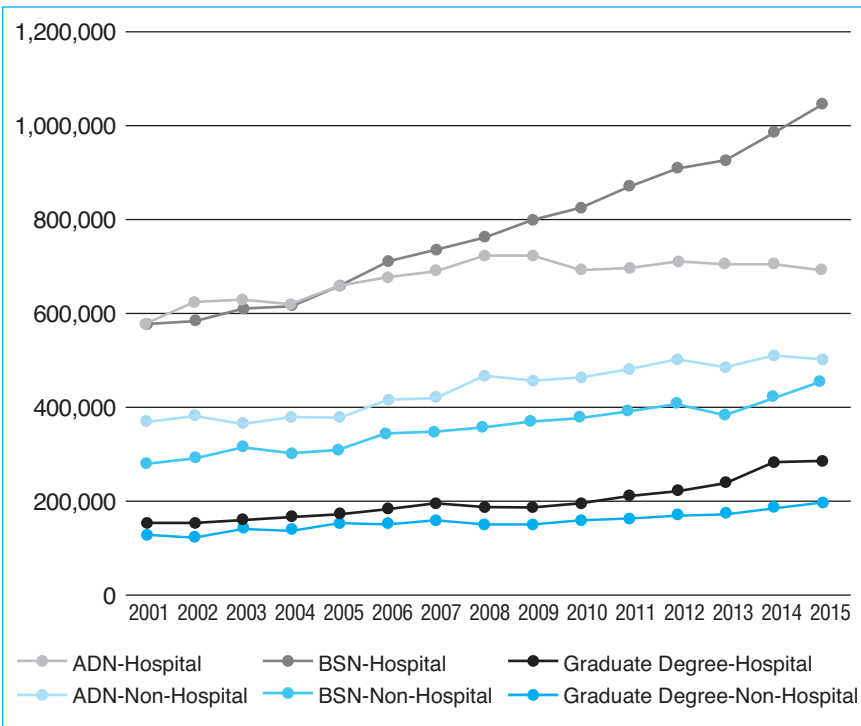
NOTE: Graduate degree includes RNs with a master's degree, PhD, or DNP.
SOURCE: Author calculations of data from the American Community Survey (2001-2015).

Figure 5.
Full-Time Equivalent Registered Nurse Average Earnings by Age, 2001-2015
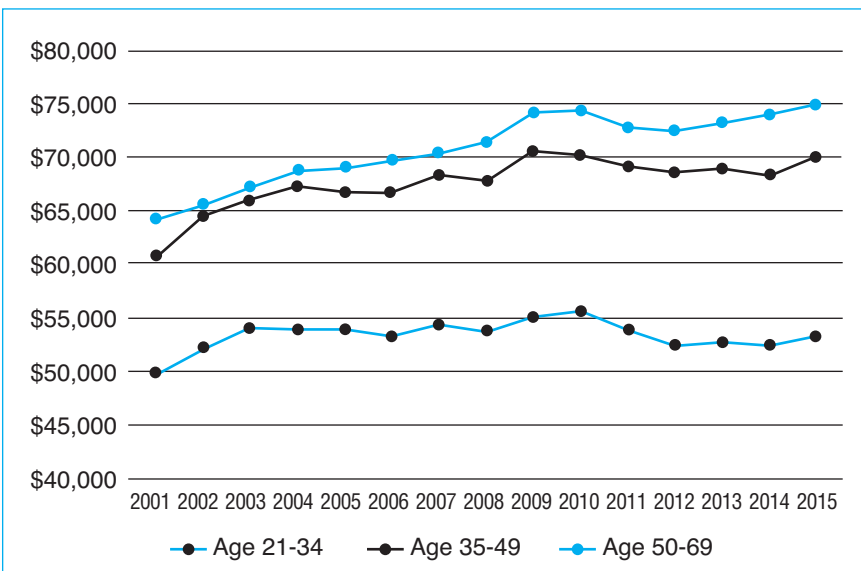
SOURCE: Author calculations of data from the American Community Survey (2001-2015).

term care facilities and in home health care, increasing from 13% in 2003 to 18% in 2013 (Auerbach, Buerhaus, & Staiger, 2015). This divergence reflects increasing preferences among hospitals for BSN-educated RNs. In non-hospital settings, the number of BSN-prepared RNs lagged below that of ADN-educated RNs until 2015 when the numbers are virtually identical. RNs with graduate degrees have grown slowly in both hospital and non-hospital settings and constitute about 500,000 FTE RNs overall.

RN earnings by age, type of education, and employment setting. Over the study period, annual earnings for FTE RNs aged 50-69 and 35-49 grew steadily through 2009, increasing by approximately $10,000 compared to 2001 (see Figure 5). Immediately following the Great Recession, annual earnings decreased several years before increasing again, particularly for older RNs. Earnings for younger RNs aged 21-34 remained between $10,000 and $15,000 below those of middle-aged and older RNs and grew very little over the 15 years (see Figure 5).

RNs with a graduate education earn significantly higher annual incomes than RNs prepared with either a BSN or ADN (see Figure 6). Their incomes also grew at a faster rate, at least until 2010. Additionally, the difference in earnings widened after 2005. In that year, RNs with a graduate degree earned about $10,000 more than a BSN-educated RN and $20,000 more than an ADN-prepared RN; by 2015 these earnings differences had roughly doubled. Additionally, after reaching their peak earnings in 2010, earnings of RNs educated with an ADN decreased at a slightly faster rate than BSN and graduate-prepared RNs.
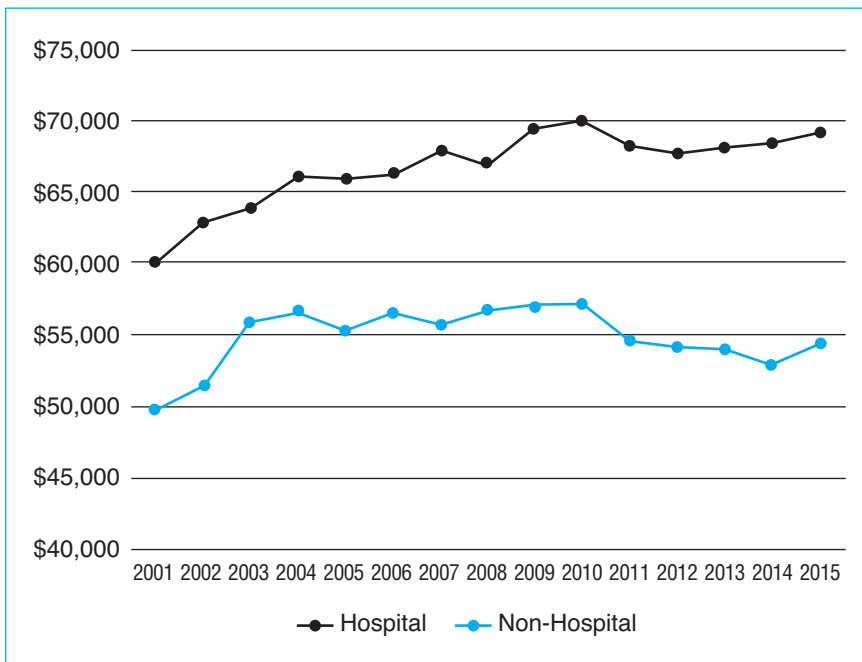
Overall, changes in the average annual earnings of FTE RNs employed in hospitals and in non-hospital settings largely tracked each other (see Figure 7). When earnings increased/decreased in

Figure 6.
Full-Time Equivalent Registered Nurse Average Earnings by
Type of Degree, 2001-2015
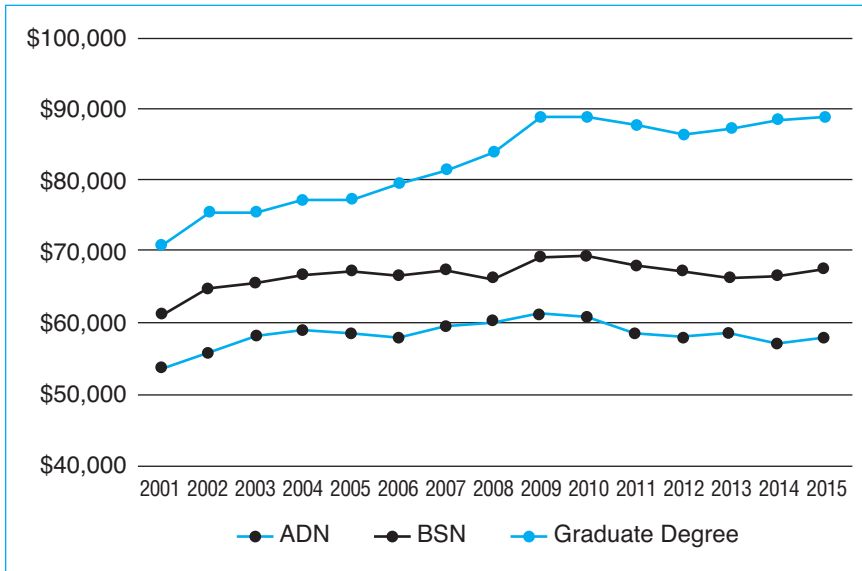
NOTE: Graduate degree includes RNs with a master's degree, PhD, or DNP.
SOURCE: Author calculations of data from the American Community Survey (2001-2015).

Figure 7.
Full-Time Equivalent Registered Nurse Average Earnings in
Hospital and Non-Hospital Employment Setting, 2001-2015

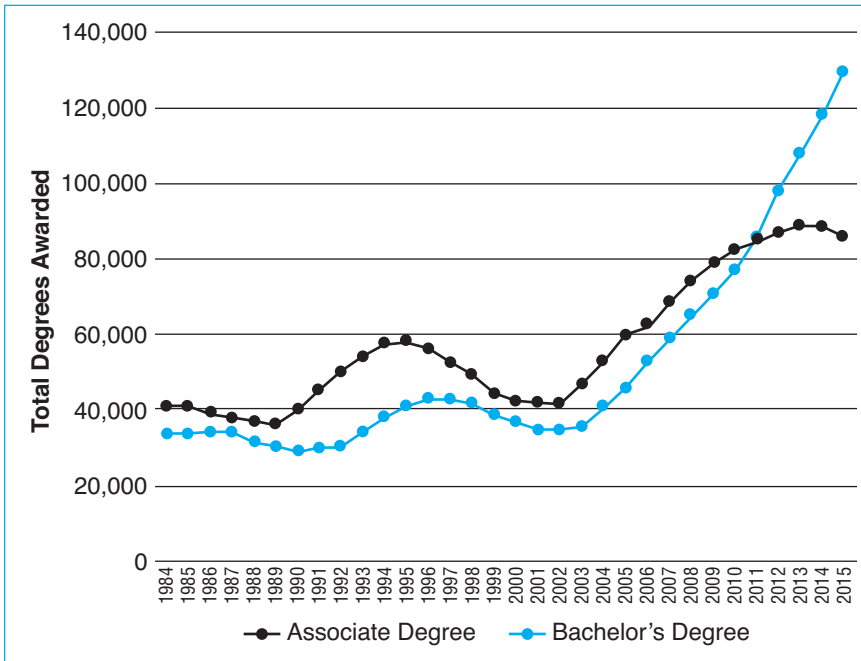SOURCE: Author calculations of data from the American Community Survey (2001-2015).

one setting, so too did earnings in the other sector. Not surprisingly average annual earnings received by hospital-employed RNs consistently exceeded earnings of RNs employed in non-hospital settings by 15%-20%.

Trends in nursing education. Since the early 1980s the annual number of degrees awarded to graduates of ADN programs consistently exceeded the number awarded to graduates of BSN programs (see Figure 8). This trend continued through the past decade until, in 2011, the number of BSN graduates surpassed ADN graduates. Since that crossover year, the number of BSN graduates accelerated rapidly, while the number of ADN graduates leveled-off and even began to decline.

During the 1980s the number of RNs graduating with a master's or doctoral degree varied between 5,000 and 7,000 annually (see Figure 9) and in the 1990s the number increased to just below 10,000 per year. However, in the early 2000s, the annual production of RNs with graduate degrees began increasing and accelerated at an even faster rate after 2009. By 2015, the number of RNs with a graduate degree increased to more than 40,000 per year, four times the number that graduated in 2000.

Future supply of RNs. As described more fully elsewhere (Auerbach, Staiger, & Buerhaus, in press), the authors estimate the number of RNs between 2015 and 2030 is expected to increase by 36%, to just over 4 million RNs. This growth is driven largely by the increased number of people graduating from nursing education programs and is particularly notable because it takes into account the retirement of approximately 1 million RNs between now and 2030. However, this growth in the number of RNs will not occur uniformly across the nation, but will vary significantly by state and by region (Auerbach et al., in press). While this estimated growth in RN supply is encouraging, like all projections,

**Figure 8.
Degrees Awarded in Associate and Baccalaureate Nursing
Education Programs, 1984-2015**

**Figure 9.
Master's and Doctoral Degrees Awarded, 1984-2015**
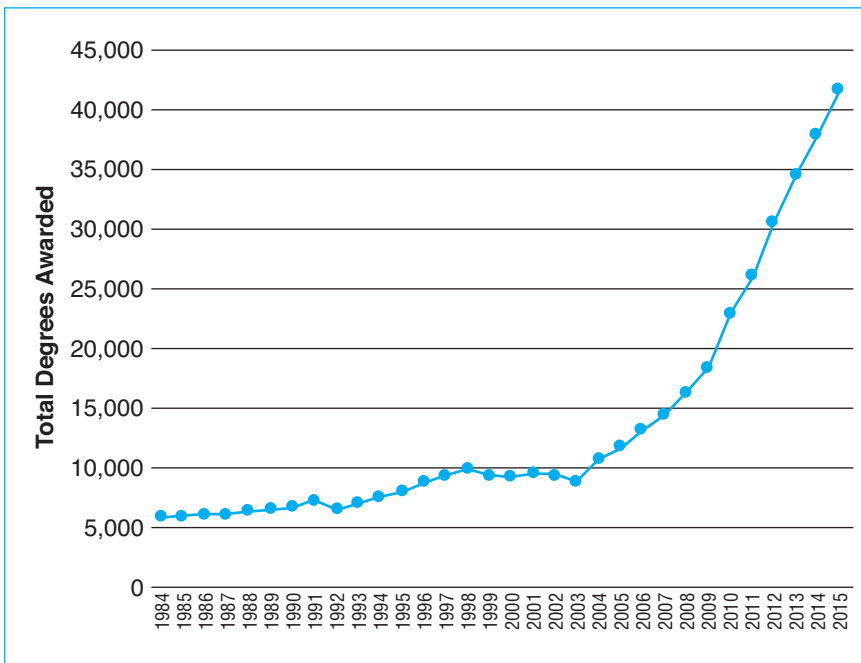
the estimates are based on assumptions that may not hold over the projection period. Furthermore, whether the expected growth in RN supply through 2030 will be large enough to avoid the development of national or regional shortages depends on how fast, how large, and the geographical location of future increases in demand for RNs.

Discussion

Forecasts of the future size of the RN workforce made in 2000 indicated that, unless something was done to increase the flow of new nurses into the workforce, there would not be enough RNs to replace the retirement of 1 million RNs predicted to begin in 2015 and avert a large national RN shortage from developing by 2020 (Buerhaus et al., 2000). In 2002, Johnson & Johnson initiated the *Campaign for Nursing's Future* to increase interest and enrollment in nursing education. Over the past decade this national initiative, supported by other private and public efforts, helped spark an increase in nursing graduates that continues to this day. Consequently, the size of the RN workforce increased by over 1 million FTE RNs from 2001 to 2015 and is projected to grow by another 1 million by 2030.

Along with rapid growth in the last 15 years, the age composition of the RN workforce has changed. As the baby-boom generation approaches retirement, the cohort of RNs age 50 and over is predicted to remain roughly constant over the next 15 years. This stagnation is matched with growing numbers of graduates from nursing education programs, increasing the cohort of RNs aged 35 and under. The rapid growth of millennial RNs into the workforce will result in the workforce being dominated by RNs between 35 and 49 as these RNs age over the next 15 years.

The past 15 years also showed an increase in the overall education of the workforce. This increase is

marked by total BSN degrees awarded surpassing ADN degrees, which likely reflects: hospitals becoming aware of better outcomes associated with BSN-prepared RNs relative to ADN-prepared RNs (Aiken, Clarke, Cheung, Sloan, & Silber, 2003); provision of new economic incentives that rewarded hospitals for improved quality; development and spread of the Magnet Recognition Program® that requires hospitals to have a higher proportion of BSN-educated RNs; and, the recommendations of the 2010 IOM report that set a goal of the nursing workforce composed of 80% BSN-prepared RNs by 2020. Throughout the recent past, there has also been a sharp increase in the number of RNs with master's and doctoral degrees awarded. More highly educated RNs have also received higher incomes compared to ADN-prepared RNs, indicating a higher rate of economic return to investing in higher nursing education. The earnings gap in hospitals compared to non-hospital settings has widened, which is partly related to the increase in the proportion of BSN-prepared RNs employed in hospitals.

Over the past 15 years, the RN workforce has weathered many significant changes, the number employed has increased, and the educational preparation of the RN workforce has improved dramatically. And, according to annual polls conducted by Gallup, during this period the nursing profession consistently ranked as the nation's most trusted profession (Norman, 2016).

Looking ahead, these remarkable achievements will be tested by new challenges over the next 15 years (Buerhaus, Skinner, Auerbach, & Staiger, 2017). The nation's 78 million baby boomers are aging and becoming beneficiaries of the Medicare program. Three in four people over age 65 have multiple chronic diseases, which will increase the overall demand for RNs as well as the complexity and intensity of nursing care that will be required to manage this medically complicated population. Another challenge concerns the growing shortage of primary care and specialty physicians. These shortages will shift increasing amounts of healthcare delivery onto RNs and advanced practice nurses, who will need to find ways to maintain the public's access to care, particularly in rural and other underserved areas. Still another challenge is the loss of nursing knowledge, experience, and skill that will be felt in the nation's healthcare delivery systems as RNs born in the baby boom generation – one-third of the current RN workforce – retires by 2030. A fourth major challenge confronting the RN workforce concerns the development of new health reforms that will reshape healthcare delivery and payment systems. While each of these challenges is unique and consequential, it is important to realize the RN workforce in the United States will confront all of these challenges simultaneously! Those concerned with the future of the RN workforce need to anticipate these challenges and act to assure the RN workforce is prepared to overcome them. $

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