

Data Appendix to “Racial Health Inequities in the 19th Century US: Evidence from Childhood Sex Ratios”

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Data on Childhood Sex Ratios in the 19th-century US

Under-5 populations by sex for 1850, 1860, and 1870, for the US and for states, are reported in the *Ninth Census – Volume II. The Vital Statistics of the United States*: Tables XXIII (all races), XXVI (whites), and XXIX (Blacks).¹

Under-five populations by sex for 1880 are reported in *Statistics of the Population of the United States at the Tenth Census (June 1, 1880)*.² National totals (white and nonwhite) are reported for single years of age in Table Table XX.³ Table XXI reports state totals for these data.⁴ IPUMS “full count samples”⁵ are available decennially for 1850–1880, for non-slave populations. When both are available, we average the census volume and the IPUMS full count values of under-5 populations by sex, taking each as a plausible tally of the underling census manuscripts.

Data on Infant Mortality and Childhood Sex Ratios

The data for Figure 1 and regression analysis are direct estimates of infant mortality, taken from vital statistics, combined with under-5 sex ratios from censuses or population registries. Our non-US data cover: Sweden (1757–1960), districts of Prussia (1849–1910), Denmark (1840–1960), Belgium (1846–1960), England and Wales (1851–1961), the Netherlands (1859–1960), Scotland (1861–1960), districts of Bavaria (1863–1880), New Zealand (1867–1961), Austria and Austrian Provinces (1869–1961), Australia (1880–1961), Germany (1920–1960), Switzerland (1880–1960), Finland (1885–1960), Norway (1890–1960), France (1901–1954), Italy (1911–1961), and South Africa (1918–1921). Our US data cover Massachusetts from 1860–1960, and an increasing number of states from 1900 onward (see below).

¹US Census Bureau 1872, pp. 563, 575, 610, 619, 649, 658. “Race” categories follow usage in the source.

²The [US Census website](#) refers to this volume as “1880 Census: Volume 1. Statistics of the Population of the United States”.

³Table XX. Population of the United States, by specified age, sex, race, ... 1880; pp. 48-49

⁴Table XXI. Population, by specified age, sex, race, ... 1880; pp. 552-645

⁵Ruggles et al (2021).

Non-US Data Sources

For many historical populations, the [Human Mortality Database](#) provides original data, and data from other sources, for infant mortality rates and under-five sex ratios. We expand our geographic scope by also drawing on vital statistics and census data from various official sources for populations not included in the HMD. In many cases, the data are available from [International Historical Statistics](#) (Palgrave Macmillan (Ed.) 2013), which we abbreviate as *IHS* below. Specific sources and methods by polity follow.

Australia (1876–1961)

Under-5 populations by sex are census values for non-aboriginal populations. We have decennial data from 1881–1921 and single-year values for 1933, 1947, 1954, and 1961. The data for 1881 and 1891 are reported in [Caldwell \(1987:33–34\)](#). The 1901 and 1911 data are from the 1911 Census of Australia.⁶ Data for 1921, 1933, 1947, 1954, and 1961 are reported in the Census of 1966.⁷ Infant mortality rates for 1876–1901 are from [McDonald et al. \(1987:58\)](#).⁸ Rates for 1901–1961 are from Australian Bureau of Statistics, [Historical Population](#).⁹

Austrian Provinces (1865–1910)

For Provinces of Austria, we have under-5 populations by sex for 1869, 1880, 1890, 1900, and 1910, from Statistics Austria.¹⁰ Births and infant deaths for 1865–1880 are reported annually in the issues of Austria’s *Statistisches Jahrbuch*.¹¹ Data for 1886–1910 are reported annually in the volumes of *Österreichische Statistik, Bewegung der Bevölkerung . . .*¹²

Austria (1930–1961)

Under-5 populations by sex are for the years 1934, 1951, and 1961, reported in Statistik Austria, [Statistisches Jahrbuch 2010](#).¹³ Infant mortality rates (1930–1961) are from *IHS* (2013: 3577,3580,3583), Series A7.

⁶*Census of the Commonwealth of Australia taken for the night between the 2nd and 3rd April, 1911*, Vol. II, Part 1 – Ages, pp. 10–11.

⁷Commonwealth Bureau of Census and Statistics (1970), *Census of Population and Housing, 30 June 1966 Commonwealth of Australia. Volume 1. Population: single characteristics, part 1. Age*, pp. 10–11.

⁸Series MFM 154, in Chapter 3 of Vamplew (1987), *Australians – Historical Statistics*.

⁹Deaths [data downloads](#), Table 5.4 “Infant mortality rates, states and territories, 1901 onwards”, released 2019-04-18. Downloaded 2021-06-21

¹⁰STATcube – Statistical Database of STATISTICS AUSTRIA, Dataset: Population census data since 1869 by age and Provinces, downloaded 2023-02-20.

¹¹E.g. the 1865 data are in *Statistisches Jahrbuch der Österreichischen Monarchie - Für das Jahr 1866* (Wien, 1868), pp. 18, 20–21. The Jahrbuch issues, whose titles vary somewhat, are available from [austrian literature online](#).

¹²For example, the 1886 data are in *Österreichische Statistik, Bewegung der Bevölkerung der im Reichsrathe vertretenen Königreiche und Länder im Jahre 1886*. The volumes for 1886–1890, 1896–1900, and 1906–1910 are available online in the *Österreichische Statistik, 1880-* section of the Österreichische Nationalbibliothek.

¹³2.08 Bevölkerung 1869 bis 2001 nach fünfjährigen Altersgruppen und Geschlecht (Population 1869 to 2001 by five-year age groups and sex, p. 45

Belgium (1842–1961)

Under-5 populations by sex are census data, decennially 1846–1866 and 1880–1910, with single-years 1930, 1947, and 1961. The data were obtained through the HMD (downloaded 2021-07-01). The data for 1846, 1856, 1866, 1880, 1890, 1900, and 1910 are reported in the volumes for 1893, 1908, and 1923–24 of *Annuaire Statistique de la Belgique*¹⁴. The source for the 1930 data is the 1940 volume of *Annuaire Statistique de la Belgique et du Congo Belge* (pp. 34–35). The 1947 data are from the 1947 census of Belgium.¹⁵ The data for 1961 are from the 1961 census.¹⁶ Infant mortality rates for Belgium (1842–1961) are HMD estimates (downloaded 2021-10-26).

Denmark (1836–1960)

Under-5 populations by sex are quinquennial 1840–1860 and 1910–1960, and decennial 1870–1890. The data were obtained through the HMD (downloaded on 2021-07-01). The data for 1840–1890 are from Danmarks Statistik (1905), *Befolkningsforholdene i DK i det 19. Aarhundrede*, STATISTISK TABELVÆRK, FEMTE RÆKKE, LITRA A NR. 5, Tabel 46, p. 55; [available online](#) According to the HMD (DNKref.pdf), the data for 1910–1960 are “population estimates ... produced by Danmarks Statistik”, which were “obtained directly from the statistical office.” Infant mortality rates (1836–1960) are HMD estimates (downloaded on 2021-10-26).

England and Wales (1847–1961)

Under-5 populations by sex for England and Wales are decennial for 1851–1891 and quinquennial for 1901–1961. The decennial data (1851–1891) are from the censuses of England and Wales, as reported in Mitchell & Deane (1962:12). The quinquennial data (1901–1961) are from the [Historic Mortality Datasets](#) of the National Archives.¹⁷ Infant mortality rates (1847–1961) are from Mitchell & Deane (1962:36-37) for 1847–1937 and from *IHS* (2013: 3582, 3587) for 1942–1961.

Finland (1881–1960)

Under-5 populations by sex are quinquennial from 1885 to 1960, obtained through the HMD (downloaded 2022-02-28). The HMD identifies Statistics Finland as the source of the data.¹⁸ Infant mortality rates (1881–1960) are HMD estimates (downloaded on 2021-10-26).

¹⁴For 1846, 1893:64; for 1856, 1909:64; and 1926:30 for 1866 and decennially 1880–1900. These volumes are available online from HathiTrust: [1893](#), [1908](#), and [1923–24](#)

¹⁵Institut National de Statistique (1951), *Recensement Général de la Population, de L’Industrie et du Commerce au 31 décembre 1947, tome V, Répartition de la population par âge*, Tableau 1 - Répartition des habitants par âge et sexe ...” (p. 10). Bruxelles: Imprimerie Fr. Van Muysewinkel. The volume is [available online](#) from KU Leuven libraries.

¹⁶Institut National de Statistique (1965). *Recensement Général de la Population, 31 décembre 1961, tome V, Répartition de la population par âge*. Bruxelles: Institut National de Statistique. 1965); [available online](#) from KU Leuven libraries.

¹⁷RG 69/2, [Historic Mortality: 1901–1995 dataset](#), Population, 1901–1995 (file POPLNS.csv), downloaded 2021-06-18.

¹⁸Under-five populations for 1885–1940 and 1945–1970 were received as computer files by the HMD from Statistics Finland: “Population estimates for years 1866–1940,” and “Population estimates for years 1941–

France (1897–1954)

Under-5 populations by sex are quinquennial 1901–1946, with single-years 1954, 1962, 1968. The data were obtained through the HMD (downloaded on 2021-07-01), which identifies the source as Vallin & Meslé (2001).¹⁹

Infant mortality rates (1897–1968) are HMD estimates (downloaded on 2021-10-26).

German Republic (1920–1933)

Under-5 populations by sex are census values for 1925 and 1933; the data are from the *Statistisches Jahrbuch* of 1929 and 1939.²⁰ IHS (2013:3454, Series A2) also reports these age-sex population data, but rounded to the nearest thousand.²¹

Infant Mortality Rates (1921–1933) are from IHS (2013: 3577, 3580), Series A7.

West Germany (1956–1960)

Under-5 populations by sex for 1960 were obtained through the HMD (downloaded on 2021-10-26), which identifies the source as Statistisches Bundesamt.²² Infant mortality rates (1956–1960) are HMD estimates (downloaded on 2021-10-26).

Italy (1907–1961)

Under-5 populations by sex for 1936 and decennially 1911–1931 and 1951–1961, from Istat (Italian National Institute of Statistics), [Time Series](#).²³

Infant mortality rates (1907–1961) from Istat [Time Series](#).²⁴

Kingdom of Bavaria (1863–1880)

Infant mortality and under-5 population by Regierungsbezirk. We have infant mortality rates for 1863–80 and under-5 sex ratios for 1867, 1875, and 1880. Infant mortality data for 1862–1875 are from Mayr (1878), *Die Bewegung der bayerischen Bevölkerung in den Jahren 1862/63 bis 1875*.²⁵ Infant mortality data for 1876–80 are from [Zeitschrift des](#)

1995.” This according to the “Data Sources” (<https://mortality.org/hmd/FIN/DOCS/ref.pdf> – login required) on the [Finland](#) page of the [HMD website](#) (accessed 2022-03-02.)

¹⁹The “Data sources” (<https://mortality.org/hmd/FRATNP/DOCS/ref.pdf> – login required) on the HMD data page for [France](#) describe the source as follows: “Vallin, J. and F. Meslé. (2001). Tableau I-C-1: Population par sexe et âge (de 0 à 100 ans), au 1 janvier, de 1899 à 1998, avec deux estimations selon le territoire pour les années de changement de territoire [revised post-publication]. In: Tables de mortalité françaises pour les XIXe et XXe siècles et projections pour le XXIe siècle. Paris: Institut national d’études démographiques.cite Table Tableau I-C-1: Population par sexe et âge (de 0 à 100 ans), au 1 janvier, de 1899 à 1998” (accessed 2022-03-03).

²⁰The 1925 data from 1929, p. 14; 1933 from 1939, p. 14.

²¹The IHS value for 1933 differs from ours; we use the value from the 1933 census (June 16); the IHS values for 1933 are consistent with the estimates for Dec. 31, 1933, found in *Statistisches Jahrbuch 1936*, p. 12.

²²Annual population estimates as of December 31st, by age (0–94, 95+) and sex. Unpublished data.

²³Population, Population by age class and sex, aging ratio and dependency ratio at Census from 1861 to 2011 according to reference year borders ([Table_2.2.1.xls](#)).

²⁴Health, Infant mortality rate by age at death and sex; perinatal mortality rate by sex - Years 1863–2013 ([Table_4.8.xls](#)).

²⁵<https://www.digitale-sammlungen.de/view/bsb11362367?page=12,13>

Königlich-Bayerischen Statistischen Bureaus. 13. 1881.²⁶ The 1867 census of Bavaria has under-5 populations by sex.²⁷ The under-5 data for 1875 are from *Die bayerische Bevölkerung nach Geschlecht, Alter, Civilstand und Staatsangehörigkeit: Volkszählung von 1875*. The 1880 census data for under-5 populations by sex are from *Beiträge zur Statistik Bayerns*, vol. 45-46 (1882-1883).

Kingdom of Prussia (1849, 1871-1910)

We have data at the level of the Regierungsbezirk (district).²⁸ We have under-five populations by sex, for the years 1849, 1875, and 1880. We have under-six populations by sex quinquennially from 1895 to 1910. All but the 1849 data are from the “[Galloway Prussia Database 1861 to 1914](#)”. That database also provides infant mortality data (births and infant deaths) annually for 1871-1910.

With the exception of 1849, we pair under-5 sex ratios with the 5-year rolling means of infant mortality. We do not have Prussian infant mortality data for 1845-48, and so we pair the single year of infant mortality data for 1849 with the under-five sex ratio for that year. The 1849 data are from *Tabellen und amtliche Nachrichten über den Preussischen Staat für das Jahr 1849*; Vol. 1 for under-five populations, Vol. 2 for births and infant deaths.

New Zealand (1863–1961)

Under-5 census populations by sex are for 1867, 1874, and 1881; quinquennially for 1886–1926 and 1951–1961; and also for 1936 and 1945. Data are for the non-Maori population until 1951. The data for 1867, 1874, and 1881 are found in the 1881 census.²⁹ Quinquennial data for 1886–1916 are reported in the 1916 census.³⁰ The data for 1936, 1945, and quinquennially 1951–1961, are from the [Stats NZ Store House](#).³¹

Infant mortality rates are for the non-Maori population from 1863–1945 and for the total population from 1947–1960. Data for 1863–1936 are from [Stats NZ Store House](#).³² The data for 1936–1945 are from [The New Zealand Official Year-book 1957](#).³³ Data for 1947–1961 are for the total population (including Maori), from [Stats NZ Inforshare](#).³⁴

Netherlands (1855–1960)

Under-5 populations by sex (1859, 1869, and quinquennially 1875–1970) were obtained through the HMD (downloaded on 2021-07-01), which identifies the sources as the NIDI

²⁶p. 191 for births, p. 198 for infant deaths.

²⁷*Die Volkszählung im Königreiche Bayern vom 3. December 1867. 2: Die bayerische Bevölkerung nach Alter, Civilstand und Geschlecht.*

²⁸We exclude the very small Sigmaringen from our data set; all the other Regierungsbezirke have u5 populations over 25 thousand.

²⁹*Results of a census of the colony of New Zealand, taken for the night of the 3rd of April, 1881*, Chapter 28, Table 1, “Showing the Increase of Persons of Both Sexes, Males, and Females (exclusive of Maoris), at different Ages, in the Intervals between the various Censuses, from December, 1864, to April, 1881.”

³⁰*Results of a census of the Dominion of New Zealand . . . 1916, Part II Ages, p. 1.*

³¹[Spreadsheet](#) (182.xls) titled [A1.6 Population by age and sex \(Long-term data series; Population;\)](#), spreadsheet A1.6 (citing Bloomfield (1984), “Census Reports: Table II.6. Age Groups . . . 1874-1976”).

³²A2.7 Infant mortality rate and infant mortality number ([spreadsheet](#)), Thorns/Sedgwick non-Maori (column 3).

³³Section 4 – [Vital Statistics](#). European Infant Mortality.

³⁴Population, Death Rates - DMM, [Infant mortality rate \(Annual-Dec\)](#).

mortality database for 1859–1949 and Statistics Netherlands (Centraal Bureau voor de Statistiek) for 1950–1960. Infant mortality rates (1855–1960) are HMD estimates (downloaded on 2021-10-26).

Norway (1886–1960)

Under-five populations by sex are census values, decennially 1890–1930 and 1950–60, and for the year 1946.³⁵ Data for 1890–1900 are from Statistics Norway (1910).³⁶ Data for 1910–1930 are reported in the 1930 census.³⁷ The rest of the age-sex data for Norway are taken from published census volumes from the respective years: 1946 from Statistics Norway (1951), *Folketellingen 1946, Hefte 3*³⁸; 1950 from Statistics Norway (1953), *Folketellingen 1950, Hefte 2*.³⁹; 1960 from Statistics Norway (1963), *Folketellingen 1960, Hefte 2*.⁴⁰; and 1970 from Statistics Norway (1971)⁴¹ (https://www.ssb.no/a/histstat/nos/nos_a448.pdf) (Population by age and marital status 31 December 1970), pp. 24–25.].

Credible IMR data for Norway start with 1876 (Backer 1961).⁴² Infant mortality rates (1886–1970) are from IHS (2013: 3578, 3581, 3585); Statistics Norway online data on births and infant-deaths corroborate the IHS infant mortality data.⁴³

Scotland (1857–1961)

Under-5 populations by sex are decennial 1861–1901 and quinquennial from 1911 to 1971; the data were obtained through the HMD (downloaded on 2021-07-01); original sources are as follows. The quinquennial data for 1861 to 1881 are published in the 1881 census.⁴⁴ Data for 1891–1901 are in the 1901 census.⁴⁵ Quinquennial data for 1911 to 1936 are from

³⁵The census values refer to January 1 of a year so we treat them as the prior year’s ending value (so our 1890 U5 counts are from the January 1, 1891 census). The IHS and HMD list Norway’s population data with the census years (so our 1890 value is listed in HMD as 1891).

³⁶*Norges Folkemængde fordelt paa de enkelte aldersaar, 1846-1901*, Norges Officielle Statistik. V. 113, pp. 32, 34.

³⁷Statistics Norway (1934), *Folketellingen 1930, Hefte 5. Folkemengden fordelt efter kjønn, alder og ekteskapelig stilling*, p. 2.

³⁸*Folkemengden etter kjønn, alder og ekteskapelig stilling, ...*, Tabeller p. 2.

³⁹*Folkemengden etter kjønn, alder og ekteskapelig stilling ...* (Population census December 1, 1950, Second volume, Population by sex, age, and marital status ...), Tabeller p. 2.

⁴⁰*Folkemengden etter kjønn, alder og ekteskapelig status*.

⁴¹*Folkemengden etter alder og ekteskapelig status 31. desember 1970*

⁴²Although counts of births and infant deaths start with the year 1836, we are guided by the judgment of Julie E. Backer, writing as “former chief of the Population Statistics Division, Central Bureau of Statistics of Norway”. According to Backer (1961, p. 36), until 1876 infants who died early inflated counts of the stillborn, with live-births and infant deaths correspondingly understated. STATISTISK SENTRALBYRÅ (Oslo 1961). Although some early publications from Statistics Norway report IMR data from before 1876, their *Historical Statistics* of 1978, 1994, and 2000 present 5-year average values of IMR starting with 1876. In our view, that corroborates our conclusion that 1876 marks the start of reliable IMR data for Norway.

⁴³Statistisk sentralbyrå, *Historisk statistikk, 3.13 Folkemengde, fødte, døde, ekteskap, flyttinger og folketilvekst*.

⁴⁴Scotland Census Office (1883), *Ninth decennial census of the population of Scotland ... 1881 ... Vol. II*, Appendix tables; with the 1861 and 1871 data in Table XXII, “Population of Scotland in 1861 and 1871, in sexes and ages ...” (p. xxxii) and the 1871 and 1881 in Table XXI, “Population of Scotland in 1871 and 1881, in sexes and ages ...” (p. xxxii). The volume is available [online](#) from HathiTrust.

⁴⁵Scotland Census Office (1903), *Eleventh decennial census of the population of Scotland ... 1901 ... Vol. II*, Appendix Tables, Table 1, “Population of Scotland in 1891 and 1901, distinguishing males and females

the General Register Office for Scotland.⁴⁶ Quinquennial data for 1941 to 1971 are from General Register Office for Scotland.⁴⁷ Infant mortality rates (1857–1971) are HMD estimates (downloaded on 2021-10-26).

South Africa (1913–1921)

We have under-5 census populations by sex for 1918 and 1921, reported in the 1922 and 1925 volumes of the *Official Yearbook* of South Africa.⁴⁸ Infant mortality rates (1913–1921) are from *IHS* (2013:219) Series A7.

Sweden (1753–1960)

We have under-5 populations by sex for 1757, 1763, 1850, and quinquennially for 1785–1805, 1815–1835 and 1860–1970. Data for 1860–1970 are from Statistics Sweden.⁴⁹ For years before 1860, we use “official” counts reported by Sundbärg (1908:180).⁵⁰ We use years for which those “official” counts are consistent with Sundbärg’s “corrected” counts (pp. 208, 216, 224), in terms of childhood sex ratios; the latter figures are used by the HMD.⁵¹ Infant mortality rates (1753–1960) are from Statistics Sweden.⁵²

Switzerland (1875–1960)

We have under-5 populations by sex for 1880, 1888, decennially 1900–1930, 1941, and decennially 1950–1960. The data are from Historical Statistics of Switzerland, *Population*.⁵³ Infant mortality rates (1875–1960) are calculated from data on births and infant-deaths from Historical Statistics of Switzerland, *Marriage, Birth, and Death*.⁵⁴ These IMRs are corroborated by *IHS* (2013: 3578,3582) Series A7.

at each year of life . . . ” (p. xxxii). Available [online from Google Books](#).

⁴⁶Mid-year population estimates by sex and five year age group, 1911–1938. The HMD reports these as “Retrieved 15 May 2008” <http://www.gro-scotland.gov.uk>.

⁴⁷Mid-year population estimates by sex and single year of age until the last age 85+ (1939–1970) or 90+ (1971–2001); unpublished data received by HMD via email on 28 February 28, 2007.

⁴⁸The 1918 data are in Union office of census and statistics (1923), *Official Yearbook of the Union and of Basutoland, Bechuanaland Protectorate and Swaziland, No. 5 –1922* (pp. 158–59); Pretoria: The Government Printing and Stationary Office. The 1921 data are in Union office of census and statistics (1927), *Official Yearbook of the Union and of Basutoland, Bechuanaland Protectorate and Swaziland, No. 8 –1925* (p. 868); Pretoria: The Government Printing and Stationary Office.

⁴⁹Statistical Database, Population, Population statistics, Number of inhabitants, *Population by age and sex. Year 1860–2021* (accessed 2022-02-28). The HMD uses these data.

⁵⁰We relied on a variety of internet translation sites to access Sundbärg’s tables and discussion, which are in Swedish.

⁵¹We deem two counts to be consistent when their child sex ratios differ by less than 0.5% (log basis). When the difference is greater, we deem the observations to be unreliable.

⁵²Statistical Database, Population, Population statistics, Deaths, *Live births, stillbirths and infant mortality rates by sex. Year 1749–2020* (accessed 2022-03-01).

⁵³HSSO, 2012. Tab. B.8a. hssso.ch/2012/b/8a (Total Residential Population by Age in Five Year Increments (Approximate Ages), 1860–1990)

⁵⁴HSSO, 2012. Tab.C.41. hssso.ch/2012/c/41 (Total Deaths (Excluding Stillborn Births) by Age Group 1867–1995) and HSSO, 2012. Tab.C.5a hssso.ch/2012/c/5a (Marriage, Birth, and Death 1867–1995: General Overview).

US Data Sources for IMR and CSR

Except as otherwise noted, we use the 20th-century US vital statistics definition of urban, referring to cities with population 10,000 or more.

The State of Massachusetts (1860–1925)

We use state totals quinquennially 1860–1895, 1905–1915, and 1925. For 1900, 1920, and 1930 we have various regional breakdowns of Massachusetts data (see below), so we do not use the state totals. The state-level data are for the total population (white and nonwhite). Massachusetts state censuses provide under-five populations by sex decennially 1865–1925.⁵⁵ The US federal censuses include the state’s data decennially for 1860–1890 and 1910.⁵⁶ We average the values from published federal census volumes with the available IPUMS full count data (1860–1880, 1910)⁵⁷

Annual infant mortality rates (1856–1925) for the state are from *HSUS (2006)* Series Ab928.⁵⁸

Other states and areas of the US (1900, 1920, 1930)

Aggregates were formed to achieve a minimum under-5 population over 49,000 in order to reduce the role of noise in sex-ratio data.

US areas in 1900 include 23 observations. These are comprised of rural Northern New England (ME, NH, VT); rural Southern New England rural (CT, MA, RI); Boston MA, other MA urban, other New England urban; NY rural, Brooklyn NY, Manhattan NY, other New York City, other NY urban; NJ rural, NJ urban; Philadelphia PA, other PA cities (registration cities with population over 4,000); MI rural, MI urban; Cleveland & Cincinnati; Chicago; Milwaukee & Minneapolis & St Paul; St Louis; other Midwestern cities (registration cities with population over 4,000); registration cities of the South; registration cities of the West. Infant mortality rates are single-year values calculated from births and infant deaths reported in US Census Office (1902), *Twelfth Census, Census Reports Volume III, Vital Statistics Part 1*, Table 19; under-five populations by sex are from the same source.

⁵⁵*Abstract of the Census of Massachusetts, 1865*, p. 2; *The census of Massachusetts: 1875, Volume I, Population and social statistics*, p. 269 (the published total for age-one females corrected from 15589 to 13589 via pp. 263–68); *The census of Massachusetts: 1885, Volume I, Population and social statistics, Part 1*, p. 434; *Census of the Commonwealth of Massachusetts: 1895, Volume II, Population and social statistics*, p. 422; *Census of the Commonwealth of Massachusetts 1905, volume 1, population and social statistics*, p. 480; *The decennial census 1915*, p. 478. These are available [online](#)

⁵⁶*Ninth Census, Volume II, The Vital Statistics of the United States*, Table XXIII, pp. 563, 575 (data for 1860 as well as 1870). *Statistics of the population of the United States at the tenth census (June 1, 1880)*, Table XXI, p. 592. *Report on the population of the United States at the eleventh census: 1890, Part II*, Table 3, pp. 104–105. *Twelfth census of the United States, taken in the year 1900, Population Part II* (Census Reports Volume II), *Ages*, Table 3, pp. 110–111. *Thirteenth census of the United States taken in the year 1910, volume 1, population 1910, General Report and Analysis*, Table 43, p. 380.

⁵⁷Steven Ruggles, Catherine A. Fitch, Ronald Goeken, J. David Hacker, Matt A. Nelson, Evan Roberts, Megan Schouweiler, and Matthew Sobek. IPUMS Ancestry Full Count Data: Version 3.0 [dataset]. Minneapolis, MN: IPUMS, 2021. The 1890 census manuscripts have not survived, so there is no full count data for that year.

⁵⁸Data for 1856–1941 are from Massachusetts vital statistics; after 1942, data are from US vital statistics.

US areas in 1920 include 37 observations. These are comprised of rural and urban parts of MA, NY, PA, MD, IN, MI, OH, WI, and CA; the urban parts are exclusive of larger cities, which are included separately. The largest cities enter individually: Boston, Brooklyn, New York City, Philadelphia, Pittsburgh, Chicago. Smaller cities are in urban aggregates, as follows: other MA urban, urban CT, other urban New England; urban KS & MN; urban areas of the South; urban WA & OR. We also have: rural northern New England (ME, NH, VT), rural CT & RI, the rural parts of each of KS, MN, and VA; rural WA & OR; and the state of UT.

For 1920, infant mortality rates are calculated from on births and infant deaths for 1915–1919, taken from annual reports of birth statistics for the BRA.⁵⁹ The 1920 US census data refer to population as of January 1, 1920 so we take the simple averages (of births and of infant deaths) for the 5 years from 1915 to 1919.

Under-five populations by sex are from the IPUMS 1920 full count data.⁶⁰

US areas in 1930 include 66 observations. These are comprised of rural and urban parts of New Jersey, New York, Pennsylvania, Illinois, Indiana, Michigan, Ohio, Wisconsin, Iowa, Missouri, Washington, and California; the urban parts are exclusive of larger cities, which are included separately. The largest cities were entered individually: New York City, Chicago, Detroit, Philadelphia, Los Angeles, Cleveland, Boston, Pittsburgh, St Louis. Smaller cities were grouped to varying degrees, as follows: Minneapolis & St Paul; San Francisco & Oakland; Baltimore & Washington DC, and other southern cities (New Orleans, Louisville, Atlanta, Memphis, Nashville). Cities smaller than those above are included in various urban aggregates, as follows: urban Massachusetts excluding Boston; urban New England excluding Massachusetts; West North Central urban (excluding Iowa and Missouri, included above); South Atlantic urban; other urban South (urban areas of states in the East South Central and West South Central census Divisions, exclusive of cities mentioned above). For 1930, we also have the rural parts of the states of Kansas, Minnesota, Nebraska, North Dakota, Virginia, Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Kentucky, Tennessee, and West Virginia.⁶¹ Rural aggregates (for under-five populations over 49,000) include northern New England rural (ME, VT, NH), southern New England rural (CT, MA, RI), and rural Maryland & Delaware. With very small urban populations, we aggregated the smaller states Idaho & Utah, and Montana & Wyoming. Finally, for each of Colorado, New Mexico, and Oregon we use the entire state, because the urban portions fell well below our 49000 population-size threshold.

The 1930 data for California, Colorado, and New Mexico refer to total populations (white and nonwhite). Colorado births and infants deaths are not presented by race in 1930. For

⁵⁹US Bureau of the Census, *Birth statistics for the registration area of the United States* : 1915, first annual report (Washington: GPO, 1917); 1916, second annual report (1918); and *Birth statistics for the birth registration area of the United States* 1917, third annual report (1919); 1918, fourth annual report (1920); 1919, fifth annual report (1921). These are available [online at HathiTrust](#)

⁶⁰Steven Ruggles, Catherine A. Fitch, Ronald Goeken, J. David Hacker, Matt A. Nelson, Evan Roberts, Megan Schouweiler, and Matthew Sobek. IPUMS Ancestry Full Count Data: Version 3.0 [dataset]. Minneapolis, MN: IPUMS, 2021.

⁶¹The urban parts of these states fell below our 49,000 population threshold, so they are included in urban aggregates (described above).

the other states, total populations are used because the 1930 census (unlike other censuses) classified persons deemed “Mexican” as non-white.⁶²

For 1930, infant mortality rates are calculated from births and infant deaths for 1925–1930, taken from annual reports of birth statistics for the BRA.⁶³ The 1930 US census data refer to the population as of April 15, 1930; for an appropriate average IMR, we take weighted averages (of births and of infant deaths) across the 6 years 1925–1930; 1925 is weighted 260/365 of one-fifth, 1930 is weighted 105/365 of one-fifth, and the other 4 years each weighted one-fifth (thus we treat April 15 as 105 days through the year). Under-five populations by sex are from the IPUMS 1930 full count data.⁶⁴

⁶²See e.g. the 1940 Census (1943), *Population Volume 2, Characteristics of the population . . . , Part 1: United States Summary . . .*, p. 3). The 1940 census includes various corrected counts for the 1930 census, with “Mexicans” classified as “white” as in the census years other than 1930.

⁶³US Bureau of the Census, *Birth, stillbirth, and infant mortality statistics for the birth registration area of the United States* 1925, eleventh annual report, part 1 (Washington: GPO, 1927); 1926, twelfth annual report, part 1 (1929); 1927, thirteenth annual report, part 1 (1930); 1928, fourteenth annual report (1930); 1929, fifteenth annual report (1932); 1930, sixteenth annual report (1934). These are available [online at HathiTrust](#)

⁶⁴Steven Ruggles, Catherine A. Fitch, Ronald Goeken, J. David Hacker, Matt A. Nelson, Evan Roberts, Megan Schouweiler, and Matthew Sobek. IPUMS Ancestry Full Count Data: Version 3.0 [dataset]. Minneapolis, MN: IPUMS, 2021.

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⁶⁵The [US Census website](#) refers to this volume as “1880 Census: Volume 1. Statistics of the Population of the United States”.