



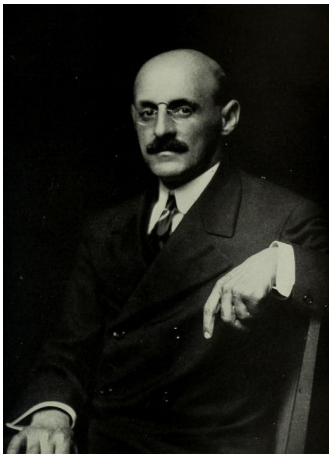
# Medical School Closures and Health Care Market Adjustment in the Flexner Report Era

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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

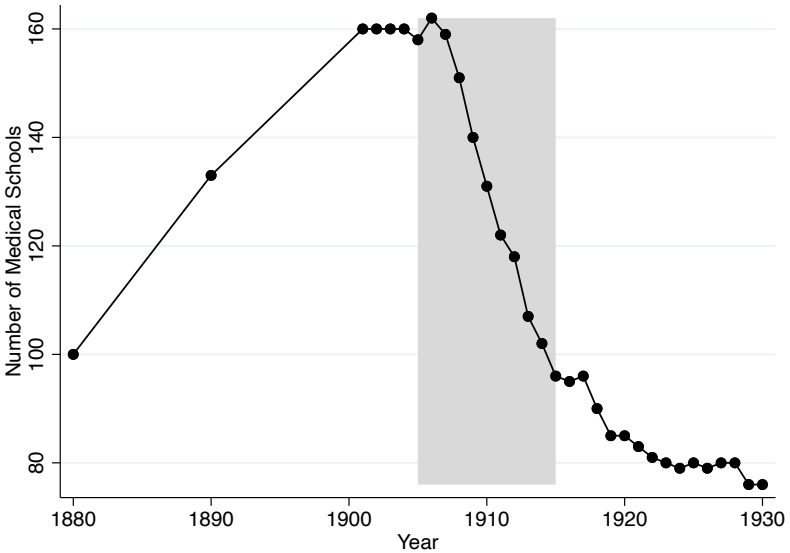
WITH AN INTRODUCTION BY  
HENRY S. PRITCHETT  
PRESIDENT OF THE FOUNDATION

BULLETIN NUMBER FOUR (1910)

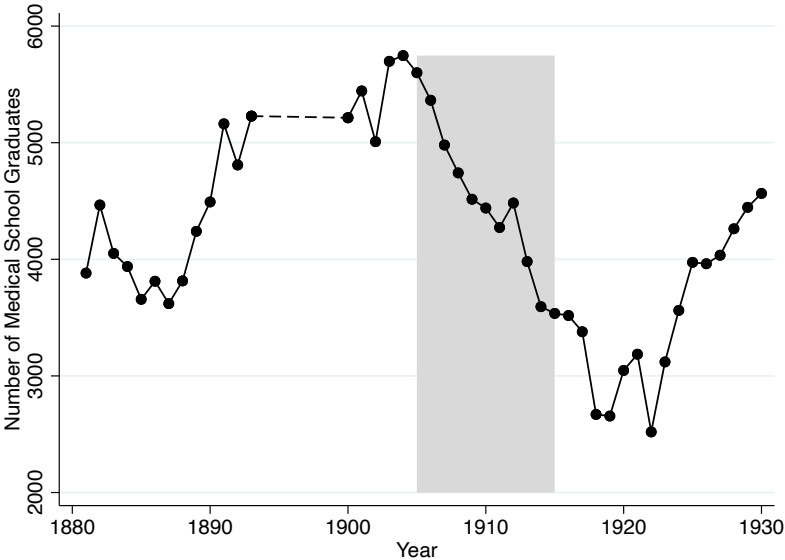
*(Reproduced in 1960)*

*(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

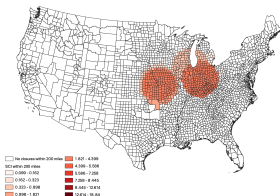


# Empirical strategy

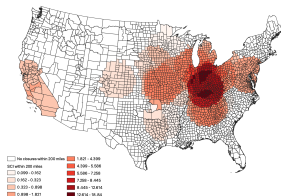
- ▶ Difference-in-differences with continuous treatment
  - ▶ Use medical school graduates from 1901-1904 to construct a county-level measure of physician flow at risk from medical school closures
  - ▶ Focus on the impact of closures within 0-200 miles of a county → most medical school graduates (~90%)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

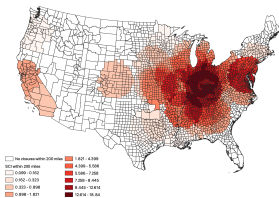
1905



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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