

# Mortality Rates and Life Expectancy of Veterans



from 1980 to 2014, and by  
Education and Income

Department of Veterans Affairs

National Center for Veterans Analysis  
and Statistics

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## **Introduction**

This report generates estimates of mortality rates and life expectancy for Veterans for ages 20 to 85, in the 10 to 15 year periods of 1980-89, 1990-99, 2000-14, and attempts to measure the socioeconomic differentials in life expectancy such as education and income in Veterans and compare them with the U.S. population. Life expectancy, a measure summarizing the mortality experience over a life time, is an estimate of expected life-years at a specific age. Life expectancy is computed directly from the mortality rate at each age. Similar to the mortality rates, the life expectancy of Veterans should be close to the life expectancy of the U. S. population. The gaps in life expectancy by socioeconomic factors have been observed in the U. S. population (3).

Veterans are a preselected group of healthy people from the general population. A soldier has to be fit both physically and mentally to endure the hardship in an adverse environment such as a battle field. The healthy soldier/worker effect gradually subdues over time. The mortality rates of recently separated Veterans are expected to be lower than those of the U. S. population and the mortality rates will become very similar as Veterans get older. This is similar to the selection effect of underwriting requirement provision in the insurance industries. It has been well-documented in epidemiology studies (1, 2). The study design is based on available data. A direct comparison of mortality of Veterans to U. S. population from the literature may be difficult. This study draws conclusions based on the known facts from the current study and other studies in the literature.

## **Study Data**

The Data Governance and Analytics (DGA) business line developed the Veterans Eligibility Trends and Statistics (USVETS) dataset in fiscal year 2015. USVETS is a data environment consisting mainly of data sources from the Veterans Benefit Administration, the Veterans Health Administration, the Department of Defense's Defense Manpower Data Center, and other data sources including commercial data sources. This dataset contains information about individual living and deceased Veterans including demographics, details of military service, and VA benefit usage. The dataset contains one record per Veteran. It includes all living and deceased Veterans. DGA uses its database to conduct statistical analysis, predictive modeling, and reporting. Like any other dataset, USVETS has its limitations and assumptions that users need to consider.

1. USVETS tends to be more accurate for Veteran records below the age of 67 than for older Veterans due to missing DoD records for older Veterans. This limitation will gradually decrease over time.
2. USVETS is mixed data. It uses internal VA administrative and external commercial vendor data. For the internal VA administrative data, DGA does not have control over input data production or quality of these sources. Although DGA applies rigorous data quality techniques to ensure the high quality of these data, there may be flaws in data inputs that are not identified.
3. For the commercial vendor data, the contractor collects data from a variety of sources such as public records, surveys, and on-line and off-line registrations. The accuracy and completeness of the data is determined by these sources. The data may not be complete and in some cases the data may not be current due to timing of updates from these sources.
4. Like all other databases, USVETS relies on business rules that allow the data manager to select one data element over another data element for achieving validity, reliability and consistency. Thus, counts derived from USVETS may differ from other internal VA administrative databases.
5. Some of USVETS administrative variables may have special limitations based on how the data was collected and imputed. For certain variables USVETS may use commercial vendor data to supplement or replace VA administrative data.
6. USVETS is subject to continuous scrutiny, revision and refresh in the pursuit of producing the best Veteran data for Veteran analysis, planning and policy. Accordingly, USVETS versions may vary.

The data in the study is from the 2015 USVETS database, combining Veterans data from Department of Defense, Veterans Benefit Administration, Veterans Health Administration, and others, with a total of 38,078,566 administrative records (of living and dead Veterans). We applied rigorous exclusion rules that reduced the number of records for this analysis to 32,045,185. The top three reasons for excluding a record were: (1) the Veteran died prior to 1980 because the study focuses on the years 1980 to 2014; (2) the Veteran's record did not have a separation date; and (3) the Veteran's record did not pass SSA validation test. Some records are waiting for SSA validation and are excluded from this study.

Table 1. shows the number of records by gender, living status and median birth year in 1980-2014. Those records without a separation date are older with a median birth year of 1930 versus those with a separation date and median birth year of 1946.

**Table 1. Gender, Living Status and Median Birth Year, USVETS, 1980-2014**

	Total	Male	Female	Unknown	Living	Dead	Median Birth Year
In Analysis (percent)	32,045,185 100	29,898,534 93	2,131,391 7	15,260 0	17,839,658 56	14,205,527 44	1946
No Sep Date (percent)	1,641,374 100	1,526,514 93	113,999 7	861 0	634,071 39	1,007,303 61	1930
Additional Data (percent)	1,344,350 100	1,283,380 95	60,117 4	853 0	338,697 25	1,005,653 75	1927

Source: U.S. Veterans Eligibility Trends and Statistics, 2015  
Prepared by the National Center for Veterans Analysis and Statistics

A consumer-data collecting company has provided socioeconomic data for 28,364,986 records in this analysis. For the smaller study focused on education and income, we excluded Veterans who died before the year 2011 because that education and income data does not exist in our dataset. This smaller study had a total of 19,780,867 records to compute the socioeconomic differentials in life expectancy in the years of 2011-2014. The education variable has 4 levels: 'Completed high school,' 'Completed College,' 'Completed graduate school,' and 'Attended vocational/technical.' Roughly 24 percent are unknown. The 'Highest Education Completed' combines the education levels into 3 categories: 'None or unknown', 'High school', and 'College+.' 'College+' includes 'Completed College', 'Completed graduate school', and 'Attended vocational/technical'.

The estimated household income of commercial vendor data has 13 brackets:

- 'Less than \$15,000',
- '\$15,000-\$19,999',
- '\$20,000-\$29,999',
- '\$30,000-\$39,999',
- '\$40,000-\$49,999',
- '\$50,000-\$59,999',
- '\$60,000-\$69,999',
- '\$70,000-\$79,999',
- '\$80,000-\$89,999',
- '\$90,000-\$99,999',
- '\$100,000-124,999',
- '\$125,000-149,999', and
- 'Greater than \$149,999.'

Roughly 15 percent are unknown and grouped into 3 categories: 'Less than \$20,000 or unknown', '\$20,000-\$49,999', and 'Greater than \$49,999.' The unknown has been shown to be similar to the low income brackets and therefore is combined with the 'less than \$20,000 income' category.

Table 2. shows the number of records by gender, living status and median birth year, by education and income categories, for the years 2011-2014. The unexpected high percentage of deaths for the group of 'College+' education can be explained by older ages of this group from the median birth year of 1952, compared to all groups from the median birth year of 1956. The low percentage of deaths of the group of income of 'Less than \$20,000 or unknown' can be due to younger ages of the median birth year of 1960 and due to having more female records, 12% vs. 9% for all.

**Table 2. Gender, Living Status and Median Birth Year by Education and Income, USVETS, 2011-2014**

	Total	Male	Female	Unknown	Living	Dead	Median Birth Year
All	19,780,867	17,995,776	1,785,091	0	17,603,143	2,177,724	1956
(percent)	100	91	9	0	89	11	
None or Unknown	4,683,567	4,274,742	408,825	0	4,104,087	579,480	1957
(percent)	100	91	9	0	88	12	
High School	7,812,912	7,112,723	700,189	0	7,068,037	744,875	1958
(percent)	100	91	9	0	90	10	
College - Plus	7,284,388	6,608,311	676,077	0	6,431,019	853,369	1952
(percent)	100	91	9	0	88	12	
<\$20K or Unknown	4,726,590	4,170,204	556,386	0	4,164,609	561,981	1960
(percent)	100	88	12	0	88	12	
\$20K - \$49K	5,495,762	5,040,307	455,455	0	4,719,363	776,399	1953
(percent)	100	92	8	0	86	14	
\$50K - Plus	9,588,515	8,785,265	773,250	0	8,719,171	839,344	1956
(percent)	100	92	8	0	91	9	

Source: U.S. Veterans Eligibility Trends and Statistics, 2015  
 Prepared by the National Center for Veterans Analysis and Statistics

### Person-Years Method

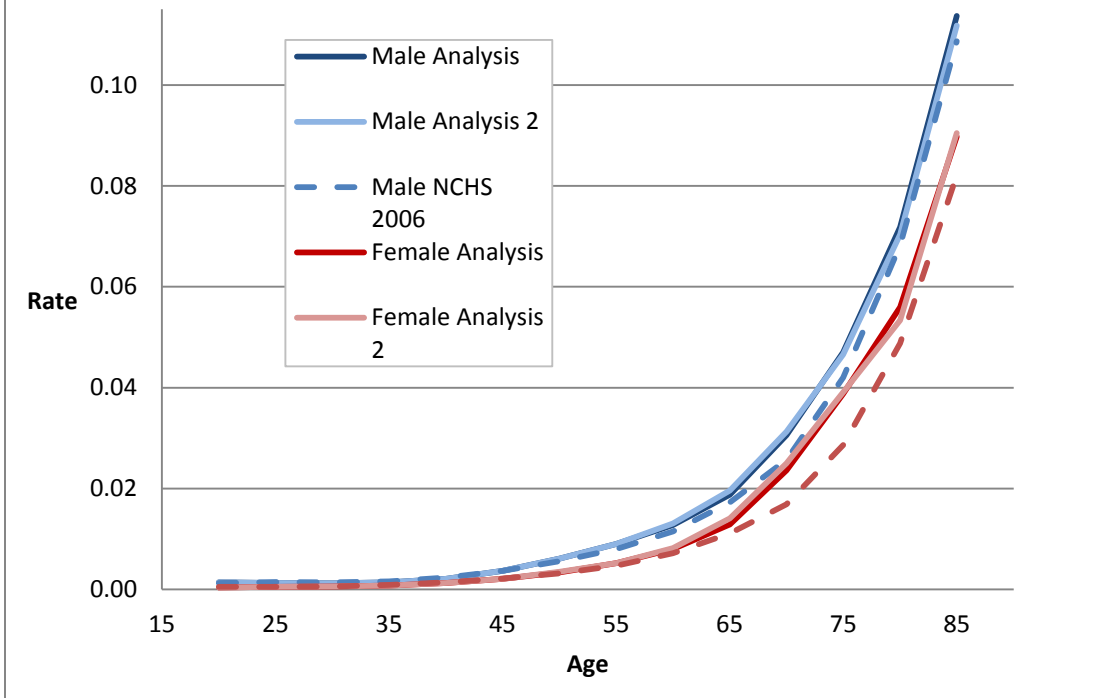
Person-years are computed for each attained age and calendar year. For example, a Veteran born on March 19, 1949, would get 0.2 person-year at age 30 and year 1980,

0.8 person-year at age 31 and year 1980, 0.2 person-year at age 31 and year 1981, and so on if no death occurred in the years of study. The same person would only get 0.5 person-year at age 31 and year 1980 if he or she died on July 1, 1980, and he or she would get no further person-year contribution. Person-years are then combined at each age for all Veterans in the study from January 1, 1980, through December 31, 2014. The mortality rate at each age is computed by dividing the number of deaths at the age by the number of persons surviving to the age which is the sum of person-years and half of number of deaths at the age. It assumes uniform distribution of deaths during the year last for the age. Then, these rates are fed into a life table to compute the life expectancy at each age. The standard error of life expectancy shown in parentheses in the tables is computed based on Chiang's formula (4).

## **Results**

Mortality rate and life expectancy at each age, from ages 20 to 85, and each 10-15 years period, 1980-1989, 1990-1999, and 2000-2014, were computed for male and female Veterans, respectively. Tables 3 and 4, and Figures 1 and 2, compare the Veteran mortality rate and life expectancy in years 2000-2014 to those of U. S. population in 2006 (5). Only the mortality rate and life expectancy at ages 20, 25, 30... 85 are shown for demonstration purposes. Compared to the U. S. population, the mortality rates of Veterans are higher at older ages, and the life expectancy of Veterans are estimated to be 0.7-0.9 life-years shorter for males, and to be 1.2-1.3 life-years shorter for female at age 25, 45, and 65.

**Figure 1. Mortality rate by gender and age, USVETS, 2000-2014 and NCHS 2006**

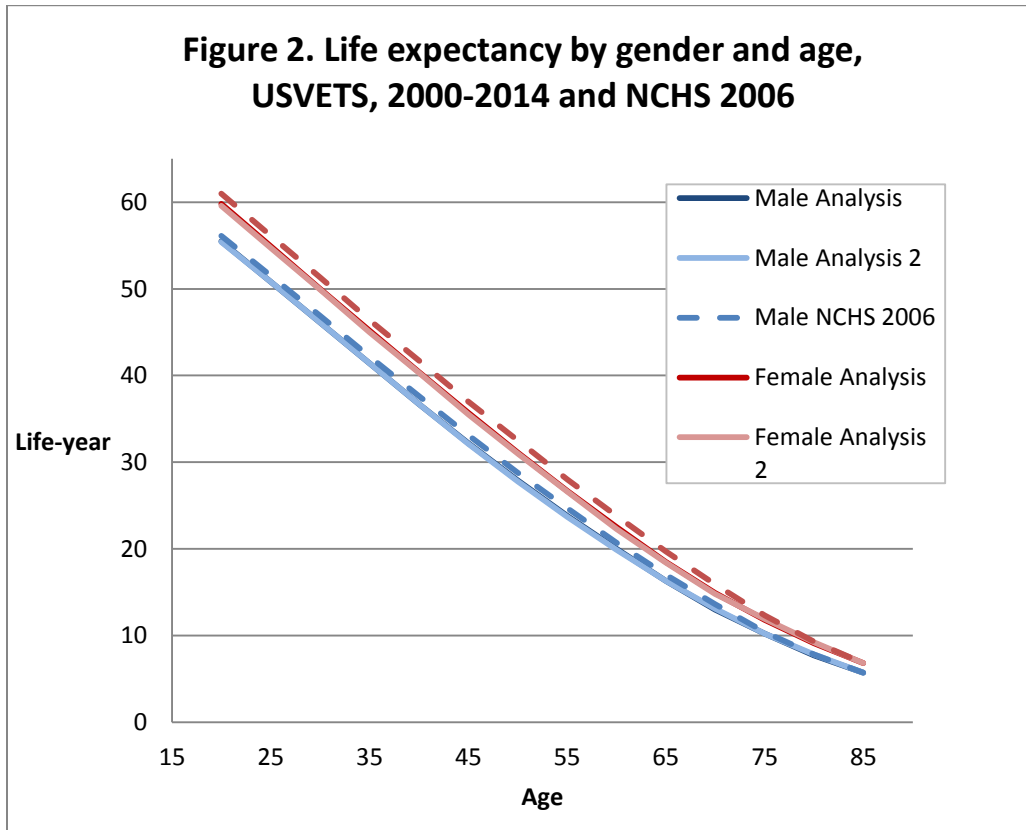


Source: U.S. Veterans Eligibility Trends and Statistics, 2015  
 Prepared by the National Center for Veterans Analysis and Statistics

**Table 3. Mortality Rate by Gender and Age, USVETS, 2000-2014 and NCHS 2006**

Age	Male Analysis	Male Analysis 2	Male NCHS 2006	Female Analysis	Female Analysis 2	Female NCHS 2006
20	0.0014	0.0014	0.0013	0.0004	0.0004	0.0005
25	0.0013	0.0013	0.0015	0.0005	0.0005	0.0005
30	0.0012	0.0012	0.0014	0.0006	0.0006	0.0006
35	0.0014	0.0014	0.0016	0.0008	0.0008	0.0009
40	0.0021	0.0021	0.0024	0.0013	0.0013	0.0014
45	0.0037	0.0037	0.0037	0.0021	0.0021	0.0022
50	0.0061	0.0061	0.0056	0.0034	0.0035	0.0032
55	0.009	0.009	0.008	0.0052	0.0052	0.0047
60	0.0128	0.0131	0.0115	0.008	0.0082	0.0072
65	0.0188	0.0196	0.0173	0.0129	0.0141	0.0111
70	0.0306	0.0313	0.0257	0.0236	0.025	0.0169
75	0.047	0.0466	0.042	0.0388	0.0391	0.0286
80	0.0718	0.0704	0.0682	0.056	0.0534	0.0488
85	0.1137	0.1118	0.1087	0.0898	0.0905	0.0821

Source: U.S. Veterans Eligibility Trends and Statistics, 2015  
 Prepared by the National Center for Veterans Analysis and Statistics



Source: U.S. Veterans Eligibility Trends and Statistics, 2015  
 Prepared by the National Center for Veterans Analysis and Statistics

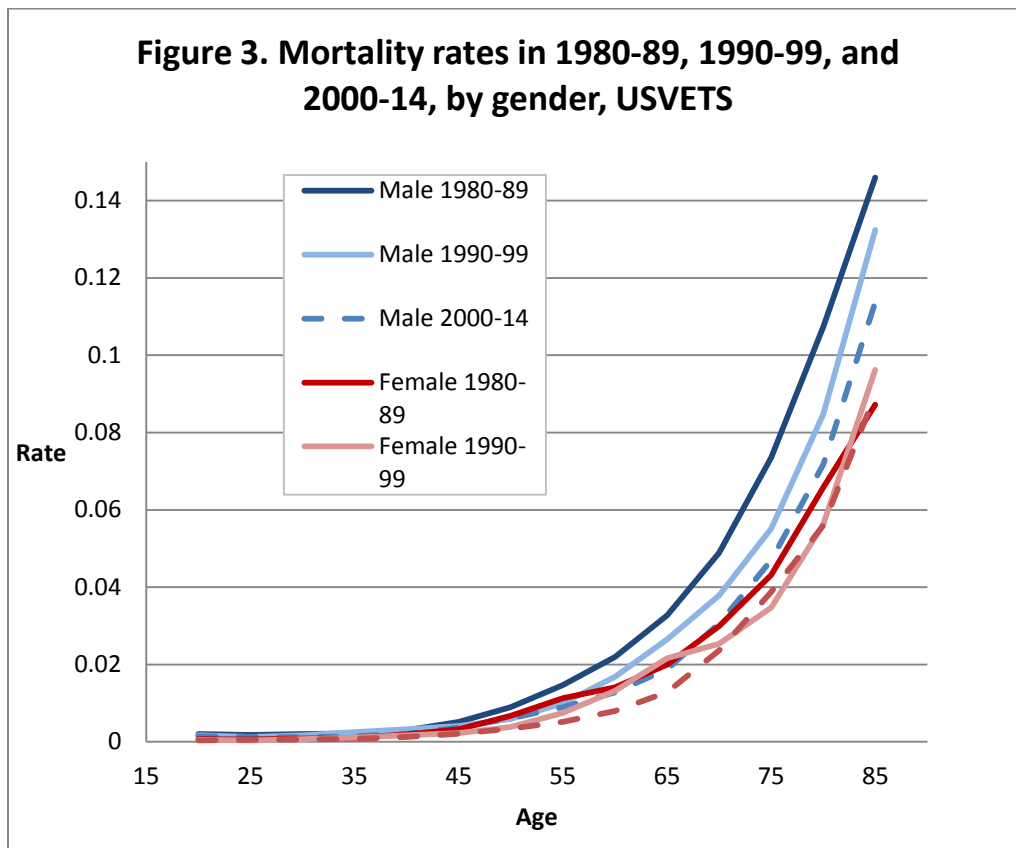
**Table 4. Life Expectancy by Gender and Age, USVETS, 2000-2014 and NCHS 2006**

Age	Male Analysis	Male Analysis 2	Male NCHS 2006	Female Analysis	Female Analysis 2	Female NCHS 2006
20	55.5	55.4	56.1	59.8	59.6	61
25	50.8	50.8	51.5	54.9	54.7	56.1
30	46.1	46.1	46.9	50	49.9	51.3
35	41.4	41.4	42.2	45.2	45	46.4
40	36.7	36.7	37.6	40.4	40.3	41.7
45	32.2	32.1	33.1	35.7	35.5	37
50	27.9	27.8	28.8	31.1	31	32.5
55	23.8	23.7	24.7	26.7	26.6	28
60	20	19.9	20.7	22.5	22.3	23.8
65	16.3	16.3	17	18.5	18.4	19.7
70	13	13.1	13.6	14.9	14.8	15.9
75	10.2	10.2	10.4	11.8	11.9	12.3
80	7.7	7.8	7.8	9.1	9.2	9.3
85	5.7	5.7	5.7	6.8	6.8	6.8

Source: U.S. Veterans Eligibility Trends and Statistics, 2015  
 Prepared by the National Center for Veterans Analysis and Statistics



Tables 5a, 5b, 6a, and 6b, and Figures 3 and 4, show the numbers of person-years and deaths, mortality rates, and life expectancy in analysis at ages 20, 25, 30...85 and in each 10-15 years period, 1980-1989, 1990-1999, 2000-2014, for male and female Veterans, respectively. The mortality rates decrease over these decades, and the life expectancy at age 25 increases from 45.8 to 50.8 and from 51.3 to 54.9 life-years for male and female, respectively. The unusual lower mortality rate in 1980-89 compared to the one in 1990-99 for female at age 85, in Table 6b, maybe due to the difficulty of obtaining death information for this small cohort of very old persons.



Source: U.S. Veterans Eligibility Trends and Statistics, 2015  
 Prepared by the National Center for Veterans Analysis and Statistics

**Table 5a. Mortality Rate, Life Expectancy by Period of Years and Age, USVETS, 1980-2014, Male Veterans**

Age	Person Years 1980-89	Person Years 1990-99	Person Years 2000-14	Number of Deaths 1980-89	Number of Deaths 1990-99	Number of Deaths 2000-14
20	906,604	555,766	646,414	1,831	939	923
25	2,979,550	2,069,756	1,957,747	5,460	2,764	2,483
30	4,020,259	2,996,572	2,726,936	8,088	5,169	3,180
35	5,139,857	3,578,061	3,398,299	11,163	8,919	4,928
40	4,469,663	4,193,533	4,392,584	13,432	13,920	9,395
45	3,060,167	5,208,731	5,217,855	15,861	21,529	19,155
50	3,556,154	4,442,358	5,924,441	32,063	26,184	36,253
55	4,549,851	2,907,182	6,786,077	67,350	29,200	61,427
60	5,135,876	3,152,734	6,139,397	114,151	53,358	79,375
65	4,228,587	3,703,497	4,984,232	140,740	99,301	94,758
70	2,250,959	3,782,355	3,660,386	112,851	146,141	113,817
75	939,952	2,713,872	3,448,722	71,740	153,938	165,999
80	344,084	1,145,430	3,082,489	39,066	101,492	229,652
85	274,511	326,842	1,827,346	43,240	46,342	220,293

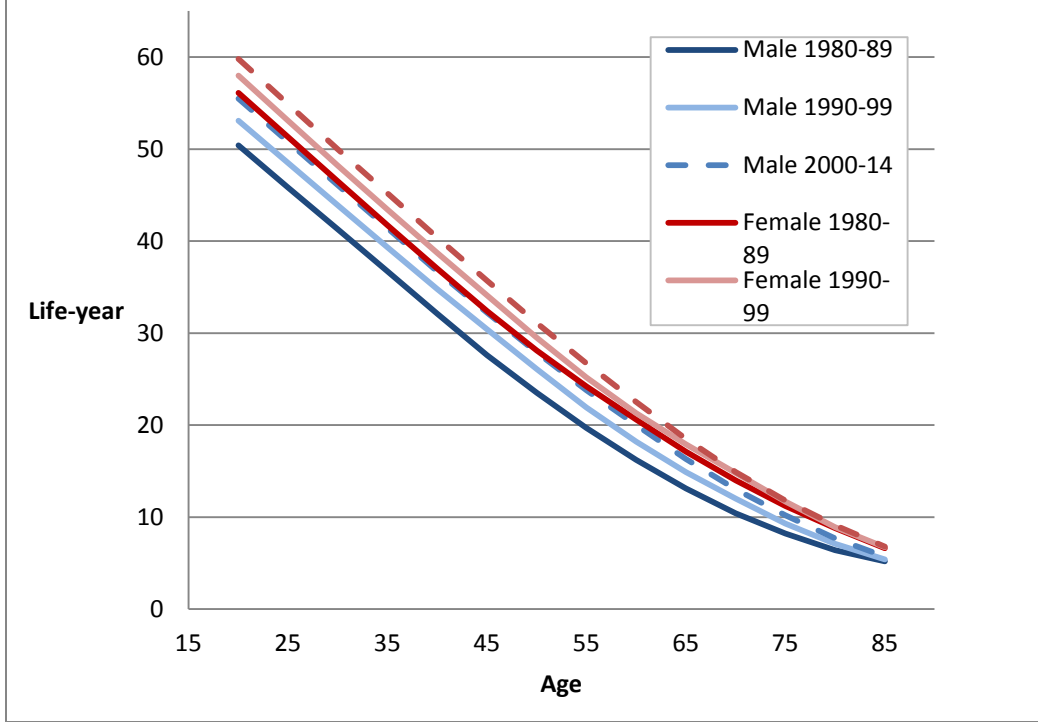
Source: U.S. Veterans Eligibility Trends and Statistics, 2015  
 Prepared by the National Center for Veterans Analysis and Statistics

**Table 5b. Mortality Rate, Life Expectancy by Period of Years and Age, USVETS, 1980-2014, Male Veterans**

Age	Mortality Rates 1980-89	Mortality Rates 1990-99	Mortality Rates 2000-14	Life Expectancy 1980-89	Life Expectancy 1990-99	Life Expectancy 2000-14
20	0.002	0.0017	0.0014	50.4	53.1	55.5
25	0.0018	0.0013	0.0013	45.8	48.5	50.8
30	0.002	0.0017	0.0012	41.3	43.9	46.1
35	0.0022	0.0025	0.0014	36.7	39.3	41.4
40	0.003	0.0033	0.0021	32.1	34.8	36.7
45	0.0052	0.0041	0.0037	27.6	30.4	32.2
50	0.009	0.0059	0.0061	23.5	26.1	27.9
55	0.0147	0.01	0.009	19.7	21.9	23.8
60	0.022	0.0168	0.0128	16.2	18.2	20.0
65	0.0327	0.0265	0.0188	13.1	14.9	16.3
70	0.0489	0.0379	0.0306	10.4	12.0	13.0
75	0.0735	0.0552	0.047	8.2	9.3	10.2
80	0.1074	0.0848	0.0718	6.4	7.1	7.7
85	0.146	0.1324	0.1137	5.2	5.4	5.7

Source: U.S. Veterans Eligibility Trends and Statistics, 2015  
 Prepared by the National Center for Veterans Analysis and Statistics

**Figure 4. Life expectancy in 1980-89, 1990-99, and 2000-14, by gender, USVETS**



Source: U.S. Veterans Eligibility Trends and Statistics, 2015  
 Prepared by the National Center for Veterans Analysis and Statistics

**Table 6a. Person years, Number of deaths by Period of Years and Age, USVETS, 1980-2014, Female Veterans**

Age	Person Years 1980-89	Person Years 1990-99	Person Years 2000-14	Number of Deaths 1980-89	Number of Deaths 1990-99	Number of Deaths 2000-14
20	118,319	114,457	177,424	77	58	71
25	317,925	300,504	445,477	198	129	241
30	301,056	419,996	562,242	263	298	345
35	194,094	447,612	595,184	203	494	495
40	99,882	351,162	674,940	189	614	902
45	58,322	212,088	701,459	193	485	1,450
50	52,081	105,011	621,849	351	405	2,144
55	55,190	58,257	428,870	628	437	2,226
60	119,384	48,258	238,834	1,700	639	1,918
65	126,100	47,349	118,313	2,552	1,033	1,538
70	57,157	97,156	68,446	1,737	2,497	1,632
75	28,161	96,053	52,556	1,242	3,387	2,077
80	15,173	37,651	79,908	1,032	2,183	4,607
85	9,752	14,453	64,134	889	1,460	6,027

Source: U.S. Veterans Eligibility Trends and Statistics, 2015  
 Prepared by the National Center for Veterans Analysis and Statistics

**Table 6b. Mortality Rate, Life Expectancy by Period of Years and Age, USVETS, 1980-2014, Female Veterans**

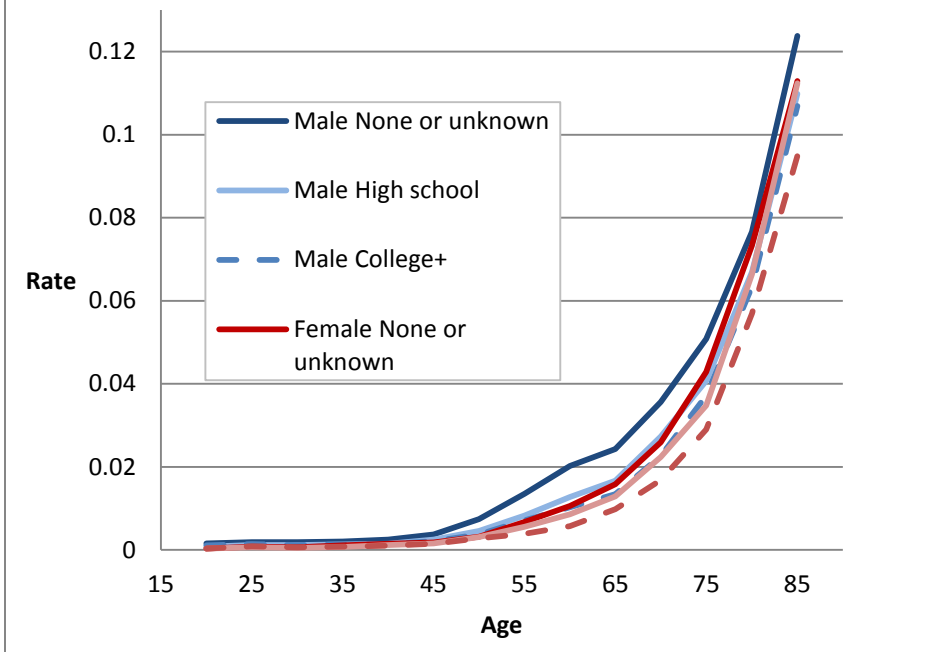
Age	Mortality Rates 1980-89	Mortality Rates 1990-99	Mortality Rates 2000-14	Life Expectancy 1980-89	Life Expectancy 1990-99	Life Expectancy 2000-14
20	0.0007	0.0005	0.0004	56.1	58	59.8
25	0.0006	0.0004	0.0005	51.3	53.1	54.9
30	0.0009	0.0007	0.0006	46.5	48.2	50
35	0.001	0.0011	0.0008	41.7	43.4	45.2
40	0.0019	0.0017	0.0013	37	38.7	40.4
45	0.0033	0.0023	0.0021	32.4	34.1	35.7
50	0.0067	0.0038	0.0034	28.1	29.5	31.1
55	0.0113	0.0075	0.0052	24.2	25.2	26.7
60	0.0141	0.0132	0.008	20.6	21.3	22.5
65	0.02	0.0216	0.0129	17.1	17.9	18.5
70	0.0299	0.0254	0.0236	14	14.8	14.9
75	0.0432	0.0347	0.0388	11.2	11.7	11.8
80	0.0658	0.0563	0.056	8.8	8.9	9.1
85	0.0872	0.0962	0.0898	6.6	6.7	6.8

Source: U.S. Veterans Eligibility Trends and Statistics, 2015

Prepared by the National Center for Veterans Analysis and Statistics

Tables 7 and 8, and Figures 5 and 6, show the mortality rate by education and income, for male and female, at ages 20, 25...85, in years 2011-2014.

**Figure 5. Mortality rate by gender, education, and age, USVETS, 2011-2014**



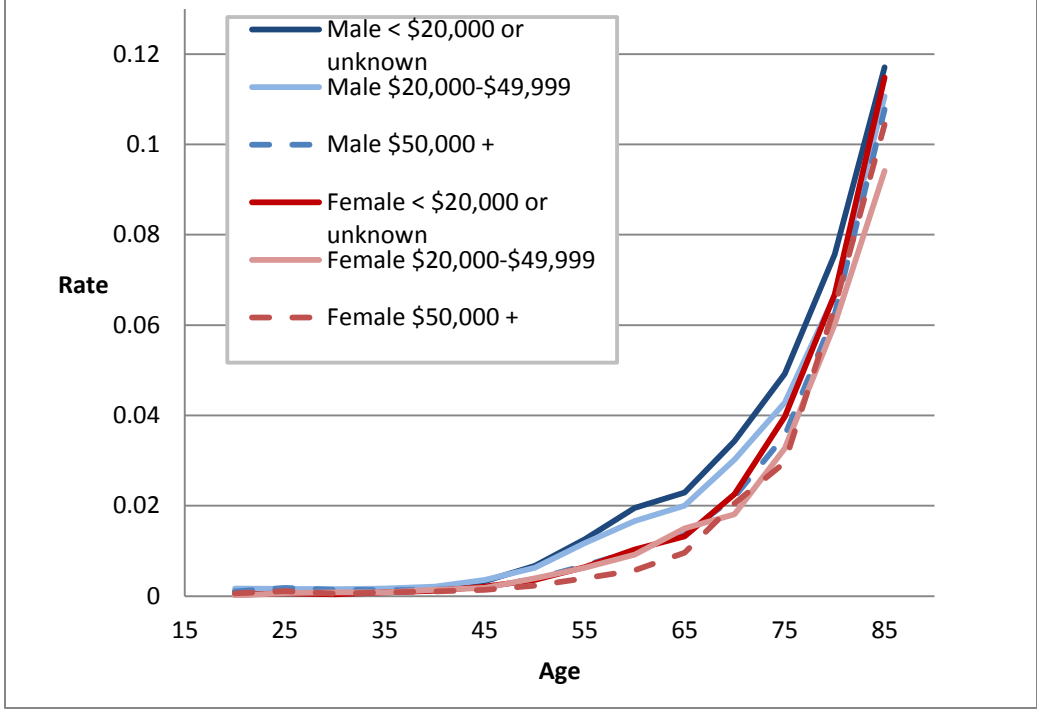
Source: U.S. Veterans Eligibility Trends and Statistics, 2015  
 Prepared by the National Center for Veterans Analysis and Statistics

**Table 7. Mortality Rate by Gender, Education and Age, USVETS, 2011-2014**

Age	Male None or unknown	Male High school	Male College+	Female None or unknown	Female High school	Female College+
20	0.0016	0.0008	0.0011	0.0003	0.0003	0.0003
25	0.0019	0.0012	0.0014	0.0008	0.0006	0.0009
30	0.0019	0.0012	0.0012	0.0006	0.0005	0.0006
35	0.002	0.0013	0.0013	0.0011	0.0007	0.0008
40	0.0025	0.0015	0.0014	0.0015	0.0012	0.001
45	0.0037	0.0025	0.0021	0.0018	0.0016	0.0015
50	0.0074	0.0046	0.0037	0.0032	0.0031	0.0028
55	0.0135	0.0083	0.0071	0.0067	0.0056	0.0039
60	0.0202	0.0127	0.0103	0.0106	0.0086	0.0057
65	0.0243	0.0167	0.0134	0.0158	0.0129	0.0098
70	0.0356	0.0273	0.0226	0.0259	0.0224	0.0168
75	0.0508	0.0407	0.0372	0.0429	0.0348	0.029
80	0.0766	0.0669	0.0634	0.0733	0.0664	0.0569
85	0.1238	0.1098	0.1069	0.1129	0.1124	0.0949

Source: U.S. Veterans Eligibility Trends and Statistics, 2015  
 Prepared by the National Center for Veterans Analysis and Statistics

**Figure 6. Mortality rate by gender, income, and age, USVETS, 2011-2014**



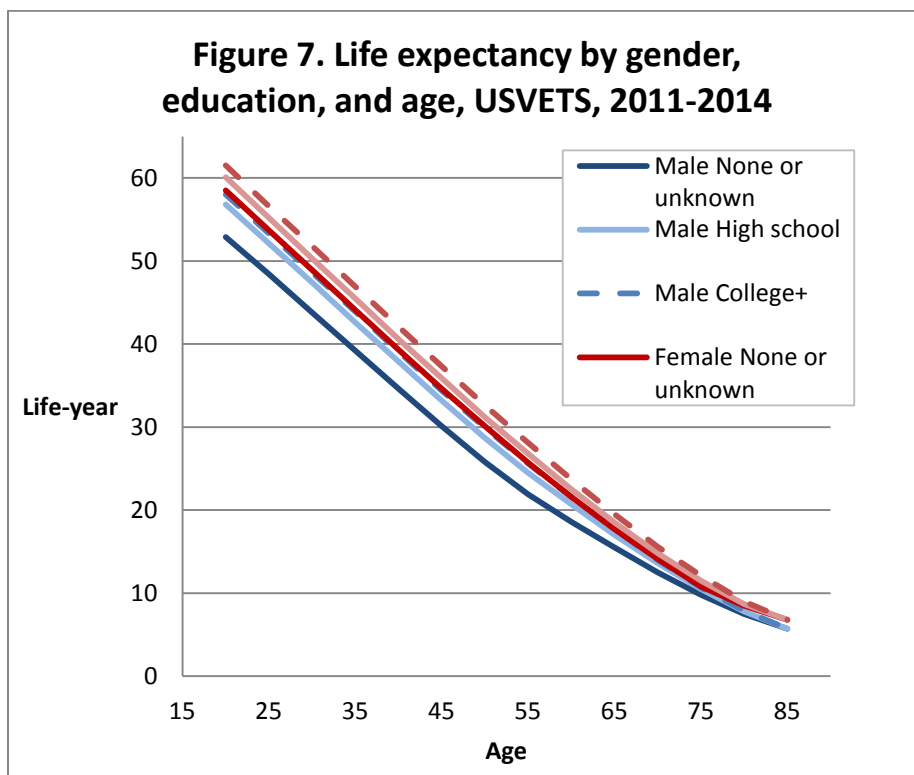
Source: U.S. Veterans Eligibility Trends and Statistics, 2015  
 Prepared by the National Center for Veterans Analysis and Statistics

**Table 8. Mortality Rate by Gender, Income and Age, USVETS, 2011-2014**

Age	Male < \$20,000 or unknown	Male \$20,000-\$49,999	Male \$50,000 +	Female < \$20,000 or unknown	Female \$20,000-\$49,999	Female \$50,000 +
20	0.001	0.0017	0.001	0.0003	0.0001	0.0006
25	0.001	0.0016	0.0018	0.0006	0.0007	0.0011
30	0.0012	0.0015	0.0014	0.0004	0.0008	0.0005
35	0.0014	0.0017	0.0013	0.0008	0.0008	0.0008
40	0.0019	0.0021	0.0014	0.0012	0.0014	0.001
45	0.0033	0.0036	0.002	0.0021	0.0018	0.0014
50	0.0067	0.0063	0.0038	0.0036	0.0039	0.0023
55	0.0126	0.0117	0.0068	0.0064	0.0063	0.0039
60	0.0195	0.0166	0.01	0.0103	0.0092	0.0057
65	0.0229	0.02	0.0136	0.0132	0.015	0.0096
70	0.0343	0.0302	0.022	0.0226	0.0181	0.0205
75	0.0492	0.0428	0.0355	0.0397	0.0327	0.0296
80	0.0756	0.0666	0.0624	0.0668	0.0602	0.064
85	0.1171	0.1106	0.1077	0.1148	0.0941	0.1044

Source: U.S. Veterans Eligibility Trends and Statistics, 2015  
 Prepared by the National Center for Veterans Analysis and Statistics

Tables 9 and 10, and Figures 7 and 8, show the life expectancy by education and income, for male and female, at ages 20, 25...85, in years 2011-2014. A male Veteran with no high school or an 'unknown education' would live, on average, 4.9, 4.3, and 2.2 less life-years at ages 25, 45, and 65, respectively, than a male Veteran who completed a college education. Similarly, a female Veteran with no high school or 'unknown education' would live, on average, 2.9, 2.7, and 1.8 less life-years at ages 25, 45, and 65, respectively. Compared to Veterans with greater than \$49,999 estimated household income, Veterans having less than \$20,000 or unknown estimated household income would, on average, live 3.9, 4.0, and 2.1 less life-years for male Veterans and live 2.2, 2.2, and 1.2 less life-years for female Veterans at ages 25, 45, and 65, respectively.

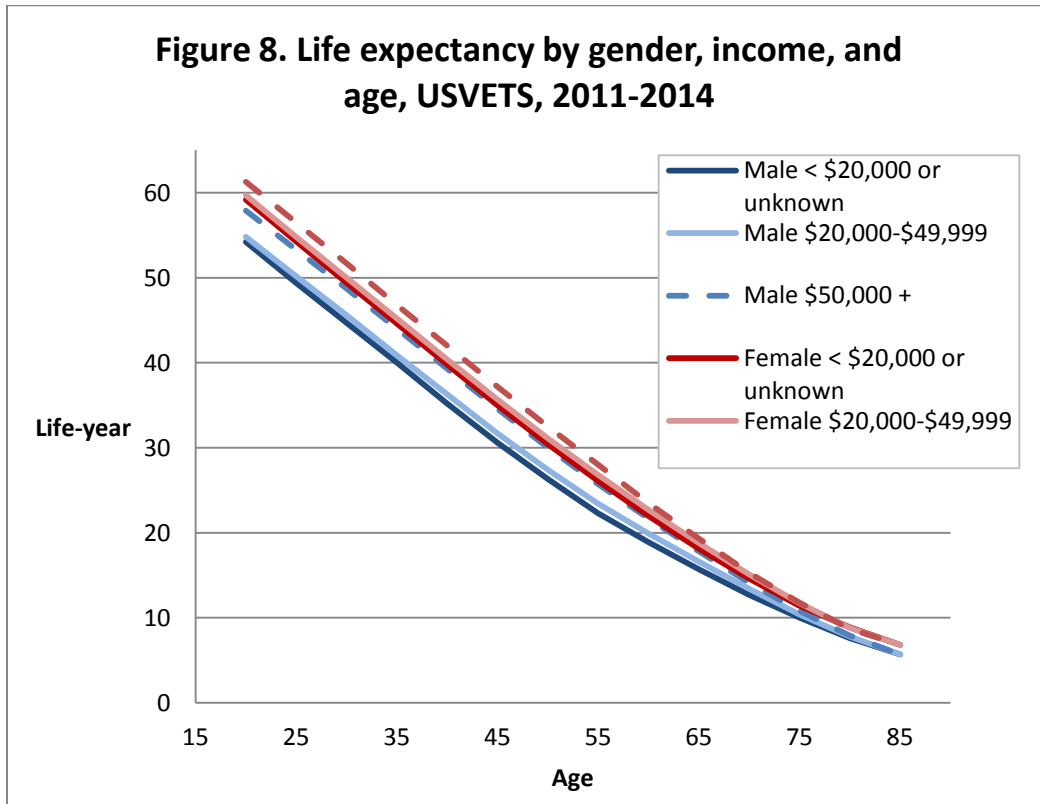


Source: U.S. Veterans Eligibility Trends and Statistics, 2015  
 Prepared by the National Center for Veterans Analysis and Statistics

**Table 9. Mortality Rate by Gender, Income and Age, USVETS, 2011-2014**

Age	Male None or unknown	Male High school	Male College+	Female None or unknown	Female High school	Female College+
20	52.9(0.03)	56.8(0.02)	58.0(0.03)	58.5(0.13)	60.1(0.10)	61.5(0.09)
25	48.4(0.03)	52.1(0.02)	53.3(0.02)	53.7(0.13)	55.2(0.10)	56.6(0.09)
30	43.8(0.03)	47.4(0.02)	48.6(0.02)	48.9(0.13)	50.3(0.10)	51.8(0.08)
35	39.2(0.02)	42.6(0.02)	43.9(0.02)	44.1(0.13)	45.5(0.10)	46.9(0.08)
40	34.6(0.02)	37.9(0.02)	39.1(0.02)	39.3(0.12)	40.6(0.10)	42.1(0.08)
45	30.1(0.02)	33.2(0.02)	34.4(0.02)	34.6(0.12)	35.9(0.10)	37.3(0.08)
50	25.8(0.02)	28.7(0.02)	29.9(0.01)	30.1(0.12)	31.2(0.10)	32.6(0.08)
55	21.9(0.02)	24.5(0.01)	25.6(0.01)	25.7(0.13)	26.8(0.10)	28.1(0.08)
60	18.6(0.02)	20.7(0.01)	21.6(0.01)	21.6(0.13)	22.5(0.10)	23.7(0.08)
65	15.5(0.02)	17.0(0.01)	17.7(0.01)	17.7(0.13)	18.5(0.10)	19.5(0.08)
70	12.5(0.02)	13.6(0.01)	14.0(0.01)	14.1(0.13)	14.8(0.10)	15.6(0.08)
75	9.8(0.01)	10.5(0.01)	10.7(0.01)	10.8(0.12)	11.5(0.09)	12.1(0.08)
80	7.5(0.01)	7.8(0.01)	7.9(0.01)	8.5(0.10)	8.7(0.08)	9.0(0.06)
85	5.7	5.7	5.7	6.8	6.8	6.8

Source: U.S. Veterans Eligibility Trends and Statistics, 2015  
 Prepared by the National Center for Veterans Analysis and Statistics



Source: U.S. Veterans Eligibility Trends and Statistics, 2015  
 Prepared by the National Center for Veterans Analysis and Statistics



**Table 10. Life Expectancy by Gender, Income and Age, USVETS, 2011-2014**

Age	Male < \$20,000 or unknown	Male \$20,000- \$49,999	Male \$50,000 +	Female < \$20,000 or unknown	Female \$20,000- \$49,999	Female \$50,000 +
20	54.2(0.03)	54.8(0.03)	57.9(0.03)	59.2(0.11)	59.7(0.10)	61.3(0.10)
25	49.4(0.03)	50.2(0.03)	53.3(0.02)	54.3(0.11)	54.8(0.10)	56.5(0.09)
30	44.7(0.02)	45.6(0.02)	48.7(0.02)	49.4(0.11)	50.0(0.10)	51.7(0.09)
35	40.0(0.02)	40.9(0.02)	44.0(0.02)	44.6(0.11)	45.2(0.10)	46.8(0.09)
40	35.2(0.02)	36.3(0.02)	39.3(0.01)	39.8(0.11)	40.4(0.10)	42.0(0.09)
45	30.6(0.02)	31.7(0.02)	34.6(0.01)	35.0(0.11)	35.7(0.10)	37.2(0.09)
50	26.3(0.02)	27.4(0.02)	30.0(0.01)	30.4(0.11)	31.1(0.10)	32.5(0.09)
55	22.3(0.02)	23.4(0.02)	25.7(0.01)	26.1(0.11)	26.8(0.10)	28.0(0.09)
60	18.9(0.02)	19.9(0.01)	21.7(0.01)	22.0(0.11)	22.7(0.10)	23.5(0.09)
65	15.7(0.02)	16.6(0.01)	17.8(0.01)	18.1(0.11)	18.8(0.10)	19.3(0.10)
70	12.7(0.02)	13.4(0.01)	14.1(0.01)	14.6(0.11)	15.1(0.10)	15.3(0.10)
75	10.0(0.01)	10.4(0.01)	10.8(0.01)	11.4(0.10)	11.7(0.09)	11.8(0.09)
80	7.6(0.01)	7.8(0.01)	7.9(0.01)	8.9(0.08)	8.8(0.07)	8.7(0.08)
85	5.7	5.7	5.7	6.8	6.8	6.8

Source: U.S. Veterans Eligibility Trends and Statistics, 2015  
 Prepared by the National Center for Veterans Analysis and Statistics

## Discussion

The study added 1,344,350 records without separation date to the analysis. The additional records have a median age of 52 based on a January 1, 1980 separation date. This will inflate only a small amount of the total of person-years because not too many of them would have actually separated after that date. By adding this older group in Analysis 2, the mortality rates were a little reduced at older ages 80+, both males and females, but still higher than those of U. S. population in Table 3 and Figure 1. The unexpected higher mortality rates may be because many Veterans come to VA for benefits only such as compensation, health care, and burial. Other reasons could be that the data has not fully accounted for Veterans who (1) never used VA medical facilities, or (2) never enrolled in VA benefit programs. In addition, the government may have been less attentive collecting Veterans information in earlier decades. The missing Veterans in records would generally be thought older and healthier.

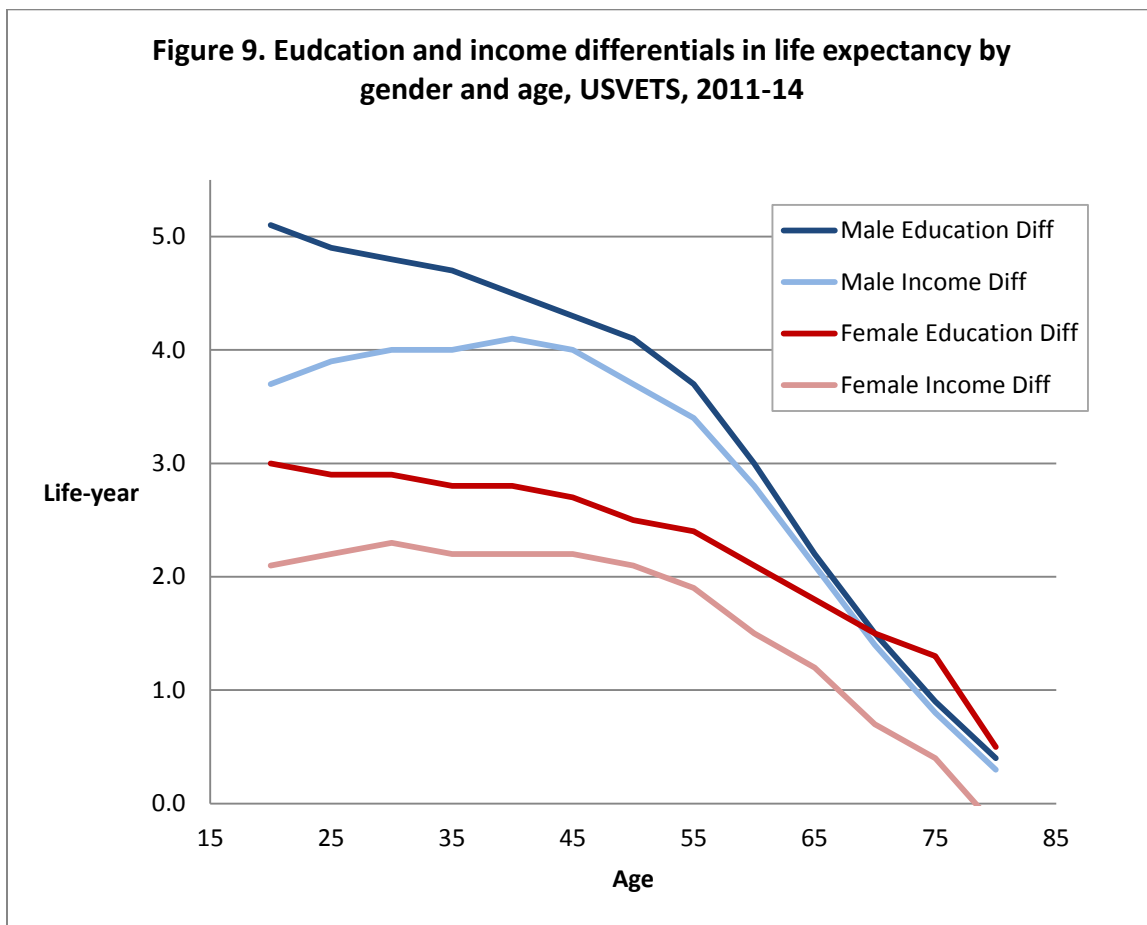
The education differentials in life expectancy of 4.9, 4.3, and 2.2 life-years for male and 2.9, 2.7, and 1.8 life-years for female Veterans in 2011-14, in Figure 9, are close to those of the U. S. population in years 1979-89 at ages 25, 45, and 65, respectively (3):

- 5.4, 4.0, and 2.3 life-years for non-Hispanic White males,
- 6.7, 4.7, and 2.6 life-years for non-Hispanic Black males,
- 2.8, 2.5, and 1.5 life-years for non-Hispanic White females, and
- 5.9, 4.6, and 2.0 life-years for non-Hispanic Black females.

The income differentials in life expectancy of 3.9, 4.0, and 2.1 life-years for male and 2.2, 2.2, and 1.2 life-years for female Veterans in 2011-14, in Figure 9, are smaller compared to U. S. population in years 1979-89 at ages 25, 45, and 65, respectively (3):

- 7.9, 6.9, and 3.3 life-years for non-Hispanic White males,
- 8.6, 7.8, and 2.8 life-years for non-Hispanic Black males,
- 3.3, 3.0, and 0.9 life-years for non-Hispanic White females, and
- 5.0, 3.5, and 0.9 life-years for non-Hispanic Black females.

The gap in life expectancy at age 25 is at least 4 life-years smaller for male Veterans and 1.1 life-years smaller for female Veterans.



Source: U.S. Veterans Eligibility Trends and Statistics, 2015  
 Prepared by the National Center for Veterans Analysis and Statistics

The life expectancy has changed since the 1980s. If the education and income categories are compatible, the comparison of differentials in life expectancy, which have cancelled out the differences in life expectancy over time, should be appropriate. A high school education may not represent the same level of education achievement as in the 1980s, but a person without a high school diploma will be in a much greater disadvantaged social status now compared to over 20 years ago. Therefore, the differential of without high school and with college education for Veterans now should be adjusted lower in comparing them to an earlier study of the U. S. population. Also, the differential of no high school education to above high school education including college years before graduation in the earlier study of U. S. population should be adjusted higher compared to the differential of no high school and college education in the current study. In either case, the education differential in the Veteran population is smaller than those in the U. S. population. In comparing income categories, the cut-off dollar amount of \$20,000 and \$50,000 in the estimated household income of Veterans in years 2011-14 are presumably similar to 1980 dollar amount of \$10,000 and \$25,000 for family income, respectively.

Even though the data may not be available for all categories in our comparison, we can draw some conclusions based on what we observed in the data that we have. For example, the life expectancy for the group of “none or unknown” education would have been lower if all unknown records had no high school education. Therefore, the life expectancy for Veterans without a high school education would have been smaller than the life expectancy of ‘none or unknown’ of Highest Education Completed in Table 9. Likewise, the life expectancy for Veterans with less than \$20,000 income would be smaller than those of ‘Less than \$20,000 or unknown’ of Estimated Household Income in Table 10. This is because the life expectancy for the group of unknown or less than \$20,000 income would have been shorter if all unknown had less than \$20,000 income. Hence, the education and income differentials in life expectancy would be more than those shown in Tables 9 and 10.

As the mortality rates are known to be unreliable at old age. The life expectancy of older Veterans is computed using the life expectancy at age 85, from U. S. life tables (6) which are 5.2, 5.4, and 5.7 life-years for male Veterans and of 6.6, 6.7, and 6.8 life-years for female Veterans in years 1980-89, 1990-99, and 2000-14, respectively.

## Conclusion

This report generates estimates of mortality rates and life expectancy for Veterans for ages 20 to 85, in the 10 to 15 year periods of 1980-89, 1990-99, 2000-14, and compares them to the U. S. population. The expected life-years for Veterans in the 2000 to 2014 time period are estimated to be about 0.8 and 1.2 life-years shorter for males and females, respectively, as compared to those of U. S. population in 2006. The estimated education differentials in life expectancy for Veterans in 2011-14 are close to those of U. S. population in 1979-89. The income differentials in life expectancy for Veterans in 2011-14, however, are estimated to be smaller. For example, life expectancy of male and female Veterans with household incomes less than \$20,000, at age 25, are estimated to be 3.9 and 2.2 less life-years than those of \$50,000+ income, respectively. The shortfall, on the other hand, is over 7.9 and 3.3 life-years for male and female in U. S. population, respectively.

The higher mortality rate estimated for Veterans compared to U. S. population may be explained, in part by the missing of older and healthier Veterans in administrative records. The education and income differentials in life expectancy are computed with acquired data from an external commercial vendor. The education differential is close to the U. S. population, but a smaller gap is found in life expectation by income in Veterans compared to the U. S. population.

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