



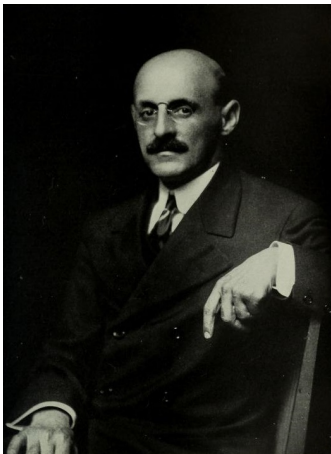
Medical School Closures and Health Care Market Adjustment in the Flexner Report Era

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Overview

- ▶ The publication of the Flexner Report (1910) plays an important role in the history of American medicine
 - ▶ Recommended the closure of a large share of medical schools on the grounds of them being low quality
- ▶ Part of a broader reform era in medicine that we term the “Flexner-era” (1905-1915)



MEDICAL EDUCATION
IN THE
UNITED STATES AND CANADA

A REPORT TO
THE CARNEGIE FOUNDATION
FOR THE ADVANCEMENT OF TEACHING

BY
ABRAHAM FLEXNER

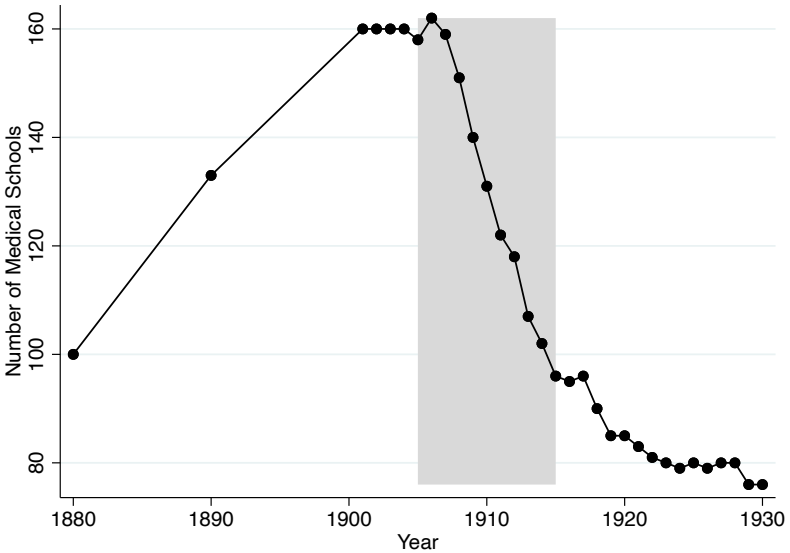
WITH AN INTRODUCTION BY
HENRY S. PRITCHETT
PRESIDENT OF THE FOUNDATION

BULLETIN NUMBER FOUR (1910)

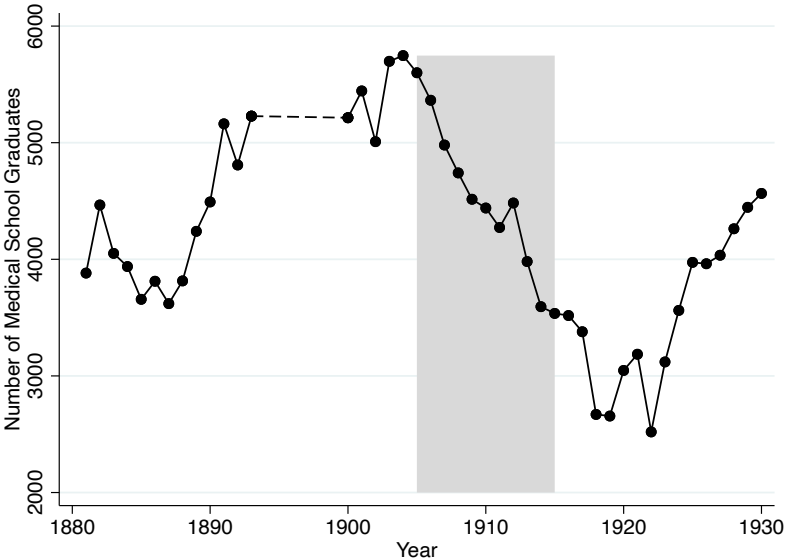
(Reproduced in 1960)

(Reproduced in 1978)

Medical Schools



Medical School Graduates



Overview

- ▶ This paper examines the consequences of Flexner-era medical schools closures on:
 - ▶ County-level physicians per 1,000
 - ▶ County-level nurses and midwives per 1,000
 - ▶ County-level infant and all-age mortality rates

Overview

- ▶ A priori, the effect of medical school closures is unclear
 - ▶ Effects on physicians
 - ▶ Complete equilibration to long-run persistence in more impacted places
 - ▶ Effects on nurses and midwives
 - ▶ No effect, positive (substitutes), or negative (complements)
 - ▶ Effects on mortality
 - ▶ Increase or decrease depending on quality/quantity trade-offs

Data

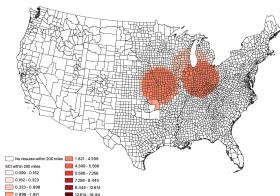
- ▶ Data on medical school closures and the number of graduates from AMA reports
- ▶ Complete count census data on physicians, professional nurses, practical nurses, and midwives
- ▶ Newly digitized vital statistics data on mortality

Empirical strategy

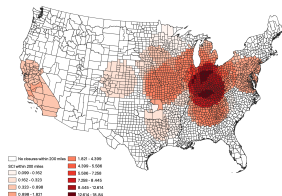
- ▶ Difference-in-differences with continuous treatment
 - ▶ Use medical school graduates from 1901-1904 to construct a county-level measure of physician flow at risk from medical school closures
 - ▶ Focus on the impact of closures within 0-200 miles of a county → most medical school graduates (~90%) located within 200 miles of the school they trained at
 - ▶ SCI 0-200 for the average county is 3.8% of national medical school graduates

School Closure Intensity (SCI)

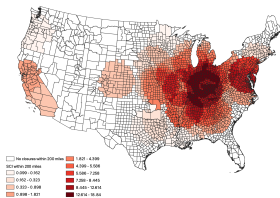
1905



1910



1915



Main Result 1

	Physicians per 1,000		
	(1)	(2)	(3)
SCI 0-200 miles	-0.005*** (0.001)	-0.006*** (0.001)	-0.006*** (0.002)
SCI 200-500 miles	-0.002** (0.001)	-0.002*** (0.001)	-0.001 (0.001)
Observations	11918	11774	9956
County & Year FE	X	X	X
County characteristics	X	X	X
Excluding counties with closures		X	X
Excluding counties within 50 miles of a closure			X

Notes: The unit of observation is a county-year. All dependent variables are per 1,000 people and PPML is used for the estimation. Standard errors are clustered at the county-level. 95% confidence intervals are displayed.

* = $p < 0.10$, ** = $p < 0.05$, *** = $p < 0.01$

Main Result 1

- ▶ Medical school closure intensity within 200 miles was negatively associated with the number of physicians per 1,000 in a county
 - ▶ The average county had a 2.3% reduction in all physicians and 5.5% reduction in young physicians
 - ▶ This effect grew over time; by 1930, the average county had a 3% reduction in all physicians and 10% reduction in young physicians

Main Result 2

- ▶ Medical school closures within 200 miles had mixed effects on nurses
 - ▶ Slower growth in professional nurses per 1,000 → complements to physicians
 - ▶ More rapid growth in practical nurses per 1,000 → substitutes to physicians
 - ▶ No effect on midwives

Main Result 3

- ▶ Infant and all age mortality decreased as a result of school closures within 200 miles
 - ▶ Average county had a 4.2% reduction in infant mortality and a 3% reduction in total mortality
 - ▶ The mechanism is likely to be through reductions in low quality physicians

Contributions

- ▶ Literature on the supply and distribution of physicians in the United States
 - ▶ Moehling et al. (2020), Andrews (2021), Miller and Weiss (2008)
 - ▶ We build on this literature by studying the entire United States, documenting the effects of closure over time, and investigating a number of margins of adjustment

Contributions

- ▶ Literature on the supply and distribution of nurses and midwives in the United States
 - ▶ Dingwall, Rafferty and Webster (2002), D'Antonio and Whelan (2009), and Egenes (2017) on nursing and Anderson et al. (2020) on midwives
 - ▶ Our paper is the first paper to examine the consequences of medical school closures for professional nurses, practical nurses, and midwives

Contributions

- ▶ Literature on the causes of declines in mortality in the first half of the twentieth century in the United States
 - ▶ Doctors: Haines (2001), Law and Kim (2005)
 - ▶ Nurses and midwives: Miller (2008), Moehling and Thomasson (2014), Anderson et al. (2020)
 - ▶ Our paper provides new evidence on the contribution of Flexner-era closures of medical schools to declines in infant and total mortality

A grayscale photograph of a large, ornate Gothic Revival building, likely Marquette University. The building features a prominent central dome with a spire, multiple gables, and numerous windows. The text is overlaid on the image.

Thanks!

If you have questions or comments, you can reach us at:

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