HEALTHY YOLO

Our Community Our Future

Mortality in Yolo County, 2015-16

June, 2018

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EXECUTIVE SUMMARY

The leading causes of death in Yolo County for 2015 to 2016 were similar to the leading causes of death in the prior report for 2010 to 2014. Four chronic conditions—heart disease, chronic lung disease, stroke and diabetes—accounted for 995 (39%) of the 2,519 deaths in 2015 and 2016.

Heart and circulatory system disease caused almost one-third (30%) of all deaths in Yolo County in 2015 and 2016, up from 28% in the prior five-year period. Chronic heart disease represented 77% of deaths related to the circulatory system. Heart disease was also the second leading cause of premature death (death in a person aged under 75) comprising 23% of all premature deaths in 2015 and 2016, up from 20% in the previous five-year period. The County Health Rankings (http://www.countyhealthrankings.org) use 75 years as the usual life expectancy; deaths at ages younger than 75 are therefore earlier than expected or premature.

Cancer death rates remained stable, and represented a slightly lower proportion (27%) of premature deaths in the most recent period, down from 30% of premature deaths in 2010 to 2014. Nonetheless, cancer death remains the leading cause of premature death. The leading causes of site-specific cancer deaths were lung, colorectal and pancreatic cancers (19.2% of cancer deaths). The proportion of deaths due to liver cancer increased from 2.9% of cancer deaths in the prior five-year period to 5.3% in 2015 and 2016.

Almost 4% of all deaths (n=96) were due to diabetes in 2015 and 2016. The death rate due to diabetes has been edging upwards over the past ten years, increasing from 16 deaths per 100,000 persons ten year ago (in 2007) to 27 per 100,000 persons in 2016.

The number of infant deaths reached a ten-year low of 4 in 2016. The counts tend to be statistically unstable from year to year due to the low number of deaths. The higher count in 2015 (n=18) were caused by more infants born extremely premature or with birth defects. Childhood (age 1 to 14) death rates since 2013 have fallen in a significant trend to 6 deaths per 100,000 children, much lower than the state rate of 12 deaths per 100,000 in 2015. In contrast, young adult (age 15 to 24) death rates in the county increased from 17 per 100,000 persons in 2012 to 31 in 2016 due to increase in suicide and drug-related overdose.

The drug-related death rate, primarily related to accidental overdose (85%), more than doubled from 7 deaths per 100,000 persons in 2007 to 16 deaths per 100,000 in 2016, and is increasing faster than the state rate, which stood at 12 deaths per 100,000 in 2015. Seventy-one percent of the deaths in the past 10 years occurred in persons aged 35 to 64. Deaths attributed solely to opioids have decreased, whereas deaths due to mixed drug intoxication and unspecified drugs have increased.

The death rate due to suicide also rose between 2013 and 2016, increasing from 4.9 suicides per 100,000 persons in 2013 to 13.5 per 100,000 in 2016.

INTRODUCTION

The current report is an update to the 2010-2014 mortality report which reviewed deaths for the previous five years. The leading causes of death in Yolo County remained unchanged: the top three being cardiovascular disease, cancer and respiratory illness. Deaths due to female breast, lung, pancreatic and colorectal cancer remain at similar levels to the previous period 2010 to 2014. Deaths from liver cancer increased in both 2015 and 2016.

The death rate for infants (children aged under one year) increased in 2015 compared to the previous five years. This appears to be a unique occurrence in 2015 and was not repeated in 2016. Child (age 1 to 14) and young adult (age 15 to 24) death rates remain low, but there has been an upward trend in death rates for the 15- to 24-year-old age group.

Many deaths were caused by chronic conditions. We continue to monitor disparities by race-ethnicity and geographic area to highlight those persons most at risk for poorer health outcomes. These conditions can be mitigated by better management and monitoring of chronic conditions, as well improvements in the community that promote outdoor exercise, walking, and public safety.

Drug-related deaths remain a concern, and have increased over the past ten years, mirroring the opioid and drug-related death epidemic that is occurring nationwide.[1-3]

We once again analyzed the death data with respect to longevity, including data on both Years of Potential Life Lost (YPLL) before age 75 (i.e., premature death) and average life expectancy. These analyses help demonstrate racial and geographic disparities in life expectancy in Yolo County.

METHODS

Death records for 2015 and 2016 were exported to Microsoft Excel from California's Vital Records Business Information System (VRBIS), an electronic database that contains death records updated on a continuous basis. These records are submitted to the National Center for Health Statistics (NCHS), where the preliminary cause of death is validated and a final cause of death is established according to NCHS criteria. Causes of death were grouped so that ICD-10 codes for the current year mapped to the same major diagnoses as ICD-9 codes that were in use until 2012. Records were reviewed by the epidemiologist to ensure they were Yolo County residents by checking the city of residence, ZIP code and address. Addresses that did not code to specific census tracts were manually coded by the epidemiologist.

The counts of deaths by major disease category for 2010 to 2014 were updated to account for causes of death that were still pending at the time the previous report was written.[4] None of the updates changed the percentage of deaths in any of the major disease categories (Table 1).

Life expectancy by census tract was calculated using an algorithm in Excel created by Alameda County that calculates death rates and thus life expectancy for age groups 0 to 4 years, 5 to 85 years in 10-year intervals, and over 85 years, standardized to the U.S. 2000 population. Inputs for the algorithm were the estimated 2014 population from the US Census American Community Survey Table S0101 (5-year estimate), and actual deaths for the years 2012 to 2016 in Yolo County by census tract in the previously described age groups.

Population data for the purpose of calculating non-geographic rates (per 100,000 persons) were obtained from the California Department of Finance (DOF) population tables posted in 2013 at (http://www.dof.ca.gov/research/demographic/dru/index.php). In most cases, percentages were rounded to the nearest whole number for clarity and readability. Linear trends were evaluated using R-squared (ρ^2), the coefficient of determination, with values >0.70 suggesting a significant linear trend. Ninety-five percent confidence intervals (95% CIs) for rates were calculated according to Szklo and Nieto.[5] No age adjustment was made for Yolo County rates, unless specified.

Geographic population data at the census tract level was sourced from the latest US Census American Community Survey (ACS) five-year estimates (2012-2016), Table S0101, which was published in December 2017 at http://www.factfinder.census.gov. These rates were not adjusted for age due to the small number of residents in census tracts (2,000 to 8,600 in Yolo County).

LEADING CAUSES OF DEATH

The leading cause of death was disease related to the circulatory system and heart, accounting for close to one-third of Yolo County deaths in 2015-16, a slightly higher percentage than in 2010-2014 (Table 1). Cancer represented the second most common cause of death with 22% of all deaths in 2015 and 2016, similar to the previous five years. Diseases of the respiratory system (primarily chronic lung disease) and diseases of the nervous system (primarily Alzheimer's and dementia) were the third and fourth leading causes of death, with similar percentages to the previous five years.

Table 1. Leading Causes of Death in Yolo County, 2010-2014 vs. 2015-2016.

Cause of Death	No. 2010-2014	Ranking	% 2010-2014	No. 2015	% in 2015	No. in 2016	% in 2016
Diseases of circulatory system incl. heart	1678	1	28%	379	30%	377	30%
Cancer (all types)	1434	2	24%	273	22%	284	22%
Diseases of respiratory system	709	3	12%	133	11%	136	11%
Diseases of nervous system	527	4	9%	136	11%	117	9%
All other causes	1590	n/a	27%	322	26%	362	28%
Total	5938			1243		1276	

Table 2. Grouped Causes of Death in Yolo County, 2010-2014 vs. 2015 and 2016.

ICD-10 Code	Cause of Death Category	No. 2010-2014	No. 2015	No. 2016
A00-B99	Infectious (incl. TB)/parasitic diseases	131	26	22
C00-D48	Cancer (all types)	1434	273	284
D50-D89	Disorders of blood and immune system	18	<5	<5
E00-E88	Endocrine, nutritional and metabolic incl. diabetes	274	51	72
F01-F99	Mental & behavioral disorders	192	32	50
G00-G98	Diseases of nervous system	527	136	117
H00-H93	Eye/ear diseases	<5	0	0
I00-I99	Diseases of circulatory system incl. heart	1678	379	377
J00-J98, U04	Diseases of respiratory system	709	133	136
J09-J22, U04	*Pneumonia/influenza/lower respiratory**	*165*	*21*	*27*
K00-K92	Diseases of digestive system	295	60	55
L00-L98	Diseases of skin/subcutaneous tissue	11	<5	<5
M00-M99	Diseases of musculoskeletal system incl. autoimmune	51	9	5
N00-N98	Diseases of genitourinary system	79	12	23
O00-O99	Pregnancy, childbirth & puerperium	<5	0	0
P00-P96	Conditions occurring in perinatal period	20	9	<5
Q00-Q99	Congenital (birth) defects	26	5	6
R00-R99	Conditions of infancy not elsewhere classified	40	18	<5
U01-03, V01-Y89	External causes of mortality incl. motor vehicle (MV) accidents, suicide, homicide	449	94	117
	Total	**5938**	**1243**	**1276**

**ICD-10 codes J09-J22, U04 (subset of diseases of the respiratory system)*

MORTALITY DEMOGRAPHICS

Similar numbers of men and women die each year (Table 3). The majority of deaths (73% and 78% in 2015 and 2016, respectively) were among non-Hispanic White residents (Table 4). About three-quarters of deaths in 2015 and 2016 were to persons aged 65 or older (Table 5).

Table 3. Deaths by Sex, 2010-2015.

Sex	2010	2011	2012	2013	2014	2015	2016
Male	580	557	604	619	605	652	649
Female	573	582	632	606	581	591	627

Table 4. Deaths by Race-Ethnicity, 2010-2016.

Race-Ethnicity	2010	2011	2012	2013	2014	2015	2016
Am Ind/AN**	8	12	<5	8	6	13	7
Asian/Pac Isl†	59	40	58	57	56	77	91
Black	26	39	26	38	27	27	36
Hispanic	168	185	193	177	200	190	220
Other	17	14	14	13	15	20	18
White	873	845	935	930	882	913	901
Unknown	2	4	<10	3	0	3	3
Total	1153	1139	1236	1226	1186	1243	1276

***American Indian/Alaska Native*

†Pacific Islander

Table 5. Deaths by Age Group, 2010-2016.

Age Group	2010	2011	2012	2013	2014	2015	2016
0-14	10	9	10	13	14	21	6
15-24	13	11	8	11	12	12	14
25-34	14	8	15	29	21	31	26
35-64	271	270	297	286	272	274	233
>64	845	841	906	887	864	917	997
Total	1153	1139	1236	1226	1184	1243	1276

INFANT, CHILD AND YOUNG ADULT MORTALITY

There was an uptick in infant deaths (children aged under 1 year) in 2015 with a significant increasing trend from 2011 to 2015 (ρ^2=0.73). Over the previous five years, on average nine deaths per year occurred, but there were 18 deaths in 2015 and a corresponding increase in the death rate (Table 6 and Figure 1). About one-third of the 2015 deaths were in infants aged more than 28 days old (defined as postneonatal) and more than half resided in Woodland. They occurred throughout the year (1 to 3 per month). Nine (50%) were from causes related to prematurity (an infant born at <37 weeks gestation), four related to birth defects, and four were of undetermined cause. The number of infant deaths in 2016 (n=4) dropped to below historical norms, so it appears 2015 was an exception.

Table 6. Infant (Age <1) Death Rates (per 1,000 Live Births).

Year	2010	2011	2012	2013	2014	2015	2016
Death rate	3.3	2.6	4.0	3.2	4.6	7.8	1.7
Live births	2425	2338	2473	2513	2409	2315	2420

Figure 1. Infant Death Rates per 1,000 Live Births, Yolo County 2007-2016.

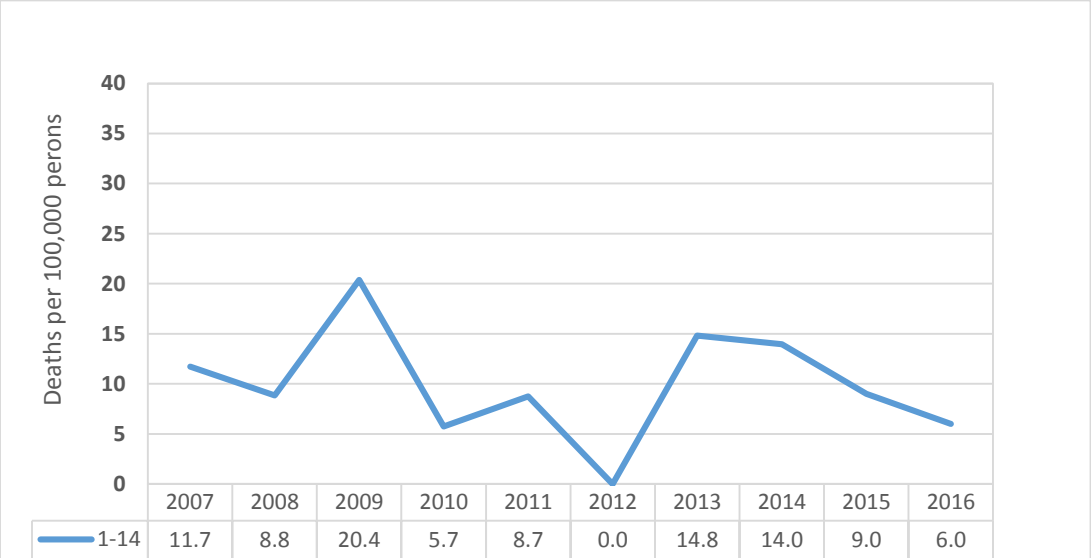
Childhood deaths (age 1 to 14) remained low as in previous years with only two deaths in 2016. The childhood death rate of 6.0 per 100,000 children in 2016 (Table 7 and Figure 2) was lower than the rate in the prior three years. There was a significant decreasing linear trend between 2013 and 2016.

Table 7. Child (Age 1 to 14) Death Rates per 100,000 Population.

Year	2010	2011	2012	2013	2014	2015	2016
Death rate	5.7	8.7	0.0	14.8	14.0	9.0	6.0
Population size*	34,856	34,313	34,066	33,753	35,817	33,334	33,420

**From the California Department of Finance.*

Figure 2. Child (age 1 to 14) Death Rates per 100,000 Persons, Yolo County 2007-2016.



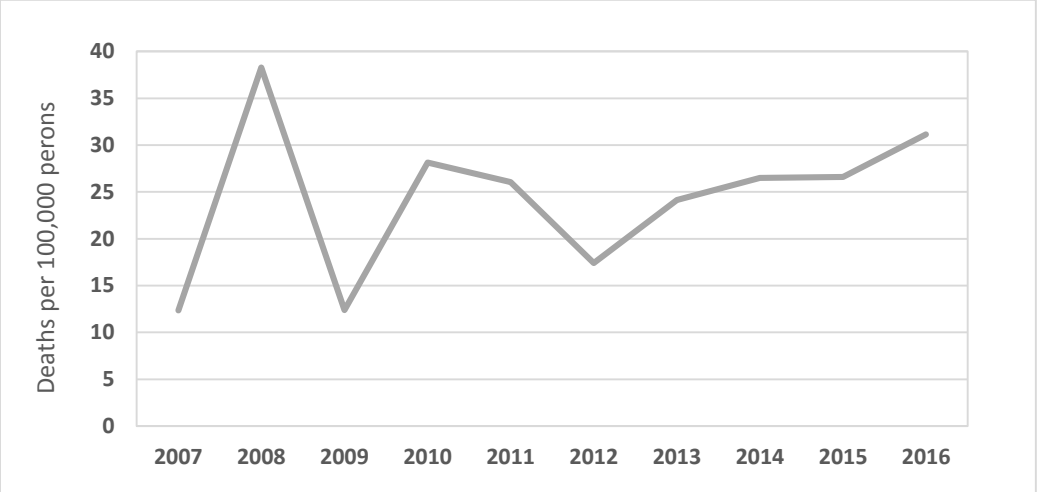
The young adult death rate (age 15 to 24) demonstrated a significant increasing linear trend from 2012 to 2016 with ρ^2=0.89 (Table 8 and Figure 3), although it has not reached the peak of 2008.

Table 8. Young Adult (Age 15 to 24) Death Rates per 100,000 Population.

Year	2010	2011	2012	2013	2014	2015	2016
Death rate	28.1	26.0	17.4	24.1	26.5	26.6	31.1
Population size*	46,212	46,078	45,931	45,552	45,305	45,100	44,953

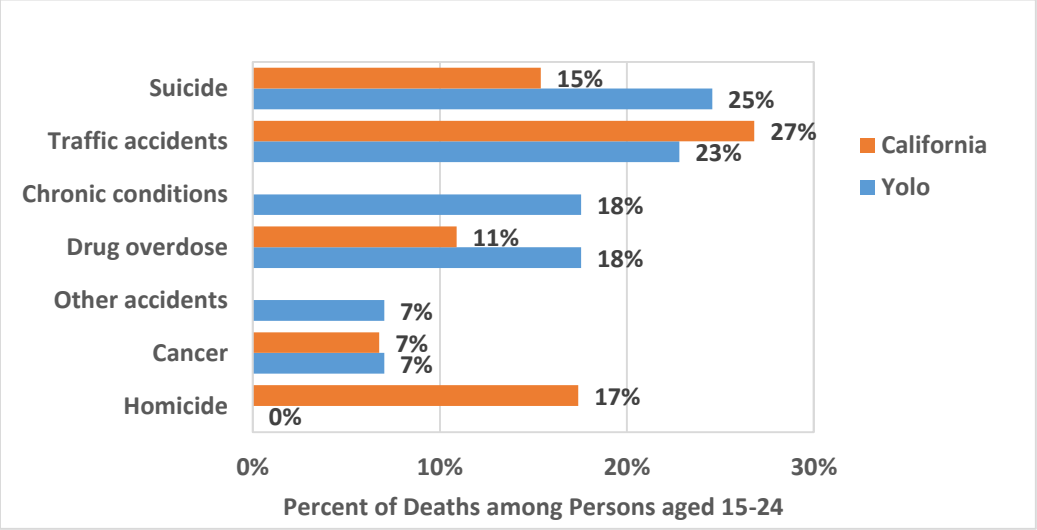
**From the California Department of Finance.*

Figure 3. Young Adult (age 15 to 24) Death Rates per 100,000 Persons, Yolo County 2007-2016.



Further investigation of the 57 young adult deaths from 2012 to 2016 revealed the three top causes of death were suicide (n=14), traffic accidents (n=13), drug overdose (n=10) and other chronic conditions (n=10), such as diabetes, autoimmune disease, heart disease, stroke, epilepsy and congenital defects (Figure 4).

Figure 4. Leading Causes of Young Adult Death (age 15 to 24), Yolo County vs. California 2012-2016.



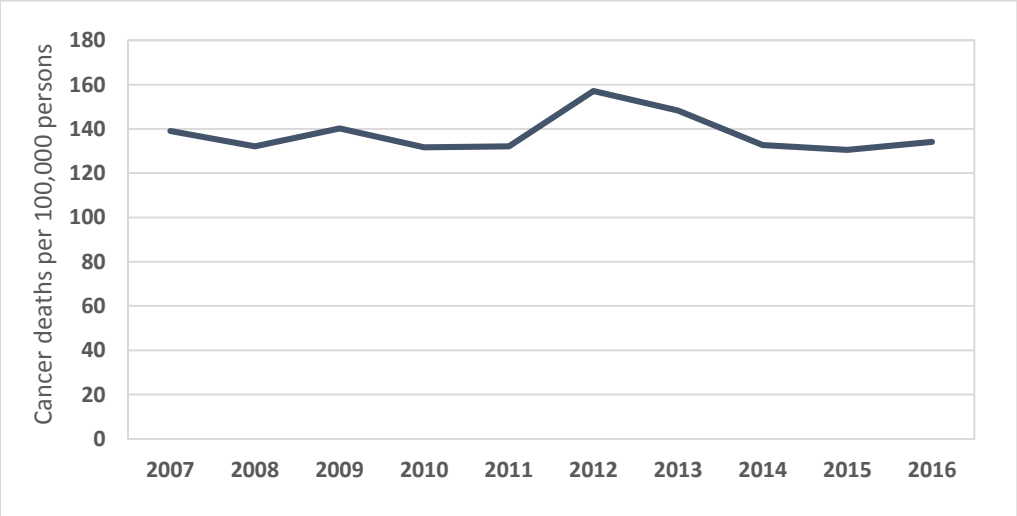
CANCER MORTALITY

In the previous five years (2010-2014), on average 287 cancer deaths occurred per year. There were 273 cancer deaths in 2015 and 284 in 2016, with no significant trend in cancer rates since 2007 (Figure 5). The leading cause of cancer death (Table 9) for 2015 and 2016 combined was lung cancer, which caused about one in five cancer deaths. The other top causes of cancer death for the same two-year period were unspecified cancer site (8%), colorectal cancer (7%), pancreatic cancer (7%) and breast cancer site (6%). Compared to the previous five years, only unspecified cancer site and colorectal cancer reversed their positions from ranks of three and two, respectively. The percentage of deaths from liver cancer in 2015 and 2016 (n=31, 5.6% of all cancer deaths) almost doubled compared to the previous five years, and now ranks seven up from eight in the leading causes of cancer death.

Table 9. Leading Causes of Cancer Death, 2010-2014 vs. 2015 and 2016.

Cancer Site	No. 2010-2014	% of 2010-2014 Cancer Deaths	Rank 2015-2016	No. 2015	% in 2015	No. 2016	% in 2016
Cancer-lung/tracheal	290	20.2%	**1**	64	23.4%	54	19.0%
Cancer-other unspecified	111	7.7%	**2**	19	7.0%	23	8.1%
Cancer-colorectal	113	7.8%	**3**	21	7.7%	19	8.0%
Cancer-pancreatic	106	6.8%	**4**	22	8.1%	16	5.6%
Cancer-breast (female)	90	6.3%	**5**	14	5.1%	20	7.0%
Cancer-prostate	75	5.2%	**6**	17	6.2%	15	5.3%
Cancer-liver	42	2.9%	**7**	16	5.9%	15	5.3%
Cancer-non-Hodgkin's lymphoma	51	3.6%	**8**	12	4.4%	7	2.3%

Figure 5. Yolo County Cancer Deaths per 100,000 persons (unadjusted for age), 2007-2016.



Cancer death rates were higher than the county average for American Indians and Whites, and lower for Asians, Blacks, Hispanics and persons of other or mixed race (Table 10).

Table 10. Cancer Death Rates by Race-Ethnicity, 2015-2016.

Race-Ethnicity	Deaths per 100,000 Persons
Am Ind/AN*	259
Asian/Pac Isl†	58
Black	94
Hispanic	73
Other	46
White	197
Unknown	ND
Total	132

**American Indian/Alaska Native*
†Pacific Islander

MORTALITY DUE TO CHRONIC DISEASE

The top four causes of chronic disease deaths accounted for 2799 (38%) of the 7304 deaths in the county from 2011 to 2016. The leading cause of death due to chronic disease was heart disease (Table 11), which is a subset of deaths caused by diseases of the circulatory system, the leading cause of death in the county. In 2015 and 2016, 585 (77%) of the 756 deaths due to diseases of the circulatory system were from chronic heart conditions.

Table 11. Number of Deaths due to Chronic Disease, Yolo County 2011-2016.

Cause of Death of Category	2011	2012	2013	2014	2015	2016	Average/year
Chronic lung disease	99	90	77	80	88	80	86
Diabetes	45	39	40	45	38	58	44
Heart disease	225	256	289	261	296	289	269
Stroke	57	74	61	64	69	77	67
Alcoholic cirrhosis	20	15	23	24	24	22	21
Obesity/osteoporosis	5	7	5	6	5	<5	5

Death rates due to heart disease were higher than the county average for Whites, and lower for Asians, Hispanics and persons of other or mixed race (Table 12).

Table 12. Heart Disease* Death Rates by Race-Ethnicity, 2015-2016.

Race-Ethnicity	Deaths per 100,000 Persons
Am Ind/AN**	129
Asian/Pac Isl†	52
Black	133
Hispanic	59
Other	20
White	192
Unknown	ND
Total	124

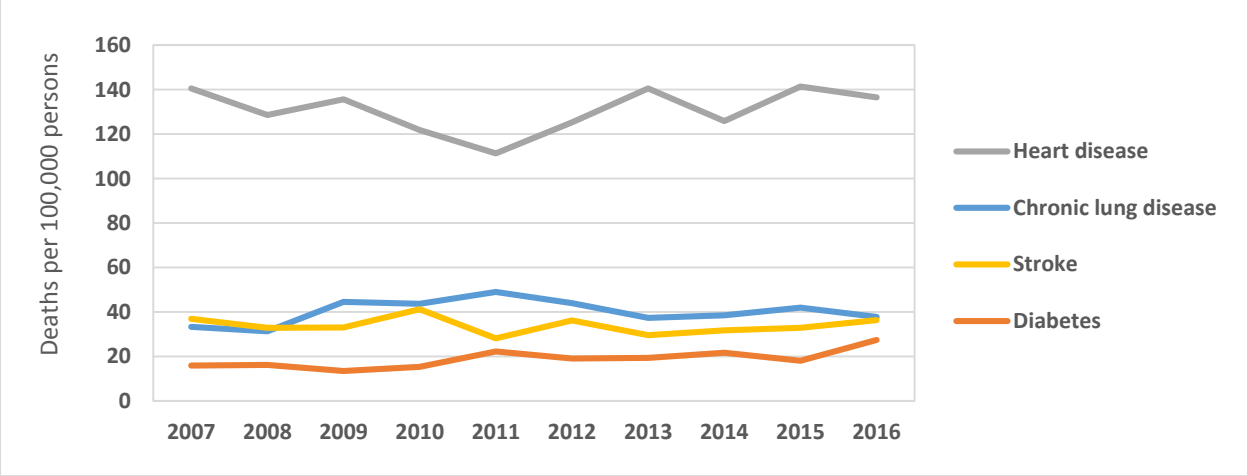
**ICD10 codes I00-I09, I11, I13, I20-I51 (CDC definition)*

***American Indian/Alaska Native*

†Pacific Islander

There were no upward or downward trends in rates due to the top causes of chronic disease death (Figure 6), although the death rate for diabetes has risen over time from 16 deaths per 100,000 persons in 2007 to 27 per 100,000 in 2016.

Figure 6. Death Rates per 100,000 Persons due to Chronic Disease, 2007-2016 (Unadjusted for Age).



DRUG-RELATED MORTALITY

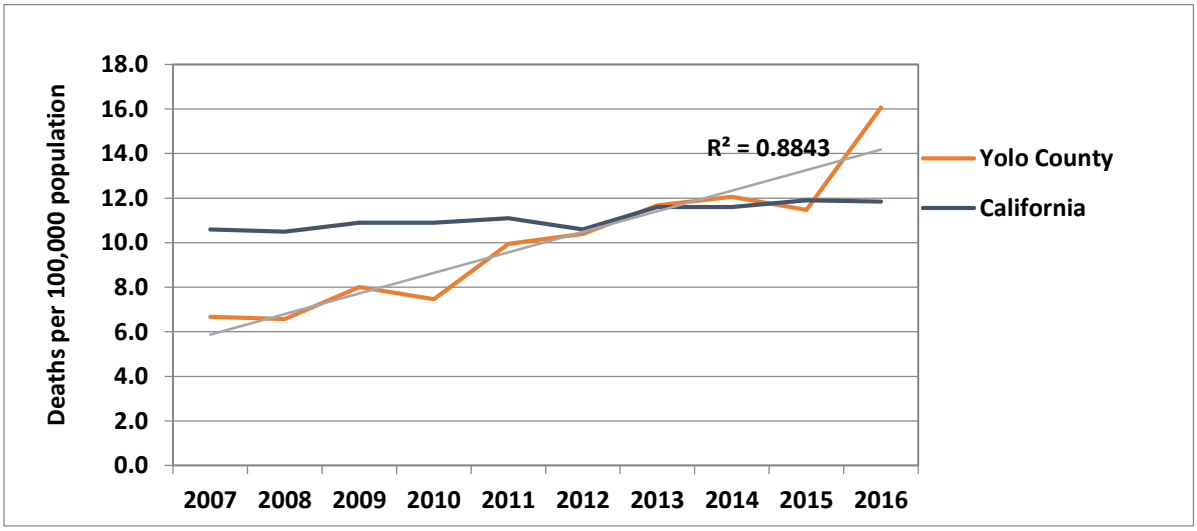
A drug-related death was defined as a death caused by drug intoxication with accidental, intentional (self-inflicted) or undetermined intent. The corresponding ICD10 codes are X41-X44, X61-X64, and Y11-Y14, respectively. The majority of Yolo County drug-related deaths from 2007 to 2016 (175 out of 205, 85%) were from accidental poisoning (i.e., overdose), and more than half involved multidrug intoxication. Among the 175 overdoses, n=31 (18%) were due to barbiturates, psychotropics and antiepileptics; n=64 (37%) were due to opiates, narcotics and psychodysleptics; and n=80 (46%) were due to other or unspecified drugs and biologicals. A separate report entitled Drug-Related Deaths in Yolo County, 2007-2015[6] provides an in-depth analysis of drug-related death in the county.

The cumulative drug-related death rate for the most recent five-year period 2012 to 2016 increased significantly to 12.4 deaths per 100,000 persons (10.3-14.8, 95% CI), up from 7.7 per 100,000 (6.1-9.8, 95% CI) in the previous five-year period (2007 to 2011). Compared to ten years ago, the death rate more than doubled from 7 to 16 deaths per 100,000 persons in 2007 and 2016, respectively (Table 13). It now exceeds the state rate. Furthermore, there was a significant upward linear trend in the drug-related death rate, mirrored at the state level, from 2007 to 2016 (ρ^2=0.88) (Figure 7). The average number of drug-related deaths increased from 15 per year between 2007 and 2011 to 26 per year between 2012 and 2016.

Table 13. Drug-Related* Deaths and Rates (per 100,000 persons), Yolo County 2007-2016.

Description	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Yolo County Deaths	13	13	16	15	20	21	24	25	24	34
Yolo County Rate	6.7	6.6	8.0	7.5	9.9	10.4	11.7	12.1	11.5	16.1
California Deaths	3848	3859	4042	4049	4177	4029	4451	4515	4652	4649
California Rate	10.6	10.5	10.9	10.9	11.1	10.6	11.6	11.6	11.9	11.8

Figure 7. Drug-Related Death Rates per 100,000 Persons, Yolo County vs. California, 2007-2016.



**A drug-related death included any death coded with ICD-10 X41-X44, X61-X64, and Y11-Y14.*

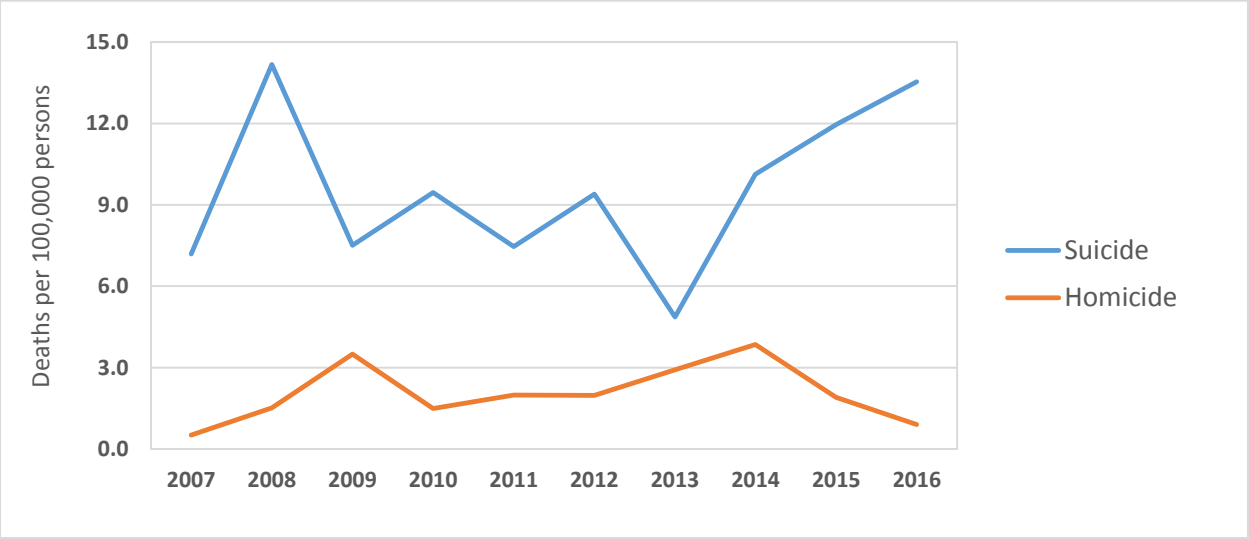
SUICIDE AND HOMICIDE

The suicide rate in Yolo County has been trending upward (ρ^2=0.91) in the past four years (2013 to 2016), after holding stable at the end of the 2000 decade (Table 14 and Figure 8). In contrast, homicide rates remain low and have fluctuated little in the past ten years.

Table 14. Suicide and Homicide Cases and Rates (per 100,000 persons), Yolo County 2007-2016.

Cause of Death or Rate	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Suicide	14	28	15	19	15	19	10	21	25	30
Suicide Rate	7.2	14.2	7.5	9.5	7.5	9.4	4.9	10.1	12.0	13.5
Homicide	1	3	7	3	4	4	6	8	4	2
Homicide Rate	0.5	1.5	3.5	1.5	2.0	2.0	2.9	3.9	1.9	0.9

Figure 8. Suicide and Homicide Rates per 100,000 Persons, Yolo County 2007-2016.



The increase in suicides is mainly reflected by more deaths in the 35- to 64-year-old age group, men, and Non-Hispanic Whites (Table 15).

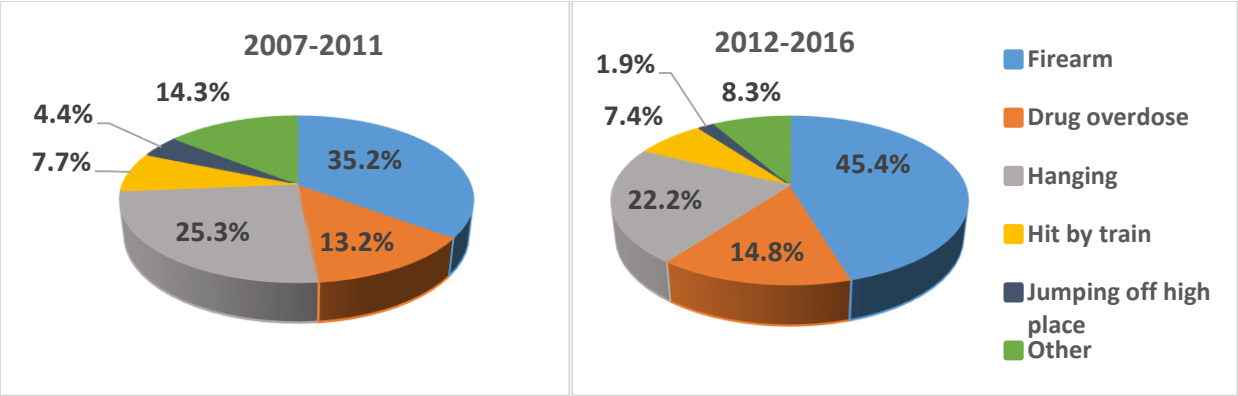
Table 15. Suicide Rates by Age (excluding <15) and Race-Ethnicity, Yolo County 2007-11 vs. 2012-16.

Demographics	2007-2011			2012-2016		
Age	**Suicides**	**Rate per 100,000**	**95% CI**	**Suicides**	**Rate per 100,000**	**95% CI**
15-34	26	6.9	4.5-10.2	29	6.7	5.2-11.2
35-64	55	16.2	12.0-21.4	69	17.2	14.5-23.5
65+	10	10.4	5.0-19.2	10	8.5	4.1-15.6
Sex						
Male	67	13.8	10.6-17.9	90	17.8	14.4-22.1
Female	24	4.7	3.0-7.0	18	3.4	2.0-5.3
Race-Ethnicity						
Asian/Pac Isl†	8	6.0	2.3-11.8	12	8.7	4.5-15.3
Hispanic	13	4.4	2.3-7.5	5	1.6	0.5-3.6
Other*	7	11.6	4.6-23.8	8	11.1	4.8-21.8
NH-White	63	12.4	9.6-16.2	84	16.5	13.0-20.4

†Pacific Islanders
**American Indian, Black, Other/2+ races*

The top three methods of suicide in the past 10 years were firearms (n=81, 41%), hanging (n=47, 24%) and drug overdose (n=28, 14%) (Figure 9). There were few changes in methods comparing the two five-year periods, other than an increase in the use of firearms (from 35% of deaths in 2007-2011 to 45% of deaths in 2012-2016) and a decrease in other methods (from 14% of deaths in 2007-2011 to 8% in 2012-2016).

Figure 9. Method of Suicide, Yolo County 2007-11 vs. 2012-16.



PREMATURE DEATH

Of the 2519 deaths that occurred in 2015 and 2016, 1079 (43%) were premature, i.e., in persons under the age of 75 (Table 16).[7] Half of premature deaths were due to just two causes: cancer (27%) and diseases of the circulatory system and heart (23%). A slightly lower percentage of premature deaths in 2015 and 2016 were due to cancer than during the previous five years (27% in 2015-16 vs. 30% in 2010-14) and a slightly higher percentage due to diseases of the circulatory system. The third leading cause of death—external causes, which includes motor vehicle accidents, falls, homicides and suicides—edged up from 14% of premature deaths in the prior five-year period to 16% in 2015 and 2016.

Table 16. Leading Causes of Premature Death in Yolo County, 2010-2016.

Cause of Death for Premature Death*	No. 2010-2014	Ranking	% of 2010-14 Deaths	No. 2015-16	% of 2015-16 Deaths
Cancer (all types)	759	1	30%	296	27%
Diseases of circulatory system incl. heart	500	2	20%	251	23%
External causes of mortality**	354	3	14%	176	16%
Diseases of respiratory system	226	4	9%	80	7%
All other causes	664	n/a	26%	276	26%
Total	2503			1079	

**Death at age less than 75 years old.*

***Accidents (including motor vehicle), falls, drug overdose, homicide and suicide.*

LIFE EXPECTANCY

Two measures were used to assess longevity. The first, Years of Potential Life Lost (YPLL), assumes that a premature death occurs before age 75. To determine the YPLL for each death, the difference between 75 and the age at death is calculated. For example, a person who died at age 50 would have a YPLL score of 25. All persons who died at age 75 and up get a score of 0. Then rates per 100,000 persons can be calculated to compare different characteristics or geographies. The lower the YPLL rate, the older the age at death. Therefore, lower YPLL rates are positive and indicate people are living longer.

The second measure uses a complex algorithm in Excel to calculate death rates in 10-year age strata across the life span and thereby estimates the expected age at death of the average resident in a census tract. The youngest (0 to 4) and oldest (85 and up) age groups have separate strata in this algorithm. The algorithm takes into account the underlying age composition of the population, so it should be considered an age-adjusted measure, whereas YPLL (as calculated here) is not.

The YPLL rate for Yolo County deaths was 4731 per 100,000 persons in 2015 and 4137 per 100,000 in 2016. Table 17 and Figures 10 and 11 show that American Indian, Black, Non-Hispanic White and Pacific Islander residents were more likely to die at younger ages. In contrast, Asian and Hispanic residents were least likely to die prematurely. It should be noted that the low population of American Indians and Pacific Islanders render the estimates unstable and subject to large swings from year to year.

Table 17. Years of Potential Life Lost (YPLL) per 100,000 Persons by Race-Ethnicity, 2015 and 2016.

Race-Ethnicity	YPLL 2015	Est'd Population (CA DOF 2015)	YPLL per 100K 2015	YPLL 2016	Est'd Population (CA DOF 2016)	YPLL per 100K 2016
Am Ind/AN*	187	1,149	16275	62	1,196	5184
Asian	638	26,797	2381	683	28,109	2430
Black	334	6,251	5343	320	5,026	6367
Hispanic	2459	64,631	3805	2128	66,917	3180
Other/mixed	41	7,505	546	289	7,504	3851
Pacific Islander	80	855	9357	73	946	7717
White	5863	102,010	5747	5231	102,641	5147
Yolo County	9898	209,198	4731	8803	211,339	4137

**American Indian/Alaska Native*

Figure 10. Years of Potential Life Lost per 100,000 Persons by Race-Ethnicity, Yolo County 2015.

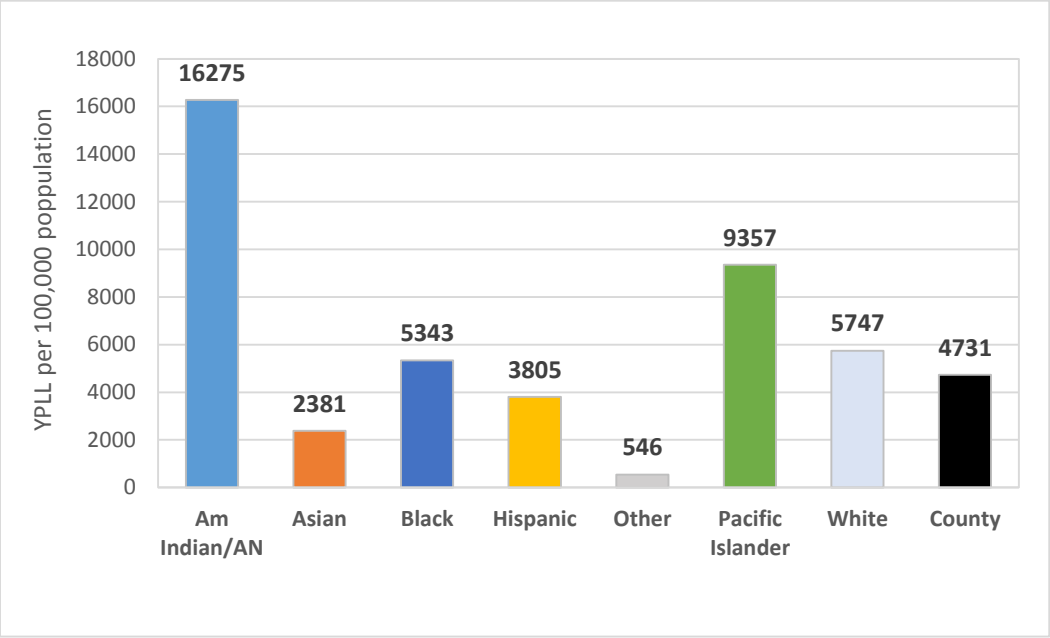
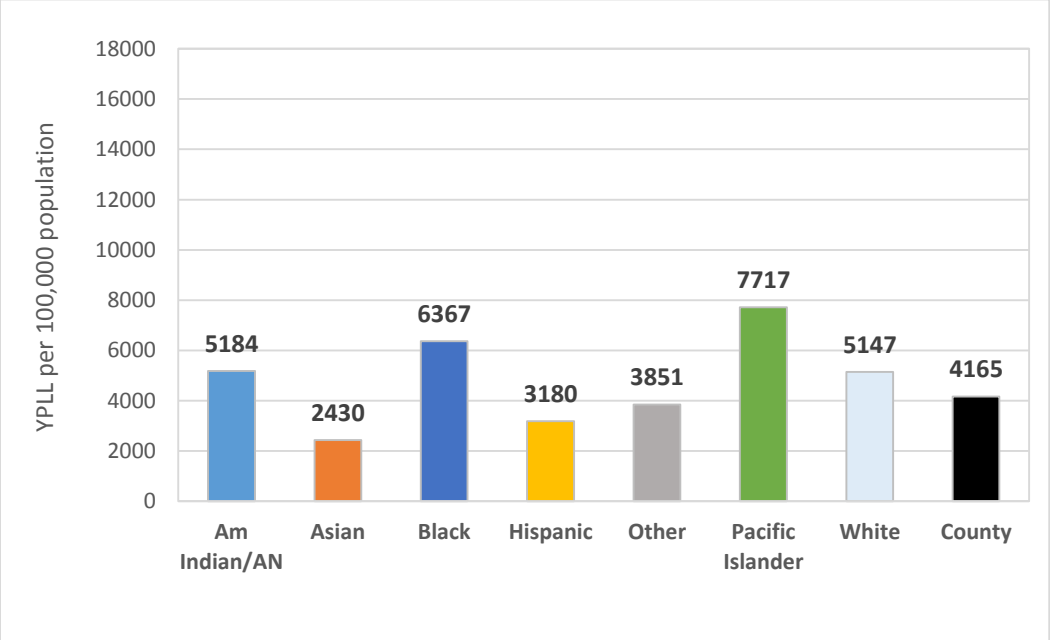
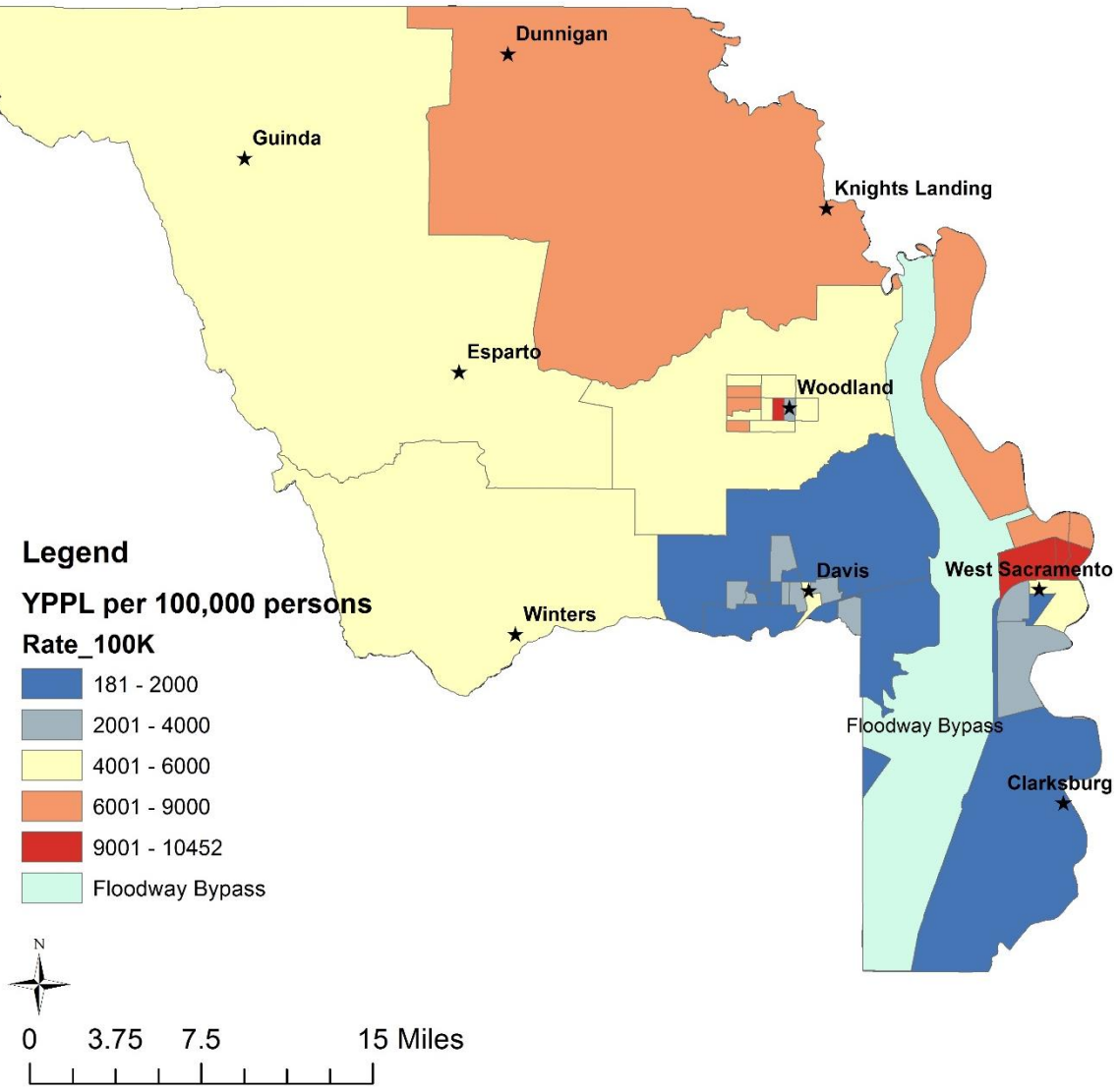


Figure 11. Years of Potential Life Lost per 100,000 Persons by Race-Ethnicity, Yolo County 2016.



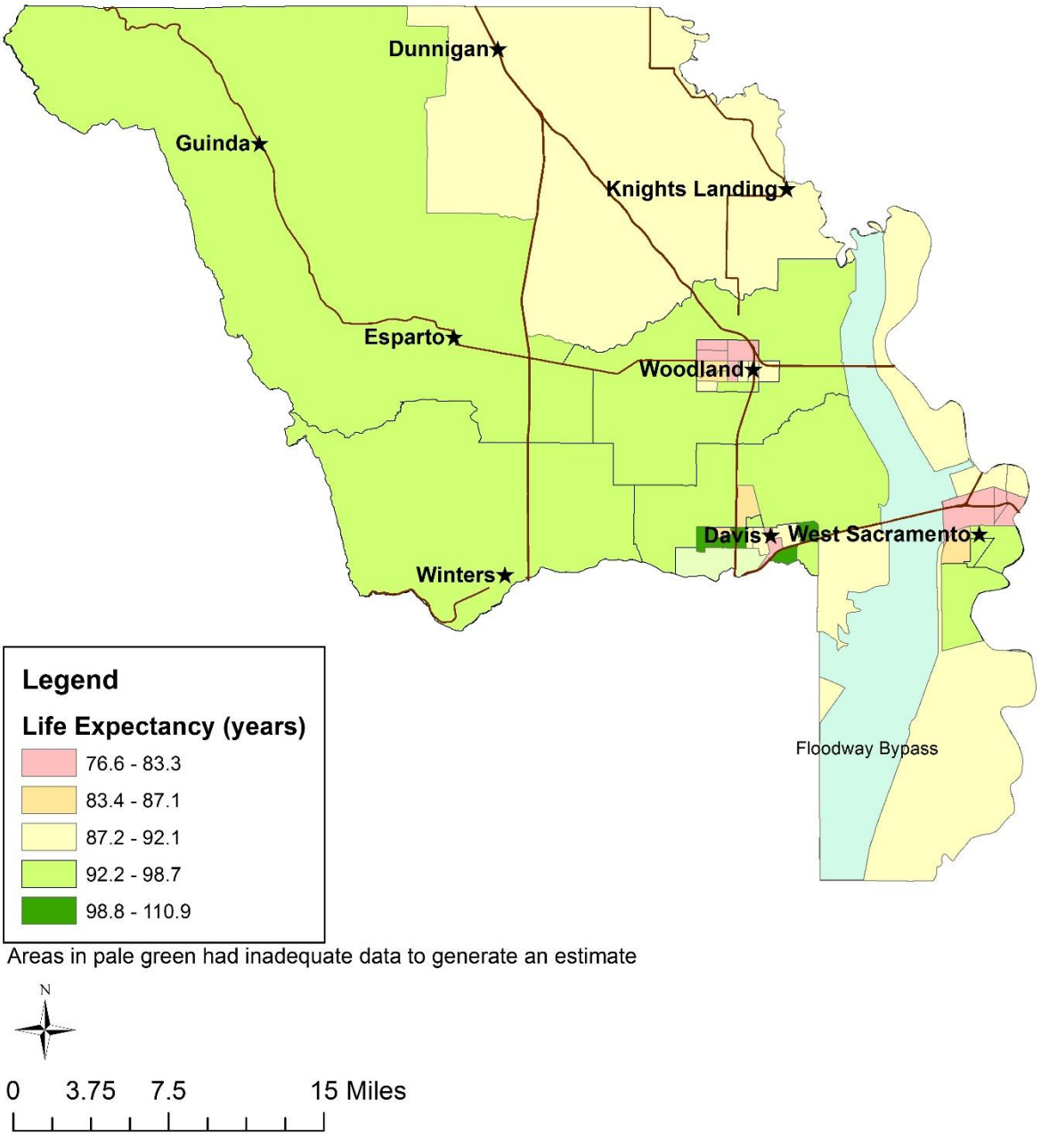
As was demonstrated in the prior report for 2010 to 2014, Figure 12 shows that more residents die at a younger age in northeastern areas of the county, in north-central areas of the city of West Sacramento, and in western and central areas of the city of Woodland than in other regions. In contrast, the northwestern region of the county and the cities of Davis and Winters have low rates of premature death.

Figure 12. Years of Potential Life Lost per 100,000 Persons by Census Tract, Yolo County 2015-2016.



Life expectancy (LE) was lowest in West Sacramento census tracts 102.01 (LE 82.1 years) and 102.03 (LE 76.6 years), census tracts 108, 109.01, 109.02 (LE 81.0 to 82.8 years) to the north of Woodland, and tract 106.02 (LE 81.0 years) in Davis.

Figure 13. Life Expectancy by Census Tract, Yolo County 2012-2016.



SUMMARY AND CONCLUSIONS

The leading causes of death in Yolo County for 2015 to 2016 were similar to the leading causes of death in the prior report for 2010 to 2014. The majority of deaths were caused by chronic disease, especially in persons under age 65. Four chronic conditions alone—heart disease, chronic lung disease, stroke and diabetes—accounted for 995 (39%) of the 2519 deaths in 2015 and 2016.

Diseases related to the circulatory system caused almost one-third (30%) of all deaths in Yolo County in 2015 and 2016, up from 28% in the prior five-year period. Chronic heart disease represented 77% (about three-quarters) of all causes of death related to the circulatory system. Heart disease was also the second leading cause of premature death, comprising 23% of all premature deaths in 2015 and 2016, up from 20% in the previous five-year period.

Cancer death rates have remained relatively stable over time. Note that the rate depicted in Figure 5 was not adjusted for the age structure of the population. The California Department of Public Health generates age-adjusted rates but they are not yet available for 2015 and 2016. The leading causes of site-specific cancer death in Yolo County were lung, colorectal and pancreatic cancers. Deaths from liver cancer have increased in the past two years, possibly connected to chronic hepatitis C virus (HCV) infection. Chronic HCV primarily affects the baby boomer generation (persons born between 1946 and 1963).

Almost 4% of all deaths (n=96) were due to diabetes in 2015 and 2016. The death rate due to diabetes has been edging upwards over the past ten years, increasing from 16 deaths per 100,000 persons in 2007 to 27 per 100,000 persons in 2016. Management of diabetes should continue to be a priority for patients and healthcare providers.

Many deaths due to chronic disease may be prevented through environmental changes that promote a healthy lifestyle, such as safe locations to exercise, interconnected parks and trails, active transportation options such as walking and biking, and living near stores that sell fresh produce. Better management of chronic conditions also can increase life expectancy. It remains to be seen if the provisions in the Affordable Care Act that incentivize providers to improve monitoring and encourage active self-management of chronic conditions will be realized.

Infant, childhood and young adult death rates remain lower than the state. In 2015, infant deaths spiked, mostly due to higher numbers of infants affected by prematurity and birth defects. Obesity and gestational diabetes increase risk factors for these outcomes, and our 2016 Live Birth Profile showed that 26% and 27% of Yolo County's expectant mothers were overweight or obese, respectively. The childhood death rate (age 1 to 14) fell in a linear trend between 2013 and 2016, and the actual number of deaths has been ≤5 for the past seven years. In contrast, the young adult death rate (age 15 to 24) has been on an upward trajectory since 2012, due to increases in suicide and drug overdose. It remains below the state rate.

Deaths due to influenza (flu), pneumonia and infectious respiratory diseases have declined by 43% from a high of 47 in 2008 to 27 in 2016. There were on average 35 deaths due to infectious respiratory disease per year from 2007 to 2016. Since the H1N1 flu pandemic in 2008 and heavy promotion of annual vaccination to prevent flu, deaths have fallen. Public health prevention efforts have focused on

vaccinating seniors and young children at free flu clinics before and during flu season, and mandating that healthcare workers be vaccinated against influenza or don masks while providing patient care during flu season. The flu clinics offered in Yolo County are open to all residents. Increasing the percentage of residents immunized against influenza also protects the most vulnerable (the very young and the aged) from contracting flu. The county's public health efforts to mass-vaccinate the public appear to be having their intended effect by reducing infection and deaths due to flu and its sequela.

Efforts are underway in the county to address the latter two issues. Mental health is a focus area of the Healthy Yolo initiative while the Yolo County Maternal Mental Health Collaborative is tackling perinatal mood and anxiety disorders. The goals of both groups are to reduce the stigma around seeking professional help for mental health illness and substance abuse, helping providers diagnose and refer patients more easily, and disseminating information to the public about where to go for help via websites and Yolo 211.

It is clear that geography plays a role in health outcomes for Yolo County residents, since life expectancy varied by census tract from a low of about 76 years in a census tract in the city of West Sacramento to over 98 years in one of the city of Davis census tracts. Life expectancy is closely correlated with social determinants of health such as educational attainment, household income, quality of housing, and neighborhood safety. Many of the factors that contribute to a longer life are lacking in the neighborhoods with the lowest life expectancies. Strategies that make healthy living easier and more affordable where people live, learn, work and play will be needed to lengthen the life span and improve the quality of life in these neighborhoods.

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