Salary Differences Between Male and Female Registered Nurses in the United States

Fifty years after the Equal Pay Act, the male-female salary gap has narrowed in many occupations. Yet pay inequality persists for certain occupations, including medicine and nursing. Studies have documented salary differences across clinical settings for diverse cohorts of physicians and higher salaries for male registered nurses (RNs). In nursing, analyses have not considered employment factors that could explain salary differences, have been cross-sectional, and have not been based on recent data. The objective of this study was to examine salaries of males and females in nursing over time and to include a more recent sample.

Methods | We determined salary trends by gender using nationally representative data from the last 6 (1988-2008) quadrennial National Sample Survey of Registered Nurses (NSSRN) (discontinued in 2008). This mail, electronic, and web survey selected a state-based probability sample of currently licensed RNs from data provided by state boards of nursing with a sample size of more than 30,000 RNs per year and a response rate of approximately 60%. We also used the American Community Survey (ACS; 2001-2013), a household survey with a response rate exceeding 90%, to extend time trends to 2013 and establish that unadjusted salary differences by gender were not limited to NSSRN data. The sample consisted of full-time employed RNs working 50 or more weeks per year and 35 hours or more per week. The outcome variable of annual salary was measured continuously in both surveys.

Using ordinary least-squares regression and employment information in the NSSRN, we assessed how much of the annual salary differences could be accounted for by demographic factors, work hours, experience, work setting, clinical specialty, job position, survey year, state of residence, and other factors. Analyses were performed using Stata version 13.1 (StataCorp) and a 2-tailed probability value of <.05 indicated statistical significance. The study was deemed exempt by a research ethics board.

Results | The NSSRN sample included 87,903 RNs, of whom 6093 (7%) were men, 10,253 (12%) were nonwhite, 58,757 (67%) were married, and 8681 (10%) had a graduate degree. The mean age was 42 years (SD, 10.4 years). The ACS sample included 205,825 RNs, of whom 20,616 (10%) were men, 38,482 (19%) were nonwhite, 134,938 (66%) were married, and 27,842 (14%) had a graduate degree. The mean age was 45 years (SD, 11.4 years).

Both surveys showed that unadjusted male salaries were higher than female salaries during every year (NSSRN, $10,775 [95% CI, $10,243-$11,306], P < .001; ACS, $9,562 [95% CI, $9,163-$9,961], P < .001; Figure 1). No statistically significant changes in female vs male salary were found over time. Using the NSSRN, regression analysis estimated an overall adjusted earnings difference of $5148 (P < .001).

Figure 1. Mean Annual Salary for Female and Male Registered Nurses (RNs)

Salary amounts reflect 2013 dollars and were normalized using the consumer price index. The American Community Survey outcome data were not adjusted due to the limited availability of explanatory variables.

a Data from the survey is available at http://datawarehouse.hrsa.gov/data/download/nssrndownload.aspx.

b Data from the survey is available at http://www.census.gov/acs/www/data_documentation/data_main/.

c Estimated from the model described in the text and in Figure 2.
The salary gap was $7678 (95% CI, $5319-$10 037; \( P < .001 \)) for ambulatory care and $3873 (95% CI, $3144-$4601; \( P < .001 \)) for hospital settings. The gap was present in all specialties except orthopedics, ranging from $3792 (95% CI, $802-$6781; \( P < .001 \)) for chronic care to $6034 (95% CI, $4175-$7893; \( P < .001 \)) for cardiology. Salary differences also existed by position, ranging from $3956 (95% CI, $2174-$5737; \( P < .001 \)) for middle management to $17 290 (95% CI, $11 690-$22 891; \( P < .001 \)) for nurse anesthetists (Figure 2). The model accounted for half of the variance in salaries (\( R^2 = 0.46 \)).

**Discussion**

Male RNs outearned female RNs across settings, specialties, and positions with no narrowing of the pay gap over time. About half of the gap was accounted for by employment and other measured characteristics. This gap is similar in magnitude to the salary differences found for physicians, to examine their pay structures and act to eliminate inequities.

Ulrike Muench, PhD, RN
Jody Sindelar, PhD
Susan H. Busch, PhD
Peter I. Buerhaus, PhD, RN

**Author Affiliations:** Department of Social and Behavioral Sciences, University of California, San Francisco (Muench); Department of Health Policy and Management, Yale School of Public Health, New Haven, Connecticut (Sindelar, Busch); Department of Health Policy, Vanderbilt University Medical Center, Nashville, Tennessee (Buerhaus).

**Corresponding Author:** Ulrike Muench, PhD, RN, Department of Social and Behavioral Sciences, University of California, 3333 California St, San Francisco, CA 94118 (ulrike.muench@ucsf.edu).

**Author Contributions:** Dr Muench had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

**Study concept and design:** All authors.

**Acquisition, analysis, or interpretation of data:** Muench, Sindelar, Buerhaus.

**Drafting of the manuscript:** All authors.

**Critical revision of the manuscript for important intellectual content:** All authors.

**Statistical analysis:** Muench, Busch.

**Obtained funding:** Muench.

**Administrative, technical, or material support:** Muench, Busch, Buerhaus.

**Study supervision:** Sindelar, Busch.
Conflict of Interest Disclosures: The authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Dr Buerhaus reported receiving payment for lectures from a variety of organizations, associations, universities, and groups; and being appointed chair of the National Health Care Workforce, which was established under the Affordable Care Act, but has not begun any work yet. No other disclosures were reported.

Funding/Support: This study was in part supported by a grant from Sigma Theta Tau, Delta Mu Chapter.

Role of the Funder/Sponsor: Sigma Theta Tau had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

Additional Information: We dedicate this study to Donna Diers, PhD (Yale School of Nursing), who died during the early stages of this research.


COMMENT & RESPONSE

Coronary Artery Disease Screening Using Coronary Computed Tomography Angiography

To the Editor The study by Dr Muhlestein and colleagues1 showed that routine screening for coronary artery disease (CAD) among asymptomatic patients with type 1 or type 2 diabetes did not reduce all-cause mortality or major ischemic cardiovascular events during the 4-year follow-up. The Detection of Ischemia in Asymptomatic Diabetics (DIAD) study already has shown similar results using adenosine-stress radionuclide myocardial perfusion imaging.2 The DIAD study did not mandate any specific treatment plan for patients with abnormal screening test results.

However, 70% of patients in the FACTOR-64 trial with mild to severe CAD after CCTA screening or with a coronary artery calcium score greater than 10 were assigned to aggressive medical therapy, including target levels of low-density lipoprotein cholesterol (LDL-C) less than 70 mg/dL, high-density lipoprotein cholesterol (HDL-C) greater than 50 mg/dL, triglycerides less than 150 mg/dL, glycated hemoglobin (HbA1c) less than 6.0%, and systolic blood pressure less than 120 mm Hg. The control group was assigned to standard care (target level of LDL-C <100 mg/dL, systolic blood pressure <130 mm Hg, and HbA1c <7%). Despite this intensive strategy in the majority of the participants undergoing CCTA screening, no differences in outcomes were observed between groups.

However, the basis for aggressive therapy in the patients who screened positive was not clearly explained. The enrollment of participants in FACTOR-64 began on July 9, 2007, and ended May 16, 2013, and all patients were followed up until August 1, 2014. The presupervised targets of the aggressive strategy were not consistent with the literature and the standard guidelines available at the beginning of enrollment. These objectives were more intensive than those recommended for patients with diabetes and CAD by both the American Heart Association and the American Diabetes Association.

It is noteworthy that the intensive glucose control (HbA1c level <6%) was abandoned in this study after the results of the Action to Control Cardiovascular Risk in Diabetes (ACCORD) glycemia trial3 were available. However, the negative results of the ACCORD blood pressure trial4 (comparing systolic blood pressure targets of 140 mm Hg vs 120 mm Hg) published 4 years before the end of FACTOR-64 did not influence the choice of blood pressure targets during follow-up.

Louis Potier, MD, PhD

Nadia Matallah, MD

Kamal Mohammedi, MD, PhD

Corresponding Author: Louis Potier, MD, PhD, Service d’Endocrinologie Diabétologie Nutrition, Groupe Hospitalier Bichat-Claude Bernard, 46 Rue Henri Huchard, 75877 Paris CEDEX 18, France (louis.potier@gmail.com).

Conflict of Interest Disclosures: The authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none were reported.


In Reply As Dr Potier and colleagues note, a major difference between FACTOR-64 and the DIAD study1 was that FACTOR-64 provided recommendations for potentially more aggressive medical and procedural management of the care of asymptomatic patients with diabetes who were found at screening to have evidence of atherosclerotic CAD. It was believed that for screening to be helpful, it must result in some change in treatment that may provide clinical benefit to the patient. When designing FACTOR-64, our goal was to provide recommendations that were as aggressive as safely possible and also more aggressive than was already recommended for patients with diabetes.

The 2007 American Diabetes Association guidelines5 recommended target levels of LDL-C less than 100 mg/dL, HbA1c...