

New Orleans Life Expectancy by Race (1880–1915): Annual Period Life Tables from Historical Death and Census Data

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Abstract

This paper documents a new dataset of annual period life tables by race (Black and White) for New Orleans, 1880–1915, derived from an extensive, person-level index of registered deaths and full-count census data. The dataset provides single-year age intervals (0–84, plus an open interval at 85+) and yields annual estimates of life expectancy at birth (e_0) and other ages. These data shed light on New Orleans’ late-nineteenth- and early-twentieth-century mortality transition—a period marked by major public-health interventions and the hardening of racial segregation. The life tables reveal a widening racial gap: White life expectancy rose steadily from the early 1890s while Black life expectancy stagnated, producing a more than 15-year difference at birth by 1915. The dataset adheres to FAIR principles and is documented for reuse, supporting historical demographic, urban, and health-inequality research. Supplementary materials include benchmark-year race-by-sex tables and a codebook. Together, these resources provide a detailed city-level reconstruction of mortality by race in the pre-registration-era United States and a foundation for comparative analyses of racialized health transitions.

Keywords

mortality transition – life expectancy – New Orleans – public health history – race and health – urban history – historical demography

Related Data Set

“NOLA Life Tables 1880–1915” with DOI 10.5281/zenodo.17422861 in repository “Zenodo”.

1. Introduction

The mortality transition in late-nineteenth and early-twentieth-century New Orleans unfolded along sharply racialized lines. Drawing on extensive, person-level death records and census denominators, a companion research article (Kennedy, under review) shows White life expectancy rising steadily

from the early 1890s, while Black life expectancy stagnated or declined, producing a White–Black gap at birth that exceeded 15 years by 1915. The dataset described here underpins that analysis. It provides annual, race-specific period life tables for the city of New Orleans, Louisiana between 1880 and 1915, allowing researchers to track year-to-year changes, align turning points with public-health and infrastructural developments, and examine age-patterned disparities across the life course.

City-level, race-specific life tables for this era are rare. By assembling consistent annual series for New Orleans, this dataset enables replication, secondary analysis (e.g., deriving infant mortality or adult survival), and comparative work across cities or periods, all while adhering to transparency and FAIR (Findable, Accessible, Interoperable, Reusable) data principles.

1.1. Research Need and Objectives

New Orleans occupies a singular place in the history of American public health. As the largest Southern port and the country's most persistent yellow-fever center, it was a focus of nineteenth-century sanitary reform, yet it completed comprehensive water, sewerage, and drainage systems only in the 1900s—decades later than comparable Northern cities due to engineering challenges in the low-lying city—and did so as racial residential segregation calcified. This combination of a heavy infectious-disease burden, delayed and uneven sanitary investment, and deepening segregation makes the city an unusually revealing setting for studying how the mortality transition was distributed across a divided urban population.

Despite this prominence, researchers have lacked consistent annual life table data by race for the period when sewerage, waterworks, and drainage expanded and residential segregation by race hardened. Especially challenging to previous studies has been the missing 1890 census, which burned in a fire in 1921, leaving a gap in the critical period between 1880 and 1900. The objectives of this data project are threefold: to assemble defensible annual numerators and denominators to compute race-specific life tables (single-year ages) for 1880–1915; to document construction choices (interpolation, infant treatment, open-interval closure, quality control) to promote reuse and critique; to enable analysis of the timing and magnitude of the racial longevity gap, including decomposition by age or derived indicators, without obligating users to reconstruct historical sources.

The companion article (Kennedy, under review) demonstrates the value of these data in establishing the timing and extent of New Orleans' separate and unequal mortality transition, and situating these findings within broader debates on infrastructure, environmental burdens, and segregation. Figure 1 charts annual life expectancy at birth (e_0) by race for New Orleans between 1880 and 1915.

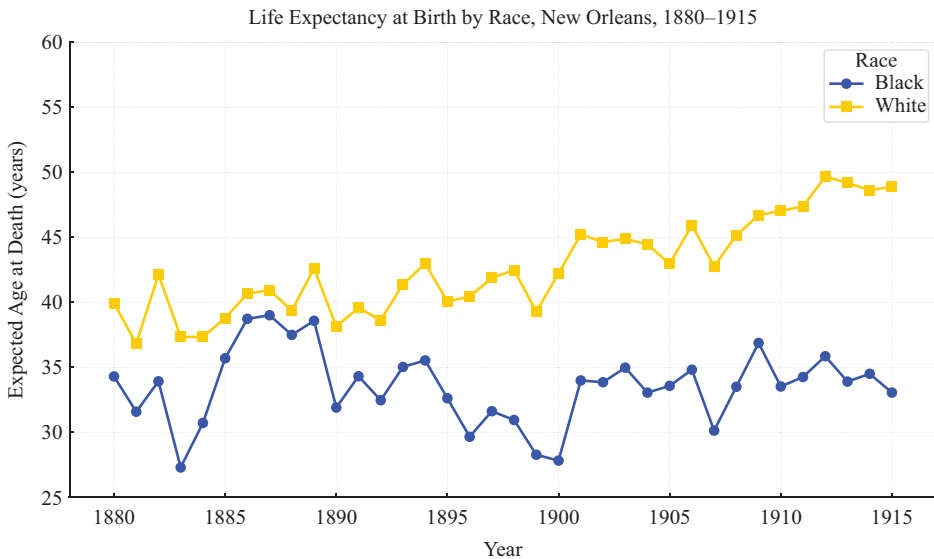


FIGURE 1: Life Expectancy at Birth (e_0) by Race, New Orleans, 1880–1915. Annual estimates are derived from period life tables combining death-certificate counts and census-based population denominators. White life expectancy at birth (yellow line) rises steadily after 1890, while Black life expectancy (blue line) stagnates or declines, producing a gap exceeding 15 years by 1915. Data from NOLA Life Tables 1880–1915 (Zenodo 10.5281/zenodo.17422861).

2. Data Collection Method

The study constructs the life tables using two primary data sources: (1) detailed death records from New Orleans, and (2) population counts from U.S. census data. Demographic methods produced estimates of annual population by age, age-specific mortality rates, and period life tables for each year.

2.1. Sources and Data Search

Deaths (numerators). The core source is the Louisiana Board of Health death certificate index for New Orleans. New Orleans was among the earliest large American cities to register vital events—one of five (with Boston, New York, Philadelphia, and Baltimore) recording deaths and births in the early nineteenth century—and Orleans Parish required death registration from 1819, a duty later assigned to the State Board of Health in 1877 (U.S. Department of Health and Human Services, 1997). Works Progress Administration (WPA)¹ clerks indexed the certificates in the 1930s; the records were microfilmed at the Louisiana State Archives and later transcribed by the New Orleans Volunteer Association for

¹ The agency was renamed the Work Projects Administration in 1939, the name under which the transcribing source lists it.

genealogical use (Louisiana Archives, 2006). Because registration was by place of occurrence, the index includes some non-residents who died in the city and rarely records residents who died elsewhere. Many more non-resident deaths occurred at Charity Hospital and other city institutions. These records largely bypassed the individual certificate stream before about 1900 and entered only the Board of Health's aggregate returns, published in its annual and biennial reports. Coroner-certified deaths, by contrast, generally entered the certificate stream; the certificate shortfall was concentrated in institutional deaths and, for the Black series, deaths at home without an attending physician.

The city's Board of Health returns fed the national series that became the federal Death Registration Area after 1900—years before most southern states joined (1900–1933)—making this an unusually early and continuous city-level record (U.S. Bureau of the Census, 1906)². Registration was more likely to miss deaths than to invent them, and under-registration fell more heavily on the Black population, so the index is a conservative count whose errors bias the measured racial gap downward rather than upward. After standardization and de-duplication, the consolidated index yields 231,135 person-level death records (1877–1915) with key fields including name, age, race (White/Colored), date of death, and certificate reference. For 1880–1915, these records are tabulated annually by single-year age and race to form death counts for life tables.

Populations (denominators). Age-race populations come from full-count IPUMS microdata for the 1880, 1900, 1910, and 1920 federal censuses (Ruggles et al., 2021). The published *Vital Statistics of the Eleventh Census* (Billings, 1896) were used to reconstruct New Orleans' age–race–sex structure in 1890. Because the 1890 report classified age by infants, single years for ages 1–4, and then 5-year age bands, both the abridged and single-year denominator series were maintained. For 1890, single-year ages were derived by evenly splitting each 5-year group with remainders applied to the early age bins. Annual intercensal populations were linearly interpolated by age, race, and sex, and the results are stable relative to smoother alternatives.

Infant exposures require particular care because birth registration in this period was incomplete and racially asymmetric. Instead of registered births, the dataset uses the census count of infants (age 0), interpolated across intercensal years, as the person-years of exposure in the denominator. Registered Black births run to only 57–65 percent of the census infant count in the early 1880s, whereas White births are complete or over-complete (ratios of 1.0–1.3, partly reflecting non-resident mothers). Using births as the denominator would therefore overstate Black

2 The national vital-registration campaign also ran through the city: the American Public Health Association adopted a resolution promoting national registration laws for vital statistics at its New Orleans meeting in December 1902, and the American Medical Association endorsed a uniform national registration system at its 1903 New Orleans conference (U.S. Bureau of the Census, 1908: 12).

and understate White infant mortality and widen the measured gap—the 1880 birth-based Black rate of 471 per 1,000, against 257 on the census count, is a registration artifact rather than mortality. Contemporary Board of Health reports even revised mortality statistics to exclude non-resident White deaths in order to improve the city’s reported health profile, though such adjustments were minor relative to the large racial disparities (Louisiana Board of Health, 1908). Where birth registration becomes more reliable (White throughout; Black from 1912), census-based and birth-based rates track closely, validating the census denominator. Because young children are undercounted in the census, this exposure runs modestly low. The New Orleans child-undercount estimates of Hacker and Helgertz (2025)—14.5 percent for Black and 7.9 percent for White infants in 1910—bound the effect, and applying them narrows the racial gap slightly (less than a year) while leaving its timing unchanged. Deaths are not added back to the infant count, which would overstate births and bias the rate downward.

2.2. Data Cleaning and Harmonization

Several harmonization and cleaning steps prepared the records for tabulation. The historical “White” and “Colored” categories were standardized into White and Black series; because these are aggregate categories, heterogeneity by nativity or ancestry is discussed in the notes but not disaggregated in this dataset. For the supplemental sex-specific work, sex—where it was missing in the sample years used for those checks—was inferred from titles and first names using the Social Security Administration top-200 decade lists, with ambiguous cases left missing; this left less than 1 percent of cases unresolved in the later years, and although the core dataset is not split by sex, these procedures inform the optional supplements (see “Data” section). Finally, dates were standardized and duplicates removed—including multiple entries for individuals recorded under more than one surname, such as married women documented under both married and maiden names—and internal quality-control flags caught pathological cases such as deaths recorded where interpolation implied zero exposure; these QC columns are not carried into the public release (documented under “Dropped fields” in the codebook).

2.3. Life Table Construction

Three sets of life tables were produced. (1) Period life tables (both sexes combined) were generated for each year from 1880 through 1915, using single-year ages 0–84 and an open interval at 85+. These provide annual estimates of life expectancy at birth (e_0) and every other age. (2) Life tables by race and sex were produced for eight benchmark years (1880, 1885, 1890, 1894, 1900, 1905, 1910, and 1915) at single-year ages (0–84, open interval 85+), published at single-year

resolution so users can use the raw death count and population to aggregate to broader age bands as needed. Because the race-by-sex counts are small, the companion analysis (Kennedy, under review) aggregates these into five-year age groups to stabilize estimates in smaller subpopulations before constructing abridged life tables. (3) Additional tables were constructed to assess the impact of different assumptions regarding infant mortality and the upper-age open interval.

The tables follow the actuarial method (Chiang, 1984), converting age-specific central death rates ($m_x = D_x / N_x$) into probabilities of death (q_x):

$$q_x = n \cdot m_x / [1 + (n - a_x) \cdot m_x]$$

where n is the width of the age interval and a_x represents the mean number of years lived in the interval by those who die within it. For the infant age group (under one year), $a_0 = 0.30$ was applied, the value observed in the New Orleans records, where infant separation factors average 0.28 for Black and 0.31 for White infants, bracketing the 0.30 applied and close to the 0.34 typical of high-mortality historical populations (Coale & Demeny, 1983; Preston et al., 2001). For single-year ages 1–84, $a_x = 0.5$ was assumed; for abridged five-year groups³, $a_x = 2.0$ for ages 1–4 (the average observed in the records) and 2.5 for subsequent intervals.

The open interval (85+) is closed by treating death above age 85 as certain ($q_{85} = 1.0$) and setting the mean years lived in that interval from the mortality actually observed there, so that $a_{85} = 1/m_{85} = e_{85}$ (about 2.8 to 7.8 years across years and races) rather than a fixed value (Preston et al., 2001).

Alternative specifications, including other observed separation factors or truncation of the open interval at 65+, altered e_0 by less than 0.1 year on average, indicating that overall results are robust to parameter choice.

3. Data: Scope, Structure, Variables, and File Formats

3.1. Scope and Coverage

- **Geography:** New Orleans, Orleans Parish, Louisiana, United States.
- **Temporal coverage:** Annual, 1880–1915 inclusive (36 years).
- **Population:** Residents recorded in death registries and censuses; races: Black and White.
- **Age detail:** Single-year ages 0–84 and open interval 85+.
- **Unit of observation:** Life table row for a specific Year × Race × Age.

3 Abridged tables constructed for the companion paper (Kennedy, under review).

3.2. Files and Formats

- **NOLA_LifeTables_1880_1915_byRace.csv** (UTF-8). Long format; one row per Year $\times$ Race $\times$ Age ($= 36 \times 2 \times 86 = 6,192$ rows).
- **NOLA_LifeTables_byRaceSex_benchmarkYears.csv** (supplement): benchmark years only: 1880, 1885, 1890, 1894, 1900, 1905, 1910, 1915. Long format; one row per Year $\times$ Race $\times$ Sex $\times$ Age ($= 8 \times 2 \times 2 \times 86 = 2,752$ rows).
- **codebook.md** describing sources, fields, units, and construction.
- **README.md**

Table 1 describes the variables in both files, and Table 2 reproduces an excerpt from the 1900 White life table to illustrate the structure.

TABLE 1: Field Map for New Orleans Life Tables, 1880–1915

Variable	Type	Description
year	int	Calendar year, 1880–1915, C.E.
race	str	“White” or “Black” (harmonized from the historical “white” / “colored”)
sex	str	“Female” or “Male”; race-by-sex benchmark supplement only. Inferred from titles and first names.
age	int	Single-year age. 0–84 are single years; 85 denotes the open interval 85+.
population	int	Mid-year population at risk (person-years of exposure): census counts at census years, linearly interpolated in intercensal years.
deaths	int	Deaths recorded in the death-certificate index for that year by race by age.
mx	float	Central death rate, $m_x = \text{deaths} / \text{population}$.
ax	float	Average years lived in the interval by those who die in it (separation factor): $a_0 = 0.30$; $a_x = 0.5$ at single-year ages 1–84; $a_{85} = 1/m_{85}$ in the open interval (85+).
qx	float	Probability of dying between age x and $x + 1$; $q_x = 1.0$ in the open interval (85+).
lx	float	Survivors to exact age x per 100,000 births ($l_0 = 100,000$).
dx	float	Deaths in the interval per 100,000 ($l_x - l_{x+1}$).
Lx	float	Person-years lived in the interval per 100,000.
Tx	float	Total person-years lived above age x per 100,000.
ex	float	Remaining life expectancy at age x , in years (e_0 is life expectancy at birth).

TABLE 2: Excerpt from the 1900 White Life Table, New Orleans

Age	Population	Deaths	qx	lx	ex
0	4609	732	0.143	100000	42.2
1	4145	202	0.048	85707	48.2
2	4741	109	0.023	81630	49.6
3	4816	64	0.013	79774	49.7
4	4767	45	0.009	78721	49.4
5	4899	30	0.006	77981	48.9
⋮	⋮	⋮	⋮	⋮	⋮
84	77	14	0.167	2988	5.0
85	337	69	1.0	2490	4.9

Displayed values show the mid-year population, registered deaths, probability of death (q_x), number of survivors (l_x per 100,000 births), and remaining life expectancy (e_x , years). The full tables for all years and races are provided in the published dataset. NOLA Life Tables 1880–1915 (Zenodo 10.5281/zenodo.17422861).

4. Data Quality and Limitations

The death index captures deaths registered with the Board of Health—about 62 percent of Black and 81 percent of White reported deaths⁴ in the 1880s–1890s, climbing to near-complete for the White series and roughly 80–85 percent for the Black series by the 1910s. The annual life tables are based on the years 1880–1915. Standardization, de-duplication, and internal consistency checks were performed. Remaining under-registration—especially among Black infants in the 1880s—likely attenuates, rather than creates, observed racial gaps (Kennedy, under review). The series has also been benchmarked against the model-based city life tables of Hacker and Helgertz (2025), which include New Orleans by race: the two agree where their designs align and diverge as expected in epidemic years and for the Black population (see the companion article’s supplementary material).

Several caveats guide interpretation. Intercensal populations rest on linear interpolation, the pragmatic choice given the available benchmarks (Anderson et al., 2021, 2022), and the five-year 1890 bins were evenly split to single-year ages; users should therefore treat year-to-year wiggles with caution, since trends and multi-year comparisons are more robust. Age heaping at digits ending in 0 and 5 occurs, more so early in the series and among Black decedents, though

4 The total deaths reported by the Board of Health pooled registered deaths (including coroner-certified cases) with unregistered deaths recorded by city institutions (with Charity Hospital providing the largest share before about 1900); stillbirths were tabulated separately.

limiting the open interval to 85+ reduces sensitivity to such tail errors, and no formal smoothing is applied so as to preserve annual granularity. The race categories are necessarily coarse: “Colored” in the sources is harmonized to Black and “White” to White, each aggregating heterogeneous communities such as affluent Creoles of color, recent European immigrants, and Black and White rural migrants. Finally, these are period life tables rather than cohort or forward-projected ones; derived indicators such as the infant mortality rate or survivorship to age 5 or 15 can be computed carefully from the columns, but to keep the dataset compact and clear, additional derived series are not included in this publication.

5. Concluding Remarks

This dataset transforms dispersed historical records into a replicable, machine-readable series of annual life tables by race for New Orleans, 1880–1915. It enables scholars to quantify and interrogate the emergence of a large racial longevity gap during a period of sweeping public-health change, and to do so with full transparency about sources and methods. As shown in the companion analysis, White life expectancy rose across the 1890s–1910s while Black life expectancy stagnated, producing a more than 15-year gap at birth by 1915 and a double-digit deficit even conditional on surviving to age 15. The dataset provides the columns needed to reproduce those findings, extend them (e.g., age-decomposition, survivorship analyses), or merge them with other historical series (e.g., neighborhood infrastructure roll-out, food prices, weather). Because the tables are annual and age-specific, they also support age-decomposition of the widening gap, comparison with other cities’ race-specific series, and linkage to the timing of infrastructure roll-out and neighborhood environmental burdens. Because the transcribed death index currently ends in 1915, extending the series into the late 1910s and 1920s—capturing the 1918 influenza pandemic and the early interwar years—awaits further digitization of the certificate record and is a natural direction for future work.

Users are encouraged to read the codebook, note the treatment of infancy and the open interval, and cite the dataset’s DOI when using any derived series (e.g., e_x , survivorship analyses). The deposit follows FAIR principles (clear metadata, open formats, persistent identifier), and community feedback is encouraged to guide versioned updates (e.g., expanded sex-specific coverage, additional quality diagnostics).

Ethics & privacy. Sources are historical public records; the published dataset contains no personal identifiers and aggregates information in standard life table form.

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Conflict of Interest Statement

The author declares no conflict of interest.

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Articles Using This Dataset

Kennedy, S. W. (under review). Unequal gains: Racial divergence in life expectancy during the mortality transition in New Orleans, 1880–1915 [revised manuscript submitted for review 07-2026]. *Social Science History*.

Repository and Submission

<https://doi.org/10.5281/zenodo.17422861>.