Supplemental Online Appendix

for

What Explains the Rising Share of US Men in Registered Nursing?

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This appendix provides additional detail on the sources for and construction of control variables introduced in Table 3 in the article text.

Demographic Trends:
Percentage Black, Hispanic, Asian, Urban Residence, and High School Completion

These measures control for changing cohort (defined as a birth state and birth year combination) composition. They are constructed from US Census and ACS data at the birth state, birth year, Census year *(s,c,t)* level, although persistence across time is high. Since our goal is a regression accounting decomposition of the trend RN share among men, we allow these measures to vary over time to capture coincident trends that may be related to RN share. For example, greater urbanization within a cohort over time may relate to more men choosing an RN career. Changes in labor force participation over time or differential mortality can also generate changes in these measures over time, for example, in high school completion.

Measures of Labor Demand

Measures of per capita elderly population, predicted health care employment share, predicted manufacturing employment share, relative RN earnings, and predicted foreign-born share of the labor force control for contemporaneous labor demand conditions and all vary at the state and year level only. Their construction is discussed in the text, but additional detail is presented here. Cohorts are matched to these conditions on the basis of birth state and US Census and ACS year, so all cohorts from a common birth state experience the same contemporaneous demand conditions. Per capita state elderly population is constructed using state population estimates from the Surveillance, Epidemiology, and End Results (SEER) Program.

In addition to per capita elderly population as a measure of demand for RNs, we control for changing demand for health care sector workers using employment data. We measure health

care sector employment using the same SA-25 and SA-25N series from the Bureau of Economic Analysis (BEA). Our analysis finds that Standard Industrial Classification (SIC) code 80 (healthcare services) is very close to North American Industry Classification System (NAICS) 2002 code 62. This is based on a comparison of the sub-industries in those two-digit codes using the Census SIC87 to NAICS 2002 concordance (https://www.census.gov/eos/www/naics/concordances/concordances.html). BEA also produced employment-by-industry estimates using both classification schemes for a three-year overlap period during which employment in both definitions of the health care sector can be directly compared. We find they deviate by 7 to 9%. We mean-adjust the series state-by-state to account for that discrepancy at the series break. For state manufacturing sector employment, we follow the methodology in Autor, Dorn, and Hansen (2013), which uses County Business Patterns data.

Because health care sector employment may reflect supply of RNs as well as demand, we use a Bartik-style predicted measure of health care and manufacturing sector employment to isolate changes in health care's share of employment that are demand driven (per capita elderly share is likely unresponsive to RN supply). We use a three-year average of state level health care employment as the base employment level, then grow that forward for all years in our data at the national health care employment growth rate, calculated by excluding each state's own contribution to national health care employment. We then calculate the predicted health care share of employment by dividing predicted state health care employment by total actual state employment in a year.

Relative earnings are calculated as the ratio between weekly earnings for high school equivalent men and (divided by) weekly earnings for college equivalent women. "Equivalent" means that two years of college or less is grouped with high school graduates with no further education. Those with three years of college or more are grouped with college graduates. This designation approximates that in Autor, Katz, and Kearney (2008). Weekly earnings are calculated from the March Current Population Survey (CPS) Annual Social and Economic Supplement (ASEC) by state and year for workers aged 25 to 55. Using national aggregates, we find that weekly earnings for RNs are very highly correlated (0.98) with those for college equivalent women, so we use the latter weekly wage as a proxy for RN wages in a state. Small sample sizes make direct computation of RN earnings at the state-year level inadvisable. Under the assumption that state labor markets for workers defined by gender and skill are competitive, this proxy should

strongly influence RN earnings. This relative earnings measure is trending down over time and higher values should be associated with fewer men choosing nursing if contemporaneous relative wages determine occupation choice.

We construct a predicted measure of exposure to immigrant workers as the share foreign-born in the age 18 to 65 labor force of a cohort's birth state over time. Similar to the health sector employment variable, we construct a Bartik-style measure of immigration using a state's population of foreign-born workers age 18 to 39 in 1980 and growing it forward at the national growth rate, calculated by excluding each state's own contribution to the national foreign-born population. To calculate predicted foreign-born share, we divide each state's predicted foreign-born population by actual state population in a year. Since this measure reflects contemporaneous conditions facing a cohort, we group it with the contemporaneous demand measures. But as discussed in the text, the share foreign-born in a cohort reflects a shift out in labor supply, which may have only indirect effects on native occupation choices or local demand.

Postsecondary Education Access (per capita College Availability) at Age 18

We merge our cohorts to data on opportunities for postsecondary education in their birth state at the time of going to college. Specifically, these are measures of per capita college availability at the state level in the year a cohort turned 18. To obtain these measures for our complete set of cohorts, we combine two separate data series on the number of local colleges. The first is a series of number of two- and four-year colleges at the county level assembled by Currie and Moretti (2003) and spanning 1940 to 1996. The second is data on number of colleges of various types by state, which we assembled form the Integrated Post-secondary Educational Data System (IPEDS) website (https://nces.ed.gov/ipeds/Home/UseTheData) for 1990 to 2013.

As discussed in the text, we harmonize these series where needed. Specifically, inspection of the Currie-Moretti series and the IPEDS series show a smooth transition between series at the state-level for the number of four-year public colleges. This makes sense, as Currie and Moretti collected their data on numbers of colleges from guides listing college options, and it is likely that any existing state four-year colleges were represented in both those guides and in the IPEDs survey of all higher education institutions. The series still match reasonably well for public two-year colleges, but less well for private colleges. For two-year private colleges, a substantial discrepancy occurs between the two series, with the Currie-Moretti series reporting smaller numbers of such

colleges than the IPEDs survey. This may be because IPEDs more exhaustively surveys such colleges, whereas guides may fail to include some short-lived or very small private two-year colleges.

Gender Role Attitudes

We are also interested in the role that social attitudes might play in encouraging men to take on a non-traditional occupation such as nursing. To measure these, we use four questions from the General Social Survey (GSS) on gender roles (Fortin 2015). Following Fortin, we construct an index of agreement with traditional gender role assignments and another indicating agreement with gender-egalitarian roles. Each index averages together two related questions on their respective approaches to gender roles.[1] Our final index averages the two separate indices and corrects for their directionality. Principal components analysis (unreported) shows that a single factor drives more than 78% of the variation in the gender attitudes variables. Hence, we view these controls as different measures of the same underlying changes in gender attitudes.

Finally, the GSS survey design places some further limitations on our main sample when we add these measures to our data. The GSS does not provide estimates at the state level for all 50 states. We typically observe responses for 30 to 40 states on these measures in a given wave. Also, the GSS is not administered annually, and these questions were not always asked in a given wave. We assume these measures change smoothly over time and linearly interpolate our measures at the state level for intervening survey years in which these measures were not available.

Early Career State Unemployment Rates

[1] From Fortin (2015: 382): "The index of traditional attitudes (**TRAD**) is derived as an average agreement with the statements 'It is much better for everyone involved if the man is the achiever outside the home and the woman takes care of the home and family' (FEFAM) and 'A preschool child is likely to suffer if his or her mother works' (FEPRESCH). In the GSS, the better statement meant to capture egalitarian attitudes, 'If your party nominated a woman for President, would you vote for her if she were qualified for the job?' (FEPRES) was not asked in the 2000s. I thus use as second best disagreement with the statement, 'Most men are better suited emotionally for politics than are most women' (FEPOL) and agreement with the statement, 'A working mother can establish just as warm and secure a relationship with her children as a mother who does not work' (FECHLD) to capture egalitarian attitudes (**EGAL**).[19] As shown in panel B of Table 1, there are sizeable differences (denoted Δ), of at least 10 points, between non-participating and participating women in these traditional and egalitarian attitudes."

We construct measures of early career labor market conditions cohorts faced using annual data from the Bureau of Labor Statistics state unemployment rate series, which is based on the Current Population Survey (CPS). We assign to each cohort the unemployment conditions in its birth state averaged over the years during which a cohort was between ages 18 and 24. We also match each birth state–birth year *(s,c)* cohort to the unemployment rate it would have experienced in state *s* as it aged. To deal with noisiness associated with the sometimes small state-level cell sizes in the CPS, we generate non-overlapping three-year averages of all state-level unemployment rate variables.

References

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Currie, Janet, and Enrico Moretti. 2003. Mother's education and the intergenerational transmission of human capital: Evidence from college openings. *Quarterly Journal of Economics* 118(4): 1495–1532.

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Table A.1. Descriptive Statistics for Main Estimating Sample, 1980–2013

Variable	*N*	*Mean*	*Std dev*	*Min*	*Max*
RN	5,916	0.002	0.003	0.000	0.035
Birth year	5,916	1974.75	10.57	1954	1995
Age	5,916	27.75	6.25	18	39
Age 18–24	5,916	0.36	0.48	0.00	1.00
Age 25–29	5,916	0.23	0.42	0.00	1.00
Age 30–34	5,916	0.22	0.41	0.00	1.00
Age 35–39	5,916	0.19	0.39	0.00	1.00
White	5,916	0.81	0.14	0.18	1.00
Black	5,916	0.11	0.12	0.00	0.70
Asian	5,916	0.06	0.10	0.00	0.79
Hispanic	5,916	0.06	0.09	0.00	0.49
High school	5,916	0.84	0.13	0.03	1.00
Urban	5,916	0.61	0.17	0.05	0.96
Per capita enrollment in public 2-year colleges	5,542	0.50	0.32	0.00	1.74
Per capita elderly population	5,916	0.13	0.02	0.03	0.19
Health employment share (predicted)	5,916	0.10	0.04	0.02	0.20
Manufacturing employment share (predicted)	5,916	0.13	0.08	0.01	0.43
Contemporaneous unemployment rate	5,916	0.06	0.02	0.03	0.13
Age 18–24 unemployment rate	5,916	0.06	0.02	0.03	0.14
Relative earnings	2,088	0.62	0.07	0.27	0.94
Foreign-born share (predicted)	5,916	0.13	0.08	0.01	0.43
Gender Attitudes Index	2,796	0.69	0.16	0.00	1.00

Notes: Descriptive statistics based on data collapsed by state, birth year, and US Census/ACS year for US-born males age 18–39.

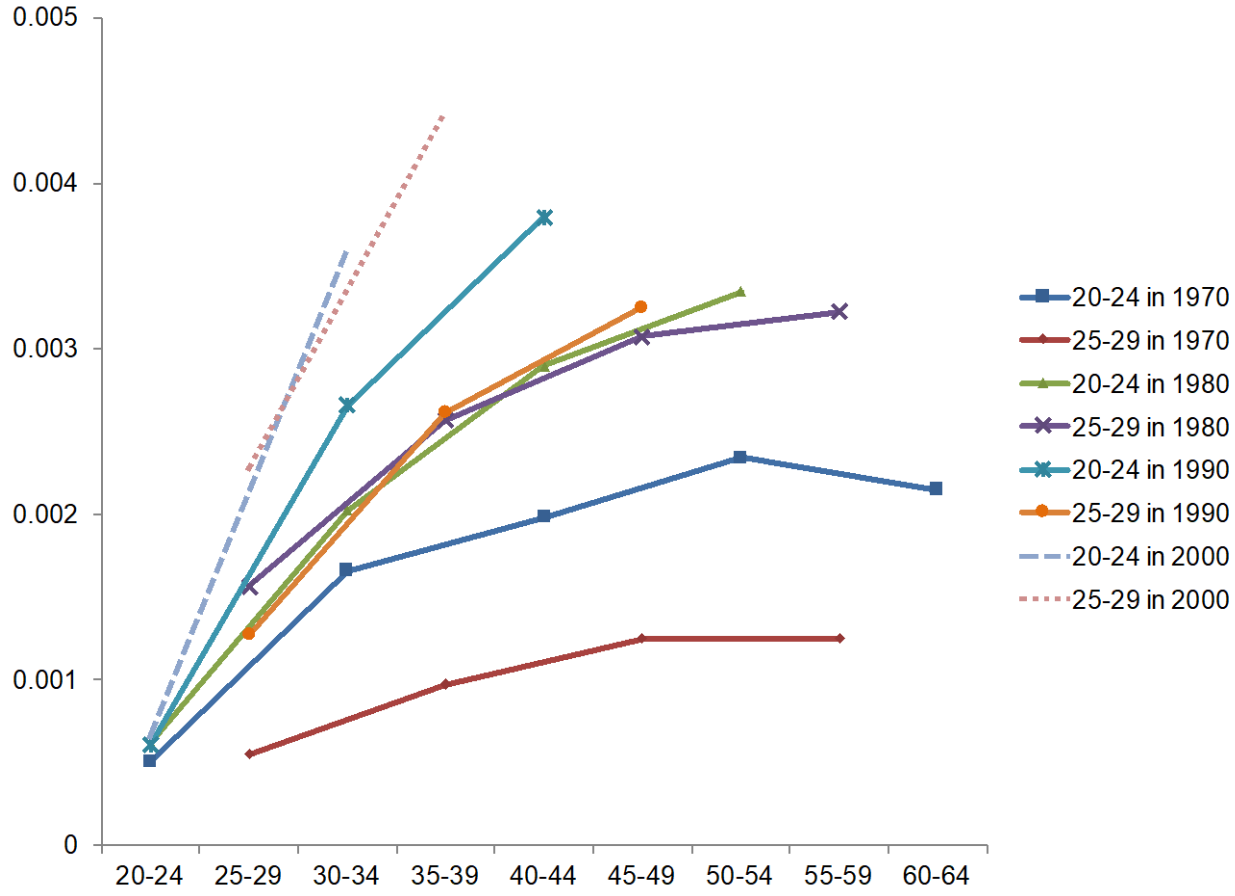
Table A.2. Regression Decomposition of RN Share among US Men into Components Due to Trend Factors, Excluding Year Dummy Controls

Characteristic (X)	*(1)* *Coefficient*	*(2)* *Change in X*	*(3)* *Predicted change in RN share for males*	*(4)* *% change explained*
Demographics				
Black	–0.0037	0.0239	–0.00009	–5.9
Asian	–0.0019	0.1021	–0.00019	–12.9
Hispanic	0.0024	0.0923	0.00022	14.8
Completed high school	0.0013	0.0781	0.00010	6.8
Urban	0.0034	0.0756	0.00026	17.1
Contemporaneous demand				
Per capita elderly population	0.0117	0.0336	0.00039	26.2
Predicted health employment share	0.0085	0.0458	0.00039	25.9
Predicted manufacturing share	–0.0018	–0.1509	0.00027	18.1
Unemployment rate	–0.0016	0.0010	–0.000002	–0.1†
Ln(Relative earnings)	0.0001	–0.4767	–0.00005	–3.2†
Predicted foreign-born share	–0.0014	0.0631	–0.00009	–5.9
Conditions at age 18				
Per capita number of public 2-year colleges	0.0013	0.0204693	0.00003	1.8
Gender Attitude Index	0.0019	0.1059265	0.00020	13.4

Notes: Column (1) of this table presents coefficients from the same specifications as those in column (1) of Table 4, but excludes year fixed effects. Column (2) is based on the authors' calculations. Column (3) is the product of columns (1) and (2). The share of men age 18–39 who reported RN as their occupation increased by .0015 (.0011 to .0026) between 1980 and 2013. Column (4) is column (3)'s share of this total increase.

† indicates that coefficient in column (1) used to compute column (4) entry was not significant at the 10% level or better.

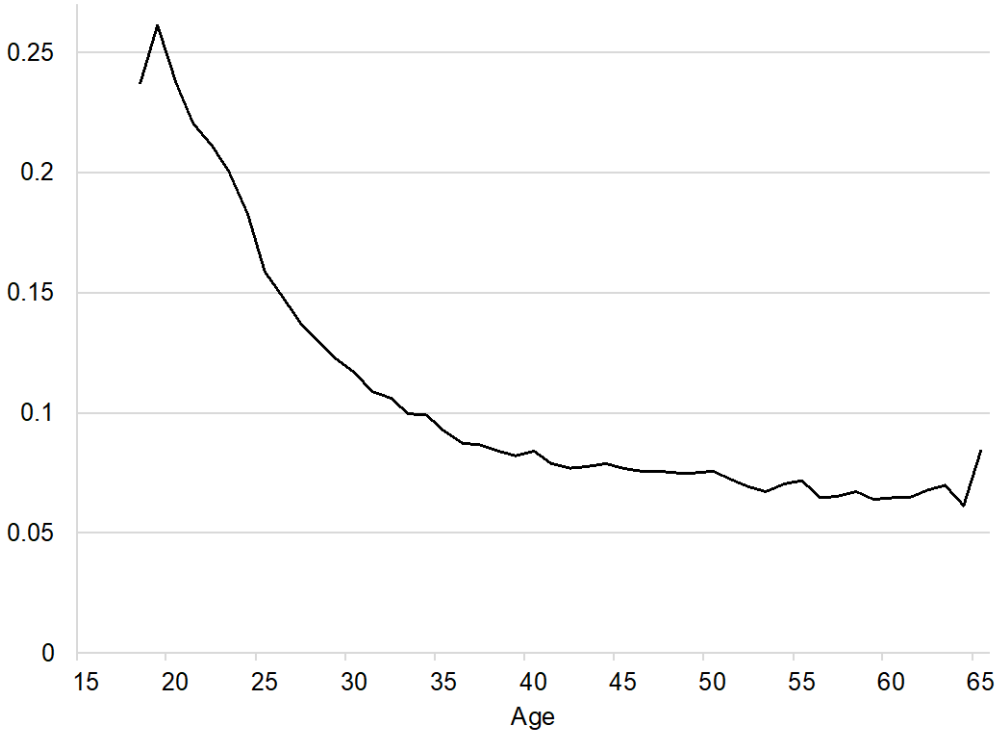
Figure A.1. **Probability That Men Report Nursing as Their Occupation at a Given Age, by Cohort**



Sources: Decadal US Censuses 1980–2010 and American Community Survey 2008–2010 and 2011–2013 (3-year averages).

Note: Sample is all respondents age 18–65.

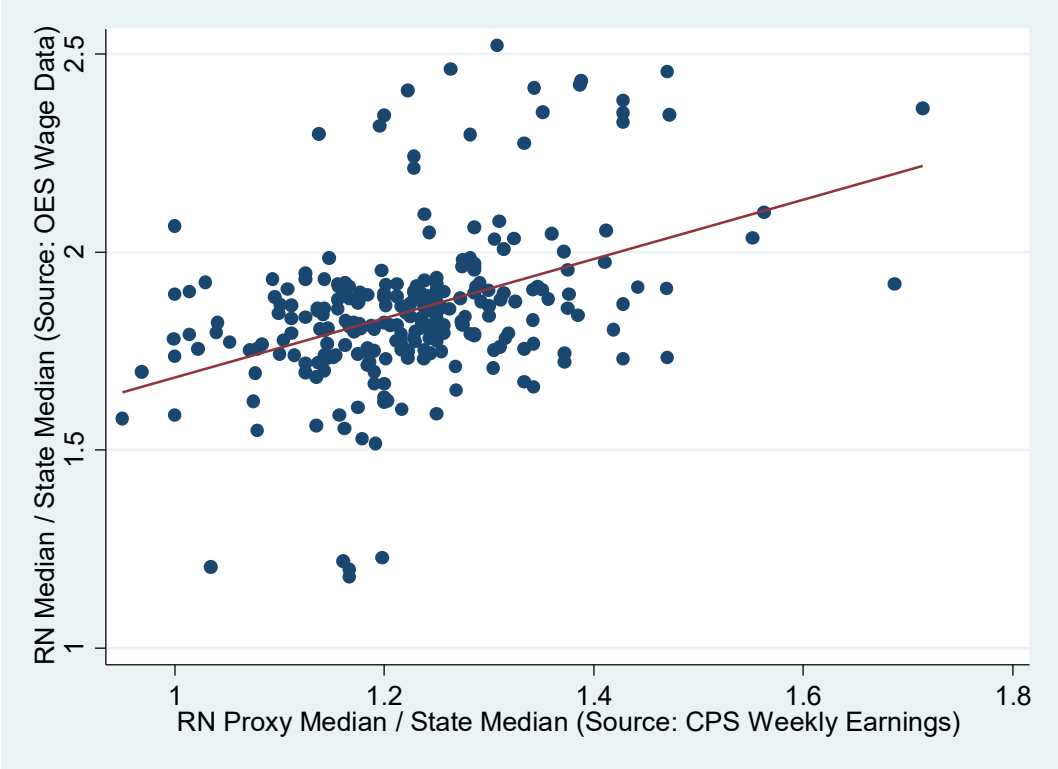
Figure A.2. **Share of Males in the Labor Force Who Reported a Different Occupation the Previous Year, by Age**



Sources: March Current Population Survey (CPS) for 1980–2013. March CPS data are obtained from the Integrated Public Use Micro-data Series (IPUMS.), Current Population Survey (Flood et al. 2015).

Notes: For each survey year, the March CPS asks respondents to report their occupation and industry in both the current and previous calendar year. We identify workers who reported a previous occupation as those who reported a different occupation for these two variables; respondents with missing observations for either variable were dropped. Data are not weighted.

Figure A.3. **Correlation between RN Wage Proxy and Observed RN Wages in Years of Available Overlap (2012–2016)**



Source: Data are from the Bureau of Labor Statistics Occupational Employment Statistics (OES) and the Current Population Survey, IPUMS version, 2012 to 2016. March CPS data are obtained from the Integrated Public Use Micro-data Series (IPUMS.), Current Population Survey (Flood et al. 2015).

Notes: The *y*-axis is (state's hourly wage for RN) / (state median hourly wage) in the OES. The *x*-axis is (RN proxy) / (state median weekly earnings) where RN proxy is weekly earnings for college-educated women, both constructed from the CPS microdata.