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United States Life Tables, 2009

by Elizabeth Arias, Ph.D., Division of Vital Statistics

Abstract

Objectives—This report presents complete period life tables for the United States by race, Hispanic origin, and sex based on age-specific death rates in 2009.

Methods—Data used to prepare the 2009 life tables are 2009 final mortality statistics; July 1, 2009, population estimates based on the 2000 decennial census; and 2009 Medicare data for persons aged 66–99. The methodology used to estimate the 2009 life tables is the same as that used for data year 2008, which was revised from that used for data years 2000–2007. The methodology used to estimate the life tables for the Hispanic population remains unchanged from that developed for the publication of life tables by Hispanic origin for data year 2006.

Results—In 2009, the overall expectation of life at birth was 78.5 years. Between 2008 and 2009, life expectancy at birth increased for all groups considered. Life expectancy increased for both males (from 75.6 to 76.0) and females (80.6 to 80.9) and for the white population (78.5 to 78.8), the black population (74.0 to 74.5), the Hispanic population (81.0 to 81.2), the non-Hispanic white population (78.4 to 78.7), and the non-Hispanic black population (73.7 to 74.2).

Keywords: life expectancy • survival • death rates • race

Introduction

There are two types of U.S. life tables: the cohort (or generation) life table and the period (or current) life table. The cohort life table presents the mortality experience of a particular birth cohort—all persons born in the year 1900, for example—from the moment of birth through consecutive ages in successive calendar years. Based on age-specific death rates observed through consecutive calendar years, the cohort life table reflects the mortality experience of an actual cohort from birth until no lives remain in the group. To prepare just a single complete cohort life table requires data over many years. It is usually not feasible to construct cohort life tables entirely on the basis of observed data for real cohorts due to data unavailability or incompleteness (1). For example, a life table representation of the

mortality experience of a cohort of persons born in 1970 would require the use of data projection techniques to estimate deaths into the future (2,3).

Unlike the cohort life table, the period life table does not represent the mortality experience of an actual birth cohort. Rather, the period life table presents what would happen to a hypothetical cohort if it experienced throughout its entire life the mortality conditions of a particular period in time. For example, a period life table for 2009 assumes a hypothetical cohort that is subject throughout its lifetime to the age-specific death rates prevailing for the actual population in 2009. The period life table may thus be characterized as rendering a “snapshot” of current mortality experience and showing the long-range implications of a set of age-specific death rates that prevailed in a given year. In this report, the term “life table” refers only to the period life table and not to the cohort life table.

Life tables can be classified in two ways according to the length of the age interval in which data are presented. A complete life table contains data for every single year of age. An abridged life table typically contains data by 5- or 10-year age intervals. A complete life table, of course, can easily be aggregated into 5- or 10-year age groups (refer to [Technical Notes](#) at the end of this report for instructions). Other than the decennial life tables, U.S. life tables based on data prior to 1997 are abridged life tables constructed by reference to a standard table (4). This report presents complete period life tables by race, Hispanic origin, race for the non-Hispanic population, and sex.

Data and Methods

The data used to prepare the U.S. life tables for 2009 are final numbers of deaths for the year 2009, postcensal population estimates for the year 2009, and age-specific death and population counts for Medicare beneficiaries aged 66–99 for the year 2009 from the Centers for Medicare & Medicaid Services. Data from the Medicare program are used to supplement vital statistics and census data for ages 66 and over. (See [Technical Notes](#) for a detailed description of the data sets used.)

Table 17. Life table for non-Hispanic black males: United States, 2009Spreadsheet version available from: ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/62_07/Table17.xls.

Age (years)	Probability of dying between ages x and $x + 1$	Number surviving to age x	Number dying between ages x and $x + 1$	Person-years lived between ages x and $x + 1$	Total number of person-years lived above age x	Expectation of life at age x
	q_x	l_x	d_x	L_x	T_x	e_x
0-1	0.013788	100,000	1,379	98,791	7,070,649	70.7
1-2	0.000688	98,621	68	98,587	6,971,859	70.7
2-3	0.000506	98,553	50	98,528	6,873,271	69.7
3-4	0.000331	98,503	33	98,487	6,774,743	68.8
4-5	0.000249	98,471	25	98,459	6,676,256	67.8
5-6	0.000255	98,446	25	98,434	6,577,797	66.8
6-7	0.000234	98,421	23	98,410	6,479,363	65.8
7-8	0.000213	98,398	21	98,388	6,380,954	64.8
8-9	0.000184	98,377	18	98,368	6,282,566	63.9
9-10	0.000149	98,359	15	98,352	6,184,198	62.9
10-11	0.000121	98,344	12	98,338	6,085,846	61.9
11-12	0.000129	98,333	13	98,326	5,987,508	60.9
12-13	0.000201	98,320	20	98,310	5,889,181	59.9
13-14	0.000349	98,300	34	98,283	5,790,871	58.9
14-15	0.000543	98,266	53	98,239	5,692,588	57.9
15-16	0.000738	98,212	73	98,176	5,594,349	57.0
16-17	0.000915	98,140	90	98,095	5,496,173	56.0
17-18	0.001089	98,050	107	97,997	5,398,078	55.1
18-19	0.001264	97,943	124	97,881	5,300,081	54.1
19-20	0.001443	97,820	141	97,749	5,202,200	53.2
20-21	0.001642	97,678	160	97,598	5,104,451	52.3
21-22	0.001837	97,518	179	97,428	5,006,853	51.3
22-23	0.001980	97,339	193	97,242	4,909,425	50.4
23-24	0.002042	97,146	198	97,047	4,812,182	49.5
24-25	0.002042	96,948	198	96,849	4,715,135	48.6
25-26	0.002019	96,750	195	96,652	4,618,287	47.7
26-27	0.002010	96,554	194	96,457	4,521,635	46.8
27-28	0.002020	96,360	195	96,263	4,425,177	45.9
28-29	0.002065	96,166	199	96,066	4,328,915	45.0
29-30	0.002143	95,967	206	95,864	4,232,848	44.1
30-31	0.002239	95,761	214	95,654	4,136,984	43.2
31-32	0.002337	95,547	223	95,435	4,041,330	42.3
32-33	0.002466	95,324	235	95,206	3,945,895	41.4
33-34	0.002518	95,089	239	94,969	3,850,689	40.5
34-35	0.002595	94,849	246	94,726	3,755,720	39.6
35-36	0.002682	94,603	254	94,476	3,660,994	38.7
36-37	0.002794	94,349	264	94,217	3,566,518	37.8
37-38	0.002934	94,086	276	93,948	3,472,300	36.9
38-39	0.003112	93,810	292	93,664	3,378,353	36.0
39-40	0.003329	93,518	311	93,362	3,284,689	35.1
40-41	0.003584	93,206	334	93,039	3,191,327	34.2
41-42	0.003869	92,872	359	92,693	3,098,288	33.4
42-43	0.004185	92,513	387	92,319	3,005,595	32.5
43-44	0.004523	92,126	417	91,918	2,913,276	31.6
44-45	0.004884	91,709	448	91,485	2,821,358	30.8
45-46	0.005242	91,261	478	91,022	2,729,873	29.9
46-47	0.005642	90,783	512	90,527	2,638,851	29.1
47-48	0.006163	90,271	556	89,993	2,548,324	28.2
48-49	0.006855	89,714	615	89,407	2,458,331	27.4
49-50	0.007699	89,099	686	88,756	2,368,924	26.6
50-51	0.008620	88,413	762	88,032	2,280,168	25.8
51-52	0.009562	87,651	838	87,232	2,192,136	25.0
52-53	0.010560	86,813	917	86,355	2,104,904	24.2
53-54	0.011606	85,896	997	85,398	2,018,549	23.5
54-55	0.012704	84,899	1,079	84,360	1,933,151	22.8
55-56	0.013917	83,821	1,167	83,238	1,848,791	22.1
56-57	0.015210	82,654	1,257	82,026	1,765,553	21.4
57-58	0.016460	81,397	1,340	80,727	1,683,527	20.7
58-59	0.017597	80,057	1,409	79,353	1,602,800	20.0
59-60	0.018655	78,649	1,467	77,915	1,523,447	19.4
60-61	0.019749	77,181	1,524	76,419	1,445,532	18.7
61-62	0.020970	75,657	1,587	74,864	1,369,113	18.1

See footnote at end of table.

Table 17. Life table for non-Hispanic black males: United States, 2009—Con.Spreadsheet version available from: ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/62_07/Table17.xls.

Age (years)	Probability of dying between ages x and $x + 1$	Number surviving to age x	Number dying between ages x and $x + 1$	Person-years lived between ages x and $x + 1$	Total number of person-years lived above age x	Expectation of life at age x
	q_x	l_x	d_x	L_x	T_x	e_x
62–63	0.022289	74,071	1,651	73,245	1,294,249	17.5
63–64	0.023737	72,420	1,719	71,560	1,221,004	16.9
64–65	0.025318	70,701	1,790	69,806	1,149,444	16.3
65–66	0.027068	68,911	1,865	67,978	1,079,638	15.7
66–67	0.028909	67,045	1,938	66,076	1,011,660	15.1
67–68	0.030709	65,107	1,999	64,107	945,584	14.5
68–69	0.032470	63,108	2,049	62,083	881,477	14.0
69–70	0.034194	61,059	2,088	60,015	819,393	13.4
70–71	0.035732	58,971	2,107	57,917	759,379	12.9
71–72	0.037432	56,864	2,129	55,799	701,461	12.3
72–73	0.039432	54,735	2,158	53,656	645,662	11.8
73–74	0.042080	52,577	2,212	51,471	592,006	11.3
74–75	0.045148	50,364	2,274	49,227	540,535	10.7
75–76	0.048581	48,091	2,336	46,922	491,308	10.2
76–77	0.052665	45,754	2,410	44,549	444,385	9.7
77–78	0.056475	43,345	2,448	42,121	399,836	9.2
78–79	0.061092	40,897	2,498	39,648	357,715	8.7
79–80	0.066729	38,398	2,562	37,117	318,068	8.3
80–81	0.071569	35,836	2,565	34,554	280,951	7.8
81–82	0.077092	33,271	2,565	31,989	246,397	7.4
82–83	0.084963	30,706	2,609	29,402	214,408	7.0
83–84	0.093643	28,097	2,631	26,782	185,006	6.6
84–85	0.101743	25,466	2,591	24,171	158,225	6.2
85–86	0.110409	22,875	2,526	21,612	134,054	5.9
86–87	0.119657	20,350	2,435	19,132	112,441	5.5
87–88	0.129499	17,915	2,320	16,755	93,309	5.2
88–89	0.139944	15,595	2,182	14,504	76,555	4.9
89–90	0.150994	13,412	2,025	12,400	62,051	4.6
90–91	0.162647	11,387	1,852	10,461	49,651	4.4
91–92	0.174895	9,535	1,668	8,701	39,190	4.1
92–93	0.187721	7,867	1,477	7,129	30,489	3.9
93–94	0.201103	6,391	1,285	5,748	23,360	3.7
94–95	0.215011	5,105	1,098	4,557	17,612	3.4
95–96	0.229407	4,008	919	3,548	13,056	3.3
96–97	0.244246	3,088	754	2,711	9,508	3.1
97–98	0.259475	2,334	606	2,031	6,796	2.9
98–99	0.275035	1,728	475	1,491	4,765	2.8
99–100	0.290861	1,253	364	1,071	3,275	2.6
100 and over	1.000000	889	889	2,204	2,204	2.5

SOURCE: CDC/NCHS, National Vital Statistics System.

Table 18. Life table for non-Hispanic black females: United States, 2009Spreadsheet version available from: ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/62_07/Table18.xls.

Age (years)	Probability of dying between ages x and $x + 1$	Number surviving to age x	Number dying between ages x and $x + 1$	Person-years lived between ages x and $x + 1$	Total number of person-years lived above age x	Expectation of life at age x
	q_x	l_x	d_x	L_x	T_x	e_x
0-1	0.010898	100,000	1,090	99,052	7,737,833	77.4
1-2	0.000647	98,910	64	98,878	7,638,781	77.2
2-3	0.000359	98,846	36	98,828	7,539,903	76.3
3-4	0.000309	98,811	31	98,795	7,441,074	75.3
4-5	0.000251	98,780	25	98,768	7,342,279	74.3
5-6	0.000211	98,755	21	98,745	7,243,511	73.3
6-7	0.000180	98,735	18	98,726	7,144,766	72.4
7-8	0.000159	98,717	16	98,709	7,046,040	71.4
8-9	0.000147	98,701	15	98,694	6,947,331	70.4
9-10	0.000144	98,687	14	98,679	6,848,638	69.4
10-11	0.000148	98,672	15	98,665	6,749,958	68.4
11-12	0.000161	98,658	16	98,650	6,651,293	67.4
12-13	0.000182	98,642	18	98,633	6,552,643	66.4
13-14	0.000211	98,624	21	98,614	6,454,010	65.4
14-15	0.000243	98,603	24	98,591	6,355,397	64.5
15-16	0.000278	98,579	27	98,565	6,256,806	63.5
16-17	0.000314	98,552	31	98,536	6,158,240	62.5
17-18	0.000354	98,521	35	98,503	6,059,704	61.5
18-19	0.000403	98,486	40	98,466	5,961,200	60.5
19-20	0.000459	98,446	45	98,424	5,862,734	59.6
20-21	0.000523	98,401	51	98,375	5,764,311	58.6
21-22	0.000588	98,350	58	98,321	5,665,935	57.6
22-23	0.000649	98,292	64	98,260	5,567,614	56.6
23-24	0.000697	98,228	68	98,194	5,469,354	55.7
24-25	0.000736	98,160	72	98,124	5,371,161	54.7
25-26	0.000775	98,087	76	98,049	5,273,037	53.8
26-27	0.000819	98,011	80	97,971	5,174,988	52.8
27-28	0.000865	97,931	85	97,889	5,077,016	51.8
28-29	0.000913	97,846	89	97,802	4,979,128	50.9
29-30	0.000968	97,757	95	97,710	4,881,326	49.9
30-31	0.001032	97,662	101	97,612	4,783,616	49.0
31-32	0.001105	97,562	108	97,508	4,686,004	48.0
32-33	0.001192	97,454	116	97,396	4,588,496	47.1
33-34	0.001266	97,338	123	97,276	4,491,100	46.1
34-35	0.001351	97,214	131	97,149	4,393,824	45.2
35-36	0.001444	97,083	140	97,013	4,296,676	44.3
36-37	0.001552	96,943	150	96,868	4,199,663	43.3
37-38	0.001680	96,792	163	96,711	4,102,795	42.4
38-39	0.001834	96,630	177	96,541	4,006,084	41.5
39-40	0.002016	96,453	194	96,355	3,909,542	40.5
40-41	0.002215	96,258	213	96,152	3,813,187	39.6
41-42	0.002433	96,045	234	95,928	3,717,036	38.7
42-43	0.002678	95,811	257	95,683	3,621,108	37.8
43-44	0.002948	95,555	282	95,414	3,525,425	36.9
44-45	0.003232	95,273	308	95,119	3,430,011	36.0
45-46	0.003512	94,965	333	94,798	3,334,892	35.1
46-47	0.003798	94,632	359	94,452	3,240,093	34.2
47-48	0.004120	94,272	388	94,078	3,145,642	33.4
48-49	0.004497	93,884	422	93,673	3,051,564	32.5
49-50	0.004927	93,462	460	93,231	2,957,891	31.6
50-51	0.005394	93,001	502	92,750	2,864,660	30.8
51-52	0.005871	92,499	543	92,228	2,771,909	30.0
52-53	0.006349	91,956	584	91,664	2,679,681	29.1
53-54	0.006816	91,373	623	91,061	2,588,017	28.3
54-55	0.007282	90,750	661	90,419	2,496,956	27.5
55-56	0.007779	90,089	701	89,739	2,406,537	26.7
56-57	0.008321	89,388	744	89,016	2,316,798	25.9
57-58	0.008894	88,644	788	88,250	2,227,782	25.1
58-59	0.009503	87,856	835	87,438	2,139,532	24.4
59-60	0.010158	87,021	884	86,579	2,052,093	23.6
60-61	0.010885	86,137	938	85,668	1,965,514	22.8
61-62	0.011690	85,199	996	84,702	1,879,846	22.1

See footnote at end of table.

Table 18. Life table for non-Hispanic black females: United States, 2009—Con.Spreadsheet version available from: ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/62_07/Table18.xls.

Age (years)	Probability of dying between ages x and $x + 1$	Number surviving to age x	Number dying between ages x and $x + 1$	Person-years lived between ages x and $x + 1$	Total number of person-years lived above age x	Expectation of life at age x
	q_x	l_x	d_x	L_x	T_x	e_x
62-63	0.012556	84,204	1,057	83,675	1,795,144	21.3
63-64	0.013473	83,146	1,120	82,586	1,711,469	20.6
64-65	0.014451	82,026	1,185	81,433	1,628,883	19.9
65-66	0.015530	80,841	1,255	80,213	1,547,450	19.1
66-67	0.016706	79,585	1,330	78,920	1,467,237	18.4
67-68	0.017997	78,256	1,408	77,551	1,388,317	17.7
68-69	0.019323	76,847	1,485	76,105	1,310,765	17.1
69-70	0.020640	75,362	1,555	74,585	1,234,660	16.4
70-71	0.022165	73,807	1,636	72,989	1,160,076	15.7
71-72	0.023879	72,171	1,723	71,309	1,087,087	15.1
72-73	0.025498	70,448	1,796	69,550	1,015,777	14.4
73-74	0.027328	68,651	1,876	67,713	946,228	13.8
74-75	0.029583	66,775	1,975	65,788	878,514	13.2
75-76	0.032060	64,800	2,077	63,761	812,727	12.5
76-77	0.034330	62,722	2,153	61,646	748,965	11.9
77-78	0.036954	60,569	2,238	59,450	687,319	11.3
78-79	0.040565	58,331	2,366	57,148	627,869	10.8
79-80	0.044849	55,965	2,510	54,710	570,722	10.2
80-81	0.049137	53,455	2,627	52,141	516,012	9.7
81-82	0.053775	50,828	2,733	49,462	463,870	9.1
82-83	0.059824	48,095	2,877	46,656	414,409	8.6
83-84	0.065791	45,218	2,975	43,730	367,752	8.1
84-85	0.071683	42,243	3,028	40,729	324,022	7.7
85-86	0.078981	39,215	3,097	37,666	283,294	7.2
86-87	0.086578	36,117	3,127	34,554	245,628	6.8
87-88	0.094788	32,990	3,127	31,427	211,074	6.4
88-89	0.103637	29,863	3,095	28,316	179,647	6.0
89-90	0.113149	26,768	3,029	25,254	151,331	5.7
90-91	0.123343	23,740	2,928	22,275	126,077	5.3
91-92	0.134232	20,811	2,794	19,415	103,802	5.0
92-93	0.145825	18,018	2,627	16,704	84,387	4.7
93-94	0.158122	15,390	2,434	14,174	67,683	4.4
94-95	0.171114	12,957	2,217	11,848	53,509	4.1
95-96	0.184787	10,740	1,985	9,747	41,661	3.9
96-97	0.199113	8,755	1,743	7,884	31,913	3.6
97-98	0.214056	7,012	1,501	6,261	24,030	3.4
98-99	0.229570	5,511	1,265	4,878	17,768	3.2
99-100	0.245598	4,246	1,043	3,724	12,890	3.0
100 and over	1.000000	3,203	3,203	9,166	9,166	2.9

SOURCE: CDC/NCHS, National Vital Statistics System.