Who are temporary nurses?

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Introduction and summary

Health care organizations have faced increasing pressure to reduce costs over the past few decades. In the early 1980s, Congress passed legislation to reimburse hospitals' Medicare claims for certain services based on fixed prices by diagnosis rather than for the full cost of treating each patient, providing an incentive for hospitals to reduce their treatment costs (Anderson and Wootton, 1991; and Bellemore, 1998). In 1997, this payment structure was expanded to include nonacute treatment, such as home health care (McClellan, 2000). At the same time, there has been a rapid increase in the proportion of Americans who are enrolled in managed care health insurance plans,[1] which oversee treatment decisions to control health care consumption and bargain aggressively on price with health care providers (Cutler, McClellan, and Newhouse, 2000).[2]

In view of the fact that labor costs represent approximately 40 percent of receipts for medical facilities,[3] these changes might be expected to put additional pressure on health care organizations to restructure their staffing patterns, including those for registered nurses, known as RNs (Buerhaus and Staiger, 1999). For hospitals, RNs represent 27.2 percent of employment and 35.7 percent of payroll.[4] Just as the health care industry faces the need to reduce labor costs, it also must serve the aging U.S. population, which is likely to increase the demand for various kinds of health care services. How to efficiently maintain the appropriate nurse staffing levels is one of the most important issues for today's health care industry. One way health care organizations can gain some flexibility in their staffing is by hiring temporary nurses.

Temporary employment is widely considered to add flexibility to firms' staffing in various industries, allowing them to accommodate temporary increases and decreases in their business activities. By using temporary employment arrangements, firms can meet a surge in demand, and when a downturn comes, they can reduce temporary workers without making costly adjustment to their permanent employment levels (Segal and Sullivan, 1997; Houseman, 2001; and Ono and Zelenev, 2003). Although temp RNs are generally paid more than permanent nurses, by hiring temps, health care organizations can gain this flexibility without having to increase wages for all existing permanent nurses.

While demand for health care is relatively stable compared with the fluctuations in the overall economy (see appendix, table A1.1, p. 11), nurse staffing flexibility is important, since it has direct implications for the quality of care provided. A significant body of research suggests that appropriate nurse staffing is an important factor in improving the efficiency and productivity of health care. The Agency for Healthcare Research and Quality finds that lower nurse staffing levels are associated with higher rates of poor patient outcomes, such as pneumonia, shock, cardiac arrest, and urinary tract infection (Agency for Healthcare Research and Quality, 2004). Responding to this, California enacted legislation mandating hospitals to maintain certain nurse-to-patient ratios, and several other states are considering such measures. Others have pointed out the importance of adjusting staffing levels based on various factors, including patient need and fluctuations, staff skill mix, nursing unit layout, type of hospital, technology availability, and patient turnover. Maintaining an appropriate staffing

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level is a challenge. Up to now, the use of temps in the health care industry has been lower than in the overall economy;[5] however, some evidence suggests that it is increasing rapidly. Indeed, total health care temporary staffing revenue tripled between 1993 and 2002 (Staffing Industry Analysts Inc., 2005).

Despite the acknowledged importance of temporary nurses, the characteristics of temporary nurses and the nature of their labor markets are not well documented. Relevant work focuses on the role of compensation in the decision of nurses to work through agencies, using cross-sectional data from the 1990 *Biennial Survey of Illinois Registered Nurses* (Bellemore, 1998) or the nature of hospitals' decisions to hire temps (Houseman, Kalleberg, and Erickcek, 2003).

In this article, we use the data from the *National Sample Survey of Registered Nurses* (NSSRN) to compare the characteristics of temporary and permanent RNs. We also compare our findings for the nursing profession with characteristics of temporary and permanent workers in other occupations. Finally, we look at the role of geography in an RN's decision to become a temporary worker. In particular, we examine how the size of a local market is associated with the likelihood that an RN chooses temporary work.

Registered nurses and the temporary help service industry

Many health care organizations rely on health care staffing companies for temporary nurses. More than half of total health care staffing revenue is generated through the placement of nurses (Staffing Industry Analysts Inc., 2005).

Temporary RNs hired through staffing agencies are broadly categorized as per diem nurses and travel nurses. Per diem nurses work wherever they are needed on a given day, responding to last-minute requests, such as filling in for sick nurses. Some per diem assignments may last for weeks, for example, to substitute for permanent nurses on vacation or maternity leave.[6] The agencies typically provide benefits if the hours exceed a certain amount. Unlike per diem nurses, travel nurses are assigned for 13 weeks to a certain hospital or health care organization. This is the industry's standard arrangement, although the assignments may be extended. The staffing agencies typically provide benefits, as well as an allowance for moving and housing. The agencies also reimburse nurses for their cost of obtaining a new state license.

Unlike employees in occupations that typically hire temporary workers, such as cleaning services and data entry, RNs are highly skilled. They hold one of three postsecondary nursing degrees: an associate's degree, earned in two years at a community college; a diploma degree, earned in three years at a hospital-sponsored nursing school; or a bachelor's degree, earned in four years at a university or college.[7] To obtain a nursing license, applicants must graduate from an accredited nursing program, meet state specific requirements, and pass the National Council Licensure Exam (NCLEX). Among high-skilled temps, RN representation is high, and this is reflected in the pay scale.[8] Table A1.2 in the appendix (p. 11) shows the predominant occupations in the temporary help service industry (Kilcoyne, 2005). Temp RN is the most dominant occupation with a mean wage over $20 per hour. Other occupations with the highest representation tend to be low-skilled ones, including laborers and freight, stock, and material movers (18.5 percent), office clerks (5.4 percent), and packers and packagers (4.5 percent). In fact, temp RNs are paid higher hourly wages than permanent nurses, which is not usually the case for temporary workers in other sectors.[9]

Data

We analyze data on registered nurses from the 1980, 1984, 1988, 1992, 1996, and 2000 versions of the *National Sample Survey of Registered Nurses*.[10] The NSSRN surveys between 1 percent and 15 percent of the nurses registered with each state's Board of Nursing.[11] We focus on RNs working in a nursing-related field[12] in the contiguous U.S. at the time of the survey, which yields about 24,000 observations per year (approximately 146,000 overall). Our data set, which is a series of survey year cross sections, does not allow us to track individual nurses over time.

Who are temporary registered nurses?

Table 1 shows summary statistics of key individual characteristics of RNs in our sample. We also compare the characteristics of temporary and permanent RNs to the same characteristics for all other temporary and permanent workers, using the most recent NSSRN (2000) and the U.S. Bureau of Labor Statistics' February 2001 *Current Population Survey, Contingent Worker Supplement*.[13] The statistics are weighted to reflect population characteristics. First, relative to all workers, nurses are predominantly female (96 percent). The shares of workers who are white, are married, or have children are also higher among the RN population than among all workers. In addition, while all RNs have some postsecondary education, the percentage of those who are enrolled in school (presumably seeking an additional degree) is higher for RNs than for other workers.

TABLE 1

Comparison between temporary and permanent workers: Registered nurses and all occupations

	All sample years	Registered nurses, 2000			All workers, 2001		
		Total	Perm	Temp	Total	Perm	Temp
Married	0.711	0.715	0.718	0.538	0.568	0.572	0.348
Parent	0.582	0.575	0.578	0.413	0.386	0.389	0.278
White	0.902	0.871	0.872	0.796	0.835	0.835	0.816
Female	0.957	0.944	0.944	0.905	0.483	0.483	0.497
Bachelor's degree holder	0.254	0.307	0.307	0.303	0.280	0.282	0.178
Enrolled in school:							
All					0.069	0.065	0.276
Those with associate's degree or more[a]	0.100	0.076	0.077	0.059	0.005	0.005	0.030
Observations	145,757	26,778	26,309	469	33,950	33,324	626

[a]Since all registered nurses have a postsecondary degree, we report the proportion of all workers with at least an associate's degree who are currently enrolled in school. This excludes high school students and those seeking their first postsecondary degree.

Notes: All values are weighted (using survey-provided weights) to reflect population characteristics. For the *National Sample Survey of Registered Nurses*, temporary nurses are those who indicated that they work through employment agencies in their primary jobs. For the *Current Population Survey, Contingent Worker Supplement*, temporary workers are defined as wage and salary workers who had worked at their jobs for a year or less and who expected to keep their jobs for at most another year; see Polivka (1996) for details regarding contingent worker definitions. For the *National Sample Survey of Registered Nurses*, we include all registered nurses working in a nursing-related field. For the *Current Population Survey, Contingent Worker Supplement*, we include all eligible individuals, that is, all employed adult civilian labor force members.

Sources: Authors' calculations based on data from the 2000 *National Sample Survey of Registered Nurses* and 2001 *Current Population Survey, Contingent Work Supplement*, February.

The relationship between the characteristics of temporary and permanent RNs is often similar to the relationship between those of temporary and permanent workers. Temporary employees are less likely to be married or have children than their permanent counterparts. They are also less likely to be white. This relationship differs, however, in terms of education. Both temporary and permanent RNs have almost the same share of bachelor's degree holders, while for all workers, the share of those with bachelor's degrees is much lower among temps. Permanent nurses are slightly more likely to take classes than temporary nurses, while for workers as a whole, the share of school enrollment is much higher among temps. It may be inappropriate to compare the school enrollment rates of nurses and other workers, since all RNs must have a postsecondary degree. We also calculate the share of all workers who already hold at least an associate's degree and who are enrolled in school; for all workers, temporary workers remain much more likely to be students relative to permanent workers.

Where are temporary nurses?

Next, we consider whether there is difference in a nurse's propensity to work as a temp based on the size of the local market.

There are various reasons why city size may be correlated with a nurse's propensity to work as a temp. For example, local market size may be associated with volatility of local health care demand or the existence of different types of health care organizations, which may influence demand for temporary nurses. In addition, local market size may affect the matching efficiency of the job search process, as well as the level of competition among health care organizations, as we discuss in the next section.

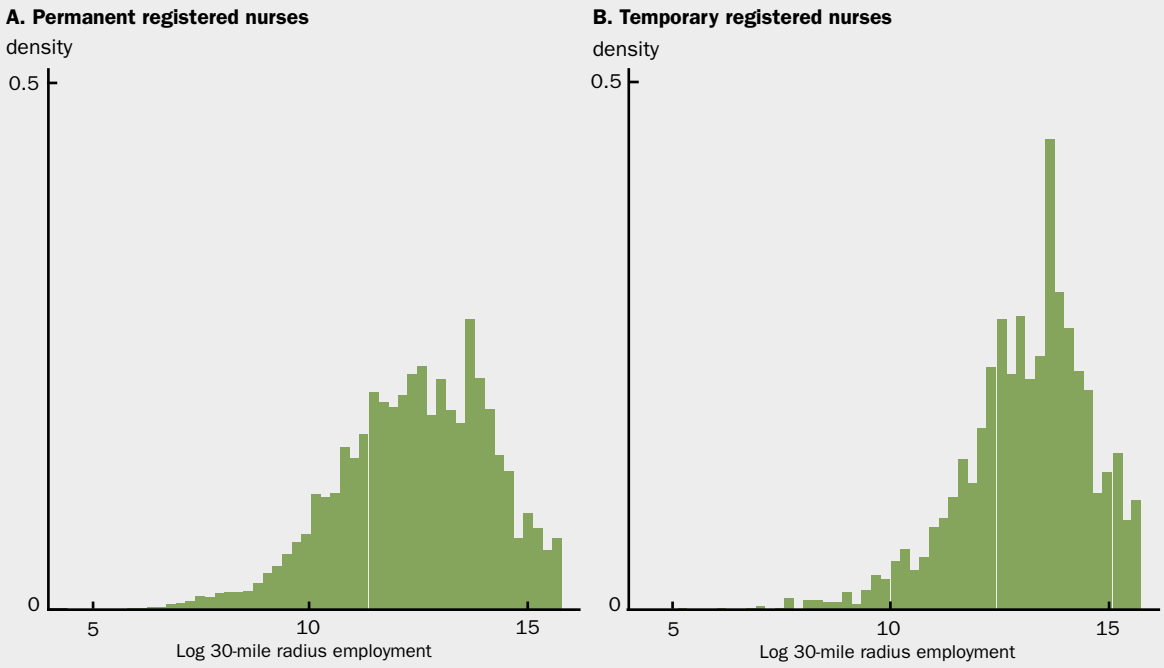
Matching story

Finding a new ideal position in a timely fashion is even more important for temporary nurses than for permanent nurses, since a temporary job assignment is, by nature, based on a short-term contract. For workers to maintain a stable income through temporary positions, it is crucial that they are able to find the next job with satisfactory conditions (such as wage, schedule, duties, or lifestyle) easily and quickly. Efficiency in the matching process is also essential to the firms looking for temporary assistance. Because of the short-term nature of these positions, health care organizations need temporary workers who can perform specific functions with minimal training.

More vacant positions or more demand for temporary nurses in a market would increase the probability that a nurse finds a satisfactory position in a given time, while at the same time such conditions would lower the probability that each hospital finds enough qualified nurses to fill its positions. On the other hand, a greater supply of qualified nurses would lower the probability that each nurse finds a suitable position, while it would increase the probability that each hospital finds enough qualified nurses. In sum, an increase in the participants on one side of the trade

FIGURE 1

Geographical distribution of permanent and temporary registered nurses



Source: Authors' calculations based on data from the *National Sample Survey of Registered Nurses*.

will reduce the likelihood that those participants will find a partner (congestion effects) but increase the probability that participants on the other side of the trade will find a partner (thick market effects) (Petrongolo, 2001). Whether thick market or congestion effects dominate as market size changes is an empirical question.

Monopsony story

Note that the size of local markets may also represent the level of competition among health care organizations, which may influence a nurse's propensity to work as a temp. In a smaller (less dense) local market with fewer competitors, health care organizations may be monopsonistic (able to exert a disproportionate influence on the market). If present, monopsony power leads health care organizations to offer wage rates below the nurses' marginal product. This, in turn, reduces the supply of nursing labor below levels associated with competitive wage rates. Moreover, because the marginal product of nursing labor exceeds the wage, monopsonistic health care organizations have incentives to hire additional nurses at their current wage rate.[14]

Health care organizations with monopsony power have incentives to "wage discriminate." That is, if there are two distinct groups of nurses with different supply elasticities, monopsonistic hospitals will have an incentive to offer higher wages to the group with the higher elasticity of supply. Of course, a hospital may have difficulty paying different wage rates to its permanent nurse employees, as this may create morale or legal problems. However, if nurses with higher labor supply elasticities are also those willing to work through a temporary agency, hospitals can accomplish a form of wage discrimination by paying temporary nurses higher wages.[15] If our measure of local market size reflects the concentration of the local health care industry and if indeed temporary nurses are those with high labor supply elasticities, greater local market size may lower the probability that a nurse will be hired as a temp.

In figure 1, we show the geographical distribution of permanent and temporary nurses' employment. To measure local market size, we calculate the total employment of all counties within 30 miles or less from each nurse's work county, using the U.S. Census Bureau's *County Business Patterns* data. Although the relevant labor market may vary in radius depending on factors such as population density, when nurses in our sample live and work in different counties, home

and work counties tend to be 20 miles to 30 miles apart from each other (see appendix, table A1.4, p. 12). Over the years, the average local market size ranges from 180,000 employees to 300,000 employees. The overall mean is roughly the size of Omaha, Nebraska; Portland, Maine; or Columbia, South Carolina. Figure 1 indicates that temp RNs tend to work in bigger local markets than permanent RNs. We return to this point when we discuss the marginal effects of local market size.

Probit analysis

Here we perform probit analysis to examine the marginal effects of individual characteristics and local market size on an RN's propensity to be a temp.

Model

Let U_i^{Temp} stand for RN i's net utility from working as a temp. The utility would reflect factors such as the wage as well as the likelihood of becoming unemployed after the assignment, and it would vary depending on the nurse's characteristics as well as a city's relevant labor market. We specify the net utility as:

$$1) \quad U_i^{Temp} = \alpha^{Temp\prime} x_i + \beta^{Temp} s_i + \gamma^{Temp\prime} y_i + \varepsilon_i^{Temp},$$

where x_i is a vector of individual characteristics, s_i stands for the size of the local market in which individual i works, and y_i is a vector of dummies for individual i's survey year. Individual characteristics are dummies for whether a nurse is married, a parent, enrolled in school, a bachelor's degree holder, white, or female, as well as a series of dummies for age categories. Analogously, we also specify the net utility from working as a permanent nurse as:

$$2) \quad U_i^{Perm} = \alpha^{Perm\prime} x_i + \beta^{Perm} s_i + \gamma^{Perm\prime} y_i + \varepsilon_i^{Perm}.$$

A nurse chooses to be a temp when $U_i^{Temp} > U_i^{Perm}$. From equations 1 and 2, this condition can be written as:

$$U_i^{Temp} - U_i^{Perm} = \alpha' x_i + \beta s_i + \gamma' y_i + \varepsilon_i > 0,$$

where $\alpha \equiv \alpha^{Temp} - \alpha^{Perm}$, $\beta \equiv \beta^{Temp} - \beta^{Perm}$, $\gamma \equiv \gamma^{Temp} - \gamma^{Perm}$, and $\varepsilon_i \equiv \varepsilon_i^{Temp} - \varepsilon_i^{Perm}$. Assuming that ε_i follows the normal distribution, we estimate α, β, and γ by probit analysis.[16] The estimates of these parameters tell us how individual characteristics and local market size are associated with the utility from working as a temp relative to that from working as a permanent employee.

We estimate the probit models using state dummies to net out state-specific factors associated with an RN's propensity to become a temp. One such factor is the processing time to become registered as an RN in a particular state. A slower registration process in a particular state would require nurses to wait for a long time before they could work as RNs, and would make it difficult for them to work as temps in that state. Another factor is the regulation surrounding health care organizations. Stricter regulations on health care staffing levels or nurse-to-patient ratios in one state versus another may increase hospitals' demand for temporary nurses; this may influence wages offered to temporary nurses and thereby influence a nurse's propensity to work as a temp.

Results

Column 1 in table 2 shows the result of estimating the probit model as specified previously. In column 2, we show the results of the probit analysis with dummies for the position title and whether or not a nurse works for a hospital. We include 13 position title dummies to see whether the effect of other variables persists after netting out position-specific factors. We include a hospital dummy to net out the effect of different types of health care organizations, which may have different needs for temporary nurses. For example, hospitals in our sample use temps slightly less than other health care organizations. If the geographic distribution of hospitals is systematically associated with local market size, then without a hospital dummy this would be reflected in the effect of local market size. By including the hospital dummy, we can partially remove such effects. These results are qualitatively similar to those in column 1. Coefficients on dummy variables represent the impact of a discrete change in that variable on the probability that an RN chooses temp work, and coefficients on continuous variables represent the impact of a marginal change on the probability. Recall that all regressors are dummies except for local market size. The effect of each variable is generally large, roughly on the order of one-third to one-half of the estimated propensity to be a temporary nurse.

Individual characteristics of nurses

We find that being married or having children separately and significantly reduces the probability of choosing temporary work. One potential explanation for this result involves a nurse's willingness to travel. Married nurses or nurses with children may be more limited in their willingness to move because of spousal employment or children's school enrollment.

TABLE 2

Probit analysis results

Dependent variable = 1 if a registered nurse works through a temporary agency

	Coefficient: dF/dX	
	1	2
Married	–0.00529***	–0.00506***
Has children	–0.00444***	–0.00417***
Enrolled in school	–0.00326***	–0.00114***
Bachelor's degree or higher	–0.00472***	–0.00291***
White	–0.00532***	–0.00471***
Female	–0.00902***	–0.00866***
Age dummies (excluded category is age 35–39)		
Younger than 25	–0.00391***	–0.00403***
25–29	0.00524***	0.00348***
30–34	0.00387***	0.00317***
40–44	–0.00245***	–0.00230***
45–49	–0.00274**	–0.00232**
50–54	–0.00350***	–0.00338***
55–59	–0.00466***	–0.00486***
60–64	–0.00365**	–0.00509***
65 and older	0.00854***	0.00038
Local market size		
30-mile radius employment	0.00342***	0.00266***
Position title dummies		Yes
Hospital dummies		Yes
Year dummies	Yes	Yes
State dummies	Yes	Yes
Observations	145,757	145,757

**Significant at the 5 percent level.
***Significant at the 1 percent level.
Note: White/Huber robust standard errors with clustering over each local market were calculated.
Source: Authors' calculations based on data from the *National Sample Survey of Registered Nurses*.

In contrast, nurses who are not married or those without children may be willing to move and therefore have access to multiple local markets. This may increase matching efficiency and increase the utility from a temporary position relative to a permanent position. For mobile nurses, then, the potential for a better match through travel nursing should increase their probability of choosing temp work as opposed to permanent work; in contrast, married nurses and parents should choose temp work less often. Our results also indicate that RNs enrolled in school are less likely to choose temporary work than other RNs, all else being equal. Like marriage and parenthood, school enrollment may make RNs less free to move between local markets and, as we established before, consequently less likely to work in temporary positions.[17]

The negative coefficient for the dummy for RNs with children contrasts with the result in Bellemore (1998) based on the 1990 *Biennial Survey of Illinois Registered Nurses*. Bellemore finds statistically significant evidence that nurses with children less than six years old are more likely to be temps. It is possible that the presence of preschool children requires more flexible work arrangements, which may be made possible through temporary work, especially per diem arrangements. Our data do not distinguish between per diem and travel nurses. It is possible that while there are positive effects of having children for those who seek per diem temporary opportunities, the negative effects of having children for those who seek travel nurse positions dominate in our sample.

Turning to the effect of education, registered nurses with a bachelor's degree or higher (BA RNs) are less likely to work through a temporary agency than nurses with associate's or diploma degrees (non-BA RNs); the relative attractiveness of permanent employment versus temporary employment seems to be greater for BA RNs than non-BA RNs. This could be explained by different career opportunities for BA RNs versus non-BA RNs, as well as different opportunities for permanent positions versus temporary positions.

RNs with a bachelor's degree tend to have better access to nonstaff positions and more challenging work (Lehrer, White, and Young, 1991), and these positions tend to pay higher wages. The left two columns of table 3 show the distribution of BA RNs and non-BA RNs working in a nursing field for each position title. The next two columns show, for each position, the BA RN's and non-BA RN's employment share relative to the overall share. This ratio shows which positions are filled more intensively by BA RNs and non-BA RNs. Values greater than 1 indicate that a certain position is filled by BA RNs or non-BA RNs disproportionately more than their overall share. Positions in the table are ordered by the mean hourly wage expressed in 2000 dollars. Highly paid positions tend to be filled by BA RNs, and the four lowest-paid positions tend to be filled by less educated RNs. In table 4, we present the distribution of RNs within each education

TABLE 3

Education distribution of registered nurses, by position title, 1980–2000

Position title	Education share by position		Education share relative to overall share		Mean real wage[a]
	Non-BA	BA	Non-BA	BA	
	(percent)				
Anesthetist	73.15	26.85	0.980	1.060	34.50
Midwife/practitioner	52.50	47.50	0.703	1.875	25.65
Administrator	73.68	26.32	0.987	1.039	23.69
Consultant	66.96	33.04	0.897	1.304	23.19
Instructor	57.77	42.23	0.774	1.667	22.89
Researcher	55.57	44.43	0.744	1.753	22.55
Specialist	60.25	39.75	0.807	1.569	22.50
Head nurse	76.76	23.24	1.028	0.917	21.63
Clinician	65.02	34.98	0.871	1.380	21.44
Other	74.72	25.28	1.001	0.998	21.17
Supervisor	82.59	17.41	1.106	0.687	21.01
Regular/staff nurse	75.84	24.16	1.016	0.953	19.91
Private duty nurse	85.48	14.52	1.145	0.573	19.26
Overall	74.66	25.34	1	1	20.85

[a]Constant 2000 dollars per hour, using Consumer Price Index.
Notes: All values are weighted to reflect the registered nurse population working in a nursing-related field. BA indicates bachelor's degree.
Source: Authors' calculations based on data from the *National Sample Survey of Registered Nurses*.

TABLE 4

Distribution of registered nurse position titles, by education and employment status, 1980–2000

Position title	Non-BA			BA			Mean real wage[a]
	Temp	Perm	Perm/temp	Temp	Perm	Perm/temp	
	(percent)	*(percent)*		*(percent)*	*(percent)*		
Anesthetist	1.0	1.1	1.10	0.8	1.2	1.50	34.50
Midwife/practitioner	0.5	1.3	2.60	1.0	3.5	3.50	25.65
Administrator	2.6	5.7	2.19	2.9	5.9	2.03	23.69
Consultant	1.2	0.8	0.67	1.0	1.2	1.20	23.19
Instructor	0.7	3.1	4.43	0.5	6.5	13.00	22.89
Researcher	0.3	0.3	1.00	0.3	0.8	2.67	22.55
Specialist	0.9	1.4	1.56	1.4	2.6	1.86	22.50
Head nurse	1.2	5.8	4.83	1.0	5.1	5.10	21.63
Clinician	0.8	1.0	1.25	1.3	1.5	1.15	21.44
Other	3.4	6.5	1.91	2.4	6.4	2.67	21.17
Supervisor	3.0	5.7	1.90	2.1	3.5	1.67	21.01
Regular/staff nurse	69.4	66.5	0.96	77.5	61.3	0.79	19.91
Private duty nurse	15.1	0.7	0.05	8.1	0.3	0.04	19.26
Total | mean wage	100	100		100	100		20.85

[a]Constant 2000 dollars per hour, using Consumer Price Index.
Notes: All values are weighted to reflect the registered nurse population working in a nursing-related field. BA indicates bachelor's degree. Perm/temp indicates the ratio of permanent employment share to temporary employment share.
Source: Authors' calculations based on data from the *National Sample Survey of Registered Nurses*.

group across different position titles separately for permanent and temporary RNs. Table 4 shows that nursing positions with higher pay tend to be held by permanent employees, especially among BA RNs. Therefore, when making employment choices, BA RNs have more high-paying opportunities to work as permanent nurses than non-BA RNs do, which may make BA RNs choose temp work less often.

Note that when we control for position title in our probit analysis, the effect of the bachelor's degree dummy becomes smaller, but the coefficient remains negative and significant (see column 2 in table 2). Among RNs with the same positions, RNs with a bachelor's degree are less likely to be temps. This can be partially attributed to heterogeneity within the rather broad position categories given in the NSSRN.[18]

Including such position dummies may not fully control for the differences in promotion opportunities between temp and permanent arrangements.

Age coefficients in our probit results show how the propensity to be a temporary nurse differs relative to that of 35–39 year olds, the omitted group. Overall, the youngest RNs are the least likely to be temporary nurses, but by the mid-twenties through the mid-thirties, the probability that an RN chooses temporary employment exceeds that of the omitted group, peaking at 30–34 years old. Temporary agencies can choose which nurses to accept onto their "roster," and agencies usually require that nurses be certified and have at least some experience.[19] These requirements are consistent with the negative coefficient for the youngest nurses, who may not have sufficient experience to work through an agency.

After age 39, RNs become less and less likely to be temp nurses until they reach age 65. Many temp RNs, especially travel nurses, use their assignments to try out different hospitals or locations before deciding on a permanent position. The movement away from temp work in midlife may be reflecting that more and more temp nurses eventually find good permanent matches as they work longer in the industry. In contrast, the oldest nurses—those past the retirement age—are the most likely to be temps in our sample. It is possible that these nurses use temp work as a transition into retirement, working for a particular health care organization or in a particular position.[20] In fact, when we include dummies for position title and hospital, the significance of the coefficient for the eldest age dummy disappears.

Note that in Bellemore (1998), where the data allow the author to control for experience in addition to age, the marginal effect of age is positive and that of experience is negative. To the extent that both effects exist, our finding through the early thirties may be dominated by the age effects in Bellemore (1998), and our finding after the mid-thirties may be dominated by the experience effects found in Bellemore (1998). He claims that, given a certain level of experience, older nurses value flexibility in hours more than younger nurses and thus work through agencies. As we mentioned, temporary arrangements in our sample include both travel and per diem settings. While travel nurse positions tend to be a full-time position, in per diem arrangements, schedules can often be more flexible based on individual requirements. It is possible that for per diem nurses, the flexibility story could also be applied to explain our results.

Local market size

The probability that an RN works as a temp increases with local market size after controlling for a nurse's individual characteristics and state-specific factors. This is prevalent even after we control for 13 position categories and whether or not a nurse works in a hospital. This result may indicate that bigger local markets facilitate better matching (thick market effects) and increase the utility of becoming a temporary nurse. In a bigger city, a nurse can find a new job in a timely fashion after a temporary assignment ends, without having to move to a new city. Per diem nurses can more easily find assignments that suit their preferences, having many health care organizations with various needs in a locality. If our measure of local market size reflects competition in the local health care industry, based on our sample, the effect of monopsony seems to be dominated by the market thickness effect for matching. The magnitude of the effect of local market size is large. For all years, the average log of local market size is 12.36, which is the equivalent of 233,000 employees. All else being equal, a one standard deviation increase in local market size (1.72 log points, or the increase from 231,000 to 1.3 million employees) increases the propensity for a nurse to be a temporary worker by about one-third, from 1.5 percent to 2.1 percent. However, as we mentioned earlier, there may be other explanations. It is possible that local market size is systematically associated with the volatility of health care demand or geographical difference in the mix of health care organization types—factors that are not fully controlled for in our analysis.

Conclusion

This article adds descriptive facts to a relatively small literature on temporary nurses (Bellemore, 1998; and Houseman, Kalleberg, and Erickcek, 2003). We examine the characteristics of temporary RNs relative to permanent RNs, as well as the characteristics of permanent and temporary workers in other industries. Tabulations from the *National Sample Survey of Registered Nurses* and *Current Population Survey* show that both temporary and permanent RNs are more likely to be female, married, or parents than workers in other industries. Also, the tabulations show that temporary and permanent RNs tend to be more educated than the average worker in the *Current Population Survey*. We also find that similar characteristics are associated with choosing temp work among RNs and all other workers.

In particular, our probit results suggest that RNs who are more mobile choose to be temps more often;

our results also suggest that RNs in larger local markets choose to be temps more often. These findings seem to support the idea that the larger the labor market to which a nurse has access, the more inclined she will be to choose to be a temp—in either travel or per diem arrangements. The use of temporary nurses can be seen as one way to overcome cost pressures and/or demand fluctuations in the health care industry. However, how much health care organizations can rely on temporary nurses for their staffing needs may be limited by the scope of the local market. It may also depend on demographic characteristics of working RNs that determine their geographic mobility, which in turn would determine their likelihood to be travel nurses.

NOTES

[1]In 1987, only one-quarter of the privately insured population was in managed care; by 1997, three-quarters of the privately insured were in managed care plans (Gabel et al., 1989; and Jensen et al., 1997).

[2]Using data sets from Massachusetts on the treatment of heart disease, Cutler, McClellan, and Newhouse (2000) find that health maintenance organization plans have 30 percent to 40 percent lower expenditures than traditional insurance plans.

[3]According to the U.S. Census Bureau, in 2002, payroll accounted for 39 percent of the receipts for hospitals and 46.4 percent for nursing and residential care facilities; for all facilities combined, the payroll component was 40.8 percent (www.census.gov/econ/census02/data/us/US000_62.HTM#N622).

[4]Authors' calculations based on data from the U.S. Bureau of Labor Statistics' Occupation and Employment Statistics (www.bls.gov/oes/current/naics2_62.htm).

[5]In 2002, temp share of employed workers was 0.72 percent for the health care industry, 1.98 percent for the goods-producing industry, and 1.83 percent for the service-producing industry (based on data from the February *Current Population Surveys* for 1995, 1997, 1999, and 2001).

[6]Per diem opportunities can be obtained directly through the hospital system by becoming part of the system's pool of per diem staff.

[7]Associate's degree and bachelor's degree nursing programs focus more on classroom learning than diploma programs, which are housed in hospitals and emphasize learning through contact with patients (Lehrer, White, and Young, 1991).

[8]Health-related occupations (registered nurses; nursing aides, orderlies, and attendants; licensed practical and licensed vocational nurses; and home health aides) represented 5.2 percent of all temporary service employment in May 2004; nearly half of those employed as temps in health-related occupations were RNs (Kilcoyne, 2005).

[9]Hourly wages of temp RNs are about $5 higher than those of permanent RNs. For all temporary workers, hourly wages are, on average, $5 lower than those of permanent workers (Kilcoyne, 2005).

[10]We do not use the 1977 NSSRN because it lacks key information about temporary employment status.

[11]We drop observations that lack valid age, gender, or geography codes.

[12]Reported position titles for nurses working in relevant fields include anesthetist, midwife/practitioner, administrator, consultant, instructor, researcher, specialist, head nurse, clinician, supervisor, regular/staff nurse, and private duty nurse.

[13]The *Current Population Survey* has asked supplemental questions about contingent workers every other February (except in 2003) since 1995.

[14]Thus, if asked, hospitals with monopsony power may report a shortage of nurses. This is often considered one of the reasons for the nurse shortage in the U.S.

[15]This, at least anecdotally, appears to be the typical case (Houseman, 2001).

[16]In the actual estimation, we obtain the estimates of the parameters that are divided by the standard deviation of ε_i.

[17]It is possible that marital or parental status directly influences the relative wage of temp positions versus permanent positions. An analysis of this question is beyond the scope of this article.

[18]While 34 position title categories are listed in the questionnaire, the NSSRN aggregates these categories into 13 (one of which is "other") in the data set.

[19]According to an industry magazine, "industry standards require that travel nurses have two years within the last years of recent experience in the specialty for which they are going on contract" (Green, 2004).

[20]Although they are not included in our sample, 74 percent of the RNs over 65 years old in the survey are not currently working as nurses; 93 percent of these report that they are not looking for a nursing job, which we take to mean they are retired.

APPENDIX

Volatility of health care industry employment

There are various reasons why staffing needs fluctuate in health care organizations on a daily and/or seasonal basis. Factors including inflows and outflows of tourists, local disasters, and patient acuity levels affect the demand for health care and, consequently, the demand for temp nurses. Temporary leave of regular employees due to maternity, vacation, or sickness also creates demand for temporary help. While we cannot observe the demand of health care services directly, here we summarize monthly fluctuations in health care employment, using the standard deviation of the growth rate during the period from January 1990 to May 2005. In table A1.1, we use the U.S. Bureau of Labor Statistics' data on the industry monthly employment series (nonseasonally adjusted) for each state.

TABLE A1.1

State monthly employment volatility for 41 U.S. states and the District of Columbia

Standard deviation of the monthly growth rate

Industry	Mean	25th percentile	Median	75th percentile
Health care (NAICS 6562)	0.0065	0.0052	0.0059	0.0066
Goods-producing	0.0163	0.0095	0.0147	0.0189
Service-producing	0.0117	0.0104	0.0117	0.0125

Notes: We exclude states for which monthly employment data were unavailable from January 1990 to May 2005 for the three sectors featured. Specifically, we exclude Alaska, Indiana, Iowa, Kentucky, Michigan, Nebraska, Ohio, Vermont, and Virginia. NAICS means North American Industry Classification System.
Source: Authors' calculations based on data from the U.S. Bureau of Labor Statistics.

Comparing temporary nurses with other temporary workers

In table A1.2, we present comparisons from Kilcoyne (2005) between temp RNs and other temporary workers.

Permanent and temporary comparison for occupation groups

Table A1.3 shows comparisons between temporary and permanent workers in blue collar, pink collar, and white collar occupations. While some statistics are based on a small number of observations, we can see that many features that are found for all workers persist for all categories. Compared with permanent workers, temporary workers are less likely to be married, have children, or have bachelor's degrees; however, temps are more likely to be enrolled in school than permanent workers.

Local market size

The NSSRN includes information on each RN's counties of employment and residence. Using that, we summarize the distance between home and work for permanent and temporary nurses. Note that employers that hire travel nurses often provide housing near the workplace; thus, some travel nurses may report the same

TABLE A1.2

Predominant occupations in the temporary help service industry, May 2004

	Temp service employment	Percentage of temp service employment	Average hourly wage (U.S. dollars)
All occupations	2,375,330	100	12.53
Laborers and freight, stock, and material movers, hand	439,390	18.5	8.69
Office clerks, general	127,420	5.4	10.53
Packers and packagers, hand	107,850	4.5	8.09
Team assemblers	103,470	4.4	9.68
Production workers, all other	77,660	3.3	9.66
Helpers—production workers	72,020	3.0	8.41
Customer service representatives	62,760	2.6	11.72
Construction laborers	53,970	2.3	9.27
Packaging and filling machine operators and tenders	51,640	2.2	8.96
Secretaries, except legal, medical, and executive	47,730	2.0	12.39
Executive secretaries and administrative assistants	47,370	1.9	15.57
Data entry keyers	45,010	1.9	10.80
Registered nurses	44,820	1.9	30.99
Receptionists and information clerks	40,320	1.7	10.67
Assemblers and fabricators, all other	38,380	1.7	9.48
Office and administrative support workers, all other	38,380	1.6	9.48
Nursing aides, orderlies, and attendants	36,130	1.5	11.64
Janitors and cleaners, except maids and housekeeping cleaners	30,210	1.3	8.40

Source: Kilcoyne (2005).

TABLE A1.3

Comparison between permanent and temporary employment, by occupation

	Blue collar			Pink collar			White collar		
	All	Perm	Temp	All	Perm	Temp	All	Perm	Temp
Married	0.572	0.576	0.380	0.546	0.551	0.352	0.667	0.669	0.390
Parent	0.392	0.395	0.297	0.388	0.389	0.346	0.423	0.425	0.231
White	0.835	0.834	0.853	0.823	0.825	0.722	0.869	0.869	0.801
Female	0.177	0.177	0.205	0.791	0.792	0.733	0.488	0.487	0.629
Bachelor's degree holder	0.058	0.059	0.051	0.136	0.137	0.114	0.512	0.513	0.317
Student	0.043	0.041	0.133	0.080	0.074	0.354	0.016	0.014	0.290
Student (excluding those in high school)	0.025	0.024	0.084	0.062	0.057	0.259	0.014	0.012	0.290
Observations in the sample	8,580	8,397	183	5,200	5,078	122	4,860	4,825	35

Notes: All values are weighted to reflect population characteristics. Blue collar: 1980 Standard Occupational Classification Codes 473–499 (farming, forestry and fishing), 503–699 (precision production, craft and repair), 703–799 (machine operators, assemblers, and inspectors), 803–859 (transportation and material moving), and 863–889 (handlers, equipment cleaners, helpers and laborers). Pink collar: 1980 Standard Occupational Classification Codes 303–389 (administrative support, including clerical). White collar: 1980 Standard Occupational Classification Codes 003–037 (executive, administrative and managerial) and 043–199 (professional specialty).
Source: Authors' calculations based on data from the 2001 *Current Population Survey, Contingent Work Supplement*, February.

county for their home and work, even if they actually moved far from their previous location. Nevertheless, here we calculate the distance between reported home and work counties.

We combine home and work counties in the nurse data with latitude and longitude data on county centroids, and for nurses whose home and work counties are different, we calculate distances between these counties. Table A1.4 shows the percentage of permanent and temporary nurses who reported that their home and work counties are different. For those nurses, the table shows some summary statistics of distance. The table indicates that, in general, the distance between home and work is greater for temporary nurses than permanent nurses. For most permanent nurses, the commuting distance seems to be within 30 miles.

It is also interesting to note that the distance between home and work has steadily increased for permanent nurses year by year. For temporary nurses, however, while mean, median, and 75th percentile distances are all highest in the latest year of the data, we do not observe a consistent increase from 1980. This may be partly due to the small number of observations we rely on to calculate these statistics for temporary workers. Of the 145,757 observations in our data, 2,684 are temps. Since only about 30 percent report different home and work counties, we rely on the data from 730 temporary nurses (about 120 per year) to calculate the summary statistics for the distance. Note, however, that average distance in some years is quite high for temporary nurses, which seems to indicate that there are some temporary workers who travel. In our sample, before we incorporate the sampling weight, the raw average of the distance for temporary nurses exceeds 100 miles for four of the six years, while for permanent nurses, it does not exceed 50 miles in any year.

TABLE A1.4

Distance between home and work counties reported

	All nurses		Among nurses whose home and work counties are different					
	Intracounty commuting		Mean		Median		75th percentile	
	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp
	(percent)		*(miles)*		*(miles)*		*(miles)*	
1980	17.76	25.66	43.60	56.18	19.81	21.26	27.64	33.05
1984	19.94	19.30	36.56	102.98	20.64	22.72	28.45	38.49
1988	22.01	26.29	34.51	63.32	21.28	20.23	29.96	30.08
1992	25.33	27.10	37.50	69.08	21.86	23.41	30.16	38.76
1996	25.78	31.69	37.60	52.02	23.10	21.47	31.60	33.67
2000	28.55	33.26	40.13	88.53	23.29	24.12	31.60	43.14

Note: All values are weighted to reflect the registered nurse population working in a nursing-related field.
Source: Authors' calculations based on data from the *National Sample Survey of Registered Nurses*.

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