

Supplemental Online Content

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This supplemental material has been provided by the authors to give readers additional information about their work

eAPPENDIXPart I: Population counts by census tract and single year of age

The ACS provides census tract population counts for the following age groups: ages 0-4, 5-9, 10-14, 15-17, 18-19, 20-24, ..., 30-34, 35-44, ..., 75-84, 85+. To obtain counts by single year of age, we assumed that the age distribution within each age group and census tract equaled the statewide age distribution within that age group.¹ For example, if a given census tract had a population of 1,000 people age 18-19, and if 60% of Californians in that age group were age 18 and 40% were age 19, then we assumed that the specific tract had 600 18 year-olds and 400 19 year-olds. Assuming instead that populations were equally distributed within age groups produced largely similar estimates. Although the use of 5-year abridged life tables is customary for life expectancy calculations, population data for Californians ages 35-84 were only available in 10-year age groups. Using adjusted population counts and taking advantage of the single-year-of-age-specific death counts available for this study were considered preferable to translating 10-year age groups into narrower 5-year age groups.

Part II: Matching racial and ethnic groups in the death and population data

We constructed census tract level mortality rates for the following four racial ethnic groups: Hispanic, Non-Hispanic White, Non-Hispanic Black, and Non-Hispanic Asian populations. While death data are available for these exact racial and ethnic categories, the ACS population counts for census tracts were reported for different categories: Hispanic, Non-Hispanic White, total Black (including Hispanic Black), and total Asian (including Hispanic Asian). To obtain comparable estimates for the non-Hispanic Black and non-Hispanic Asian populations, we multiplied the total Black and total Asian population in each census tract by the respective share of Black and Asian Californians (statewide) who did not identify as Hispanic.

Part III: Estimation of linear gradients

Linear gradients were estimated for each year via Ordinary Least Squares (OLS) regressions of life expectancy on income percentile based on the equation:

$$LE_p = \alpha + \beta \text{ percentile}_p + \varepsilon_p$$

where LE_p , referred to life expectancy in income percentile p , and the estimated coefficient β represented the linear gradient of group g in year t .

Changes in the linear gradient between year t and $t+x$ were estimated via OLS regressions in data covering year t and $t+x$ using the following equation:

$$LE_{p,t} = \alpha + \beta * \text{percentile}_p + \gamma * D[t+1]_t + \delta * \text{percentile}_p * D[t+1]_t + \varepsilon_{p,t}$$

where $D[t+1]$ represented a binary indicator variable that equaled 1 in year $t+x$. The estimated coefficient β represented the linear gradient in year t , while the estimated coefficient δ represented the change in gradient between year t and $t+x$.

Differences between the non-Hispanic White and Hispanic populations in the change in the linear gradient between year t and $t+x$ were estimated via OLS regressions in data restricted to the non-Hispanic White and Hispanic populations in year t and $t+x$ using the following equation:

$$\begin{aligned} LE_{p,t,g} = & \alpha_1 + \alpha_2 * D[Hisp]_g + \beta_1 * \text{percentile}_p + \beta_2 * \text{percentile}_p * D[Hisp]_g + \\ & + \gamma_1 * D[t+1]_t + \gamma_2 * D[t+1]_t * D[Hisp]_g + \\ & + \delta_1 * \text{percentile}_p * D[t+1]_t + \delta_2 * \text{percentile}_p * D[t+1]_t * D[Hisp]_g + \varepsilon_{p,t,g} \end{aligned}$$

where $D[Hisp]$ represented a binary indicator variable that equals 1 for the Hispanic population. The estimated coefficient δ_1 represented the change in the gradient between year t and $t+x$ for the non-Hispanic White population, while the estimated coefficient δ_2 represented the difference between the Hispanic and the non-Hispanic White population in the change in the gradient between year t and $t+x$.

References

1. Annual Estimates of the Civilian Population by Single Year of Age and Sex for the United States, States, and the District of Columbia: April 1, 2010 to July 1, 2020. US Census Bureau.
<https://www.census.gov/programs-surveys/popest/technical-documentation/research/evaluation-estimates/2020-evaluation-estimates/2010s-state-detail.html>

eTable 1: Life expectancy and population counts among the Hispanic population, statewide and across 7,964 California census tracts grouped into ventiles by median income.

Median income ventile ^a	Hispanic					
	Population ^b (in thousands)	Life expectancy (years)			Life expectancy change relative to 2019 (years)	
		2019	2020	2021	2020	2021
1	1,172	80.95	74.90	74.12	-6.05	-6.83
2	1,213	81.70	76.34	75.19	-5.36	-6.51
3	1,125	81.53	76.36	75.51	-5.16	-6.01
4	1,117	82.14	76.88	75.96	-5.26	-6.18
5	1,080	82.42	77.76	76.29	-4.66	-6.13
6	1,039	82.04	77.69	76.60	-4.35	-5.44
7	1,015	82.22	78.05	76.75	-4.17	-5.48
8	890	82.67	78.71	77.53	-3.96	-5.14
9	836	82.37	79.28	77.34	-3.09	-5.03
10	857	83.30	78.97	77.08	-4.33	-6.21
11	821	83.52	79.87	77.87	-3.65	-5.65
12	732	83.03	79.15	77.90	-3.87	-5.13
13	609	84.76	81.45	79.66	-3.31	-5.10
14	568	84.29	80.78	79.47	-3.51	-4.82
15	539	83.99	80.87	79.95	-3.12	-4.04
16	472	85.07	82.42	80.91	-2.65	-4.16
17	417	85.33	82.66	81.37	-2.67	-3.96
18	338	86.13	83.56	82.81	-2.58	-3.32
19	279	87.52	84.95	83.28	-2.57	-4.24
20	164	87.41	85.07	85.43	-2.34	-1.98
Statewide	15,328	82.55	78.14	76.81	-4.41	-5.74

Notes: ^a Median income ventiles were constructed by ranking census tracts based on their median income and grouping them into 20 groups of approximately equal population size based on the *overall* population of the census tracts. The size of the Hispanic population decreased at higher ventiles because of the declining share of Hispanic populations residing in census tracts with higher income.

^b Population reported for 2019.

eTable 2: Life expectancy and population counts among the non-Hispanic Asian population, statewide and across 7,964 California census tracts grouped into ventiles by median income.

Median income ventile ^a	Asian Non-Hispanic					
	Population ^b (in thousands)	Life expectancy (years)			Life expectancy change relative to 2019 (years)	
		2019	2020	2021	2020	2021
1	159	85.59	81.65	80.36	-3.94	-5.23
2	134	84.38	81.57	80.75	-2.82	-3.64
3	150	84.70	82.50	81.56	-2.20	-3.14
4	152	85.69	81.51	81.42	-4.18	-4.27
5	164	85.66	82.31	82.18	-3.35	-3.48
6	174	84.55	83.20	81.64	-1.35	-2.91
7	224	87.10	83.35	82.69	-3.75	-4.41
8	209	86.45	82.87	82.38	-3.58	-4.07
9	250	86.23	83.72	82.00	-2.52	-4.23
10	225	85.57	83.43	83.60	-2.14	-1.97
11	249	86.05	83.44	82.65	-2.60	-3.40
12	268	85.42	83.33	83.12	-2.09	-2.30
13	269	86.33	84.79	83.67	-1.55	-2.66
14	333	85.71	84.39	83.29	-1.32	-2.42
15	358	86.47	84.74	83.52	-1.73	-2.95
16	361	88.05	85.71	84.98	-2.34	-3.07
17	408	86.94	85.45	84.56	-1.49	-2.38
18	415	87.70	86.30	85.40	-1.41	-2.31
19	454	89.82	87.58	87.68	-2.24	-2.15
20	544	89.55	88.85	87.72	-0.70	-1.83
Statewide	5,617	86.56	84.24	83.52	-2.32	-3.04

Notes: ^a Median income ventiles were constructed by ranking census tracts based on their median income and grouping them into 20 groups of approximately equal population size based on the *overall* population of the census tracts. The size of the non-Hispanic Asian population increased at higher ventiles because of the increasing share of non-Hispanic Asian populations residing in census tracts with higher income.

^b Population reported for 2019.

eTable 3: Life expectancy and population counts among the non-Hispanic Black population, statewide and across 7,964 California census tracts grouped into ventiles by median income.

Median income ventile ^a	Black Non-Hispanic					
	Population ^b (in thousands)	Life expectancy (years)			Life expectancy change relative to 2019 (years)	
		2019	2020	2021	2020	2021
1	192	70.66	67.09	65.72	-3.57	-4.95
2	151	72.21	68.08	68.21	-4.12	-4.00
3	147	73.10	70.31	69.68	-2.79	-3.42
4	133	74.10	70.38	70.60	-3.72	-3.50
5	138	75.43	72.23	71.80	-3.21	-3.64
6	141	74.78	72.05	71.59	-2.73	-3.20
7	123	75.29	72.71	70.92	-2.57	-4.36
8	96	75.06	73.34	71.71	-1.73	-3.35
9	112	77.00	74.04	73.22	-2.96	-3.77
10	103	75.51	73.14	73.28	-2.38	-2.23
11	105	76.43	74.33	73.34	-2.10	-3.09
12	101	76.97	72.77	72.73	-4.21	-4.24
13	86	78.83	74.35	74.65	-4.47	-4.18
14	101	77.89	76.35	77.27	-1.54	-0.62
15	92	77.47	75.86	75.14	-1.61	-2.33
16	75	77.41	74.57	74.27	-2.83	-3.14
17	81	80.40	77.94	78.91	-2.46	-1.50
18	63	79.80	77.18	77.14	-2.63	-2.67
19	47	80.07	77.50	77.03	-2.57	-3.04
20	29	81.64	79.04	77.85	-2.60	-3.79
Statewide	2,169	74.87	71.65	71.02	-3.21	-3.84

Notes: ^a Median income ventiles were constructed by ranking census tracts based on their median income and grouping them into 20 groups of approximately equal population size based on the *overall* population of the census tracts. The size of the non-Hispanic Black population decreased at higher ventiles because of the declining share of non-Hispanic Black populations residing in census tracts with higher income.

^b Population reported for 2019.

eTable 4: Life expectancy and population counts among the non-Hispanic White population, statewide and across 7,964 California census tracts grouped into ventiles by median income.

Median income ventile ^a	White Non-Hispanic					
	Population ^b (in thousands)	Life expectancy (years)			Life expectancy change relative to 2019 (years)	
		2019	2020	2021	2020	2021
1	378	72.86	71.04	70.42	-1.82	-2.44
2	387	74.75	72.84	72.98	-1.91	-1.77
3	461	77.60	76.03	75.08	-1.57	-2.52
4	493	77.65	76.10	75.02	-1.55	-2.63
5	513	78.14	76.68	75.70	-1.46	-2.44
6	537	78.71	77.40	76.79	-1.31	-1.92
7	523	79.24	77.50	77.06	-1.74	-2.17
8	683	79.60	78.04	77.62	-1.57	-1.99
9	683	80.19	79.05	78.30	-1.14	-1.89
10	691	79.88	78.66	78.00	-1.22	-1.88
11	704	80.20	79.38	78.79	-0.83	-1.42
12	772	81.47	80.09	79.50	-1.38	-1.97
13	904	81.53	80.39	79.94	-1.13	-1.59
14	861	81.82	81.10	80.97	-0.72	-0.85
15	868	82.17	80.98	80.68	-1.18	-1.48
16	948	82.49	81.77	81.16	-0.72	-1.33
17	944	83.25	82.41	81.53	-0.85	-1.72
18	1,034	83.78	82.70	82.35	-1.08	-1.43
19	1,079	84.73	84.09	83.49	-0.63	-1.24
20	1,108	85.94	85.23	84.79	-0.72	-1.15
Statewide	14,605	80.57	79.28	78.67	-1.29	-1.90

Notes: ^a Median income ventiles were constructed by ranking census tracts based on their median income and grouping them into 20 groups of approximately equal population size based on the *overall* population of the census tracts. The size of the non-Hispanic White population increased at higher ventiles because of the increasing share of non-Hispanic White populations residing in census tracts with higher income.

^b Population reported for 2019.