

Death in the country: The role of rural health initiatives in the mortality transition of the United States

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Death in the Country

The Role of Rural Health Initiatives in the Mortality Transition of the United States

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Abstract

This study examines reductions in rural mortality due to health and sanitation efforts in U.S. counties over the years 1908-1933. Identification exploits variation in the location and timing of health investments to measure the reductions in mortality for the post-implementation period. Endogeneity of the health investment is addressed using the preexisting infectious disease mortality. Results are consistent under both estimation strategies. Infant deaths decline, even when accounting for state-level time trends.

Data

For this paper three novel sources of historical data are collected at the county-level: overall mortality, infant mortality, and health investment data. Overall mortality and infant mortality are pulled from county-level records provided in the U.S. Vital Statistics. The health investment data is extracted from The History of County Health Organizations.

Conclusions

Results estimate that health initiatives improved infant mortality outcomes by an average of two deaths per 1,000 births. This decline accounts for 7-10% of the total mortality improvements for children under one. The strongest effect occurs in the Midwest, the South, and among black infants. Gains in overall health are less clear; crude mortality only declines when accounting for preexisting infectious disease mortality.



Source: U.S. Mortality Records
Note: Overall mortality excludes year 1918

Figure I: The above figure shows the mortality decline from 1910-1933.

TABLE 52.—Record of parish births with—Continued

LOUISIANA—Continued

MAJORS PARISH

(Full-time work began Feb. 10, 1907)

Year	Director (name and professional degree)	Actual period of operation	Number of persons										Annual appropriations (supplied by expensing agencies)					
			Full time					Part time					Total budget	Actual	State fund	United States		
			Men	Non-paid	Un-paid	De-partment	Chap-lain	Other	Men	Non-paid	Un-paid	De-partment				Public Health Service	Other Federal funds	Other State funds
1907	L. E. Criss, M. D.	Oct. 29-Dec. 31, 1906	1	0	0	1	0	0	0	0	0	0	\$1,000.00	\$1,000.00	0.00	0.00	0.00	\$275.00
1908	W. H. Brown, M. D.	Jan. 1-Sept. 30, 1907	1	0	0	1	0	0	0	0	0	0	11,000.00	11,000.00	0.00	2,000.00	0.00	0.00
1909	E. P. Foreman, M. D.	Oct. 1-Sept. 30, 1908	1	0	0	1	0	0	0	0	0	0	8,000.00	8,000.00	0.00	1,500.00	0.00	0.00
1910	—do—	—do—	1	0	0	1	0	0	0	0	0	0	8,000.00	8,000.00	0.00	1,500.00	0.00	0.00
1911	—do—	—do—	1	0	0	1	0	0	0	0	0	0	8,000.00	8,000.00	0.00	1,500.00	0.00	0.00
1912	—do—	—do—	1	0	0	1	0	0	0	0	0	0	10,000.00	10,000.00	1,000.00	5,000.00	0.00	0.00

MOREHOUSE PARISH

(Full-time work began Aug. 17, 1907)

Year	Director (name and professional degree)	Actual period of operation	Number of persons										Annual appropriations (supplied by expensing agencies)					
			Full time					Part time					Total budget	Actual	State fund	United States		
			Men	Non-paid	Un-paid	De-partment	Chap-lain	Other	Men	Non-paid	Un-paid	De-partment				Public Health Service	Other Federal funds	Other State funds
1907	J. W. Williams, M. D.	Aug. 17-Dec. 31, 1906	1	0	0	1	0	0	0	0	0	0	\$4,125.00	\$1,000.00	0.00	\$1,319.00	0.00	\$885.00
1908	N. P. Lida, M. D.	Jan. 1-Sept. 30, 1907	1	0	0	1	0	0	0	0	0	0	11,000.00	11,000.00	0.00	2,000.00	0.00	0.00
1909	—do—	—do—	1	0	0	1	0	0	0	0	0	0	11,000.00	11,000.00	0.00	2,000.00	0.00	0.00
1910	—do—	—do—	1	0	0	1	0	0	0	0	0	0	11,000.00	11,000.00	0.00	2,000.00	0.00	0.00
1911	—do—	—do—	1	0	0	1	0	0	0	0	0	0	11,000.00	11,000.00	0.00	2,000.00	0.00	0.00
1912	—do—	—do—	1	0	0	1	0	0	0	0	0	0	8,000.00	8,000.00	0.00	2,400.00	1,000.00	0.00

SUMMARY AND RATE TABLES

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TABLE 5.—POPULATION, BIRTHS AND DEATHS WITH RATES PER 1,000 POPULATION, INFANT MORTALITY AND STILLBIRTHS, BY THE TENTH REGISTRATION AREA IN CONTIGUOUS UNITED STATES AND THE SUBDIVISIONS: 1928—Continued

AREA	Population July 1, 1928	Number	BIRTHS AND DEATHS (Estimated for 1928)				INFANT MORTALITY (Estimated for 1928)				STILLBIRTHS	
			Rate per 1,000 population		Rate per 1,000 population		Rate per 1,000 population		Rate per 1,000 population	Rate per 1,000 population		
REGISTRATION COUNTRIES			Births	Deaths	Births	Deaths	Births	Deaths	Births	Deaths	Number	Rate
ALABAMA	2,098,000	10,512	10,512	10,512	10,512	10,512	10,512	10,512	10,512	10,512	10,512	10,512
ARKANSAS	1,098,000	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256
CALIFORNIA	2,998,000	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990
CONNECTICUT	1,098,000	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256
DELAWARE	298,000	1,490	1,490	1,490	1,490	1,490	1,490	1,490	1,490	1,490	1,490	1,490
FLORIDA	1,998,000	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990
GEORGIA	1,998,000	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990
ILLINOIS	3,998,000	19,990	19,990	19,990	19,990	19,990	19,990	19,990	19,990	19,990	19,990	19,990
INDIANA	2,998,000	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990
IOWA	2,998,000	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990
KANSAS	2,998,000	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990
KENTUCKY	1,998,000	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990
LOUISIANA	1,998,000	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990
MAINE	1,098,000	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256
MARYLAND	1,998,000	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990
MASSACHUSETTS	1,998,000	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990
MICHIGAN	2,998,000	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990
MINNESOTA	2,998,000	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990
MISSISSIPPI	1,998,000	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990
MISSOURI	2,998,000	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990
MONTANA	1,098,000	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256
NEBRASKA	2,998,000	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990
NEVADA	298,000	1,490	1,490	1,490	1,490	1,490	1,490	1,490	1,490	1,490	1,490	1,490
NEW HAMPSHIRE	1,098,000	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256
NEW JERSEY	2,998,000	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990
NEW MEXICO	1,098,000	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256
NEW YORK	11,998,000	59,990	59,990	59,990	59,990	59,990	59,990	59,990	59,990	59,990	59,990	59,990
NORTH CAROLINA	2,998,000	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990
NORTH DAKOTA	1,098,000	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256
OHIO	3,998,000	19,990	19,990	19,990	19,990	19,990	19,990	19,990	19,990	19,990	19,990	19,990
OKLAHOMA	1,998,000	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990
OREGON	1,098,000	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256
PENNSYLVANIA	5,998,000	29,990	29,990	29,990	29,990	29,990	29,990	29,990	29,990	29,990	29,990	29,990
RHODE ISLAND	1,098,000	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256
SOUTH CAROLINA	1,998,000	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990
SOUTH DAKOTA	1,098,000	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256
TENNESSEE	2,998,000	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990
TEXAS	3,998,000	19,990	19,990	19,990	19,990	19,990	19,990	19,990	19,990	19,990	19,990	19,990
UTAH	1,098,000	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256
Vermont	298,000	1,490	1,490	1,490	1,490	1,490	1,490	1,490	1,490	1,490	1,490	1,490
Virginia	2,998,000	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990
Washington	1,998,000	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990	9,990
West Virginia	1,098,000	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256
Wisconsin	2,998,000	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990	14,990
Wyoming	1,098,000	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256	5,256

Figure II: The original data in PDF form.

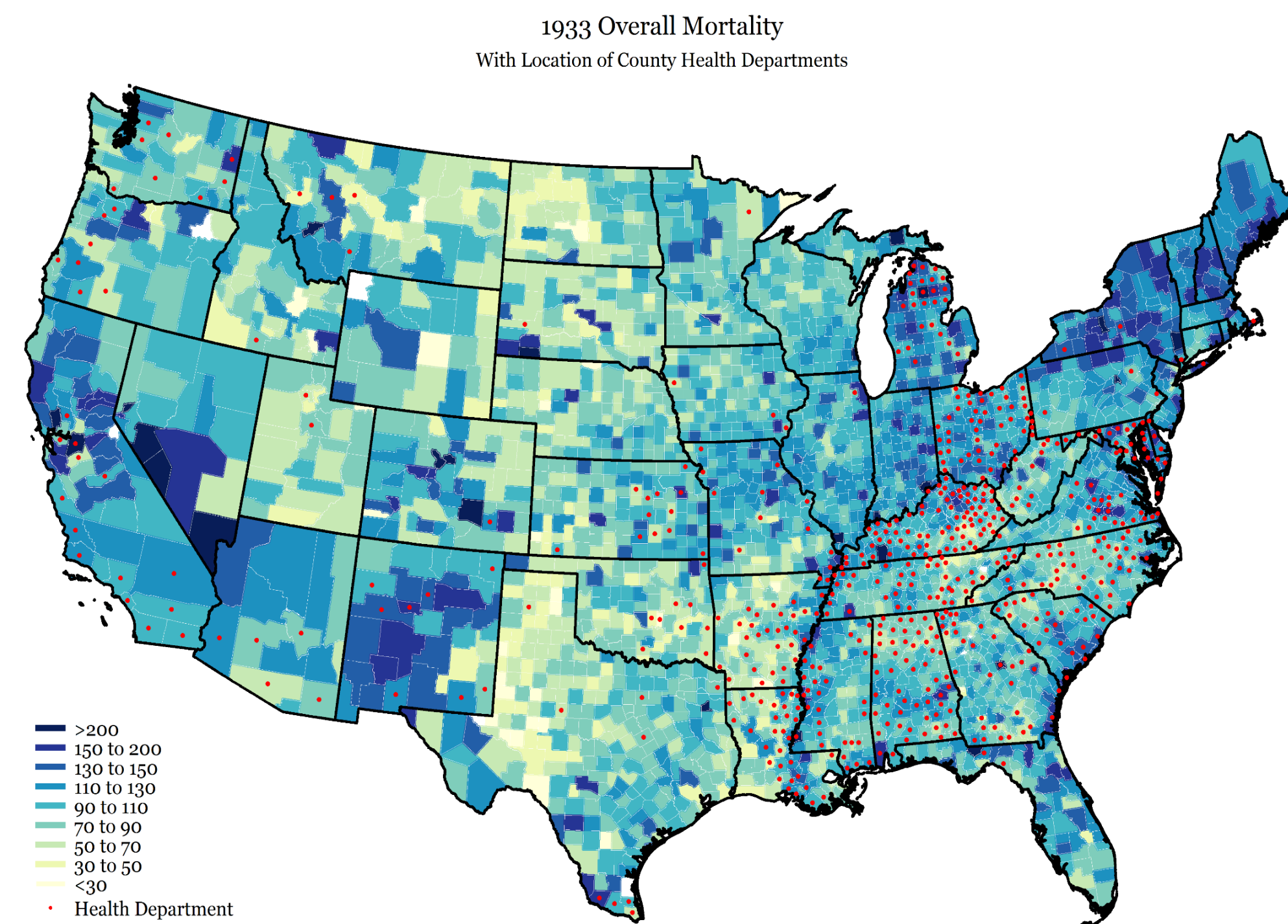


Figure III: The distribution of overall mortality and health investments in year 1933.
Overall mortality is the rate is per 10,000 deaths.

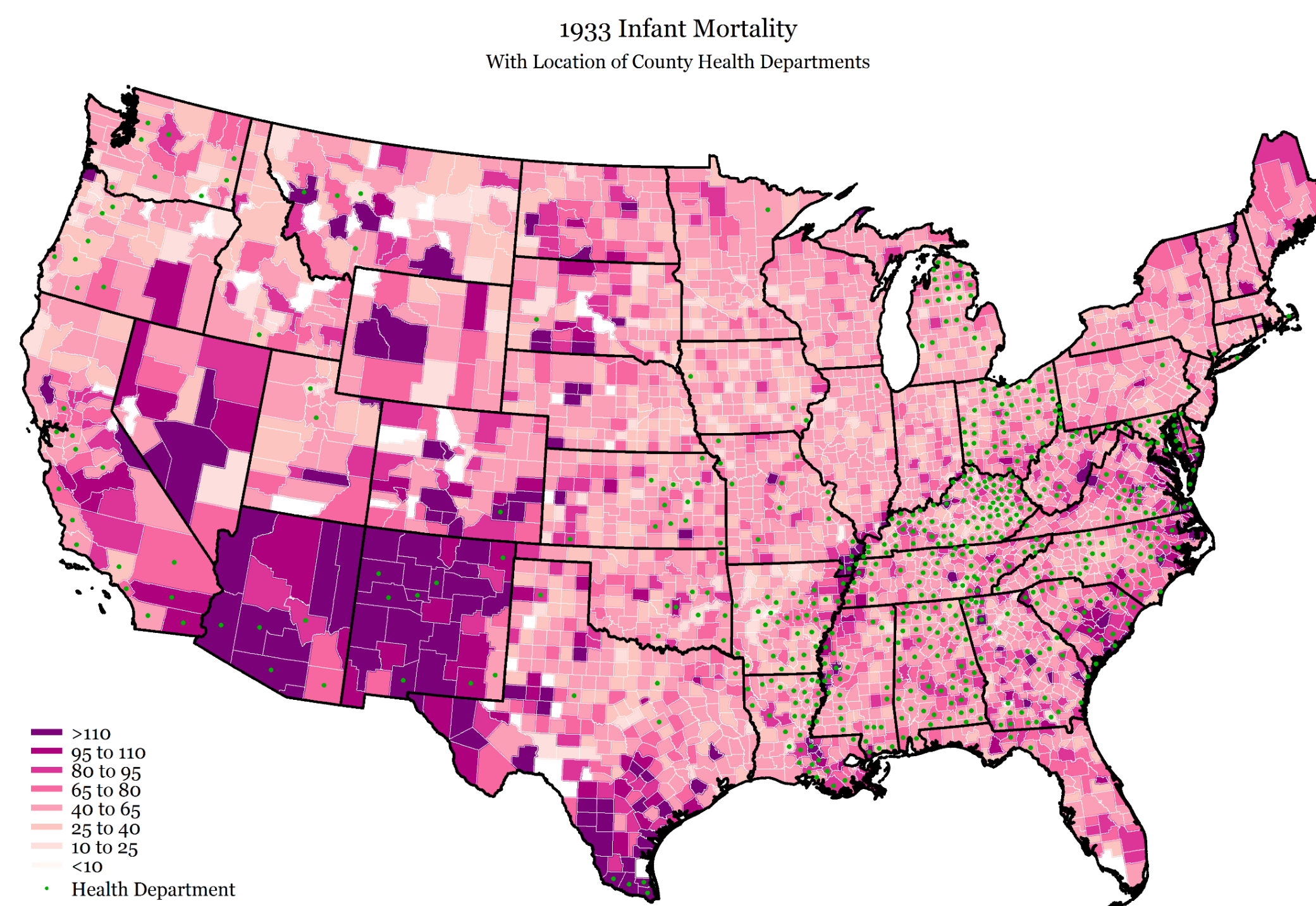


Figure IV: The distribution of infant mortality and health investments in year 1933.
Infant mortality is the rate is per 1,000 births.

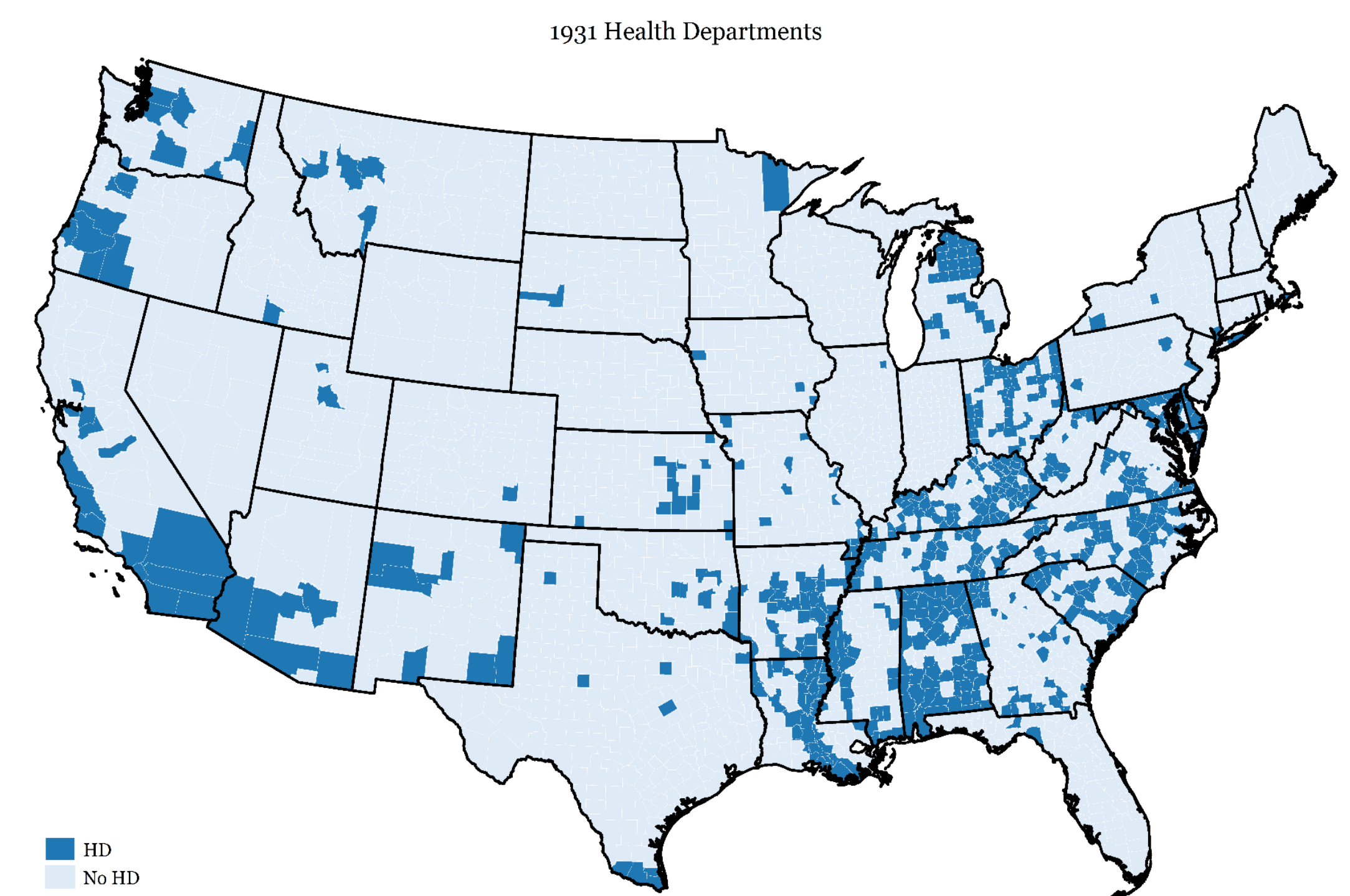


Figure V: The distribution of health departments throughout the U.S. in 1931.

Mapping Methods

All data is extracted from PDF documents by the author (see figure II). County boundaries were unified and the health data matched with overall mortality. Using county specific shapefiles available from the IPUMS data release, the location of each indicator was determined. The included maps were produced in Stata software to reference geographic boundaries.

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