NBER WORKING PAPER SERIES

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Working Paper 33461
http://www.nber.org/papers/w33461

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
February 2025

This work benefited tremendously from comments from Jose Fernandez, faculty and students in the economics department of the University of Georgia Department of Economics, and participants of an ASSA/LERA session. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

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JEL No. I0, J01, J30

ABSTRACT

Males comprise a small fraction of the nurse labor force, yet across the distribution of wages, male nurses earn more than females. In this paper, we use nurse survey data to decompose the sex-based wage gap and to explore why male nurses earn a premium in a female-dominated profession. We consider the role of traditional factors such as human capital and family structure, along with explanations that are more specific to nursing. Results indicate that overtime pay is a significant factor, particularly among hospital workers, but otherwise, after accounting for an extensive set of job-related characteristics, the wage gap persists.

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Introduction

Sex-based wage gaps have persisted for generations. These gaps are often at the forefront of labor market-based policy discussions, and academics and advocates alike focus on the topic to highlight both the inequality of pay and the inequality of opportunity. A commonly cited statistics is that women earn 82 cents for every dollar a man earns (Jones 2021). Sex-based wage gaps have been attributed, in part, to the occupational sorting of women, who tend to cluster in lower-paid fields relative to men (Sloane et al. 2021). Certain occupations, such as librarians, teachers, and nurses, have traditionally been female-dominated and therefore make for interesting case studies in which to look for earning differentials, as inequality of opportunity should be less of a concern.

In this paper, we focus on the nursing profession where males comprise only a small fraction of the workforce, yet earn, on average, higher wages than their female counterparts. Over time, there has been a noticeable increase in the proportion of male nurses, with various factors such as the healthcare sector expansion and changing gender attitudes contributing to this trend. Despite this, wage disparities persist between male and female nurses, with male nurses consistently earning more. In 2022 for example, male registered nurses (RN) earned 27% more annually than female RNs, while only comprising 12% of the RN labor force (authors' calculations from the American Community Survey).

Throughout this paper we explore why male nurses appear to earn a wage premium in a female-dominated profession. We examine many plausible explanations for this disparity. Specifically, we consider the role of traditional factors thought to contribute to the wage gap, including human capital, union status, and the role of family responsibility. We also examine differences in skills and job characteristics among male and female nurses. We evaluate other

explanations that are more specific to the nursing profession and include compensating wage differentials that arise from the physical nature of the job and the flexibility to work non-standard shifts.

Using nationally representative samples of actively licensed registered nurses, our results show that even after accounting for variables representing many aspects of the worker and the job, the male wage premium still exists. Using decomposition methods on hourly wages at the mean and across the distribution, we find that human capital and job characteristics, such as level of care and employment setting, contribute the most to the explained component of the wage gap. In contrast, traditional factors such as family status, demographics, and union status explain little to none of the gap.

The average observed wage gap ranges from 4 to 10 percent. That is, if female nurses make $50 per hour on average, male nurses earn a premium of $2.00 to $5.00 per hour. However, we show some instances where the premium is smaller, and where observed characteristics can more than explain the gap. Overall, the source of the wage gap is nuanced but the presence of overtime pay, especially among hospital workers, accounts for much of the gap.

Understanding the factors that contribute to this gender wage gap has important implications for policy, particularly in terms of promoting equal opportunities. Our analyses offer new insights into the sources of sex-based wage disparities and can help promoting greater sex-based equity in the nursing profession.

Background

This paper focuses on two groups of nurses, registered nurses (RNs) and advanced practice registered nurses (APRNs). These nurses differ in their education, training, and scope of

practice. RNs typically have an associate or bachelor's degree in nursing with the primary duties of providing and coordinating patient care. APRNs are RNs with an advanced degree (Master's or PhD). As APRNs may diagnose, order tests, prescribe, and treat, their scope of work goes well beyond that of a RN. There are four types of APRNs: Nurse practitioner (NP), certified nurse midwife (NM), certified registered nurse anesthetist (NA), and clinical nurse specialist (CNS). NPs are the most common category, comprising about 80% of the APRN workforce. There are currently over 3.1 million RNs employed in the United States, compared to about 324,000 APRNs (BLS 2024).

Nursing has always been a predominately female profession, but in recent years, the proportion of nurses who are men has been growing. Figure 1 shows this trend using data from the Current Population Survey (CPS) for RNs and NPs. As Figure 1 shows, the percent of employed RNs who are male increased from 8.9% in 2011 to 12.1% in 2022, reflecting a 36% increase over this period. The trends for NPs are similar with a 20.2% increase in the number of male NPs from 2011 to 2022. Munnich and Wozniak (2020) identify both demand and supply side factors as drivers of these trends. They find that the expansion of the healthcare sector, higher education attainment, urbanization, changing gender attitudes, and shocks to local manufacturing employment all contribute to the increases in the rates at which males choose to become RNs.

Figure 2 shows the difference in real (2011 dollars) median weekly earnings by sex for full-time RNs calculated from the Current Population Survey (CPS). The corresponding data for NPs is not available from the CPS due to the small numbers of men working as NPs. Real wages have been fairly stagnant over time, however, across all years, weekly earnings for men are greater than that of women. The average difference is $122.

There is an extensive body of literature on the male-female wage gap that encompasses research on the presence and causes of the gap across many professions. We refer the reader to Blau and Kahn (2017) for an overview and to Sloane et al. (2021) for a discussion of sex-based sorting into college majors and occupations. Dill and Frogner (2024) describe the size of the gap for a variety of health care workers over time by education and occupation groups. More recent work has focused the attention on gender-based wage gaps in "gender blind" settings, where evidence of wage premiums for males exists (Adams-Prassl et al. 2022). Goldin and Katz (2016) study the gender earnings gap in the egalitarian profession of the pharmacy where the share of female workers was 54% in 2011. Using log hourly earnings regressions, they find a gap of 4.72% that can be mostly explained after controlling for a number of variables.

There is also a relevant literature about willingness to pay for job amenities including regular scheduling, flexibility in scheduling hours, and work from home. Mas and Pallais (2017) provide recent credible evidence on how workers value these amenities. They find that women place a higher value on avoiding irregular schedules than do men, and the largest effect occurs among women with young children. However, neither sex is willing to pay for flexibility in schedules or flexibility in number of hours worked. They also find that the sex-based differences in the prevalence of these amenities contributes minimally to the wage gap. Similar conclusions are found in a study of rideshare drivers by Cook et al. (2021).

There are a limited number of wage gap studies specific to the nursing profession. Gauci et al. (2022) provide a comprehensive review of eleven studies from various nations that describe the size of the wage gap. This includes U.S.-based studies by Greene et al. (2017) who find the largest salary gap exists between male and female NPs in surgical specialties compared to other nurse specialties, and by Wilson et al. (2018) who compare the male-female wage gap of

registered nurses to that of another female dominated profession, teachers. However, we identified only two U.S. based studies that explicitly decompose the wage gap (Kalist 2002; Jones and Gates 2004) and two studies that estimate sex-specific regression coefficients and use those to quantify wage premiums and penalties (Muench et al. 2015; Muench et al. 2016). These four studies all use data from earlier years of the National Sample Survey of Registered Nurses (NSSRN) with Kalist (2002) using the 1992 and 1996 cross sections, Jones and Gates (2004) using the 2000 cross section, and the Muench et al. papers (2015, 2016) spanning 1998-2008.

The previous literature varies in the amount of the male-female wage gap explained by the variables chosen. The observable characteristics used by Jones and Gates (2004) explain 43% of the wage gap, while Kalist's (2002) model explains only 8.6% or 11% of the gap, depending on which group is treated as the disadvantaged one. Muench et al. (2015) report explaining about half of the variation in wages for RNs working full-time.

The nurse work force has changed appreciably in the last few decades warranting an updated analysis of the components of the wage gap. In the previous studies, the proportion of male nurses ranged from 6% to 7%. Figure 1 shows the proportion of male nurses has nearly doubled since then. More importantly, APRNs have become a more integral part of the health care workforce over time (see the right panel of Figure 1) and are increasingly empowered to deliver health care to the full extent of their training (see McMichael and Markowitz 2022). While all previous studies include indicator variables for work as an APRN, they do not separate out these nurses from other RNs. This omission is important since APRNs have different job skills and responsibilities and earn more on average than RNs. As discussed further below, APRNs have different employment characteristics including self-employment, unionization, and clinical specialty.

To highlight the need to separate out APRNs from RNs, consider the finding by Jones and Gates (2004). They report that 43% of the wage gap is explained by observable characteristics, but being a nurse anesthetist is the primary driver of this finding, accounting for 61% of the explained gap. Kalist (2002) and Muench et al. (2016) also both report substantial salary premiums to male nurse anesthetists.

Our study advances the literature in a number of ways. Our data come from the two most recent NSSRN surveys, 2018 and 2022, that better reflect the composition of the current nursing labor force than the previous studies that rely on older data. We estimate wage gaps separately for APRNs and RNs which will identify the male-female differentials within these distinct careers. Similar to the previous studies, we use a comprehensive set of job characteristics to understand the potential sources of the wage gap, but we include more details on the job characteristics than the previous studies. We build on the work of Muench et al. (2016) and propose some plausible theories on why the wage gap may occur and test those theories to see if we can eliminate the gap. Lastly, we advance the literature by going beyond the mean and analyzing differences across the distribution of wages. Nurses are an interesting case study since the high proportion of female workers makes inequality of opportunity far less of a concern than in other industries. Knowledge of the correlates of wages and any underlying biases can be useful to set wages and help attract workers to the nursing profession.

Why the sex-based wage gap may exist for nurses

Previous research has identified a standard set of factors that explain and reduce the observed sex-based wage gap. These include education, experience, job characteristics, and union membership. Family care demands are also relevant. Also known as the motherhood

wage penalty, the differential effects of having children on earnings was recently quantified to explain two-thirds of the gender pay gap (Cortés and Pan 2023). As described in the data section below, we include all of these standard variables in our decompositions of the sex-based wage gap.

In addition to these traditional factors, there are a number of reasons why males may earn wage premiums in a female dominated profession. In this section we briefly discuss some reasons that are particularly relevant for nurses and describe how we address each hypothesis.

Exit and Reentry: The Mincer and Polachek (1974) idea of attachment to the workforce is certainly relevant for nurses. That is, there may be a female wage penalty for exit and reentry, and the associated depreciation of skills from this churn. As standards of medical care are constantly changing, time away from the profession may exacerbate skill depreciation. The survey data we use includes a question asking respondents if they left work in nursing for one or more years since becoming an RN and if so, for how many years. We include the number of years away from nursing in all models to reflect the churn. We also directly test this hypothesis by limiting the samples to only the respondents who did not leave nursing to see if the wage gap remains among people with uninterrupted job tenure. Muench et al. (2016) test this hypothesis indirectly by analyzing a subsample of RNs ages 40-45 with no children currently at home, who likely did not spend time out of the labor force. They find that the earnings gap persists among this restricted sample.

Compensating wages for physical stamina: Nursing tends to be a highly physical job and there may be higher returns granted to employees who are better able to do things such as lifting or moving heavy patients (Muench et al. 2016). According to O*Net (2023), the task of performing general physical activities has a high importance score among registered nurses (89

out of 100). APRNs score lower at 54. (For context, economics professors score 11). Following Muench et al. (2016) we indirectly test for this theory by seeing if the wage differentials disappear in jobs that do not involve patient care and are presumably less physical.

Compensating wages for flexibility to work non-standard shifts: Goldin (2014) states that workers are rewarded for job flexibility, that is, the ability to work more hours and nonstandard hours. In the context of health care markets, facilities such as hospitals and urgent care centers may place more value on workers who are willing and able to work non-standard shifts. While it is difficult to directly test an individual's willingness to work non-standard shift hours, we proxy for this by limiting the sample to individuals with no children in the household to reflect the potential absence of childcare responsibilities which may lead to more flexibility in work schedules.

Overtime pay: It is possible that base wages are similar for both male and female nurses, especially for those who are represented by a union, but that overtime pay is more commonly earned by males. Bolotnyy and Emanuel (2022) find that overtime hours and unpaid time off explain the gap among unionized bus and train operators who are otherwise paid identical wages. Overtime hours are common among nurses, especially in hospitals. Some hospitals and clinics even mandate overtime work in order to meet state legislated minimum nurse-to-patient ratios. (Deering 2023). To address this, we generate an estimated base wage rate that excludes overtime and evaluate the base wage as an alternative dependent variable.

*Value of same provider-patient sex concordance***:** Another possible explanation is the need for a wage premium to entice males into a female dominated profession. Along the same vein as doctor-patient concordance (Alsan et al. 2019; Hill et al. 2023) employers may see value

in having the same gendered nurses as patients. Unfortunately, data limitations prevent us from exploring this hypothesis further.

Other hypotheses exist as to why males earn wage premiums. As reviewed by Blau and Kahn (2017) these ideas include better negotiation skills, differences in risk aversion, and more self-confidence. Soft skills may also play a role, but it is not clear in which direction. The authors note that women may have better interpersonal skills which could lead to a wage premium in their favor. Following that argument, female nurses could be seen more maternal and compassionate towards patients than male nurses. It is difficult to identify and include proxies for these ideas in the models, and they therefore remain possible but untested reasons for the observed wage gaps.

Data

The data for this study come from the 2018 and 2022 waves of the National Sample Survey of Registered Nurses (NSSRN). This survey is a nationally representative sample of actively licensed registered nurses and contains about 50,000 respondents in each wave. The survey instruments include extensive information on respondents' background, education, and employment characteristics. The samples are randomly selected from over 4 million licensure records from the National Council of State Board of Nursing, the American Association of Nurse Practitioners, and from individual state boards of nursing. Two sampling strata are used for each state, one for registered nurses holding a NP license and one for registered nurses without an NP license. This results in samples of approximately equal sizes for each group.

All respondents in our estimation samples are actively licensed to practice as registered nurses and are currently working as nurses. We also determine whether a registered nurse is

credentialed as an APRN through a question regarding receiving preparation as a nurse practitioner, nurse anesthetist, nurse-midwife, or clinical nurse specialist. Since the education, training, and job responsibilities are different for RNs and APRNS, we run all analyses separately for RNs and APRNs, with a particular focus on NPs.

Our main dependent variable of interest is the natural log of the hourly wage. Respondents were asked to estimate annual earnings with the following question: "Please estimate your 2017 [2021], pre-tax annual earnings from your primary nursing position. Include overtime and bonuses, but exclude sign-on bonuses" (USDHHS 2018, 2022). We include all respondents with reported positive earnings. Earnings are top coded at $223,000 in the 2018 wave and $250,000 in the 2022 wave. Top coding is rare, with only 0.26% of RNs and 0.98% of APRNs reporting earnings at the top code. We calculate hourly wages by dividing annual earnings by annual hours worked.[1] Since this calculation generates some implausible high and low wages, we trim the top and bottom 1 percent of the wage distribution within each wave.

Unadjusted hourly wage distributions for RNs and APRNs by sex are shown in Figure 3. This figure shows that the distribution of earnings for males lies to the right of that of females. The mean real hourly wages for male RNs ($45.49) and male APRNs ($61.22) are both higher than for female RNs ($42.92) and female APRNs ($55.73). The final samples include 36,508 RNs, of which 9.2 percent are male, and 46,446 APRNs of which 9.6 percent are male.

The explanatory variables used in the models are grouped into the following categories:

[1] In the 2018 wave, annual hours are estimated with four times the reported hours worked in a typical week, multiplied by the number of reported months worked in the year. In the 2022 wave, the calculation is based on reported number of weeks worked per year and reported hours per week worked. However, in 2022, hours per week is expressed in ranges except for 40 hours per week. We use the 2018 distribution of hours worked and assigned the 2018 mode value for each of the ranges given by the 2022 survey. The ranges and modes are as follows: Hours range 1-9 uses mode 8; range 10-19 uses mode 16; range 20-29 uses mode 24; range 30-39 uses mode 36; 40 hours remains at 40; range 41-49 uses mode 45; range 50-59 uses mode 50; range 60-69 uses mode 60; range 70-79 uses mode 70; range 80 and above uses a value of 80.

Demographics: This category includes the respondent's age, and race/ethnicity. Race/ethnicity is categorized as indicator variables for White, Black, Hispanic, Asian, and other race (including multiple races).

Family status: This includes marital status (currently married; widowed, divorced, separated; never married), and indicator variables for: 1) whether children under the age of 6 are present in the household; 2) whether children between the ages of 6 and 18 are present in the household; and 3) whether adult dependents are present in the household.

Human capital: Human capital is represented by measures of education and experience. Education is measured with an indicator for the highest nursing-related degree earned. This includes the categories of 1) high school diploma/associate degree/licensed vocational nurse-to-RN program; 2) bachelor's degree; 3) master's degree; and 4) doctorate degree. We also include an indicator of whether the initial RN degree program was located outside of the United States.[2] Experience is measured using years since graduation from initial nursing education and years of experience squared. For APRNs, we also include years of experience as an APRN (as measured by years since receiving highest nursing education), APRN experience squared, and indicator variables for type of APRN (nurse practitioner; nurse anesthetist; nurse-midwife; clinical nurse specialist; and multiple credentials.) Importantly, we also include a measure of time away from the nursing profession. The survey asks respondents if they have left work in nursing since becoming an RN, and if yes, for how many years. We include the number of years away (in ranges as specified by the 2022 survey questionnaire) as measures of labor market interruption.

[2] This variable is meant to proxy for foreign-born nurses. Cortes and Pan (2014, 2015) show the importance of foreign-born nurses to the domestic labor market. Their 2014 study finds large displacement effects but no changes in wages as a result of an influx of foreign nurses, while the 2015 study shows that Filipino nurses earn a quality-based wage premium.

Skills and Certifications: This category includes the following variables: 1) an indicator of whether a person speaks English and is fluent in at least one other language; 2) indicators for military service (current or past active duty; active duty for reserves or national guard; no military service); 3) the number of skill-based certifications obtained among ambulatory care, critical care, emergency medicine, life support, resuscitation, and trauma nursing.

Job Characteristics--Union Status and Employer type: Basic job characteristics include: 1) an indicator for representation by a labor union; and 2) employer type that distinguishes between being self-employed, employed as a traveling nurse, or employed by the organization/facility at which they are working. This last category also includes the nurses employed by an employment agency, but not a traveling nurse.

Job Characteristics--Employment setting: This series of indicator variables describes the type of setting in which the nurse works. We use the broad categories of hospital; clinic/ambulatory; long-term inpatient (nursing home, rehabilitation, inpatient mental health/substance abuse, correctional facility, hospice); and other type of setting (home health agency, occupation health, public health, dialysis center, academic department, insurance company, call center).

Job Characteristics--Level of care: Respondents are presented with a list of multiple possible answers to the question regarding level of care or type of work in which most of the time was spent. This question provides more details about the employment setting beyond the facility description described above. We include indicators for the twelve most frequently given answers: General or specialty inpatient, ambulatory care, care coordination/patient navigation, critical/intensive care, education, emergency, management/administration, home health/hospice, long-term care, public/community health, surgery, and urgent care. We collapse the remaining

options into a group of all other levels of care. This includes ancillary care, informatics, rehabilitation, research, school nurse, step-down, sub-acute, and an open-ended other option. Each of these represents less than two percent of respondents.

Job Characteristics--Clinical specialty: Respondents are asked, "in what type of clinical specialty did you spend most of your patient care time?" Multiple options are offered. We collapse these into the following care areas: general medical surgical; ambulatory; critical; cardiac; chronic; emergency/trauma; home health/hospice; labor/delivery/gynecology/obstetrics; oncology; psychiatric; all other clinical specialties; and an indicator for those nurses who do not engage in patient care. The specialties in the other category each represent less than two percent of respondents.

Location: Work state is reflected with a series of indicators for the state in which the nurse works. These indicators will reflect differences across states in the cost of living, while also representing factors such as whether or not the state is part of the nurse licensure compact and whether APRNs may practice without oversight from physicians.

Means of all included variables (with the exception of the work state indicators) are shown in Table 1 for RNs and APRNs by sex. These means are generated with values from both waves of data. One concern is that the pandemic may have altered the composition of the nurse labor force, leading to questions about the validity of pooling the two waves. Indeed, there are some notable differences in means across the years among employed nurses: Compared to the 2018 values, nurses in 2022 are slightly younger and less experienced, are less likely to have young children in the household; and are more likely to have reported taking a year or two off from nursing. Despite these differences, the observed wage gaps and the results of the

decompositions are similar whether we pool or separate the survey waves. All models below pool the two waves of data. Results for separate waves are available upon request.

Empirical estimation

Our primary research question is how much of the earnings gap between the sexes can be explained with the variables identified above. We approach this question in two ways. First, we use a standard Oaxaca-Blinder decomposition to evaluate the mean differences. Doing this gives a point of comparison for prior literature, while providing an easy-to-summarize story of what happens to average hourly wages. Our second approach is to examine the role of the observed variables in explaining the distribution of wages. This methods help to recover the counterfactual distribution of female's earnings that would hold under men's characteristics. The distributional analysis allows us to look for different explanations of the wage gap that may occur at various levels of wages.

Earnings regressions and Oaxaca-Blinder decomposition

Our primary model examines the determinants of log hourly wages. The basic regression specification is as follows:

(1) $$Ln(Hourly\ wage_{it}) = \beta_0 + \beta_1 Demographics_{it} + \beta_2 Family\ Status_{it} + \beta_3 Human\ Capital_{it} + \beta_4\ Skills_{it} + \beta_5\ Job\ Characteristics_{it} + \beta_6 Location_{it} + \beta_7 Wave_t + \varepsilon_i$$

Equation 1 is estimated separately for males and females among RNs and among APRNs. The variables include the standard human capital specification of the determinants of wages. Wages for individual *i* in survey wave *t* is a function of the demographics, family status, human capital, skills, and location variables described above. The model also includes variables describing the

full set of job characteristics: union status; employer type; employment setting; level of care, and clinical specialty. As Blau and Kahn (2017) point out, variables describing job characteristics may be endogenous and difficult to interpret as they may reflect unobserved labor market skills and human capital. Nevertheless, including these variables will help show how much of the gender-based earnings gap may be explained through these measurable job characteristics. All models are estimated using OLS with heteroskedastic robust standard errors.

The Oaxaca-Blinder decomposition is estimated using the assumption that females are the non-discriminated base group. We use a two-part decomposition as follows:

$$(2) \qquad \overline{Y}_M - \overline{Y}_F = \left(\overline{X}_M - \overline{X}_F\right)'\widehat{\beta_F} + \overline{X}_M\left(\widehat{\beta_M} - \widehat{\beta_F}\right)$$

where $\bar{Y}$ is average log wages among males (M) and females (F), $\bar{X}$ reflect average characteristics and $\hat{\beta}$ are coefficients estimated in equation 1. The first term on the right-hand side reflects the explained portion, that is, how females' average wage would change if females had the average characteristics of males. The second term reflects the unexplained portion, that is, how the betas differ, or how the predicted male wage would change if males had the same returns to wages (the betas) as females. In the results below we show the proportion of the average wage differences attributed to the explained and unexplained terms. We also delve into how much each set of variables contributes to the explained portion.

Distribution decomposition

A thorough study of wage gaps between male and female nurses requires examining wages beyond the mean. Examining wages at different parts of the distribution allows us to disentangle differences between low- and high-paid nurses. The following section describes the approach we use to assess differences in the distribution of wages. Firpo et al. (2009) (hereafter

FFL) propose a simple method that decomposes the distribution of wages into explained and unexplained components at each quantile. Using this method we assess the sex-based wage gap at different parts of the distribution.

For a distribution statistic v, such as quartiles, the wage gap can be disaggregated as

$$\Delta v = \left(\overline{X}_M - \overline{X}_F\right)'\widetilde{\beta_F} + \overline{X}_M\left(\widetilde{\beta_M} - \widetilde{\beta_F}\right), \quad (3)$$

where the coefficients $\widetilde{\beta_M}$ and $\widetilde{\beta_F}$ are obtained through the linear regression of recentered influence functions (RIFs) on the characteristics of male and female nurses, respectively. RIFs quantify the relative contribution of an observation and enable the implementation of the decomposition analysis. This approach relies on the correct approximation of the counterfactual distribution used to decompose the gap.

The methods estimate counterfactual distributions to decompose the wage gap. A counterfactual distribution is estimated using the conditional distribution of female wages and the distribution of the characteristics of males. Equation (4) represents the counterfactual distribution where Y_M and Y_F represents the earnings of males and females respectively and X_M, X_F the observed characteristics for both groups:

$$F_{Y\langle F|M\rangle}(y) := \int_{\mathcal{X}_M} F_{Y_F|X_F}(y \mid x) dF_{X_M}(x) \quad (4)$$

FFL uses a two-stage approach that estimates recentered influence functions to obtain decompositions for any distributional statistic v. In the first stage, FFL uses a reweighting method to identify the counterfactual distribution (4) based on the observed data. Reweighting helps to assess how the difference in the distribution of covariates contributes to the difference in the density of the outcome. Then, in the second stage, FFL estimates (3) the RIFs for the statistic v. Specifically, it replaces the dependent variable (log wages) with the RIFs and estimates its conditional expectation with a linear approximation of the covariates. The main advantage of this

simple method is that it requires running only one regression. However, its main limitation is that it may be prone to approximation errors due to the linear approximation (Firpo et al. 2018).

Overall, the earnings regression, the Oaxaca-Blinder decomposition, and the distribution decomposition method might all suffer from sample-selection bias due to labor force participation. Since wages are only observed for individuals already participating in the nursing labor market, the standard assumption behind all the models is that the decision to work is uncorrelated with their potential earnings. We also caution that our estimates are not causal, and data limitations prevent us from evaluating the full compensation package that includes fringe benefits and paid time off.

Results for OLS

Results for the basic OLS regressions are shown in Figure 4 for RNs and Figure 5 for APRNs. A table of coefficients and standard errors are available in Appendix Table A1. For RNs, regardless of sex, there are returns to experience, having a master's or doctorate degree, being represented by a union, working as a traveling nurse, and working in a hospital. High returns are also observed for RNs who work in critical care and management.

For RNs, the returns to the variables are often similar in magnitude (as measured by percent change) for males and females but there are some notable differences. There exists a wage premium to Black females who earn 2.6 percent more than White females, compared to the Black male coefficient of a statistically insignificant 0.5 percent. Having children does not induce a wage penalty for RNs, however, time away from nursing for 5 years or more does lower wages, with the penalty for females much larger than that for males.

Males who work in a hospital or who report management as their primary type of work earn premiums of 10.7 percent and 8.4 percent, respectively, over other types of work, compared to premiums of 8.9 percent and 7.2 percent for females. The type of work premium does not always favor males, however. Males who work report working in emergency care earn a statistically insignificant 3.9 percent premium versus an 9.5 percent premium for females. A similar disparity favoring females is apparent for inpatient care.

APRNs also enjoy returns to experience and education, although the returns to APRN experience are smaller for men. There is a wage penalty for Black male APRNs and no premium nor penalty for Black female APRNs. The largest determinant of hourly wages for APRNs is the type of APRN. Nurse anesthetists earn wage premiums of 32.5 percent (males) and 40.6 percent (females) over nurse practitioners. Clinical nurse specialists and nurse midwives are paid less than nurse practitioners, however, the sex-specific results should be considered as only suggestive since there are very few male nurses in these categories. Lastly, work type and setting also matter, with APRN working in a variety of settings earning wage premiums.

Results for Oaxaca-Blinder decomposition

Table 2 presents the outcomes of the Oaxaca-Blinder decomposition for log real hourly wages. For RNs, the unlogged real hourly wage difference is $2.57 favoring males. In log terms, the premium we decompose is 7.5 percent and the explained portion accounts for 32 percent of the difference. For APRNs, the unlogged real hourly wage difference is $5.49 favoring males. The male APRN premium decomposed is 9.5 percent, of which the explained portion accounts for 41.5 percent of the gap. In other words, the observed characteristics do a better job at explaining the APRN wage gap than the RN wage gap.

Figure 6 delves into the decomposition of the wage gap based on the contributions of the explanatory variables. For RNs, demographics and family composition play small roles in determining the wage gap, while the human capital variables exhibit a negative contribution to the wage gap and constitute the largest contributor to the explained portion. The negative value implies the characteristics would predict less of a wage gap than we observe. In other words, human capital variables reduce the male wage premium and lower the wage gap. By contrast, differences in the employment setting, level of care, and work location contribute to the wage gap.

Turning our attention to APRNs, among the explained portion, we find that demographics and family status again exert minimal influence. The primary drivers of the wage gap are APRN type, human capital, level of care, and clinical specialty. As with RNs, human capital variables lower the APRN wage gap. The largest contributor by far is the type of APRN (nurse practitioner, nurse midwife, nurse anesthetist, clinical nurse specialist, and multiple APRN certifications) at 3 percent of the total gap but 30 percent of the explained portion. The level of care and clinical specialties each explain around a quarter of the explained gap. Other variables contribute smaller amounts.

It is not surprising that the type of APRN exerts the largest influence on the explained portion of the gap. The training and job responsibilities among the different types of APRNs are rather different and warrant different pay scales. NPs constitute the largest proportion of APRNs at 89% of APRNs in this sample. They also have the broadest job duties, although often in primary care, they work in a variety of settings. Nurse anesthetists primarily work in hospitals and administer anesthesia for surgeries and procedures. Nurse midwives work in both ambulatory and hospital settings and focus on labor and delivery. Clinical nurse specialists work

in a various places but often with a specialty such as gerontology or psychiatry. Given these differences and in order to make the job more comparable across the sexes, we re-estimate the Oaxaca-Blinder decomposition among just NPs and just NAs in columns 3 and 4 of Table 2. We do not do similar analyses for CNS and NMs since there are only 37 male CNSs and 15 males NMs reported in our data. We also exclude nurses who are classified as having multiple certifications.

The results in columns 3 and 4 of Table 2 show that once we consider advance practice nurses in similar jobs, the sex-based gap falls from 9.5 percent among all APRNs to 4.5 percent for NPs and 6.1 percent for NAs. But most of the gaps for NPs and NAs remains unexplained. In the remaining analyses, we focus on NPs rather than all APRNs in order to maintain as similar of job duties as possible and see if we can further diminish or explain the sex-based wage gap among NPs. Corresponding analyses on nurse anesthetists are limited by the small sample size (N=714) with results varying a lot based on the part of the wage distribution and on other sample limitations. These results are available upon request.

Results for distribution decompositions

As stated above, the sex-based wage differential favoring males averages 7.5% for RNs and 4.5% for NPs. This section extends these observations by examining different segments of the earnings distribution. Table 3 presents the FFL method of recentered influence functions to explain the wage gap across the first and third quartiles of the distribution. Figure 7 extends these results portraying overall wage gaps and their explained variation for every decile of the hourly wage distribution. Figures 8 and 9 look at the explained variation of the covariates for the first

and third quartile. The results collectively emphasize substantial variation in the gender-based wage disparity across the earnings distribution.

We start by looking at the wage gap on the left and right parts of the RNs earning distribution using the first (25th percentile) and third quartiles (75th percentile). According to Table 3, the overall RN wage gap at the 25th percentile is 9.2 percent and decreases to 7.1 percent for the 75th percentile. When decomposing the gap, the explained component accounts for 18 percent on the first quartile and increases to 35 on the third one. Figure 7 reveals a negative slope pattern of the total gap, although the explained portion increases slightly. In other words, the higher you are the in the wage distribution, the smaller the observed wage gap between male and female RNs. The total difference of hourly wages decreases from 9.6 (10th percentile) to 5.6 percent (90th percentile).

The method by FFL allows us to disentangle the contribution of each covariate to the wage gap. Figure 8 shows these results for RNs. Human capital again explains a negative variation on the wage gap for the two quartiles. The type of employment setting, level of care, and location also explain most of the variation in both sides of the distribution.

The wage gap on NPs depicts significant variation across the wage distribution. The right plot of Figure 7 shows that the bottom half of the distribution shows a wage gap of 1.9 to 4.5 percent, specifically 2.7% at the first quartile (column 3 of Table 3), with a significant increase afterwards. The wage premium increases in the top half of the distribution with a magnitude of 8.3 percent at the 90th percentile. The observed characteristics explain negatively (reduce) the wage gap on the bottom half of the distribution, while positively explaining it on the top half. Overall, the unexplained component of the wage gap widens for the lowest and the highest paid NPs. Similar to the Oaxaca-Blinder decomposition, Figure 9 shows that human capital negatively

explains the wage gap on both quartiles, while level of care and clinical specialty explains the gap particularly at the 75th percentile.

Testing nurse-specific theories of the wage gap

It is clear from the above decomposition exercises that observed variables explain only some of the observed wage gap favoring male nurses. The main model above primarily tests theories of human capital differences and to some degree compensating wage differentials as proxied for by observable job characteristics. In this section, we analyze selected samples to see if we can reduce the gap and/or explain more of the gap based on some of the other possible reasons why the gap may exist.

Compensating wages for physical stamina: One of the theories about why male RNs may earn wage premiums has to do with the physical nature of the job. We test this theory by limiting the sample to nurses who are not involved in patient care. This allows us to see if the wage gap persists by removing the patient-care component and thereby assuming the job is less physical when it does not involve moving or lifting patients. Column 2 of Table 4 shows this result. For RNs with no patient care, the gap is 6.2 percent which is lower than the gap for all RNs shown in Column 1. The differences in the mean values of the variables explain only 22 percent of this gap. This implies that the physicality story of compensating wages does not hold for RNs.

For NPs, O*net reports the APRN/NP job duties are generally less physically demanding than the RN duties, so the results for NPs not in patient care may be less informative. Nonetheless, the gap not only persists for these nurses, but it rises to 5.6 percent with less than 10 percent explained (column 2 of Table 5).

Wage penalty for exit and reentry. Another theory for sex-based wage gaps focuses on the penalty for time away from the profession for reasons of child and family care that may fall disproportionately on females. We control for years away from nursing in the main models and show that being away 3-5 years lowers wages by 8% for male RNs and 4% for female RN. Being away for more than 5 years lowers wages by 2% for males and 13% for females. Here, we test the theory more directly by limiting the samples to nurses who did not take time away from the profession. That is, by removing the people who may face the exit penalty, we can see if the gap persists among males and females who have worked continuously and provide evidence for or against the exit penalty theory. These results in Column 3 of Tables 4 and 5 show that the exit penalty theory may not hold. For RNs, the wage gap of 7.7 percent is very close to that of the full sample and the proportion explained by the variables is 33 percent. Similarly for NPs, the wage gap remains on the same magnitude with the explained variation small and statistically insignificant.

Compensating wages for flexibility to work non-standard shifts: We limit the sample to nurses reporting no children under the age of 6 in the household in order to proxy for people who may have more flexibility to work overtime or non-standard shifts (see column 4). This sample restriction does not alter the wage gap much for either group and most of the gap remains unexplained.

Gaps explained by overtime pay. Another reason for the wage gap may lie in the structure of pay for nurses in regards to overtime. Nurses who are paid hourly may earn overtime pay at time and a half for work over 40 hours per week (WHD 2019). However, RNs and APRNs may also be classified as "learned professionals" if they are salaried, and thereby not earn overtime pay rates for excessive hours. Our measure of hourly wages is calculated by

dividing earnings by hours worked, but it is unknown if hours include time at the overtime rate or if all hours are salaried. Unfortunately, the public data do not include information on the number of hours at each pay rate, so we proxy for this in two ways. First, we limit the sample to people reporting usual weekly work hours of 40 or less. This sample limitation helps identify respondents whose income may come only from the standard pay rate. Second, we recalculate hourly wages assuming workers are paid time and a half for any hours worked over 40. This calculation recovers the base pay rate. We run the decompositions with the base pay rate for all workers and for hospital workers only who may be more likely to encounter mandatory overtime rules to satisfy nurse-to-patient staff ratios.

The results are included in columns 5-7 of Tables 4 and 5. For RNs, restricting the sample to 40 hours or less results in a slightly higher wage gap as compared to the full sample, but the explained portion rises to 40 percent. Furthermore, once we use the re-calculated wage that recovers the base wage rate, the gap shrinks to 6.9 percent of which 34 percent is explained. Restricting the sample to RNs who work in hospitals presents some surprising results. Using the base wage rate, the size of the gap falls dramatically to 3.9 percent and the explained portion overexplains the gap, meaning that the explained variables eliminate the wage gap in favor of males. These results are suggestive that males are more likely to work overtime and receive overtime pay, and that overtime may be responsible for a large proportion of the observed gap, at least among hospital workers. In models not shown, the corresponding base wage gap remains large in the other employment settings of ambulatory care and long-term care.

The results of these variations for NPs are not as straightforward, and overtime pay may be less relevant for NP. Using the 2018 Annual Social and Economic Supplement of the Current Population Survey we estimate that 43 percent of NPs report being paid by the hour compared to

66 percent of RNs. The results show that limiting the sample to workers working 40 hours or less increases the gap to 6.6 percent, although using the overtime-excluded wage rate reduces the gap down to 3.6 percent. The overtime-excluded wage gap among NPs who work in hospitals is lower still at 1.8 percent and the explained portion overexplains the gap. As with the RNs, these results are suggestive that males who work in hospitals are more likely to work overtime and receive overtime pay, and that overtime may be responsible for a large proportion of the observed gap.

Finally, we analyze the gap using the calculated base pay rate for low- and high-paid workers in Table 6. For RNs, both quartiles show similar results of the wage gap. The gap is 4.1 and 3 percent for the 25th and 75th percentile, respectively. The characteristics overexplain the gap for only the low-paid RNs. On the other hand, NPs decomposition depict a different story. When looking at low-paid NPs (column 3 of Table 6), the gap becomes negative because the adjusted female's hourly wage is higher that male's but statistically insignificant. However, this does not hold for high-paid NPs, and the wage gap favoring males again appears. That is, among NPs that work in-hospital, overtime pay might only explain the gap for low-paid workers.

Conclusions

The nursing profession provides for an interesting case study of sex-based wage gaps since males comprise only a small fraction of the workforce yet earn higher wages than female nurses. Given the very high proportion of females in the profession, inequality of opportunity should not be a concern when evaluating the wage gap. Our examination of large samples of nurses conducted in 2018 and 2022 shows that the wage gap persists after accounting for differences in education, experience, time away from the work force, job-related skills, and job

characteristics. Using decomposition methods by Oaxaca-Blinder and Firpo et al. (2009), we show that the gap persists at the mean and across the distribution of wages.

Our analyses delve into the question of why such a gap exists. Some explanations that are relevant to the nursing profession include compensating wage differentials that arise from the physical nature of the job, flexibility to work non-standard shifts, the wage penalty for exit and reentry, and the presence of overtime pay. We rule out the first three of these explanations, but provide some evidence that overtime pay may explain observed pay gap, particularly among hospital workers. Specifically, when we recalculate wages to reflect a base-pay, the gap among RNs falls from 7.5 to 3.9 percent among hospital workers who are highly likely to earn overtime pay. For similar NPs, the gap falls from 4.5 percent to 1.8 percent, although for NPs, the overtime explanation only holds at the low end of the wage distribution.

We also find that the type of nurse and where you are in the earnings distribution matters. The largest gaps occur among the lowest paid RNs and the smallest gap occurs among the lowest paid NPs. Even though we include a rich set of individual and job-related characteristics, the covariates often do not explain much of the gap. Traditional variables like demographics, family, and union status explain little of the variation of the total gap in this profession. Human capital and job characteristics contribute more to the explained part of the gap, but do not eliminate it.

In conclusion, the nursing profession exhibits sex-based wage disparities comparable in magnitude to other comparable occupations, such as pharmacists. However, with males comprising only 12 percent of the nursing labor force, it is not clear why there is a persistent wage gap ranging from 4 to 10 percent adjusted across various scenarios. Our estimations are limited by the assumptions we use to derive a reliable base pay rate. Additionally, the limited availability of data restricts our ability to investigate the sex-concordance hypothesis and other

potential reasons for the wage disparity. Moving forward, it will be intriguing to monitor whether this wage gap evolves in the coming years, particularly as the proportion of male nurses continues to rise relative to their female counterparts.

References

Adams-Prassl, A., Hara, K., Milland, K., & Callison-Burch, C. (2023). The gender wage gap in an online labor market: The cost of interruptions. *Review of Economics and Statistics*, 1-23.

Alsan, Marcella, Owen Garrick, and Grant Graziani. (2019). "Does Diversity Matter for Health? Experimental Evidence from Oakland." *American Economic Review*, 109(12): 4071–4111.

Bolotnyy, V., & Emanuel, N. (2022). Why do women earn less than men? Evidence from bus and train operators. *Journal of Labor Economics*, *40*(2), 283-323.

Blau, F. D., & Kahn, L. M. (2017). The gender wage gap: Extent, trends, and explanations. *Journal of Economic Literature*, *55*(3), 789-865.

Bureau of Labor Statistics, U.S. Department of Labor (2024), *Occupational Outlook Handbook*, at https://www.bls.gov/ooh/healthcare/registered-nurses.htm (visited *January 01, 2024*).

Cortés, P., & Pan, J. (2014). Foreign nurse importation and the supply of native nurses. *Journal of Health Economics*, *37*, 164-180.

Cortés, P., & Pan, J. (2015). The relative quality of foreign-educated nurses in the United States. *Journal of Human Resources*, *50*(4), 1009-1050.

Cortés, P., & Pan, J. (2023). Children and the remaining gender gaps in the labor market. *Journal of Economic Literature*, *61*(4), 1359-1409.

Cook, C., Diamond, R., Hall, J. V., List, J. A., & Oyer, P. (2021). The gender earnings gap in the gig economy: Evidence from over a million rideshare drivers. *The Review of Economic Studies*, *88*(5), 2210-2238.

Deering, M. (2023). Understanding Mandatory Overtime for Nurses: Which States Enforce Mandatory Overtime? *NurseJournal*, https://nursejournal.org/resources/mandatory-overtime-for-nurses. Accessed January 24 2024.

Dill, J. S., & Frogner, B. K. (2024). The gender wage gap among health care workers across educational and occupational groups. *Health Affairs Scholar*, *2*(1), qxad090.

Firpo, S. P., Fortin, N. M., & Lemieux, T. (2018). Decomposing wage distributions using recentered influence function regressions. Econometrics, 6(2), 28.

Greene, J., El-Banna, M. M., Briggs, L. A., & Park, J. (2017). Gender differences in nurse practitioner salaries. *Journal of the American Association of Nurse Practitioners*, *29*(11), 667-672.

Goldin, C. (2014). A Grand Gender Convergence: Its Last Chapter. *American Economic Review*, 104 (4): 1091-1119.

Goldin, C., & Katz, L. F. (2016). A most egalitarian profession: pharmacy and the evolution of a family-friendly occupation. Journal of Labor Economics, 34(3), 705-746.

Hill, A. J., Jones, D. B., & Woodworth, L. (2023). Physician-patient race-match reduces patient mortality. *Journal of Health Economics*, *92*, 102821.

Jones, C. B., & Gates, M. (2004). Gender-based wage differentials in a predominantly female profession: observations from nursing. *Economics of Education Review*, *23*(6), 615-631.

Jones, J. (March 19, 2021). 5 Facts About the State of the Gender Pay Gap. *U.S. Department of Labor Blog*. https://blog.dol.gov/2021/03/19/5-facts-about-the-state-of-the-gender-pay-gap

Kalist, D. E. (2002). The gender earnings gap in the RN labor market. *Nursing Economics*, *20*(4), 155.

Mas, A., & Pallais, A. (2017). Valuing alternative work arrangements. *American Economic Review*, *107*(12), 3722-3759.

McMichael, B. J., & Markowitz, S. (2023). Toward a uniform classification of nurse practitioner scope of practice laws. *Medical Care Research and Review*, *80*(4), 444-454.

Mincer, J., & Polachek, S. (1974). Family investments in human capital: Earnings of women. *Journal of political Economy*, *82*(2, Part 2), S76-S108.

Muench, U., Sindelar, J., Busch, S. H., & Buerhaus, P. I. (2015). Salary differences between male and female registered nurses in the United States. *Jama*, *313*(12), 1265-1267.

Muench, U., Sindelar, J., Busch, S. H., & Buerhaus, P. I. (2016). Exploring Explanations for the Female-Male Earnings Difference Among Registered Nurses in the United States. *Nursing Economic$*, 34(5), 214-223.

Munnich, E., & Wozniak, A. (2020). What explains the rising share of US men in registered nursing?. *ILR Review*, *73*(1), 91-123.

*O*NET Resource Center*, National Center for O*NET Development, www.onetcenter.org/. Accessed November 2023.

Sloane, C. M., Hurst, E. G., & Black, D. A. (2021). College majors, occupations, and the gender wage gap. *Journal of Economic Perspectives*, *35*(4), 223-248.

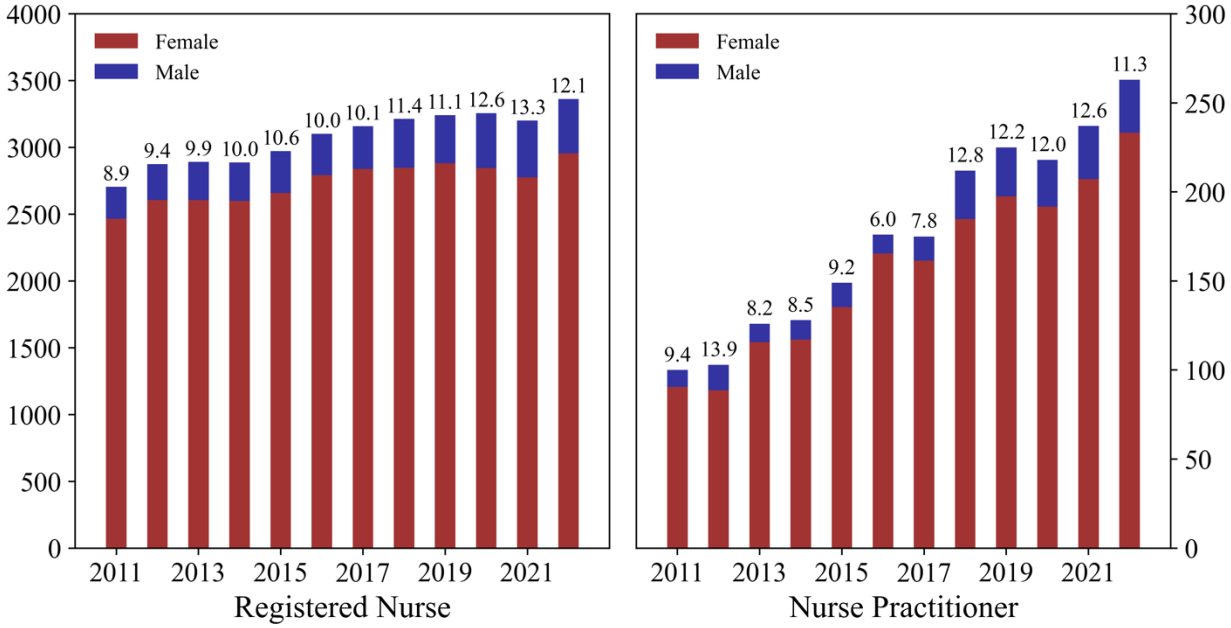
Wage and Hour Division, United States Department of Labor (September 2019). Fact Sheet #17N: Nurses and the Part 541 Exemptions Under the Fair Labor Standards Act (FLSA). https://www.dol.gov/agencies/whd/fact-sheets/17n-overtime-nurses

U.S. Department of Health and Human Services, Health Resources and Services Administration, National Center for Health Workforce Analysis. 2018. Survey Questionnaire, 2018 National Sample Survey of Registered Nurses, Rockville, Maryland.

U.S. Department of Health and Human Services, Health Resources and Services Administration, National Center for Health Workforce Analysis. 2022. Survey Questionnaire, 2022 National Sample Survey of Registered Nurses, Rockville, Maryland.

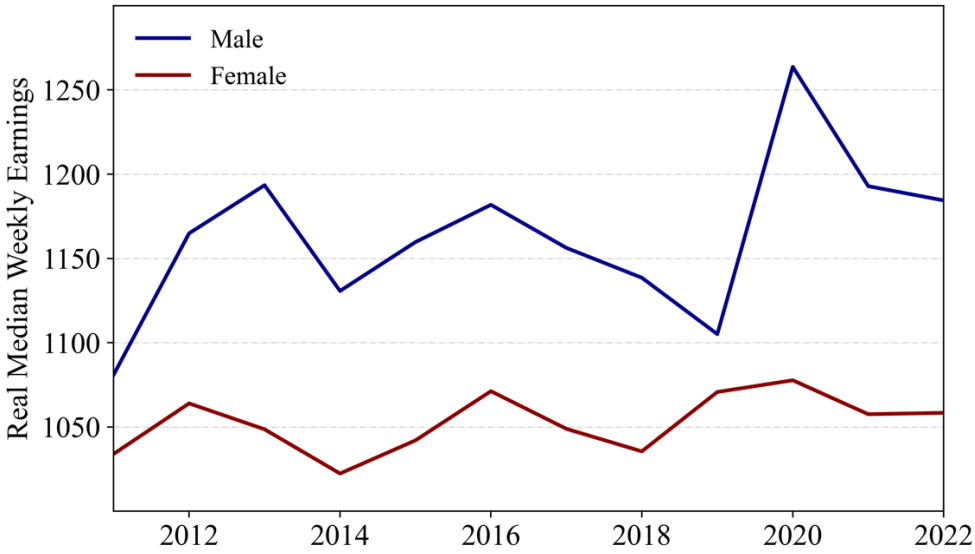
Wilson, B. L., Butler, M. J., Butler, R. J., & Johnson, W. G. (2018). Nursing gender pay differentials in the new millennium. *Journal of Nursing Scholarship*, *50*(1), 102-108.

Figure 1. Number of Employed Nurses (in 1,000s) and Percent Male



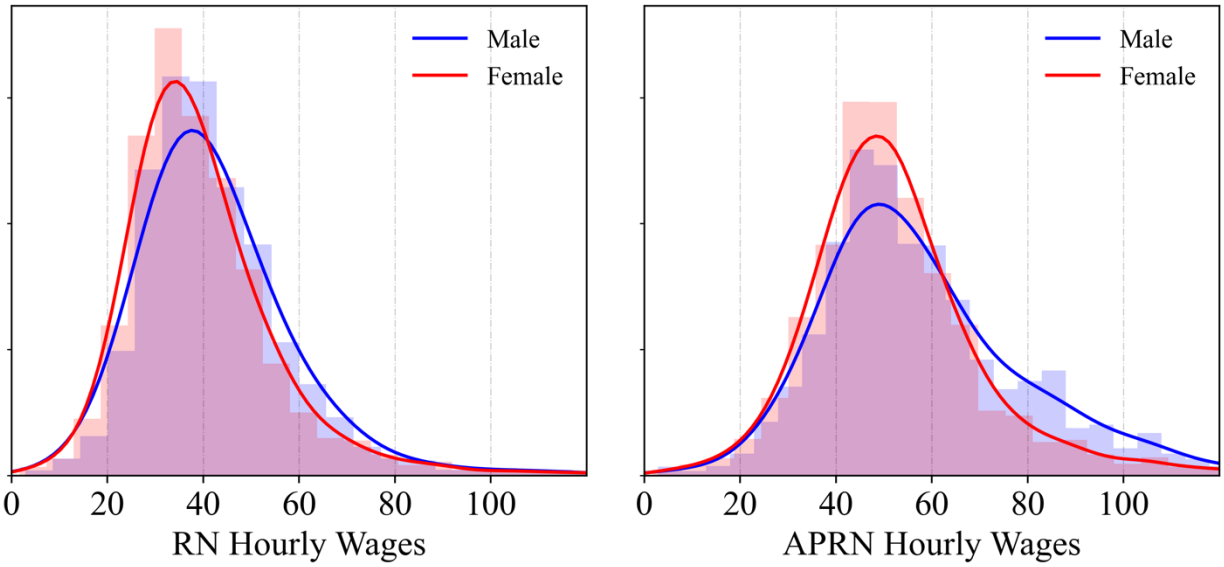
Note. Trends and composition by sex of registered nurses and nurse practitioners. Numbers at the top of each bar represent the proportion of male nurses. Source: Bureau of Labor Statistics, Current Population Survey.

Figure 2. Registered Nurses Median Weekly Earnings by Sex



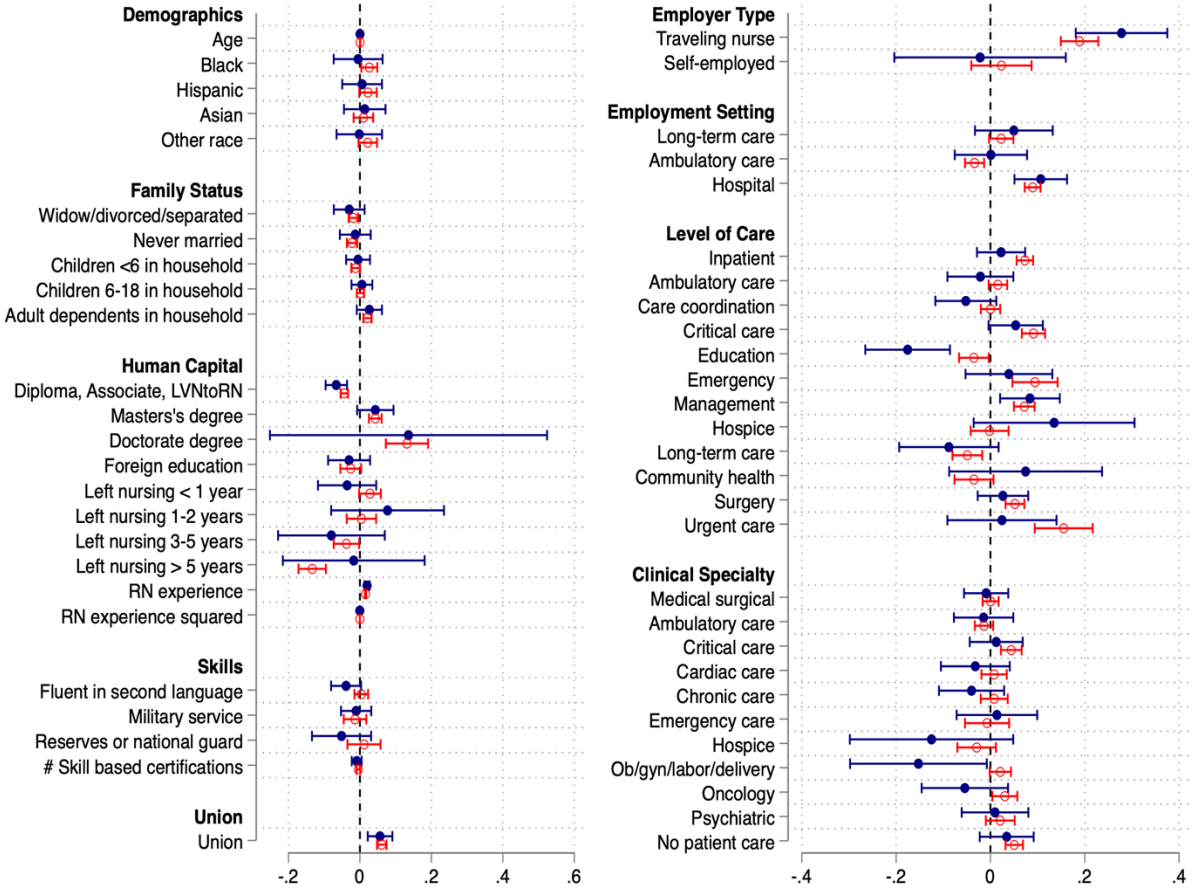
Note. Trends of real median weekly earnings expressed in 2011 dollars by sex for Registered Nurses. Source: Bureau of Labor Statistics, Current Population Survey.

Figure 3. Hourly Wage Distribution by Sex



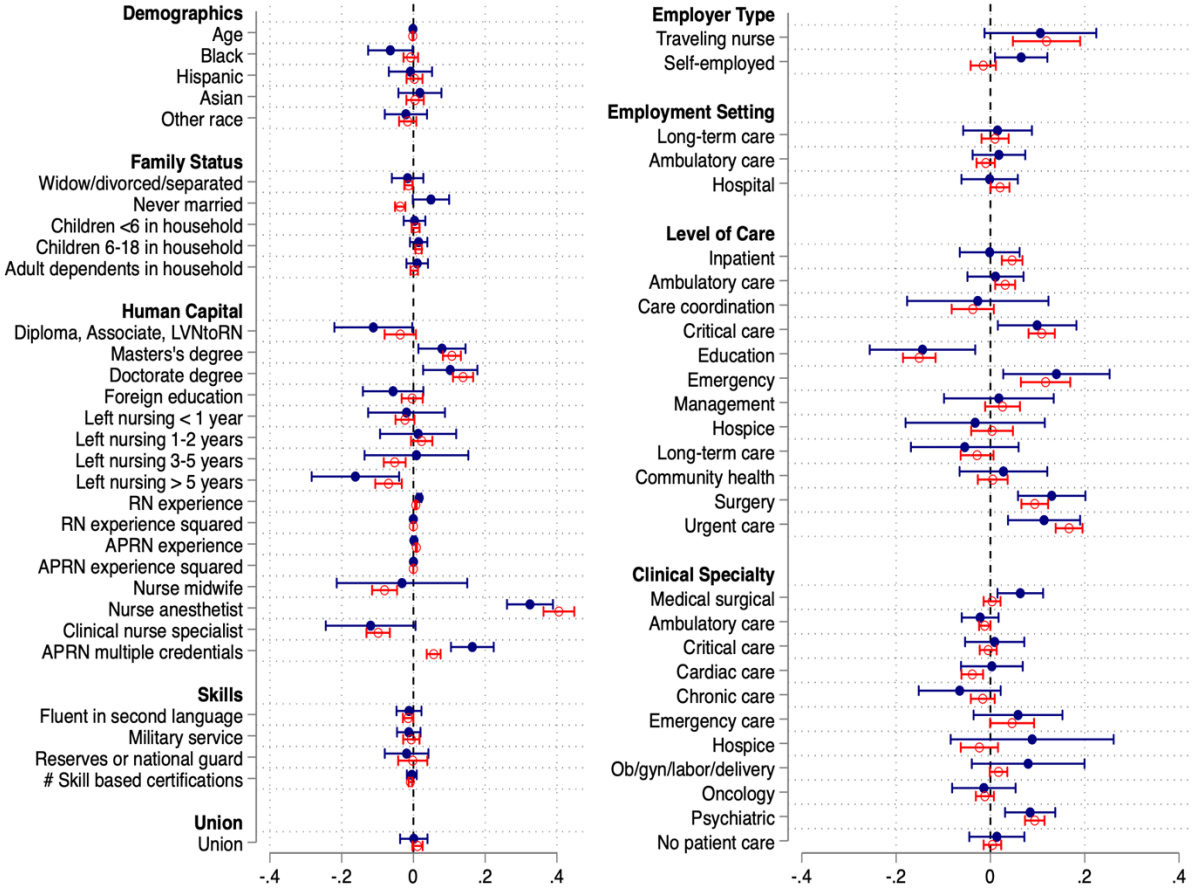
Note. Histogram and density of hourly wages by sex of registered nurses (RN) and advanced practice registered nurses (APRN).

Figure 4. Log Hourly Wage Regressions for RNs by Sex



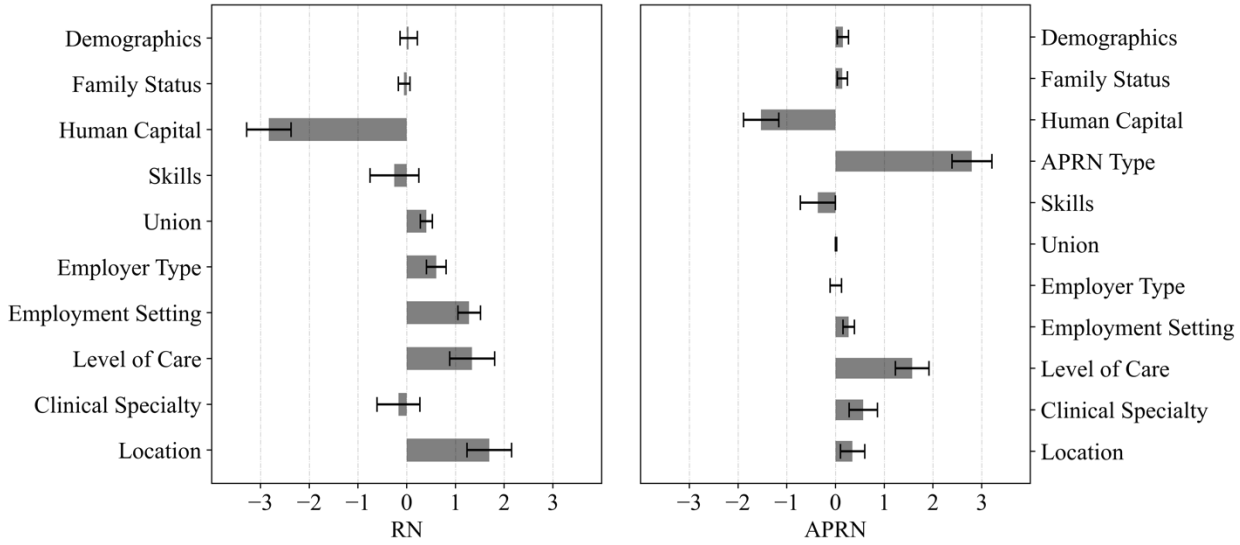
Note. Blue dots represent estimates of log hourly wage regressions for male RNs and red dots for female RNs. 95% CIs shown based on heteroskedastic robust standard errors.

Figure 5. Log Hourly Wage Regressions for APRNs by Sex



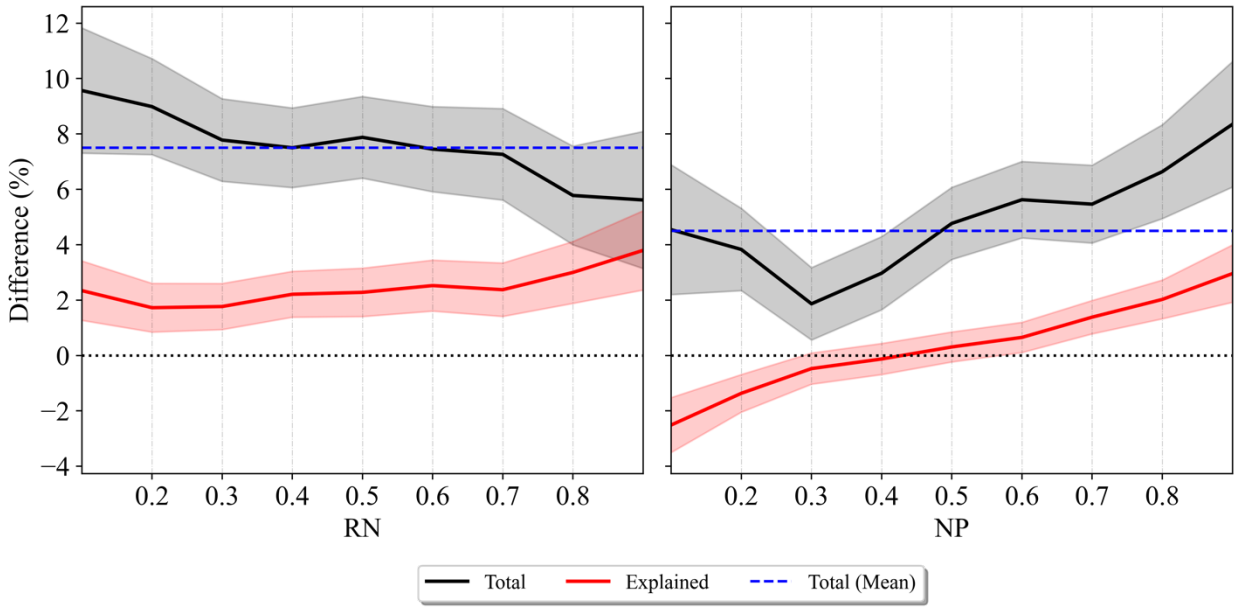
Note. Blue dots represent estimates of log hourly wage regressions for male APRNs and red dots for female APRNs. 95% CIs shown based on heteroskedastic robust standard errors.

Figure 6. Explained Component of Oaxaca-Blinder Decomposition



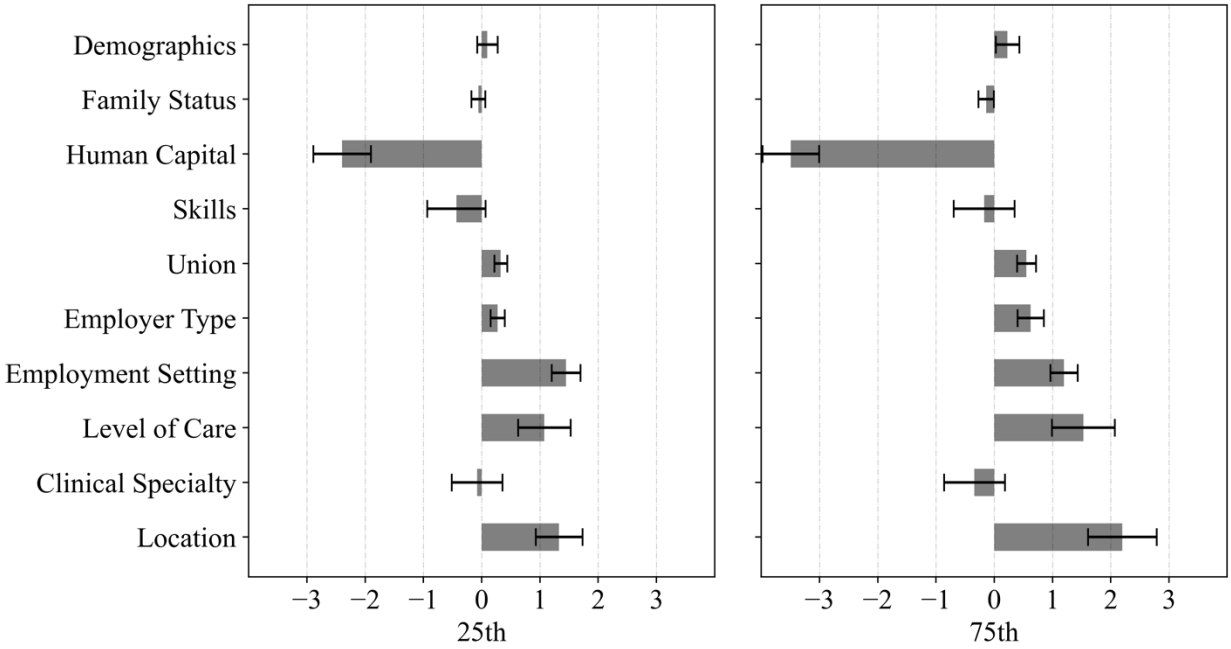
Note. Explained component of the Oaxaca-Blinder decomposition of log hourly wages by sex. The decompositions include the full set of explanatory variables detailed in the data section. The shaded boxes represent the magnitude of the explained component that contributes to the total gap as a percentage of female wages. The bars represent 95% confidence intervals.

Figure 7: Distribution Decomposition for Registered Nurses and Nurse Practitioners



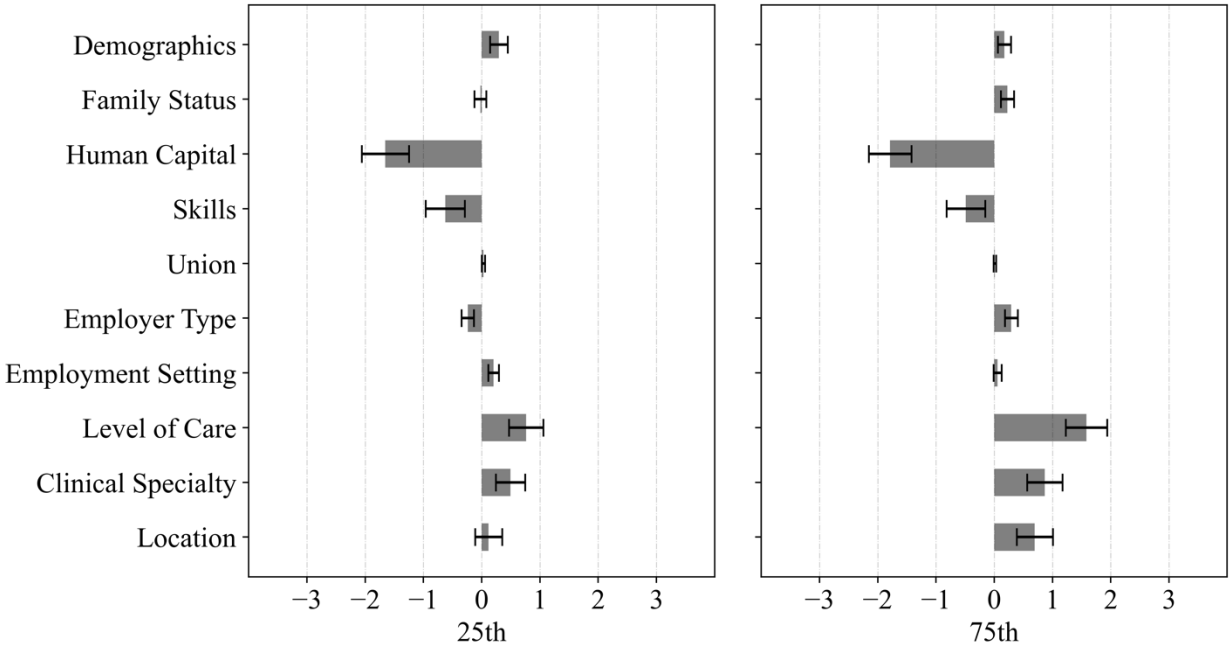
Note. Distribution decomposition of log hourly wages by sex at every decile of the distribution. The decompositions include the full set of explanatory variables detailed in the data section. The black line represents the difference in wages as a percentage of female wages on each decile. The red line is the contribution of the explained component as a percentage of the total difference. The blue line is the difference at the mean using the Oaxaca-Blinder decomposition. The shaded areas represent 95% confidence intervals.

Figure 8: Explained Component of Distribution Decomposition for Registered Nurses



Note. Explained component of the distribution decomposition of log hourly wages by sex. The decompositions include the full set of explanatory variables detailed in the data section. The shaded boxes represent the magnitude of the explained component that contributes to the total gap as a percentage of female wages at the given quartile. The bars represent 95% confidence intervals.

Figure 9: Explained Component of Distribution Decomposition for Nurse Practitioners



Note. Explained component of the distribution decomposition of log hourly wages by sex. The decompositions include the full set of explanatory variables detailed in the data section. The shaded boxes represent the magnitude of the explained component that contributes to the total gap as a percentage of female wages at the given quartile. The bars represent 95% confidence intervals.

Table 1: Means for RNs and APRNs, by Sex

	Male RNs	Female RNs		Male APRNs	Female APRNs
Real hourly wage	45.49	42.92		61.22	55.73
Demographics					
Age	46.60	48.08		48.12	48.95
Black	0.05	0.05		0.05	0.05
Hispanic	0.06	0.04		0.05	0.04
Asian	0.10	0.06		0.06	0.04
Other race	0.04	0.03		0.04	0.03
Family status					
Widow/divorced/separated	0.10	0.16		0.08	0.14
Never married	0.18	0.12		0.09	0.08
Children < age 6 in household	0.15	0.15		0.17	0.16
Children ages 6-18 in household	0.30	0.31		0.39	0.33
Adult dependents in household	0.16	0.17		0.18	0.17
Human capital					
HS/associate's degree/LVN to RN	0.39	0.37		0.02	0.02
Master's degree	0.07	0.09		0.79	0.81
Doctorate degree	0.00	0.01		0.14	0.12
Foreign education	0.07	0.04		0.03	0.02
RN experience	15.24	19.90		19.11	22.98
Left nursing < 1 year	0.05	0.05		0.03	0.04
Left nursing 1-2 years	0.02	0.03		0.03	0.03
Left nursing 3-5 years	0.01	0.03		0.01	0.02
Left nursing > 5 years	0.01	0.03		0.01	0.02
APRN experience				9.88	11.39
Nurse midwife				0.00	0.02
Nurse anesthetist				0.07	0.01
Clinical nurse specialist				0.01	0.02
APRN multiple credentials				0.08	0.05
Skills and certifications					
Fluent in second language	0.21	0.12		0.21	0.13
Military service	0.16	0.03		0.17	0.04
Reserves or national guard	0.03	0.01		0.03	0.01
Skill-based certifications	1.84	1.54		1.61	1.44
Job Characteristics--Union Status and Employer type					
Union member	0.22	0.15		0.07	0.07
Traveling nurse	0.06	0.02		0.01	0.01
Self-employed	0.01	0.02		0.10	0.07
Job Characteristics--Employment setting					
Long-term care	0.11	0.09		0.06	0.05

Ambulatory care	0.10	0.17		0.44	0.51
Hospital	0.68	0.57		0.42	0.33
Job Characteristics--Level of care					
Inpatient	0.21	0.21		0.15	0.15
Ambulatory care	0.07	0.12		0.38	0.49
Care coordination	0.03	0.06		0.00	0.01
Critical/intensive care	0.14	0.08		0.06	0.04
Education	0.02	0.04		0.03	0.04
Emergency	0.13	0.05		0.07	0.03
Management	0.05	0.06		0.02	0.02
Home health/hospice	0.04	0.06		0.02	0.03
Long-term care	0.04	0.05		0.02	0.03
Community health	0.01	0.03		0.02	0.03
Surgery	0.10	0.10		0.13	0.05
Urgent care	0.01	0.01		0.05	0.04
Job Characteristics--Clinical specialty					
Medical surgical	0.19	0.17		0.18	0.09
Ambulatory care	0.06	0.10		0.26	0.31
Critical care	0.11	0.06		0.05	0.04
Cardiac care	0.05	0.03		0.03	0.03
Chronic care	0.06	0.05		0.03	0.03
Emergency care	0.14	0.05		0.07	0.03
Home health/hospice	0.04	0.05		0.02	0.02
Ob/gyn/labor/delivery	0.00	0.06		0.01	0.06
Oncology	0.02	0.03		0.01	0.03
Psychiatric	0.06	0.03		0.11	0.07
No patient care	0.12	0.19		0.07	0.09
2022 Survey	0.53	0.48		0.52	0.48
Observations	3,361	33,147		4,454	41,992

Note: Unweighted averages by sex for Registered Nurses (RN) and Advanced Practice Registered Nurses (APRN). Means by sex are statistically different from each other with the following exceptions: Among RNs--Black; Children < age 6 in household; Children ages 6-18 in household; Left nursing < 1 year; Level of care inpatient; Level of care management; Level of care home health/hospice; Level of care surgery; Level of care urgent care. Among APRNS--Black; Adult dependents in household; HS/associate's degree/LVN to RN; Level of care inpatient; Level of care management; Clinical specialty cardiac care; Clinical specialty chronic care.

Table 2: Log Hourly Wages, Oaxaca-Blinder Decomposition

	(1) Registered Nurse	(2) Advanced Practice Registered Nurse	(3) Nurse Practitioner	(4) Nurse Anesthetist
Male ($)	$ 45.49	$ 61.22	$ 57.17	$ 91.21
Female ($)	$ 42.92	$ 55.73	$ 55.12	$ 85.91
Male (ln wage)	3.71	4.02	3.96	4.45
Female (ln wage)	3.63	3.92	3.91	4.39
Difference	0.075	0.095	0.045	0.061
	(0.008)	(0.007)	(0.007)	(0.032)
Explained (%)	32.14	41.53	4.64	17.29
	(6.14)	(3.90)	(7.14)	(56.30)
Unexplained (%)	67.85	58.46	95.35	82.70
	(10.23)	(7.27)	(16.45)	(69.79)
Observations	36,508	46,446	41,541	714

Notes: Oaxaca-Blinder decomposition of log hourly wage by sex. The decompositions include the full set of explanatory variables detailed in the data section. Rows 1 and 2 present the average hourly wage in dollars. Rows 3 and 4 present the average log wage, with the difference in row 5. Rows 6 and 7 present the contribution of the explained and unexplained components as a percentage of the difference. Heteroskedastic robust standard errors in parentheses.

Table 3: Log Hourly Wages, Quartile Decomposition

	(1) Registered Nurses (25^{th} percentile)	(2) Registered Nurses (75^{th} percentile)	(3) Nurse Practitioners (25^{th} percentile)	(4) Nurse Practitioners (75^{th} percentile)
Male ($)	$ 32.55	$ 50.13	$ 43.06	$ 63.79
Female ($)	$ 29.69	$ 46.67	$ 41.67	$ 60.42
Male (ln wage)	3.48	3.92	3.76	4.16
Female (ln wage)	3.39	3.84	3.74	4.10
Difference	0.092	0.071	0.027	0.057
	(0.008)	(0.009)	(0.007)	(0.007)
Explained (%)	18.08	35.32	-34.82	28.73
	(4.77)	(7.42)	(11.11)	(5.72)
Unexplained (%)	81.92	64.67	134.82	71.27
	(8.73)	(12.04)	(25.58)	(13.12)
Observations	36,508	36,508	41,541	41,541

Notes: Decomposition at quartile levels of log hourly wages by sex. The decompositions include the full set of explanatory variables detailed in the data section. Rows 1 and 2 present the hourly wage at the quartile in dollars. Rows 3 and 4 present the log wage at the quartile, with the difference in row 5. Rows 6 and 7 present the contributions of the explained and unexplained components as a percentage of the difference. Heteroskedastic robust standard errors in parentheses.

Table 4: Registered Nurses, Oaxaca-Blinder Decomposition

	(1) Full sample of Registered Nurses	(2) No patient care	(3) Worked continuously	(4) No children under age 6	(5) Works <= 40 hours	(6) Excluding overtime	(7) Excluding overtime & works in hospital
Male ($)	$ 45.49	$ 46.46	$ 44.56	$ 45.88	$ 48.12	$ 44.62	$ 45.22
Female ($)	$ 42.92	$ 45.23	$ 42.04	$ 43.35	$ 45.30	$ 42.31	$ 43.88
Male (ln wage)	3.71	3.75	3.71	3.71	3.75	3.68	3.71
Female (ln wage)	3.63	3.69	3.63	3.65	3.67	3.61	3.67
Difference	0.075	0.062	0.077	0.061	0.082	0.069	0.039
	(0.008)	(0.022)	(0.008)	(0.010)	(0.010)	(0.008)	(0.009)
Explained (%)	32.14	21.75	33.40	30.04	40.72	34.22	-15.57
	(6.14)	(20.78)	(6.10)	(6.94)	(7.09)	(6.72)	(15.10)
Unexplained (%)	67.85	78.25	66.59	69.95	59.27	65.77	115.57
	(10.23)	(36.52)	(9.75)	(11.80)	(11.59)	(11.42)	(23.15)
Observations	36,508	6,548	31,960	31,019	26,936	36,508	21,058

Notes: Oaxaca-Blinder decomposition of log hourly wage by sex. The decompositions include the full set of explanatory variables detailed in the data section. Rows 1 and 2 present the average hourly wage in dollars. Rows 3 and 4 present the average log wage, with the difference in row 5. Rows 6 and 7 present the contribution of the explained and unexplained components as a percentage of the difference. Heteroskedastic robust standard errors in parentheses.

Table 5: Nurse Practitioners, Oaxaca-Blinder Decomposition

	(1) Full sample of Nurse Practitioners	(2) No patient care	(3) Worked continuously	(4) No children under age 6	(5) Works <= 40 hours	(6) Excluding overtime	(7) Excluding overtime & works in hospital
Male ($)	$ 57.17	$ 55.61	$ 56.87	$ 57.72	$ 63.52	$ 55.51	$ 55.29
Female ($)	$ 55.12	$ 55.34	$ 54.61	$ 55.40	$ 60.27	$ 53.90	$ 54.51
Male (ln wage)	3.96	3.93	3.96	3.96	4.06	3.92	3.93
Female (ln wage)	3.91	3.87	3.91	3.91	3.99	3.88	3.91
Difference	0.045	0.056	0.044	0.054	0.066	0.036	0.018
	(0.007)	(0.029)	(0.007)	(0.011)	(0.010)	(0.007)	(0.012)
Explained (%)	4.64	9.54	-3.67	8.95	6.69	3.53	-25.42
	(7.14)	(25.52)	(7.48)	(7.63)	(6.54)	(9.14)	(33.51)
Unexplained (%)	95.35	90.45	103.67	91.04	93.30	96.46	125.42
	(16.45)	(56.58)	(16.87)	(17.94)	(14.96)	(21.43)	(71.14)
Observations	41,541	3,674	37,059	34,615	26,463	41,541	13,138

Notes: Oaxaca-Blinder decomposition of log hourly wage by sex. The decompositions include the full set of explanatory variables detailed in the data section. Rows 1 and 2 present the average hourly wage in dollars. Rows 3 and 4 present the average log wage, with the difference in row 5. Rows 6 and 7 present the contribution of the explained and unexplained components as a percentage of the difference. Heteroskedastic robust standard errors in parentheses.

Table 6: Excluding Overtime Pay and Works In Hospital, Quartile Decomposition

	(1) Registered Nurses (25^{th} percentile)	(2) Registered Nurses (75^{th} percentile)	(3) Nurse Practitioners (25^{th} percentile)	(4) Nurse Practitioners (75^{th} percentile)
Male ($)	$ 32.85	$ 50.73	$ 41.32	$ 64.80
Female ($)	$ 31.25	$ 49.19	$ 41.67	$ 60.87
Male (ln wage)	3.49	3.93	3.72	4.17
Female (ln wage)	3.45	3.90	3.73	4.12
Difference	0.041	0.030	-0.009	0.055
	(0.010)	(0.010)	(0.013)	(0.013)
Explained (%)	-47.02	18.26	271.41	22.97
	(13.50)	(22.39)	(66.82)	(11.23)
Unexplained (%)	147.02	81.73	-171.41	77.02
	(24.71)	(34.37)	(151.41)	(24.79)
Observations	21,058	21,058	13,138	13,138

Note: Decomposition at quartile levels of recalculation of hourly wage assuming workers are paid time and a half for any hours worked over 40. The decompositions include the full set of explanatory variables detailed in the data section. Rows 1 and 2 present the hourly wage at the quartile in dollars. Rows 3 and 4 present the log wage at the quartile, with the difference in row 5. Rows 6 and 7 present the contributions of the explained and unexplained components as a percentage of the difference. Heteroskedastic robust standard errors in parentheses.

Appendix Table 1: Log Hourly Wage Regressions for RNs and APRNs, by Sex

	(1) Male RNs	(2) Female RNs	(3) Male APRNs	(4) Female APRNs
Age	0.0002	0.001	-0.001	-0.002
	(0.001)	(0.0004)	(0.001)	(0.0004)
Black	-0.005	0.026	-0.064	-0.007
	(0.03)	(0.01)	(0.03)	(0.01)
Hispanic	0.006	0.022	-0.008	0.003
	(0.03)	(0.01)	(0.03)	(0.01)
Asian	0.013	0.010	0.018	0.005
	(0.03)	(0.01)	(0.03)	(0.01)
Other race	-0.002	0.022	-0.021	-0.016
	(0.03)	(0.01)	(0.03)	(0.01)
Widow/divorced/separated	-0.030	-0.018	-0.016	-0.014
	(0.02)	(0.01)	(0.02)	(0.01)
Never married	-0.013	-0.022	0.049	-0.037
	(0.02)	(0.01)	(0.03)	(0.01)
Children < age 6 in household	-0.005	-0.012	0.003	0.006
	(0.02)	(0.01)	(0.02)	(0.01)
Children ages 6-18 in household	0.006	0.001	0.015	0.014
	(0.01)	(0.01)	(0.01)	(0.00)
Adult dependents in household	0.026	0.021	0.011	0.002
	(0.02)	(0.01)	(0.02)	(0.01)
HS/Associate's degree/LVN to RN	-0.066	-0.044	-0.112	-0.037
	(0.02)	(0.01)	(0.06)	(0.02)
Masters's degree	0.043	0.043	0.080	0.107
	(0.03)	(0.01)	(0.03)	(0.01)
Doctorate degree	0.136	0.132	0.103	0.138
	(0.20)	(0.03)	(0.04)	(0.01)
Foreign education	-0.030	-0.026	-0.057	-0.003
	(0.03)	(0.01)	(0.04)	(0.01)
Left nursing < 1 year	-0.036	0.028	-0.019	-0.024
	(0.04)	(0.02)	(0.05)	(0.01)
Left nursing 1-2 years	0.077	0.004	0.013	0.023
	(0.08)	(0.02)	(0.05)	(0.02)
Left nursing 3-5 years	-0.080	-0.038	0.008	-0.052
	(0.08)	(0.02)	(0.07)	(0.02)
Left nursing > 5 years	-0.017	-0.134	-0.162	-0.069
	(0.10)	(0.02)	(0.06)	(0.02)
RN experience	0.020	0.016	0.016	0.007
	(0.004)	(0.001)	(0.003)	(0.001)
RN experience squared	-0.0003	-0.0002	-0.0003	-0.0001
	(0.0001)	(0.00002)	(0.0001)	(0.00002)
Fluent in second language	-0.039	0.004	-0.012	-0.015
	(0.02)	(0.01)	(0.02)	(0.01)

Military service	-0.011	-0.014	-0.013	-0.006
	(0.02)	(0.02)	(0.02)	(0.01)
Reserves or national guard	-0.051	0.011	-0.019	-0.002
	(0.04)	(0.02)	(0.03)	(0.02)
Skill-based certifications	-0.009	-0.004	-0.005	-0.009
	(0.01)	(0.003)	(0.01)	(0.003)
Union member	0.056	0.061	0.001	0.011
	(0.02)	(0.01)	(0.02)	(0.01)
Traveling nurse	0.278	0.189	0.106	0.119
	(0.05)	(0.02)	(0.06)	(0.04)
Self-employed	-0.022	0.023	0.065	-0.015
	(0.09)	(0.03)	(0.03)	(0.01)
Employment settings:				
Long-term care	0.050	0.023	0.015	0.010
	(0.04)	(0.01)	(0.04)	(0.01)
Ambulatory care	0.001	-0.034	0.018	-0.010
	(0.04)	(0.01)	(0.03)	(0.01)
Hospital	0.107	0.089	-0.002	0.020
	(0.03)	(0.01)	(0.03)	(0.01)
Level of care:				
Inpatient	0.023	0.073	-0.002	0.046
	(0.03)	(0.01)	(0.03)	(0.01)
Ambulatory care	-0.021	0.016	0.011	0.031
	(0.04)	(0.01)	(0.03)	(0.01)
Care coordination	-0.052	0.000	-0.027	-0.038
	(0.03)	(0.01)	(0.08)	(0.02)
Critical care	0.054	0.091	0.099	0.109
	(0.03)	(0.01)	(0.04)	(0.01)
Education	-0.176	-0.035	-0.144	-0.151
	(0.05)	(0.02)	(0.06)	(0.02)
Emergency	0.039	0.095	0.140	0.117
	(0.05)	(0.02)	(0.06)	(0.03)
Management	0.084	0.072	0.018	0.026
	(0.03)	(0.01)	(0.06)	(0.02)
Hospice	0.135	-0.002	-0.032	0.003
	(0.09)	(0.02)	(0.08)	(0.02)
Long-term care	-0.088	-0.049	-0.054	-0.028
	(0.05)	(0.02)	(0.06)	(0.02)
Community health	0.075	-0.035	0.028	0.005
	(0.08)	(0.02)	(0.05)	(0.02)
Surgery	0.026	0.052	0.130	0.094
	(0.03)	(0.01)	(0.04)	(0.01)
Urgent care	0.024	0.155	0.114	0.167
	(0.06)	(0.03)	(0.04)	(0.01)
Clinical specialty:				
Medical surgical	-0.009	0.0004	0.063	0.004

	(0.02)	(0.01)	(0.02)	(0.01)
Ambulatory care	-0.014	-0.014	-0.022	-0.012
	(0.03)	(0.01)	(0.02)	(0.01)
Critical care	0.012	0.044	0.009	-0.005
	(0.03)	(0.01)	(0.03)	(0.01)
Cardiac care	-0.032	0.008	0.003	-0.038
	(0.04)	(0.01)	(0.03)	(0.01)
Chronic care	-0.040	0.008	-0.065	-0.016
	(0.04)	(0.01)	(0.04)	(0.01)
Emergency care	0.014	-0.007	0.059	0.046
	(0.04)	(0.02)	(0.05)	(0.02)
Hospice	-0.125	-0.029	0.089	-0.023
	(0.09)	(0.02)	(0.09)	(0.02)
Ob/gyn/labor/delivery	-0.153	0.021	0.080	0.017
	(0.07)	(0.01)	(0.06)	(0.01)
Oncology	-0.054	0.031	-0.014	-0.012
	(0.05)	(0.01)	(0.03)	(0.01)
Psychiatric	0.010	0.021	0.084	0.094
	(0.04)	(0.02)	(0.03)	(0.01)
No patient care	0.035	0.050	0.014	0.004
	(0.03)	(0.01)	(0.03)	(0.01)
2022 Survey	0.053	0.071	-0.021	-0.001
	(0.01)	(0.005)	(0.01)	(0.004)
APRN experience			0.001	0.008
			(0.003)	(0.001)
APRN experience squared			0.0001	-0.0001
			(0.0001)	(0.00003)
Nurse midwife			-0.032	-0.080
			(0.09)	(0.02)
Nurse anesthetist			0.325	0.406
			(0.03)	(0.02)
Clinical nurse specialist			-0.119	-0.098
			(0.06)	(0.02)
APRN multiple credentials			0.164	0.056
			(0.03)	(0.01)
Work state	Yes	Yes	Yes	Yes
Observations	3,361	33,147	4,454	41,992
R^2	0.218	0.170	0.193	0.079

Note: Heteroskedastic robust standard errors in parentheses.