

Online Appendix

Does medicine run in the family—evidence from three generations of physicians in Sweden: retrospective observational study

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Analysis of whether changes in the proportion of physicians in the overall population explains growing occupational heritability among physicians in Sweden

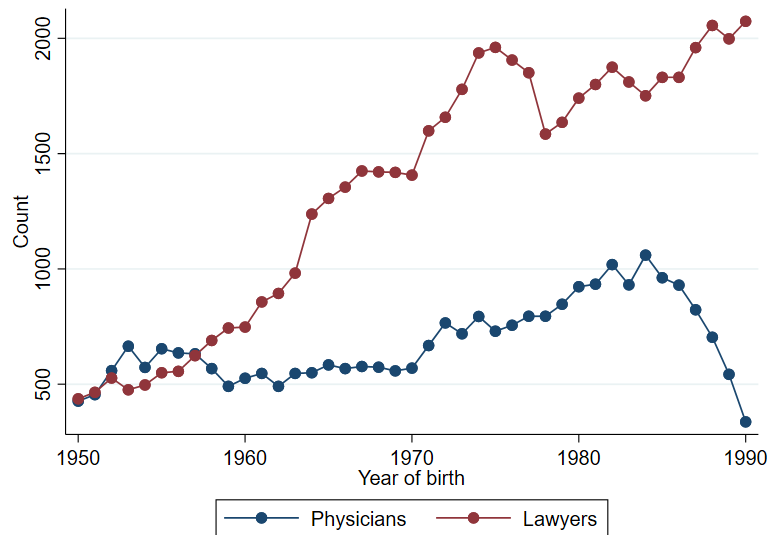
The share of physicians with physician parents could be affected by changes in the total number of physicians in Sweden over time, through two **opposing** potential mechanisms.

The first potential mechanism would generate an **upward trend** in the share of physicians with physician parents. This would happen if the number of physicians as a share of the overall population is growing over time, or, in other words, if the population is growing slower than the number of physicians in each subsequent cohort. Then, even if physicians were drawn at random in every cohort, the probability that these individuals would have physician parents would increase mechanically over time.

The second potential mechanism would generate a **downward trend** in the share of physicians with physician parents. If the labor market demand for a specific occupation (e.g., physicians) is increasing over time, so that in each cohort the labor market has to find more individuals in a given occupation than in the preceding cohort, then the fraction of individuals who can have parents in that occupation will have a declining trend.

To examine these potential mechanisms, we considered how the number of physicians and lawyers in our study population with educational background observed for both parents developed over time, both in absolute levels and as a share of the population. **Figure A1** plots the total count of individuals with a medical degree (“physicians”) and the total count of individuals with a law degree (“lawyers”), who were born in or after 1950, were alive and lived in Sweden at some point between 2001 and 2016, and whose parental educational background was observed for both parents. These counts correspond to the count of physicians reported in row 1 of **Table 2** (for physicians) and row 1 of **Table A1** (for lawyers).

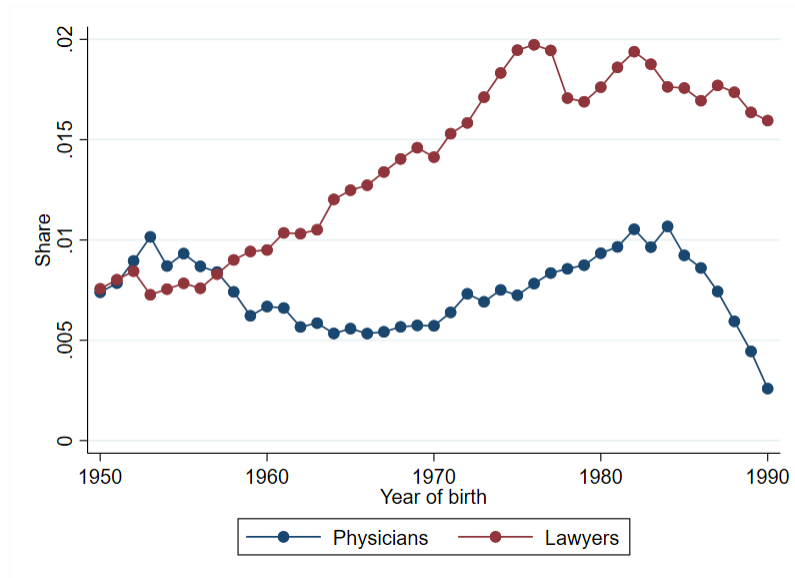
Figure A1 – Number of physicians and lawyers, by year of birth



Notes: The figure plots the number of individuals with a medical degree or law degree, by year of birth. The sample is restricted to physicians and lawyers in the study population with educational background observed for both parents.

Figure A2, in turn, plots the number of physicians and lawyers in **Figure A1** as a share of population born in or after 1950, who were alive and lived in Sweden at some point between 2001 and 2016, and whose parental educational background was observed for both parents.

Figure A2 – Share of physicians or lawyers in population, by year of birth



Notes: The figure plots the number of individuals with a medical degree or law degree, by year of birth, as a share of the population. The numerator is the number of physicians (or lawyers) in the study population restricted to physicians (or lawyers) with educational background observed for both parents. The denominator is the number of individuals born in or after 1950 who were alive and lived in Sweden at some point between 2001 and 2016 with educational background observed for both parents.

Several conclusions emerge from these patterns.

First, the share of physicians or lawyers in the population of individuals who were alive and lived in Sweden at some point between 2001 and 2016 (and whose parental education was observed for both parents) is very small, <2 percent in the cohort with the largest share, suggesting that in practice any aggregate population trends are unlikely to meaningfully affect our estimates of the share of physicians or lawyers who have parents who are physicians or lawyers.

Second, while the number and share of lawyers in the general population grew over time, the number and share of physicians remained steady, with the exception of the youngest cohorts, where the number of physicians is lagging. The latter likely stems from a combination of several factors that differentiate the medical and law degrees in Sweden. First, a medical degree takes on average 2 years longer to complete than a law degree. Second, medical school admissions are more competitive – and increasingly so over time¹ – resulting in medical degree applicants re-applying and/or pursuing other activities before enrolling into their studies. Both of these factors push in the direction of delaying the completion of a medical degree, and thus they reduce the likelihood that individuals born after 1985 have completed their medical degrees by 2016 (the last year of our educational records).

In the absence of occupational heritability – i.e., if we were just drawing physicians or lawyers from random families with observed parental educational background in each birth cohort, we would expect that the share of individuals with physician (or lawyer) parents looks like **Figure A2**. Notably, this “random draw” pattern is quite different from what we observe in our main analysis. As Figure 1 in the main manuscript illustrates, the share of physicians with physician parents grew from 6% to 20% across 1950 to 1990 birth cohorts, rather than oscillating around 1% as **Figure A2** would suggest.

These facts suggest that the observed trends in increasing occupational heritability among physicians are unlikely to be generated by the growth in the number of physicians relative to the overall population over time.

TABLE A1 – Occupational heritability among lawyers

| | Years of birth | | | | | 1950-59 vs. 1980-90 p-value |
|--|----------------|-----------|-----------|-----------|-----------|-----------------------------------|
| | All | 1950-1959 | 1960-1969 | 1970-1979 | 1980-1990 | |
| No. of lawyers with educational background observed for both parents | 55,258 | 5,566 | 11,645 | 17,319 | 20,728 | |
| % of lawyers with at least one parent who was a lawyer | 6.7 | 7.2 | 6.5 | 6.5 | 6.8 | 0.3 |
| % of lawyers with both parents who were lawyers | 0.7 | 0.5 | 0.5 | 0.6 | 0.8 | 0.006 |
| No. of lawyers with educational background observed for at least one sibling | 55,863 | 6,998 | 12,095 | 16,756 | 20,014 | |
| % of lawyers with at least one sibling who was a lawyer | 8.1 | 8.0 | 8.0 | 8.1 | 8.2 | 0.6 |
| No. of lawyers with educational background observed for at least one aunt/uncle | 43,363 | 798 | 8,342 | 15,818 | 18,405 | |
| % of lawyers with at least one aunt/uncle who was a lawyer | 5.2 | 2.8 | 4.0 | 5.0 | 6.0 | <0.0001 |
| No. of lawyers with educational background observed for at least one grandparent | 42,580 | 715 | 7,739 | 15,595 | 18,531 | |
| % of lawyers with at least one grandparent who was a lawyer | 1.5 | 0 | 0.4 | 1.1 | 2.2 | <0.0001 |

Notes: The table presents an overview of occupational heritability among individuals with completed law degrees born in 1950-1990 and alive and living in Sweden at some point between 2001 and 2016 by decade of birth. The four types of relatives are: parents, siblings, aunts/uncles and grandparents. For each type of relative, the study population was restricted to individuals with at least one relative whose educational background was observed. For the analysis involving parents, the study population was restricted to physicians with educational backgrounds observed for both parents. The last column presents the p-value for a two-sided t-test for difference in means between individuals with a law degree born in 1950-1959 and 1980-1990.

TABLE A2 – Occupational heritability among physicians and medical researchers

| | Years of birth | | | | | 1950-59 vs. 1980-90 p-value |
|---|----------------|-----------|-----------|-----------|-----------|-----------------------------------|
| | All | 1950-1959 | 1960-1969 | 1970-1979 | 1980-1990 | |
| No. of physicians with educational background observed for both parents | 41,392 | 7,421 | 7,623 | 12,035 | 14,313 | |
| % of physicians with at least one parent who was a physician | 15.9 | 9.0 | 13.3 | 17.1 | 19.9 | <0.0001 |
| % of physicians with both parents who were physicians | 3.5 | 1.5 | 2.5 | 3.7 | 5.0 | <0.0001 |
| No. of physicians with educational background observed for at least one sibling | 43,088 | 9,289 | 7,989 | 11,867 | 13,943 | |
| % of physicians with at least one sibling who was a physician | 14.8 | 16.6 | 13.9 | 14.1 | 14.8 | 0.0002 |
| No. of physicians with educational background observed for at least one aunt/uncle | 28,457 | 770 | 4,969 | 10,582 | 12,136 | |
| % of physicians with at least one aunt/uncle who was a physician | 10.4 | 3.4 | 7.7 | 9.9 | 12.3 | <0.0001 |
| No. of physicians with educational background observed for at least one grandparent | 28,045 | 673 | 4,575 | 10,503 | 12,294 | |
| % of physicians with at least one grandparent who was a physician | 2.9 | 0.2 | 0.6 | 2.3 | 4.3 | <0.0001 |

Notes: The table presents an overview of occupational heritability in medicine for individuals that completed either clinical or research degrees (for example, biomedicine) in medical schools. The study population born in 1950-1990 by decade of birth. The four types of relatives are: parents, siblings, aunts/uncles and grandparents. For each type of relative, the study population was restricted to individuals with at least one relative whose educational background was observed. For the analysis involving parents, the study population was restricted to individuals with educational backgrounds observed for both parents. The last column presents the p-value for a two-sided t-test for difference in means between individuals born in 1950-1959 and 1980-1990.

REFERENCES

1. Chen Y, Persson P, Polyakova M. The roots of health inequality and the value of intra-family expertise. National Bureau of Economic Research; 2019 Feb 28.