

TRENDS

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Research & Planning

Nursing in Wyoming, Part One: Supply and Retention

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“Turnover data indicate that Wyoming graduates are more likely to remain in Wyoming than out-of-state graduates.”

Federal research suggests our country is currently in the middle of a nursing shortage which will increase substantially over the next decade. The General Accounting Office (GAO) report, “Emerging Nurse Shortages Due to Multiple Factors,” states that “national data are not adequate to describe the nature and extent of nurse workforce shortages, nor are the data sufficiently sensitive or current to compare nurse workforce availability across states, specialties, or provider types.”¹ Research and Planning’s (R&P) analysis is based on Wyoming administrative databases and has the capacity to answer issues of nurse shortages specifically for the State. Our findings on Wyoming’s supply of nurses are similar to many of the conclusions of the GAO report regarding national trends. This article presents part one of a three-part series exploring Wyoming’s nursing supply and demand.

RNs who were issued licenses in the State of Wyoming during the past decade. Eighty-four percent of RNs in this country work in public and private health services (SIC 80)² and are often cited as the industry’s occupational backbone. The majority of the remaining RNs are employed in Public Administration (6.3%), public and private educational services (3.3%), business services (3.3%), and social services (1.5%).³

Projected Demand

In Wyoming, health services has grown 25.1 percent from 1992 to 2000. Within this industry, the range of growth is between 39.2 percent of jobs created during the eight-year period in offices and clinics of doctors and 7.1 percent of jobs created in nursing and personal care facilities. During the same period, average employment for all industries

Scope

The shortage of nursing-related health care practitioners is not limited to Registered Nurses (RNs) but also includes many of the support occupations such as Licensed Practical Nurses (LPNs) and Certified Nursing Assistants (CNAs). Due to time constraints and difficulties associated with occupational analysis, this series of articles focuses on

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in Wyoming grew 16.6 percent. Trends in industry employment provide the foundation for occupational projections. Because RNs comprise the largest proportion of the health care industry, it is not surprising that the projected demand for RNs over the next decade will be great. Table 1 (see page 3) presents projected demand from 1998 to 2008 and the 1999 average hourly wage of RNs for all 50 states and the nation.⁴

Table 1 shows that while nationally the number of RNs is projected to grow 21.7 percent from 1998 to 2008, Wyoming should experience 12.7 percent growth. All of Wyoming's border states have a greater projected demand: Montana (19.0%), South Dakota (22.2%), Nebraska (25.2%), Colorado (26.6%), Idaho (28.7%) and Utah (46.0%). Wyoming's border states also paid higher wages in 1999 than Wyoming, which ranked 49th of the 50 states in average hourly wage. Given this, it may be difficult to attract and retain RNs in the State. Part two of this series will demonstrate that while health care services, and in particular the RNs in this industry, have relatively low turnover rates compared to other industries in Wyoming, the turnover rates are increasing. Based on the occupational projections and wages in Table 1, turnover is likely to continue to increase.

Wyoming Specific Data

The Wyoming State Board of Nursing (WSBN) provided an exhaustive database of all Registered Nurse licenses active in the State of Wyoming from 1992 to 2001.

Database variables include the following:

- Social Security Number (SSN)
- Date of License Issue
- Date of License Expiration
- Date of Birth
- Gender
- School of Training
- Year of Graduation

This database was merged with R&P's Wage Records⁵ database which contains the employer and wages by SSN for all calendar

quarters from 1992Q1 to 2001Q3. Combining these two data sets made it possible to track RNs across time through the labor force.

Wyoming's Wage Records is further supplemented with wage record data provided through data sharing agreements with several other states (Colorado, Idaho, Nebraska, New Mexico, South Dakota, Texas, and Utah). Interstate wage data provide the basis for the detailed analysis of RNs working in hospitals in 1999, which will be presented in part three.

Supply

Our databases provide us two perspectives when measuring the labor supply of RNs in Wyoming. The first is the supply of RNs with degrees from Wyoming colleges. The second is the number of RNs that actually become licensed in the State, of which graduates from Wyoming-based nursing programs are a subset. Table 2 (see page 4) lists the number of graduates with nursing degrees from all Wyoming colleges offering nursing programs.⁶ A review of Table 2 shows that the number of graduates from Wyoming schools has declined 33.2 percent over the last decade (using the first and last three-year averages). Although of much greater magnitude, this coincides with the GAO report which states that nationally, enrollments in RN associate degree programs have declined 11 percent and baccalaureate programs 19 percent from 1995 to 1998.

Table 3 (see page 5) lists the number of new licenses issued to RNs in the State by school and year⁷ from 1992 to 2001. Overall, the number of new licenses issued has declined by 20.0 percent from 1992-1994 to 1999-2001. Additionally, the proportion of those licenses issued to graduates of Wyoming schools has declined from 41.3 percent to 25.3 percent. State employers are relying more heavily on graduates from institutions outside Wyoming to fill nursing positions. In comparing Tables 2 and 3, it

(Text continued on page 4)

Table 1: Projected Demand for Registered Nurses and Average Hourly Wage (1999) by State, 1998-2008

State	Base Employment 1998	Projected Employment 2008	Annual Jobs Created	Total Percentage Change	Average Hourly Wage (1999)	Wage Rank
United States	2,073,000	2,523,250	79,240	21.7	\$21.38	
Alabama	30,000	37,300	1,230	24.3	\$18.65	41
Alaska	3,900	5,450	220	39.7	23.29	10
Arizona	28,400	38,000	1,430	33.8	20.84	18
Arkansas	20,200	28,050	1,120	38.9	18.40	43
California	172,100	221,200	8,160	28.5	26.00	2
<i>Colorado</i>	<i>27,450</i>	<i>34,750</i>	<i>1,180</i>	<i>26.6</i>	<i>21.01</i>	<i>15</i>
Connecticut	30,000	34,500	950	15.0	23.79	5
Delaware	6,250	7,800	260	24.8	20.88	17
Florida	118,650	151,200	5,220	27.4	20.36	22
Georgia	51,700	67,200	2,410	30.0	19.56	30
Hawaii	8,600	10,000	280	16.3	27.37	1
<i>Idaho</i>	<i>9,750</i>	<i>12,550</i>	<i>440</i>	<i>28.7</i>	<i>19.43</i>	<i>32</i>
Illinois	100,150	116,250	3,260	16.1	20.15	24
Indiana	46,300	57,250	1,860	23.7	18.98	36
Iowa	24,900	29,000	820	16.5	16.76	50
Kansas	23,000	29,450	1,020	28.0	18.44	42
Kentucky	31,600	38,650	1,230	22.3	19.32	34
Louisiana	32,700	38,500	1,120	17.7	20.27	23
Maine	11,750	14,400	460	22.6	19.46	31
Maryland	40,650	49,700	1,580	22.3	23.54	7
Massachusetts	73,950	84,400	2,270	14.1	23.66	6
Michigan	74,300	81,100	1,910	9.2	21.88	14
Minnesota	39,800	46,850	1,360	17.7	23.39	9
Mississippi	21,000	24,750	720	17.9	19.20	35
Missouri	49,350	57,200	1,600	15.9	18.92	37
<i>Montana</i>	<i>6,850</i>	<i>8,150</i>	<i>240</i>	<i>19.0</i>	<i>17.61</i>	<i>48</i>
<i>Nebraska</i>	<i>15,250</i>	<i>19,100</i>	<i>640</i>	<i>25.2</i>	<i>18.07</i>	<i>44</i>
Nevada	9,650	14,400	640	49.2	23.05	12
New Hampshire	10,700	13,800	490	29.0	18.89	38
New Jersey	72,150	84,800	2,460	17.5	24.46	3
New Mexico	10,700	13,900	500	29.9	19.34	33
New York	154,550	171,750	4,270	11.1	24.27	4
North Carolina	60,000	82,800	3,270	38.0	19.57	29
North Dakota	6,750	7,900	230	17.0	18.07	45
Ohio	100,350	119,850	3,610	19.4	19.69	28
Oklahoma	24,150	30,850	1,070	27.7	18.76	40
Oregon	22,850	25,250	560	10.5	22.45	13
Pennsylvania	106,100	130,250	4,170	22.8	20.92	16
Rhode Island	9,850	11,150	290	13.2	23.10	11
South Carolina	31,400	39,350	1,310	25.3	20.41	20
<i>South Dakota</i>	<i>7,900</i>	<i>9,650</i>	<i>310</i>	<i>22.2</i>	<i>17.89</i>	<i>47</i>
Tennessee	44,500	52,750	1,560	18.5	18.78	39
Texas	127,400	155,700	4,930	22.2	20.49	19
<i>Utah</i>	<i>14,450</i>	<i>21,100</i>	<i>900</i>	<i>46.0</i>	<i>20.41</i>	<i>21</i>
Vermont	5,250	6,350	200	21.0	19.81	26
Virginia	45,550	57,850	1,980	27.0	19.86	25
Washington	41,250	53,400	1,900	29.5	23.43	8
West Virginia	13,550	15,850	450	17.0	17.92	46
Wisconsin	42,400	50,950	1,560	20.2	19.74	27
Wyoming	3,758	4,234	48	12.7	17.06	49

Note: Italicized rows represent states bordering Wyoming.

Sources: Bureau of Labor Statistics and Employment and Training Administration.

Table 2: Graduates of Registered Nurse Programs from Wyoming Colleges, 1992-2001

Year of Graduation	Casper College	Central Wyoming College	Laramie County Community College	NWCCD*	Northwest College	University of Wyoming	Western Wyoming Community College	Total
1992	48	23	49	26	24	51	20	241
1993	43	29	71	45	24	54	21	287
1994	38	31	53	23	18	56	23	242
1995	45	16	38	39	23	52	19	232
1996	43	22	24	17	17	56	23	202
1997	32	24	27	26	22	50	16	197
1998	49	14	24	24	21	42	19	193
1999	43	13	17	23	22	39	16	173
2000	40	17	22	13	16	40	19	167
2001	38	10	38	22	23	30	13	174
Percentage Change**	-6.2%	-51.8%	-55.5%	-38.3%	-7.6%	-32.3%	-25.0%	-33.2%

* Northern Wyoming Community College District (NWCCD) includes Sheridan College and the NWCCD Gillette Campus.

** Percentage Change is the change from the first three-year (1992-1994) and last three-year (1999-2001) averages.

Source: Wyoming State Board of Nursing.

appears that the decline in the proportion of licenses issued to graduates from Wyoming schools is not entirely explained by the decline in the number of Wyoming graduates. In 1992-1994, 83.0 percent of Wyoming graduates were licensed in the State; by 1999-2001, only 69.8 percent were. The decline may be due to the increased demand for RNs elsewhere in the country. So, not only is Wyoming producing fewer RNs but a greater percentage of those we do produce do not become licensed in the State.

The importance of Wyoming colleges in providing a supply of nurses for the State is demonstrated by Table 4 (see page 6). Table 4 was created using the merged WSBN and Wage Records database and shows the number of individuals issued new licenses by their appearance in Wage Records.⁸ For example, of the 227 nursing graduates of Wyoming colleges who were issued a license in 1993 (1992Q4 to 1993Q3), 208 (91.6%) worked in Wyoming in all four quarters immediately following the license issue date. In contrast, of the 342 who graduated outside Wyoming, 211 (61.7%) were found

working in Wyoming. The WSBN⁹ suggests that there are several reasons why an individual would obtain a Wyoming license but not always work in Wyoming. For example, some may be circuit nurses who come to work in Wyoming on a temporary basis,¹⁰ or insurance company representatives employed in other states who review health insurance claims of clients residing in Wyoming.

Table 4 also presents data related to retention, defined as the number of those who start working in the first year following the license issue date who still appear in Wyoming Wage Records three years later. Of the 208 nursing graduates of Wyoming colleges who appeared in the first year of license issue, 183 (88.0%) were found working for employers in Wyoming three years later. In contrast, of the 211 who graduated outside Wyoming, only 135 (64.0%) were found working in the State three years later. Thus, in terms of retention, it appears advantageous for State health services firms to solicit nursing graduates of Wyoming educational institutions.

Table 3: Wyoming Registered Nurse Licenses by College and Year of Graduation, 1992-2001

Year of Graduation	Wyoming College Graduates						
	Casper College	Central Wyoming College	Laramie County Community College	NWCCD*	Northwest College	University of Wyoming	Western Wyoming Community College
1992	41	20	36	35	14	35	21
1993	46	29	56	28	15	37	16
1994	38	22	44	41	9	33	23
1995	40	23	29	15	17	45	19
1996	33	21	23	29	14	39	17
1997	26	18	18	13	12	38	15
1998	42	10	27	25	16	28	18
1999	37	11	18	12	16	20	10
2000	35	12	13	17	9	22	15
2001	40	10	21	6	10	13	12
Percentage Change**	-10.4%	-53.5%	-61.8%	-66.3%	-7.9%	-47.6%	-38.3%

Year of Graduation	Total Wyoming Graduates	Total Out-of-State Graduates	Total Graduates	Percentage Wyoming Graduates	Percentage Out-of-State Graduates
1992	202	287	489	41.3	58.7
1993	227	342	569	39.9	60.1
1994	210	386	596	35.2	64.8
1995	188	382	570	33.0	67.0
1996	176	268	444	39.6	60.4
1997	140	289	429	32.6	67.4
1998	166	290	456	36.4	63.6
1999	124	293	417	29.7	70.3
2000	123	341	464	26.5	73.5
2001	112	331	443	25.3	74.7
Percentage Change**	-43.8%	-4.9%	-20.0%	-30.0%	19.0%

* Northern Wyoming Community College District (NWCCD) includes Sheridan College and the NWCCD Gillette Campus.

** Percentage Change is the change from the first three-year (1992-1994) and last three-year (1999-2001) averages.

Source: Wyoming State Board of Nursing.

Summary

Research suggests that the nation is experiencing a nursing shortage and Wyoming is no exception. This article, part one of the series, examined the supply of RNs in Wyoming based on the number of nursing graduates and licenses issued. Our analysis indicates that from 1998 to 2008 the demand for RNs is projected to grow 21.7 percent

nationally and 12.7 percent in Wyoming. Furthermore, the number of graduates from Wyoming's RN degree programs has declined 33.2 percent. Not only are there fewer graduates but fewer Wyoming graduates are obtaining a Wyoming license (69.8% in 1999-2001 compared to 83.0% in 1992-1994). However, even though numbers are down, turnover data indicate that Wyoming graduates are more likely to remain in

Table 4: New Wyoming Registered Nurse Licenses and Wyoming Retention for Wyoming and Out-of-State Graduates, 1993-2000

	License Issue Date	New Licenses Issued	One-year Retention	One-Year Retention Rate	Three-Year Retention	Three-Year Retention Rate
Graduates of Wyoming Colleges	1993	227	208	91.6	183	88.0
	1994	210	194	92.4	153	78.9
	1995	188	174	92.6	145	83.3
	1996	176	154	87.5	127	82.5
	1997	140	126	90.0	101	80.2
	1998	166	155	93.4	132	85.2
	1999	124	116	93.5	87	N/A*
	2000	123	114	92.7	N/A	N/A
Graduates of Out-of-State Colleges	1993	342	211	61.7	135	64.0
	1994	386	258	66.8	169	65.5
	1995	382	255	66.8	141	55.3
	1996	268	183	68.3	100	54.6
	1997	269	207	77.0	119	57.5
	1998	290	211	72.8	114	54.0
	1999	293	206	70.3	103	N/A
	2000	341	221	64.8	N/A	N/A

* Data not available for three-year analysis.

Sources: Wyoming State Board of Nursing and Research & Planning.

Wyoming than out-of-state graduates. One implication of this research is efforts that increase the number of Wyoming nursing graduates will increase the pool of RNs willing and able to remain in the State.

¹U.S. General Accounting Office, "Nursing Workforce: Emerging Nurse Shortages Due to Multiple Factors," **GAO Report GAO-01-944**, July 10, 2001, <<http://www.gao.gov>> (September 10, 2002).

²The health services industry is defined as firms in Standard Industrial Classification (SIC) 80. It includes offices and clinics of health practitioners, nursing care facilities, hospitals, medical/dental laboratories, and home health care services.

³Wyoming Department of Employment, Research & Planning, Customized Staffing Patterns and Wages, July 2001, <<http://LMI.state.wy.us/staffing/Staffing.htm>> (September 3, 2002).

⁴U.S. Department of Labor, Bureau of Labor Statistics, Wages by Area and Occupation, November 28, 2001, <<http://stats.bls.gov/bls/blswage.htm>> (August 13, 2002). U.S. Department of Labor,

Employment and Training Administration, State Occupational Projections 1998-2008, n.d., <<http://almis.dws.state.ut.us/occ/projhome.asp>> (August 13, 2002).

⁵Wage Records is an administrative database. Each employer in the State that has employees covered under Unemployment Insurance, by law, must submit quarterly tax reports to the State showing each employee's Social Security Number and wages earned. For more information, see Wayne M. Gosar, "Insurance Wage Record Summary: A New Way to Look at Wyoming," **Wyoming Labor Force Trends**, May 1995, pp. 4-8.

⁶Graduate data supplied by the Wyoming State Board of Nursing (WSBN) on August 6, 2002. Initially the draft of this article used data on the number of graduates provided by the Directors of Institutional Research for the corresponding colleges. Using the WBSN data did not materially affect the conclusion or observations in the final report.

⁷Tables 1 to 4 are based on a calendar school year.

⁸The Wage Records database does not reflect Federal employment. Therefore, some Wyoming nursing

graduates who were issued licenses are unaccounted for because they are or were employed by the Federal Government.

¹⁰The wages of temporary workers are included in the Wage Records database.

⁹Wyoming State Board of Nursing, Meeting, February 26, 2002.



Nursing in Wyoming, Part Two: Turnover

by: **Tony Glover, Senior Research Analyst**

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“Health care related industries have a a low turnover rate when compared to the overall turnover rate in Wyoming.”

In response to reports by the U.S. General Accounting Office (GAO) of a nationwide nursing shortage,¹ Research & Planning (R&P) began examining Wyoming’s position in terms of the State’s supply of Registered Nurses (RNs),² as well as our current and future demand. R&P’s findings appear as a three-part series in ***Wyoming Labor Force Trends***. Part One, featured in the September 2002 issue, focused on the supply of RNs based on the number of nursing graduates and licenses issued. This article, ***Part Two***, looks at factors that will likely affect the future demand for RNs in the State.

The GAO report suggests that the national nursing shortage is spurred by four issues:

- Aging of the nursing population
- Diversification of the health services industry
- Working conditions
- Growth in the number of care recipients

R&P found that these same issues are also affecting the supply of RNs in Wyoming. Table 1 (see page 8) shows the number of RNs working, the average quarterly wage, and the average age of those working in Wyoming’s labor force by

industry for selected years between 1992 and 2000. The average age of RNs working in Wyoming has increased over the past decade from 40.2 years to 44.5. This finding coincides with data collected by the GAO which states that, “the nurse workforce will continue to age, and, by 2010, approximately 40 percent will likely be older than 50.”³ As with the national trend, the aging and pending retirements of Wyoming’s nursing workforce will further increase the demand for RNs over the next decade.

Another factor discussed by the GAO report is the diversification of the health care industry as a result of technological advances. This factor creates an increasing demand for RNs outside a hospital setting because patients who were once cared for in hospitals are now more often accommodated in outpatient clinics and physicians’ offices. Additionally, technology has expanded the treatment of medically complex conditions (e.g., organ transplants and serious illnesses). These conditions generally require more intensive services and a larger, more specialized staff of doctors and nurses. The data in Table 1 demonstrates that there has been growth in the number of RNs, thus suggesting

Table 1: Wyoming Registered Nurses Licensed in the State by Primary Industry,* Average Quarterly Wage, and Average Age, 1992, 1995, 1998, 1999, and 2000

Industry by SIC**	Variable	1992	1995	1998	1999	2000
Hospitals	Number	1,349	1,833	2,003	2,152	2,224
	Average Quarterly Wage	\$7,264	\$8,097	\$9,426	\$9,554	\$10,073
	Average Age	39.0	40.3	41.5	41.9	42.4
Nursing Care Facilities	Number	164	352	348	326	292
	Average Quarterly Wage	\$6,361	\$6,670	\$7,554	\$8,006	\$8,606
	Average Age	41.0	39.5	41.6	43.3	44.5
Offices and Clinics	Number	186	283	366	417	442
	Average Quarterly Wage	\$5,237	\$5,878	\$6,597	\$6,782	\$7,298
	Average Age	41.7	43.1	43.4	43.9	44.4
Balance of Health Services	Number	45	117	183	133	117
	Average Quarterly Wage	\$7,400	\$7,755	\$7,762	\$7,599	\$8,091
	Average Age	41.4	41.2	41.3	41.7	42.7
Educational Services	Number	199	220	252	258	271
	Average Quarterly Wage	\$6,107	\$6,662	\$7,228	\$7,565	\$7,620
	Average Age	44.0	45.6	47.6	48.1	48.4
Social Services	Number	32	52	76	79	77
	Average Quarterly Wage	\$4,823	\$6,369	\$6,265	\$6,875	\$6,985
	Average Age	44.7	43.2	45.6	46.7	47.1
Public Administration	Number	177	251	271	268	284
	Average Quarterly Wage	\$6,688	\$7,175	\$7,739	\$8,493	\$8,769
	Average Age	42.3	43.7	46.0	46.4	47.5
Balance All Other Industries	Number	69	101	126	143	166
	Average Quarterly Wage	\$5,687	\$7,266	\$6,785	\$6,830	\$7,602
	Average Age	38.9	43.0	44.1	45.0	46.0
Total	Number	2,221	3,209	3,625	3,776	3,873
	Average Quarterly Wage	\$6,817	\$7,527	\$8,458	\$8,717	\$9,183
	Average Age	40.2	41.2	42.6	43.2	43.8

*The industry which paid the individual the largest portion of wages during the year.

**Industries are grouped by the following 2- and 3-digit Standard Industrial Classification (SIC) codes: Hospitals (SIC 806), Nursing Care Facilities (SIC 805), Offices and Clinics of Physicians and Other Health Practitioners (SIC 801-804), Balance of Health Services (SIC 807-809), Educational Services (SIC 82), Social Services (SIC 83), and Public Administration (SIC 943). The industries include both public and private entities.

Source: Wyoming State Board of Nursing database combined with Wyoming's Wage Records.

diversification in Wyoming. However, growth is varied across health care industries. For example, the number of RNs working in hospital settings has increased to 2,224 in 2000 from 1,349 in 1992 (64.9%). The number of RNs working in offices and clinics has increased to 442 in 2000 from 186 in 1992 (137.6%). Though the increase in the actual number of RNs working in offices and clinics seems small, the percentage job growth for clinic-based RNs was twice as fast as for RNs working in hospitals.

Table 1 also shows that in 2000, the highest paid RNs in Wyoming's labor force worked in hospitals earning an average quarterly wage of \$10,073. The lowest paid worked in offices and clinics at \$7,298 per quarter. However, the wage difference is likely attributable to the working conditions. The wages of RNs working in hospitals may reflect compensation for shift work, scheduled overtime, and working in an occupation that is often cited as lacking respect and recognition.⁴ These factors, which may lessen the appeal of the

occupation, likely contribute to the enrollment decline in college nursing programs.⁵

Transitions

R&P has been working with several other states to adopt a consensus on common definitions relating to turnover. This project is leading to the development of comparable data across these states, using the administrative databases collected for Unemployment Insurance tax purposes. The methodology is beyond the scope of this article, but is discussed in "Turnover Analyses; Definitions, Process, and Quantification."⁶ For an example of how New Mexico utilizes comparable data, see page 11. Table 2 presents the annual turnover rates by industry from 1992 to 2000. The rows in bold reflect RNs with active licenses within each industry. Table 2 indicates that the health care related industries have a low turnover rate (17.6% in 2000) when compared to the overall turnover rate in Wyoming (24.5% in 2000). This disputes the common assumption that turnover is relatively high in the health care industries. Further, Table 2 demonstrates that RNs in hospitals have even lower relative turnover rates (6.6% for hospital RNs compared to 11.6% for all RNs). Higher pay in hospitals may be reducing turnover among RNs in this industry.

Exiting and entering behavior offers a useful way to examine

Table 2: Turnover* Rates in Wyoming by Year and Industry, 1992, 1995, 1998, 1999, and 2000

Industry	1992	1995	1998	1999	2000
Agriculture	32.1	32.1	32.1	32.8	31.2
Mining	17.5	19.0	20.9	21.1	20.8
Construction	34.0	34.2	33.6	34.2	32.7
Manufacturing	18.6	17.6	17.4	19.1	19.9
TCPU**	17.3	15.8	17.6	18.0	16.5
Wholesale Trade	15.3	16.9	18.1	18.2	17.0
Retail Trade	26.8	28.1	31.4	31.4	30.1
FIRE***	13.9	14.3	16.3	16.6	16.5
Services	22.4	23.0	24.2	24.8	24.5
Hotels & Other Lodging Places	37.8	38.0	39.1	38.6	40.1
Personal Services	28.3	26.4	25.8	27.6	27.2
Business Services	39.7	39.8	42.2	40.7	40.8
Auto Repair, Services & Parking	24.4	25.7	25.9	26.5	24.3
Miscellaneous Repair Service	20.1	21.8	23.3	22.4	22.4
Motion Pictures	27.5	29.0	28.5	31.6	26.1
Amusement & Recreation Services	37.5	38.8	39.1	37.3	37.3
Health Services	14.6	17.0	18.3	23.7	17.6
Registered Nurses	15.6	14.2	20.2	23.5	18.3
Offices and Clinics	14.5	21.8	17.5	19.6	17.0
Registered Nurses	17.8	17.4	18.9	19.1	17.1
Nursing Care Facilities	19.8	19.6	25.8	23.6	28.4
Registered Nurses	11.5	14.2	18.4	16.1	21.2
Hospitals	12.3	9.5	9.8	12.5	10.5
Registered Nurses	7.8	5.5	6.6	8.6	6.6
Legal Services	13.8	16.4	16.3	16.6	17.3
Educational Services	13.8	14.1	15.2	15.0	15.0
Registered Nurses	13.2	14.3	14.7	16.4	14.3
Social Services	19.8	20.6	20.8	22.1	22.4
Registered Nurses	12.5	16.8	16.2	14.7	14.5
Museums & Botanical Gardens	28.5	25.7	24.2	22.8	22.0
Membership Organizations	24.8	25.7	25.8	26.0	26.7
Engineering & Management Services	21.2	19.6	20.8	25.2	23.0
Private Households	25.9	24.0	23.7	25.3	25.0
Services, Not Elsewhere Classified	15.5	15.7	17.8	16.1	18.8
Public Administration	15.1	12.2	13.7	12.9	14.1
Registered Nurses	9.4	8.2	8.8	8.0	10.0
Registered Nurses in Industries Other than Services and Public Administration	31.1	25.5	31.7	31.2	28.8
All Industries	22.4	23.0	24.5	25.0	24.5
All Registered Nurses	11.0	9.9	12.1	12.9	11.6

*Turnover is defined as the number of exiting transactions divided by the total number of transactions.

**Transportation, Communications, & Public Utilities.

***Finance, Insurance, & Real Estate.

labor market activity. Tables 3 and 4 (see below and page 11) show the number of RNs exiting (Table 3) and entering (Table 4) their primary industries. The primary industry is the industry which constitutes the largest portion of an individual's income. There were 2,152 RNs employed by hospitals (their primary industry) in 1999 (see Table 1, page 8). Based on Table 3, we know that 283 (13.2%) of these individuals left this

industry by the end of 1999. Further, we know that 375 of the 2,152 (17.4%) RNs employed by hospitals in 1999 came from some other industry or state in 1998 (see Table 4). This represents a gross churning of 29.6 percent.⁷

The average age of both the RNs exiting (41.5) and those entering (40.7) in 1999 was lower than the overall average age of all RNs

Table 3: Gross Exits of Registered Nurses Licensed in Wyoming by Primary Industry,* Average Quarterly Wage, and Average Age, 1992, 1995, 1998, 1999, and 2000

Industry by SIC**	Variable	1992	1995	1998	1999	2000
Hospitals	Number	106	211	257	283	287
	Average Quarterly Wage	\$4,964	\$6,604	\$7,280	\$7,529	\$8,270
	Average Age	37.4	38.2	39.6	39.2	40.8
Nursing Care Facilities	Number	48	91	127	114	75
	Average Quarterly Wage	\$6,093	\$5,347	\$7,281	\$7,748	\$7,532
	Average Age	41.5	36.4	38.3	42.8	42.1
Offices and Clinics	Number	50	72	85	104	107
	Average Quarterly Wage	\$4,883	\$4,600	\$7,112	\$6,216	\$6,344
	Average Age	39.0	43.1	42.0	42.5	44.1
Balance Health Services	Number	21	39	99	56	38
	Average Quarterly Wage	\$8,713	\$6,180	\$7,516	\$6,639	\$6,430
	Average Age	39.7	40.9	41.3	41.9	40.9
Educational Services	Number	23	21	35	33	48
	Average Quarterly Wage	\$4,324	\$4,087	\$5,471	\$6,388	\$5,675
	Average Age	39.8	41.0	46.5	46.9	45.7
Social Services	Number	7	15	16	21	18
	Average Quarterly Wage	\$3,641	\$5,292	\$4,857	\$6,424	\$7,202
	Average Age	41.0	39.4	43.8	45.9	44.7
Public Administration	Number	28	38	40	32	33
	Average Quarterly Wage	\$6,174	\$5,329	\$7,058	\$6,811	\$7,905
	Average Age	41.9	42.1	46.2	41.4	47.2
Balance All Other Industries	Number	34	47	46	52	71
	Average Quarterly Wage	\$4,725	\$7,409	\$5,884	\$5,974	\$6,398
	Average Age	36.6	41.2	40.5	44.0	44.1
Total Exits	Number	317	534	705	695	677
	Average Quarterly Wage	\$5,459	\$5,959	\$7,051	\$7,089	\$7,393
	Average Age	39.0	39.4	40.7	41.5	42.6

*The industry which paid the individual the largest portion of wages during the year.

**Industries are grouped by the following 2- and 3-digit Standard Industrial Classification (SIC) codes: Hospitals (SIC 806), Nursing Care Facilities (SIC 805), Offices and Clinics of Physicians and Other Health Practitioners (SIC -804), Balance of Health Services (SIC 807-809), Educational Services (SIC 82), Social Services (SIC 83), and Public Administration (SIC 943). The industries include both public and private entities.

Source: Wyoming State Board of Nursing database combined with Wyoming's Wage Records.

Table 4: Gross Entries of Registered Nurses Licensed in Wyoming by Primary Industry,* Average Quarterly Wage, and Average Age, 1993, 1995, 1998, 1999, and 2000

Industry by SIC**	Variable	1993	1995	1998	1999	2000
Hospitals	Number	288	230	266	375	310
	Average Quarterly Wage	\$6,102	\$6,078	\$6,855	\$8,426	\$8,257
	Average Age	37.3	37.4	37.4	38.4	38.3
Nursing Care Facilities	Number	67	100	66	90	74
	Average Quarterly Wage	\$4,916	\$5,028	\$6,122	\$7,274	\$7,780
	Average Age	37.6	35.5	40.2	42.3	45.3
Offices and Clinics	Number	49	105	118	134	125
	Average Quarterly Wage	\$4,274	\$4,866	\$5,766	\$6,662	\$7,123
	Average Age	36.9	42.1	40.9	42.3	42.3
Balance Health Services	Number	46	40	51	49	37
	Average Quarterly Wage	\$8,567	\$6,141	\$5,943	\$6,388	\$7,018
	Average Age	41.3	38.6	39.5	40.4	44.1
Educational Services	Number	35	31	43	41	46
	Average Quarterly Wage	\$3,735	\$4,013	\$4,840	\$5,046	\$4,946
	Average Age	39.0	40.6	44.7	44.6	43.7
Social Services	Number	14	23	27	19	18
	Average Quarterly Wage	\$5,631	\$6,168	\$6,115	\$5,908	\$6,760
	Average Age	42.0	40.8	42.0	45.5	45.4
Public Administration	Number	35	53	54	36	46
	Average Quarterly Wage	\$5,168	\$5,874	\$6,486	\$7,592	\$7,199
	Average Age	41.5	39.1	42.9	43.1	44.5
Balance All Other Industries	Number	45	34	48	58	73
	Average Quarterly Wage	\$3,873	\$6,524	\$6,451	\$5,121	\$7,387
	Average Age	38.8	38.4	41.7	43.2	45.6
Total Entries	Number	579	616	673	802	729
	Average Quarterly Wage	\$5,655	\$5,626	\$6,292	\$7,404	\$7,551
	Average Age	38.2	38.4	39.8	40.7	41.6

*The industry which paid the individual the largest portion of wages during the year.

**Industries are grouped by the following 2- and 3-digit Standard Industrial Classification (SIC) codes: Hospitals (SIC 806), Nursing Care Facilities (SIC 805), Offices and Clinics of Physicians and Other Health Practitioners (SIC 801-804), Balance of Health Services (SIC 807-809), Educational Services (SIC 82), Social Services (SIC 83), and Public Administration (SIC 943). The industries include both public and private entities.

Source: Wyoming State Board of Nursing database combined with Wyoming's Wage Records.

employed (43.2). Tables 3 and 4 give insight into the churning (exits and entries) of RNs occurring within Wyoming. They do not, however, provide information as to the origin of the RNs entering Wyoming or the destination of RNs who leave. Part three of this series will focus on where Wyoming's RNs are coming from and where they are going after leaving employment in the State.

Summary

Research indicates that the four factors influencing the nation's supply of nurses (i.e., the aging of the nursing population, diversification of the health services industry, working conditions, and growth in the number of care recipients) are also affecting the supply of RNs in Wyoming. The

average age of RNs working in Wyoming has increased over the past decade from 40.2 years to 44.5, moving them closer to retirement. Diversification within the health services industry and more care recipients may have led to increases in both the percentage of RNs employed by hospitals (64.9%) and those working in offices and clinics (137.6%). Unfortunately, the lower pay associated with working in offices and clinics and the working conditions experienced by RNs employed by hospitals may have lessened the appeal of the nursing profession, thus reducing enrollment in college nursing programs. The relatively low turnover rate of RNs in Wyoming indicates a measure of stability in terms of the current supply of nurses. However, unless efforts are made to improve working conditions and encourage enrollment in nursing programs, Wyoming's supply of RNs may not meet future demand.

¹U.S. General Accounting Office, "Nursing Workforce: Emerging Nurse Shortages Due to Multiple Factors," **GAO Report GAO-01-944**, July 10, 2001, <<http://www.gao.gov>> (September 10, 2002).

²The shortage of nursing-related health care practitioners is not limited to Registered Nurses (RNs)

but also includes many of the support occupations such as Licensed Practical Nurses (LPNs) and Certified Nursing Assistants (CNAs). Due to time constraints and difficulties associated with occupational analysis, this article series focuses on RNs who were issued licenses in the State of Wyoming during the past decade.

³U.S. General Accounting Office, "Nursing Workforce: Emerging Nurse Shortages Due to Multiple Factors," **GAO Report GAO-01-944**, July 10, 2001, <<http://www.gao.gov>> (September 10, 2002).

⁴U.S. General Accounting Office, "Nursing Workforce: Multiple Factors Create Nurse Recruitment and Retention Problems," **GAO Report GAO-01-912T**, June 27, 2001, <<http://www.gao.gov>> (September 26, 2002).

⁵U.S. General Accounting Office, "Nursing Workforce: Emerging Nurse Shortages Due to Multiple Factors," **GAO Report GAO-01-944**, July 10, 2001, <<http://www.gao.gov>> (September 10, 2002). See also Tony Glover, "Nursing in Wyoming, Part One: Supply and Retention," **Wyoming Labor Force Trends**, September 2002, pp. 9-15.

⁶Tony Glover, "Turnover Analyses; Definitions, Process, and Quantification," Working paper distributed to multi-state turnover group, Wyoming Department of Employment, Research & Planning, Casper, WY, December 2001.

⁷The formula for determining gross churning of Registered Nurses (RNs) is $([\text{exits} + \text{entries}] / \text{total number of RNs}) * 100$.



Nursing in Wyoming, Part Three: Net Flow of Employment by: Tony Glover, Senior Research Analyst

Article originally published in the April 2003 issue of *Wyoming Labor Force Trends*.

"While the net flow still shows more RNs entering Wyoming than leaving, it appears that within the next few years these trends will converge with the number of exits equaling the number of entries."

In Part Three of our "Nursing in Wyoming" series,¹ we explore two issues related to the flow of Registered Nurses (RNs) inside and outside of Wyoming's labor market. First, we demonstrate the flow of labor by focusing on RNs working in

Wyoming hospitals in 1999. We attempt to answer the questions, Where did they come from? and Where did they go? Section I uses data from our Interstate Wage Records² database. Section II returns our focus to all RNs working in Wyoming over

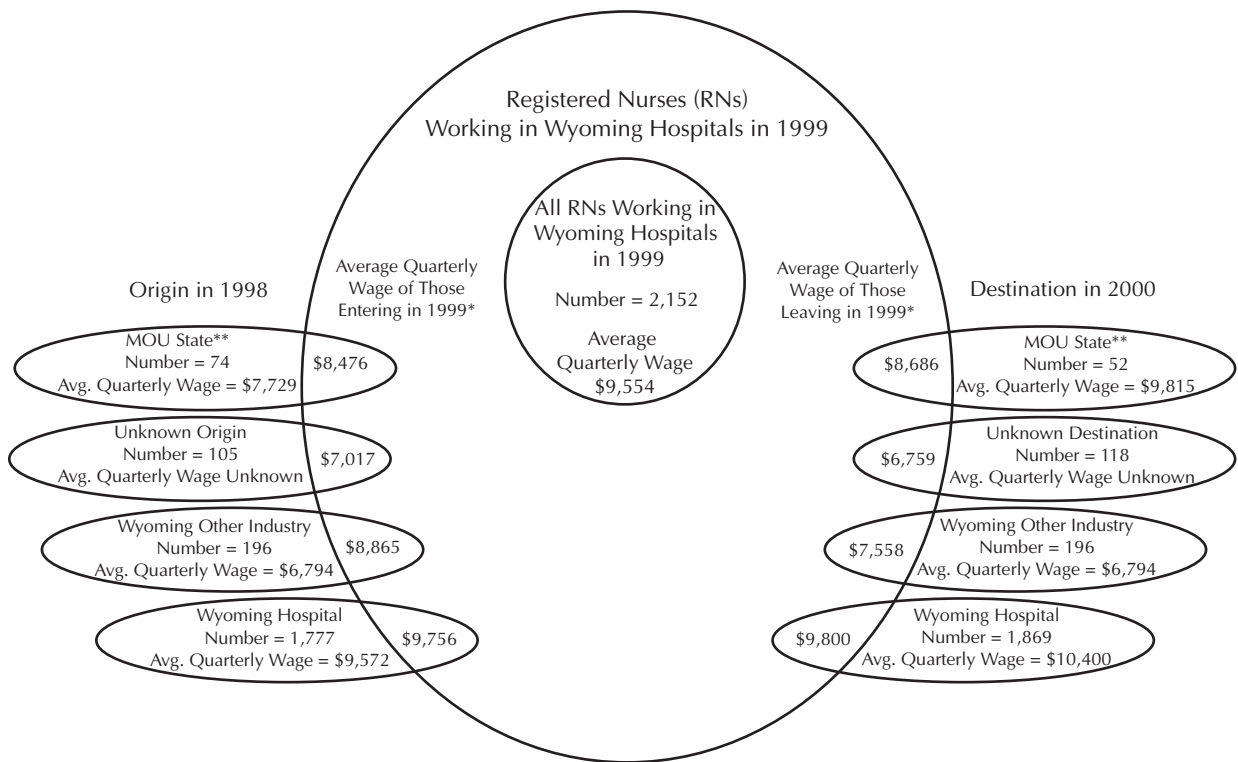
the past decade. It demonstrates that due to a decrease of new RNs entering and an increase in those leaving our labor market, Wyoming could soon face a statewide nursing shortage.

Section I

Figure 1³ was created by first restricting our analysis to the 2,152 RNs who worked in Wyoming hospitals (SIC 806)⁴ in 1999. We then determined their state and industry origin in 1998 and, likewise, their labor market destination in 2000. In 1999, 375 RNs began working in Wyoming hospitals. Of these, 74 (19.7%) had an origin in one of the seven states⁵ with which Wyoming has a data sharing

agreement. In this analysis, the seven states are referred to as Memorandum of Understanding (MOU) states. Those entering Wyoming from MOU states increased their average quarterly wage from \$7,729 in 1998 to \$8,476 in 1999. Conversely, from 1999 to 2000, we see that 52 RNs left employment in Wyoming hospitals for employment in one of our MOU states and increased their average quarterly wage from \$8,686 in 1999 to \$9,815 in 2000. The majority of RNs entering employment in Wyoming hospitals from another state in 1999 were classified as “unknown origin.” Similarly, a majority of those leaving the state were not found in MOU states and are identified as “unknown destination.” These workers remain an

Figure 1: Origin, Destination, and Average Quarterly Wage of Registered Nurses Working in Wyoming Hospitals in 1999



*RNs entering are not necessarily the same RNs leaving.
**States with which Wyoming has data sharing agreements.

enigma that may be cleared up with cooperation of additional states (i.e., Montana and California). However, we do know that those who leave tend to have more nursing experience.⁶

The largest group (52.3%) of RNs entering the hospital industry in 1999 worked in another Wyoming industry in 1998. This group is dominated by RNs with three or more years of experience who have transitioned from other health care industries, particularly nursing care facilities and offices & clinics.⁷ Furthermore, a sizeable portion (39.9%) of those leaving hospital employment in 2000 had a destination of another industry within Wyoming in 2000.

Section II

In this section we expand our analysis to all licensed RNs working in all Wyoming industries from 1993 to 2000. We also shift our focus to those either entering Wyoming’s labor market as an RN for the first time or permanently exiting Wyoming employment. A first time entry is comprised of two types of individuals. The first group are those who have worked in Wyoming in the past but appear for the first time in Wage Records as RNs after gaining a nursing license. Second are individuals who have never before appeared in Wage Records and enter Wyoming’s labor market as an RN. A permanent exit is an RN who has worked in Wyoming as an RN, but whose employment never again appears in Wage Records.

Table 1 and Figure 2 show the first time entries, permanent exits, and the net flow of RNs who entered and left employment in Wyoming during the last decade. Specifically, Table 1 shows licensed RNs who appeared in Wage records for the first time in the given year (i.e., either relocated to Wyoming or became a licensed RN),

licensed RNs who appear to have permanently exited Wyoming’s labor force, and the net flow (defined as initial entries minus permanent exits).

Table 1 indicates that the number of entries of RNs in the state from 1993 to 2000 has gradually declined, while the number of RNs leaving the state has steadily increased. While the net flow still shows more RNs entering than leaving, it appears that within the next few years these trends will converge with the number of exits equaling the number of entries. As discussed in Part One of this series,⁸ from 1998 to 2008 the number of RNs is expected to increase approximately 13 percent, requiring an average of 48 new RN positions per year. The national RN shortage will continue to impact Wyoming, due to decreasing supply and an increase in projected demand.

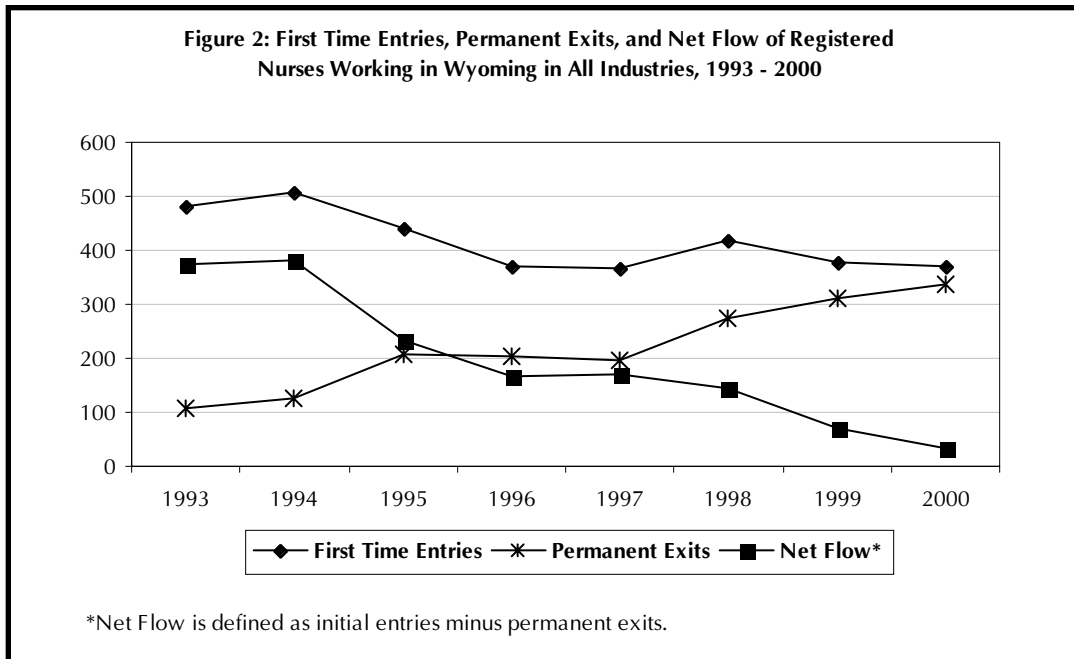
Conclusions

The findings suggest that Wyoming’s nursing shortage is likely to worsen due to multiple factors. Declining nursing program

Table 1: First Time Entries, Permanent Exits, and Net Flow of Registered Nurses Working in Wyoming in All Industries, 1993-2000

Year	First Time Entries	Permanent Exits	Net Flow*
1993	483	109	374
1994	508	125	383
1995	442	208	234
1996	372	205	167
1997	368	197	171
1998	417	273	144
1999	379	310	69
2000	371	337	34

*Net Flow is defined as initial entries minus permanent exits.



enrollments nationwide and, specifically, the decline in the number of graduates with RN degrees from Wyoming-based institutions mean that fewer new RNs will enter Wyoming's workforce. Meanwhile, the increased demand for RNs throughout the country and vacancies due to retirements will make it more difficult to retain RNs in Wyoming. These trends are further supported by Section II of this article, which shows a decline in the number of RNs entering Wyoming and an increase in the number leaving the state over the last decade. If current trends continue, more Wyoming RNs will leave than enter Wyoming employment.

While this series only serves as a beginning, our intention is to demonstrate the power of using administrative databases to explore a current labor market issue. In sum, the findings support many of the conclusions of a General Accounting Office (GAO) report⁹ and extend the analysis using several methods developed by Research & Planning.

Supply and Retention," *Wyoming Labor Force Trends*, September 2002, pp. 9-15 and "Nursing in Wyoming, Part Two: Turnover," *Trends*, October 2002, pp. 1-7.

²Wage Records is an administrative database. Each employer in the state that has employees covered under Unemployment Insurance, by law, must submit quarterly tax reports to the state showing each employee's Social Security Number and wages earned. Wage Records does not include employees of federal hospitals.

³Figure 1 of this article summarizes data from a much more detailed table in "Nursing: Supply Shortage or Retention Issue?" available on our website at <<http://doe.state.wy.us/LMI/staff=/RNsWy.pdf>>. The detailed table includes data on prior industry of employment as well as the experience level of the Registered Nurses.

⁴Standard Industrial Classification (SIC) 806 includes medical and surgical hospitals, psychiatric hospitals, and other speciality hospitals providing extensive medical treatment and continuous nursing services.

⁵The other states used in this analysis are Colorado, Idaho, Nebraska, New Mexico, South Dakota, Texas, and Utah.

¹Tony Glover, "Nursing in Wyoming, Part One:

⁶Experience is documented in the article "Nursing:

Supply Shortage or Retention Issue?” at <http://doe.state.wy.us/LMI/staff/RNsWy.pdf>.

⁷Standard Industrial Classification (SIC) codes 801 through 805. These include offices and clinics of doctors of medicine and osteopathy; offices and clinics of dentists, chiropractors, optometrists, podiatrists, and other health practitioners; and nursing and personal care facilities.

⁸Tony Glover, “Nursing in Wyoming, Part One: Supply and Retention,” *Wyoming Labor Force Trends*, September 2002, pp. 9-15.

⁹U.S. General Accounting Office, “Nursing Workforce: Emerging Nurse Shortages Due to Multiple Factors,” *GAO Report GAO-01-944*, July 10, 2001, <http://www.gao.gov> (September 10, 2002).

