City of Kansas City, Missouri
Division of
COMMUNITY ENGAGEMENT, POLICY, and ACCOUNTABILITY

KCMO PUBLIC HEALTH CONNECTION: TECHNICAL REPORT

Volume 37, Issue 3 November 2017

TOP CAUSES OF DEATH IN KANSAS CITY, MISSOURI 2012-2016

Note: We are taking a short break in our series on structural & institutionalized racism in Kansas City to bring our readers new data on the top causes of death in Kansas City.

Ranking causes of death is a popular method of presenting mortality statistics. Cause-of-death ranking is a useful tool for illustrating the relative burden of cause-specific mortality. However, it should be used with a clear understanding of what the rankings mean. Literally, the rankings denote the most frequently occurring causes of death among those eligible to be ranked. Rankings to not illustrate cause-specific mortality risk as depicted by morality rates. The rank of a specific cause may decline over time even if its mortality rate has not changed, or its rank may remain the same over time even if its mortality rate is declining.

It is also important to note that rankings do not necessarily denote the causes of death of greatest public health importance. Some causes of death of public health significance are excluded from the ranking procedure. For example, malignant neoplasms of the trachea, bronchus and lung (lung cancer) and motor vehicle accidents are not rankable causes of death, although they can be identified using standard mortality tabulation lists. Each of these is incorporated into broader rankable categories, namely, malignant cancers and accidents, respectively. Although, not perfectly suitable in all circumstances, this method provides a rankable list of causes of death that has broad appeal and acceptance in the general public health community.

This report presents the final 2012-2016 data in leading causes of death in Kansas City, Missouri by Sex, Race, Hispanic origin, age group and City Council District.

Top Causes of Death for Kansas City, MO

1. Malignant Neoplasms (cancer)
2. Heart disease
3. Accidents (Unintentional Injuries)
4. Chronic Lower Respiratory Diseases
5. Dementia
6. Stroke
7. Infections & Infectious Diseases
8. Diabetes
9. Kidney Disease
10. Alzheimer's Disease

Table 1. Deaths and Percentage of Total Deaths for the 10 Leading Causes of Death: Kansas City, 2012-2016

Cause of Death	Rank	Deaths	Percent of Total Deaths
All Causes	–	18,682	100
Malignant Cancer	1	4,145	22.2
Heart Disease	2	3,920	21.0
Accidents	3	1,106	5.9
Chronic Lower Respiratory Diseases	4	1,067	5.7
Dementia	5	1,037	5.6
Stroke	6	953	5.1
Infections/Infectious Diseases	7	838	4.5
Diabetes	8	538	2.9
Kidney Disease	9	504	2.7
Alzheimer's Disease	10	501	2.7

Data

Data in this report are based on information from all death certificates filed in Missouri where the decedent had a home address of Kansas City, Missouri. Death certificates are generally completed by funeral directors, attending physicians, medical examiners and coroners. Cause-of-death statistics for 2012-2016 presented in this report are classified in accordance with the 10th revision of International Classification of Diseases (ICD-10). Further details on data analysis and cause of death ranking procedures can be found at the end of the report.

Results

In 2012-2016, the 10 leading causes of death accounted for 79% of all deaths occurring in Kansas City. The top two causes, malignant neoplasms (cancer) and heart disease, accounted for 43% of all deaths. Accidents (unintentional injuries) ranked third, chronic lower respiratory disease (CLRD) fourth and dementia (excluding Alzheimer's disease) fifth. Together, these three composed 17.2% of all deaths in Kan-

Figure 1. Percent distribution of the 10 Leading cause of death by Sex: Kansas City, 2012-2016

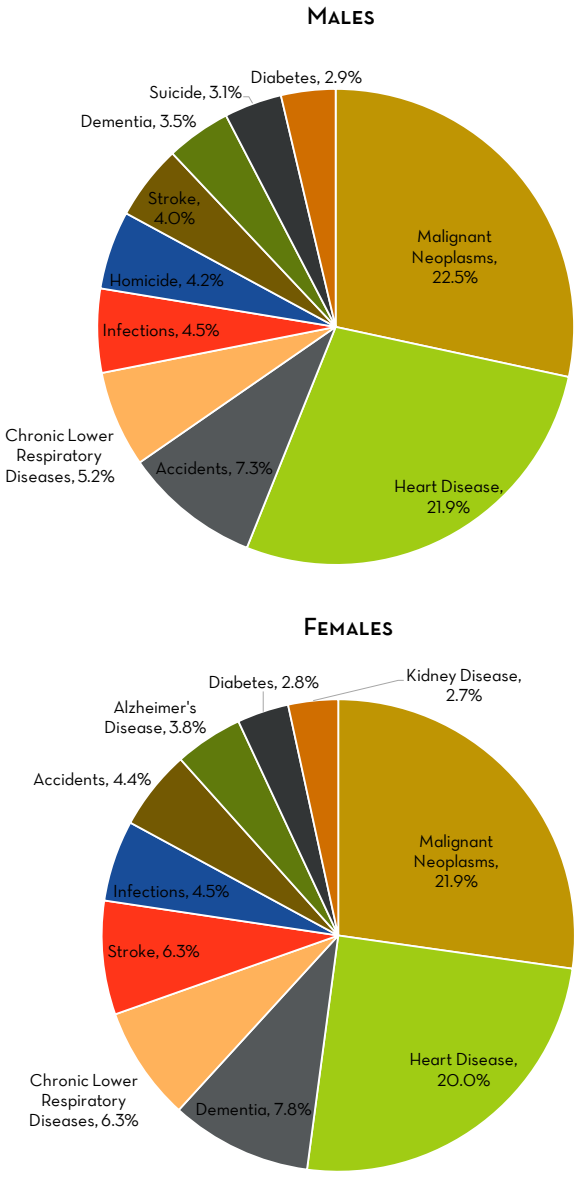


Table 2. Deaths and Percentage of Total Deaths by Race for the 10 Leading Causes of Death: Kansas City, 2012-2016

	White/Caucasian			Black/African American			Hispanic		
Cause of Death	Rank	Deaths	Percent of Total Deaths	Rank	Deaths	Percent of Total Deaths	Rank	Deaths	Percent of Total Deaths
All Causes	–	11,425	100	–	6,163	100	–	696	100
Malignant Cancer	1	2,544	22.3	1	1,366	22.2	1	128	18.4
Heart Disease	2	2,428	21.3	2	1,316	21.4	2	116	16.7
Chronic Lower Respir-	3	814	7.1	10	222	3.6	13	17	2.4
Dementia	4	707	6.2	6	283	4.6	7	30	4.3
Accidents	5	691	6.0	5	328	5.3	3	54	7.8
Stroke	6	544	4.8	4	350	5.7	4	39	5.6
Infections & Infectious Disease	7	506	4.4	7	273	4.4	5	36	5.2
Alzheimer's Disease	8	352	3.1	12	125	2.0	12	17	2.4
Suicide	9	283	2.5	18	69	1.1	8	30	4.3
Diabetes	10	263	2.3	8	237	3.8	9	28	4.0
Homicide	20	79	0.7	3	357	5.8	6	31	4.5
Kidney Disease	12	235	2.1	9	232	3.8	11	20	2.9
Chronic Liver Disease & Cirrhosis	16	145	1.3	20	48	0.8	10	20	2.9

sas City. Completing the top 10 for 2012-2016 were stroke (6th), infections & infectious disease (7th), diabetes (8th), kidney disease (9th) and Alzheimer's disease (10th, Table 1).

Differences by Sex

Some similarities were observed in the ranking of certain causes of death among males and females in 2012-2016. For both populations, cancer and heart disease ranked as the first and second leading causes of death, respectively (Figure 1). These two causes accounted for 44% of all deaths to males and 42% of all deaths to females. Another cause with an identical rank for both sexes was CLRD (4th), which accounted for approximately 5% of deaths to males and 6% of deaths to females. M

Males and females diverged in the ranking of other causes of death. In 2012-2016, accidents was the third leading cause of death for males, accounting for 7.3% of deaths in this group, but it was the seventh leading cause for females, accounting for 4.4% of deaths (Figure 1). Dementia ranked third for females, accounting for 7.8% of deaths, but it ranked eighth for males, accounting for 3.5% of deaths. Stroke ranked fifth for females with 6.3% of deaths and eighth for males, with 3.1% of deaths. Infections & infectious disease ranked fifth for males and sixth for females (both 4.5% of deaths). Finally, diabetes was the tenth leading cause of death for males (2.9% of deaths) and the ninth leading cause for females (2.7% of deaths).

Additionally, some of the leading causes of death for 2012-2016 were unique to either population. Homicide was the seventh leading cause of death among males, with 4.2% of deaths and suicide ninth with 3.1% of

deaths for males. Among females, Alzheimer's disease was eighth with 3.8% of deaths and kidney disease was tenth with 2.7% of deaths.

Differences by Race and Ethnicity

Table 2 shows variation across the two major race groups and Hispanic Origin group in the 10 leading causes of death in 2012-2016. The two major race groups shared eight of the leading causes but had di· erent relative disease burden. Malignant cancer and heart disease were the top one and two causes of death, respectively for both White/Caucasians and Black/African Americans, with similar relative burdens. Infections and infectious diseases also had an identical ranking for Whites and Blacks (7th), composing 4.4% of all deaths for both groups. Other common causes of death included Dementia (ranked 4th for Whites, 6th for Blacks), CLRD (3rd for Whites, 10th for Blacks), accidents (5th for whites, 5th for Blacks), stroke (6th for Whites, 4th for Blacks), and diabetes (10th for Whites, 8th for Blacks).

The most notable di· erence was that homicide was the 3rd leading cause of death among blacks, with 5.8% of all deaths as compared to less than 1% of all deaths for Whites (19th leading cause). Other divergent leading causes of death included Alzheimer's disease as the eighth leading cause of death for Whites (3.1% of deaths) and suicide as the ninth leading cause of death (2.5% of deaths). For Blacks, the remaining leading cause of death was kidney disease as the ninth leading cause, composing 3.8% of deaths in this group.

Deaths among those with Hispanic origin (of any race) shared seven of the ten leading causes of death with the two major race groups, with cancer and heart disease as the top two causes of death. Similar other leading causes of death included accidents (3rd leading cause, 7.8% of deaths), stroke (4th), infections and infectious disease (5th), dementia (7th) and diabetes (9th leading cause of death). Diverging from Whites, leading causes of death among those with Hispanic origin shared with Black/African Americans were homicide (6th leading cause 4.5% of deaths) . The final leading cause of death among those with Hispanic origin was chronic liver disease & cirrhosis, with 2.9% of deaths.

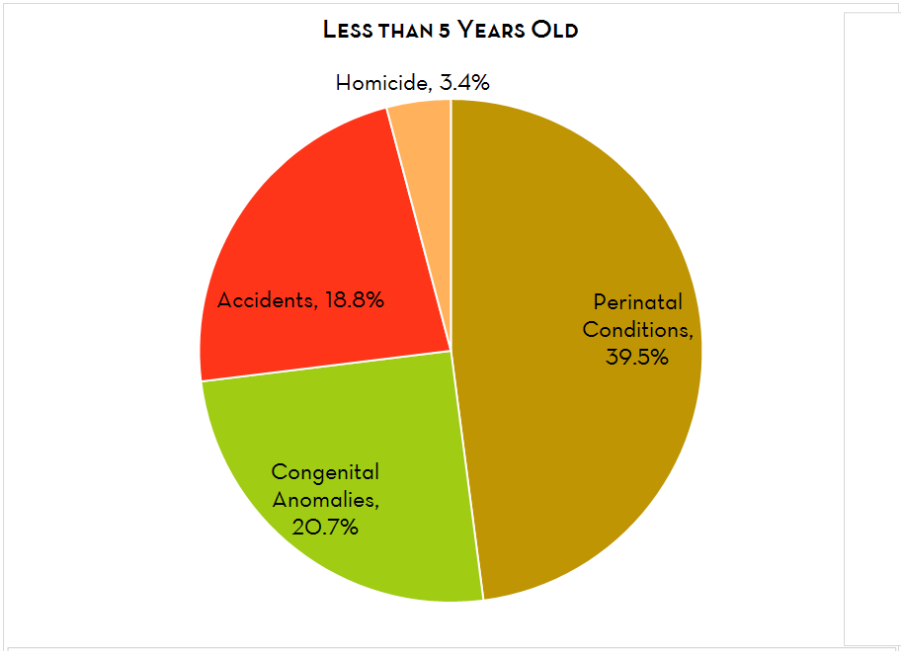
Differences by Age Group

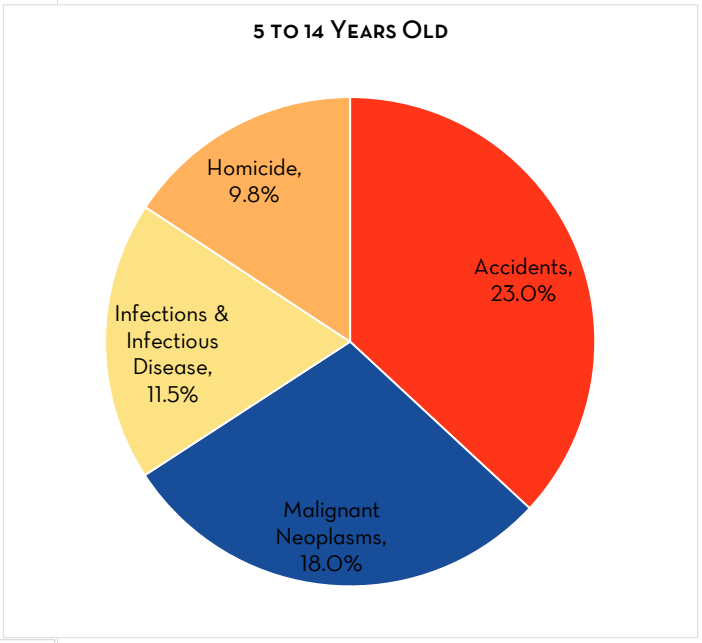
Leading causes of death for the following age categories 0-4, 5-14, 15-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75-84, and 85 and older are in Figure 2. In 2012-2016, the leading cause of death varied by age group. The leading cause of death for the population 5 to 44 years old was accidents. The relative burden of mortality from this cause was greater among children and young adults (ages 5 to 14 years, 23%; 15 to 24 years, 21.8%; and 25 to 34 years, 28%). In contrast, accidents were the 3rd leading cause among those 45 to 54 and 55 to 64 years (12% and 6%, respectively), the 10th leading cause among those 65 to 74 years (2.4%), the 11th leading cause of death among those 75 to 84 years, the 9th leading cause among those 85 years and older (3.1%, data not shown) and the 4th leading cause of death among those less than 5 years of age (18.8%).

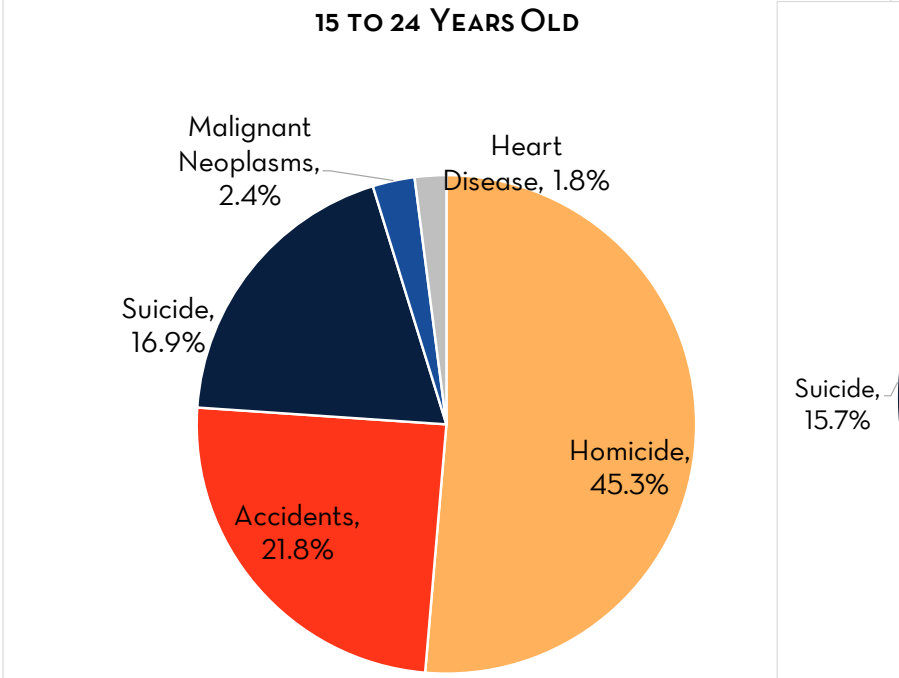
For the population 45 to 84 years, the leading cause of death was cancer, accounting for between one-fourth and one-third of deaths. Among 45 to 54 year olds, cancer made up 22.8% of deaths, 30.4% of deaths among 55 to 64 year olds, 33% among 65 to 74 year

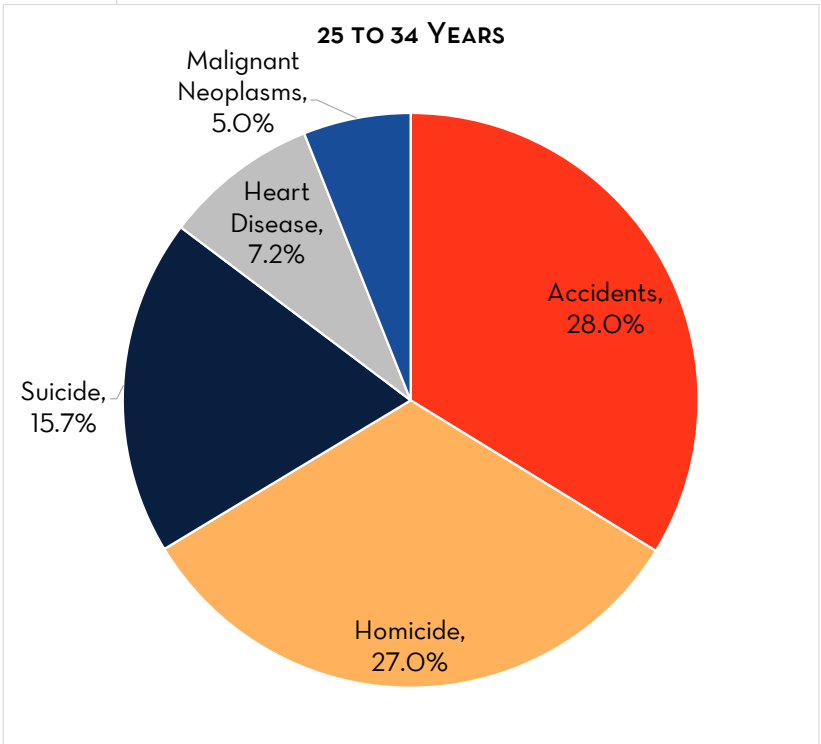
Generally, for younger age groups, external causes accounted for more deaths than other causes, whereas for older age groups, chronic diseases were far more prevalent than other causes. Causes consistently ranked among the top 5 leading causes included infections and infectious disease, accidents, homicide, cancer, suicide, chronic lower respiratory diseases, dementia and stroke.

Figure 2. Top Causes of Death by Age Group.
For age groups Less Than 5 Years Old and 5 to 14 Years Old, the top 4 causes of death are shown. For all other age groups, the top 5 causes of death are shown.

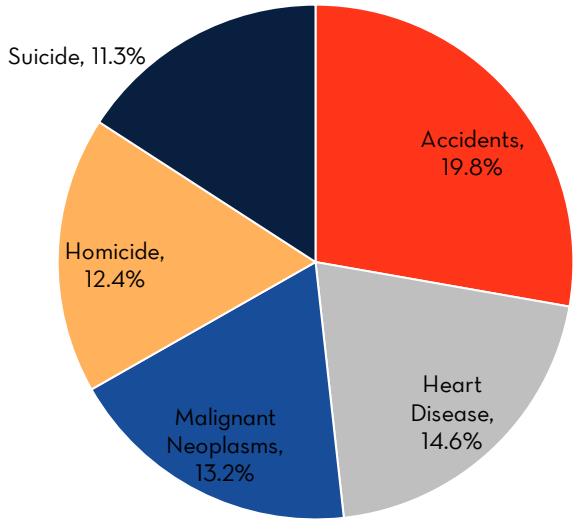




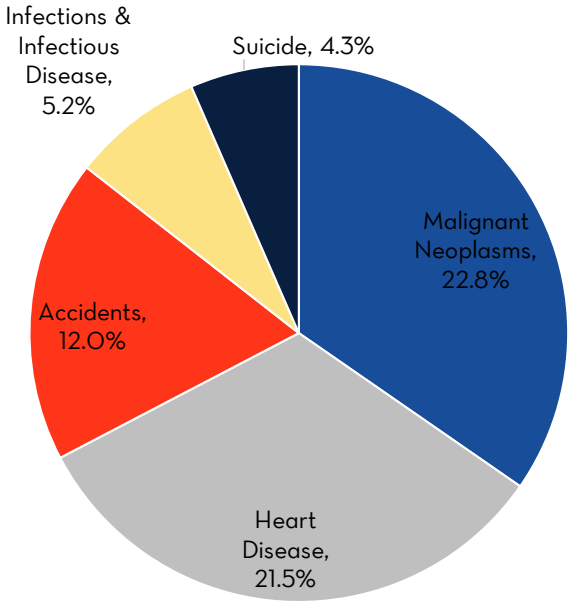




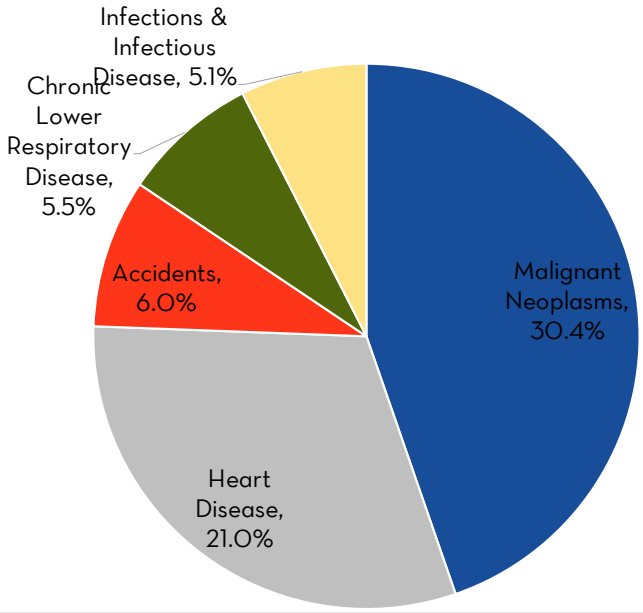
35 to 44 Years Old



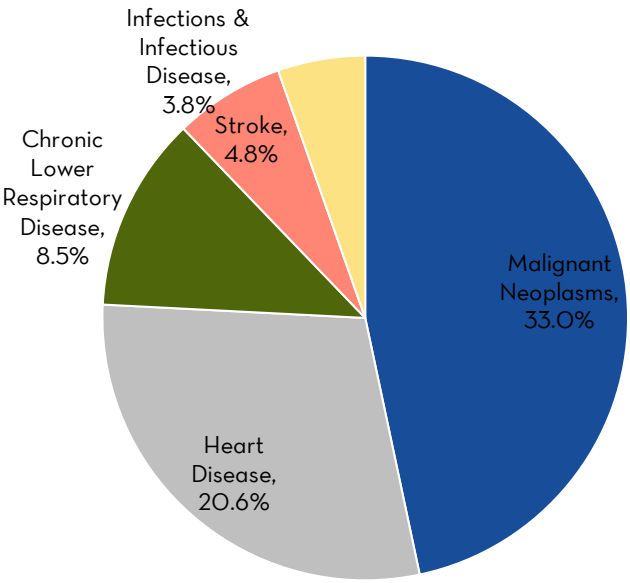
45 to 54 Years Old



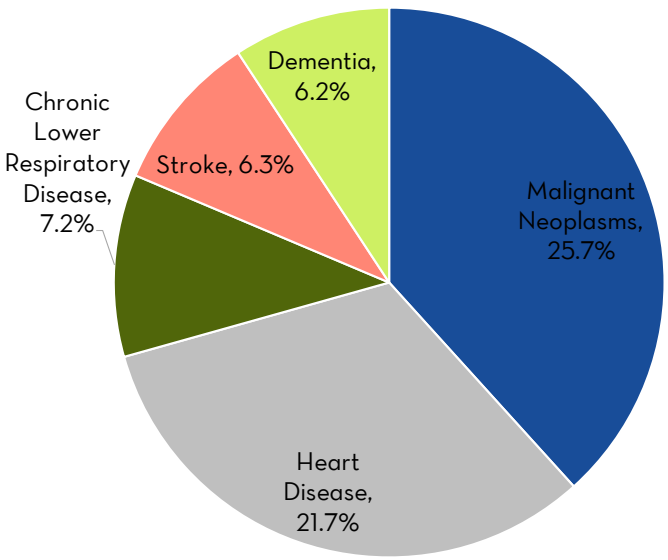
55 to 64 Years Old



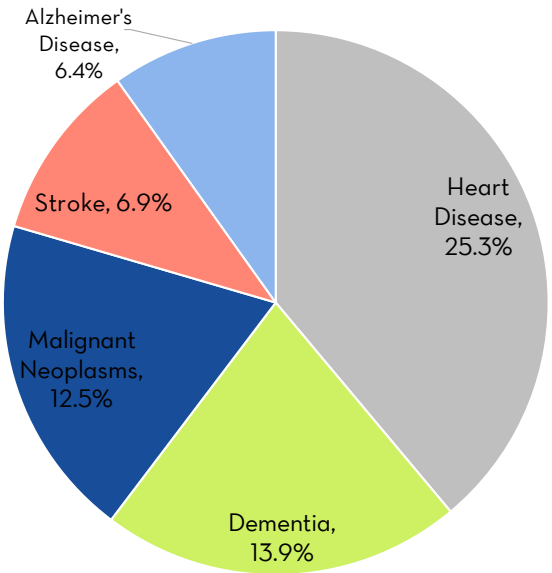
65 to 74 Years Old



75 to 84 Years Old



85 Years and Older



olds and 25.7% among 75 to 84 year olds. Cancer composed only 1.1% of deaths among those less than 5 years of age (9th leading cause of death), 18% of deaths among 5 to 14 year olds (2nd leading cause of death), 2.4% among 15 to 24 year olds (4th leading cause of death), 5% among 25 to 34 year olds (5th leading cause of death), 13.2% among 35 to 44 year olds (3rd leading cause of death) and 12.5% among those 85 years and older (3rd leading cause of death.

Heart disease was the top cause of death among the oldest age group, 85 years and older, composing 25.3% of deaths from 2012-2016. Heart disease was the 2nd leading cause of death for those 35 to 74 years, accounting for between 15% and 22% of deaths (35-44, 14.6%; 45-54, 21.5%; 55-64, 21.0%; 65-74, 20.6%; and 75-84, 21.7% of deaths).

Other patterns in the leading causes of death were observed by age group (Figure 2). Generally, for younger age groups, external causes accounted for more deaths than other causes, whereas for older age groups, chronic diseases were far more prevalent than other causes. For the population under the age of 55, homicide and/or suicide were major causes of death. Homicide was the leading cause of death among those ages 15 to 24 years (45.3% of deaths), second among those 25 to 34 years (27% of deaths), and fourth among those less than 5 years, 5 to 14 years, and 35 to 44 years (3.4%, 9.8% and 12.4% of deaths, respectively). Homicide was not in the top 5 leading causes of death for other age groups. Suicide was the 3rd leading cause of death among the 15 to 24 years and 25 to 34 years age groups, accounting for 16.9% and 15.7% of deaths, respectively. It was the fifth leading cause of death among those 35 to 44 years and 45 to 54 years of age, comprising 11.3% and 4.3% of deaths, respectively. Suicide was not in the top 5 leading causes of death among those less than 15 and older than 54 years of age. Perinatal conditions and congenital anomalies (congenital malformations) were more prevalent causes of death at the youngest ages. Additional causes consistently ranked among the top 5 leading causes included infections and infectious disease, chronic lower respiratory diseases, dementia and stroke.

Differences by City Council District

Many similarities were found across the six city council districts, with no district having a top cause of death unique to that district. Cancer and heart disease were the top two leading causes of death across all council districts, accounting for 44.9% of deaths in District 1, 42% of deaths in District 2, 43.2% of deaths in District 3, 23.5% of deaths in District 4, 42.6% of deaths in District 5, and 43.8% of deaths in District 6 (Table 3). In all districts but District 3, cancer was the leading cause of death and heart disease the second. In District 3, heart disease was the leading cause of death, with cancer second. In District 1, CLRD was the 3rd leading cause of death, account for 6.8% of deaths. CLRD was the 4th leading cause of death in Districts 2, 4 and 6 (6.8%, 6% and 5.8% of deaths, respectively), the 7th leading cause of death in District 3 (4.9%), and the 5th leading cause of death in District 5 (4.9%). Accidents ranked 4th among leading causes of death in District 1, making up 5.9% of deaths, 6th in District 2 (5.8% of deaths), 3rd in Districts 3 & 4 (6.3% and 7.9% of deaths, respectively), 7th in District 5 (4.8%), and

Table 3. Deaths and Percentage of Total Deaths by City Council District for the 10 Leading Causes of Death: Kansas City, 2012-2016

	District 1			District 2			District 3		
Cause of Death	Rank	Deaths	Percent of Total Deaths	Rank	Deaths	Percent of Total Deaths	Rank	Deaths	Percent of Total Deaths
All Causes	–	1696	100	–	2949	100	–	4457	100
Malignant Cancer	1	417	24.6	1	649	22.0	2	944	21.2
Heart Disease	2	344	20.3	2	590	20.0	1	982	22.0
Chronic Lower Respiratory Disease	3	116	6.8	4	202	6.8	6	219	4.9
Accidents	4	100	5.9	5	172	5.8	3	281	6.3
Dementia	5	79	4.7	3	209	7.1	8	182	4.2
Stroke	6	67	4.0	6	154	5.2	4	238	5.3
Suicide	7	65	3.8	10	68	2.3	14	77	1.7
Infections & Infectious Disease	8	60	3.5	8	102	3.5	7	213	4.8
Alzheimer's Disease	9	45	2.7	7	117	4.0	12	85	1.9
Diabetes	10	41	2.4	9	70	2.4	9	165	3.7
Kidney Disease	11	37	2.2	14	51	1.7	10	134	3.0
Homicide	20	12	0.7	22	18	0.6	5	233	5.2

	District 4			District 5			District 6		
Cause of Death	Rank	Deaths	Percent of Total Deaths	Rank	Deaths	Percent of Total Deaths	Rank	Deaths	Percent of Total Deaths
All Causes	–	2893	100	–	3176	100	–	3451	100
Malignant Cancer	1	640	22.1	1	704	22.2	1	781	22.6
Heart Disease	2	620	21.4	2	648	20.4	2	730	21.2
Chronic Lower Respiratory Disease	4	174	6.0	5	156	4.9	4	199	5.8
Accidents	3	229	7.9	7	152	4.8	6	162	4.7
Dementia	7	115	4.0	3	200	6.3	3	249	7.2
Stroke	6	144	5.0	4	160	5.0	5	189	5.5
Suicide	9	76	2.6	15	52	1.6	14	55	1.6
Infections & Infectious Disease	5	151	5.2	6	155	4.9	7	150	4.3
Alzheimer's Disease	12	65	2.2	8	106	3.3	10	82	2.4
Diabetes	10	73	2.5	10	92	2.9	9	96	2.8
Kidney Disease	8	76	2.6	11	87	2.7	8	117	3.4
Homicide	14	58	2.0	9	100	3.1	15	53	1.5

6th in District 6 (4.7% of deaths). Dementia was a significant leading cause of death among all six city council districts. In District 1, it was the 5th leading cause of death (54.7%); in Districts 2, 5 and 6, the 3rd leading cause of death (7.1%, 6.3%, & 7.2%, respectively); in District 3, the 8th leading cause of death (4.2%); and in District 4, the 7th leading cause of death (4.0%).

Other significant causes of death across all six city council districts were diabetes, infections & infectious disease, and stroke. Generally speaking, stroke had a larger burden on city council districts from 2012-2016, ranking higher than infections & infectious disease and diabetes. This trend was not true for District 4, where infections & infectious disease deaths were higher than stroke. Across all city council districts, infections & infectious disease deaths were a greater burden than diabetes deaths.

From here, top causes of death diverge among the city council districts. In Districts 1, 2, 5 and 6, Alzheimer's Disease was a top cause of death, accounting for between 2.4% and 4% of deaths within the 4 districts. Suicide was a top cause of death in Districts 1, 2, and 4, accounting for between 2.3 and 3.8% of deaths within these districts. In Districts 3 and 5, homicide was a leading cause of death, accounting for 5.1% of deaths (N=233) in District 3 and 3.1% (N=100) in District 5. In the remaining city council districts, homicide ranked between the 14th leading cause of death (District 4, 2% of deaths) and 22nd (District 2, 0.6% of deaths). Kidney disease was a leading cause of death for Districts 3, 4, and 6, but not for Districts 1, 2, and 5. In District 3, kidney disease ranked 10th with 3% of deaths within the district; in Districts 4 and 6, it ranked 8th, with 2.6% and 3.4% of deaths, respectively.

Discussion

This report presents leading causes of death in Kansas City, MO by age, sex, race, Hispanic origin and city council district. Cause-of-death ranking is a popular method of presenting mortality statistics and is a useful tool for illustrating the relative burden of cause-specific mortality, but it must be used cautious with a clear understand of the limitations of the underlying method.

When comparing rankings across demographic groups or over time, careful note should be made of the age distribution of the populations being compared. Leading causes of death for populations with younger age distributions will tend to show higher rankings for causes of death that are prevalent among the young, such as homicide, accidents and HIV infection. Leading causes of older populations will tend to show higher rankings for causes that are more prevalent among the elderly, such as Alzheimer's disease, heart disease, cancer and stroke.

Consideration should also be given to effects of random variation on cause-of-death rankings. When the number of events is small (perhaps fewer than 25 deaths), estimates of mortality risk are subject to random fluctuations. Especially when comparing rankings based on small numbers of deaths between groups over time, it is important to be aware that changes in relative rankings may be attributable to random variability. For this reason, the KCMO Health Department often examines death trends in 5-year increments.

Because the rank order of any particular

cause of death will depend on the list of causes from which selection is made and on the rules applies in making the selections, a clearly defined and uniform method for ranking causes of death is vital to maintain consistency in the reporting of leading causes by public health agencies. The standard method described in this and other publications[1] provide this needed structure.

Technical Notes

Procedures for ranking causes of death

The procedures used by the Kansas City, Missouri Health Department for ranking causes of death are consistent with the recommendations by both the Missouri Department of Health & Senior Services and the National Center for Health Statistics. Causes are ranked according to the number of deaths assigned to rankable causes. The number of deaths is used as the ranking criterion because it most accurately reflects that frequency of cause-specific mortality.

Developed for use with ICD-10, the "List of 113 Selected Causes of Death and Enterocolitis due to *Clostridium di· cile*" was used to select 34 rankable causes (Table A) from which the leading causes are presented in Tables 1-3 and Figures 1-2 are derived. Selection of the 34 rankable causes was guided by some basic principles. Decisions were made to select as rankable the causes of death considered most useful from a public health perspective, with the following condition: rankable causes must be mutually exclusive. Disease groups classified as other, such as "other respiratory diseases" were excluded from the rankings. E· orts were also made to maintain historical continuity where possible.

Notes:

Data by Race and Hispanic Origin

Leading-cause data are presented by selected races and Hispanic origin, which are reported separately on the death certificate. The race categories presented are: White/ Caucasian and Black/African American. Data shown by race include persons of Hispanic origin. Data shown by Hispanic origin include persons of any race. Deaths for the Hispanic population is understated to varying degrees because of net misclassifications of Hispanic origin on the death certificate, so data for this group should generally be interpreted with caution. However, racial or ethnic misclassification should not have a major impact on the cause-of-death rankings for race and Hispanic origin groups, because there is no reason to expect that racial or ethnic misclassifications varies by cause of death.

Data by City Council District

Leading-cause data are also presented by Kansas City Council District. Kansas City, Missouri is divided into six council districts that are revised according to the population at least every five years. For this report, districts were defined by zip code.

For more information, please contact Elizabeth Walsh, MPH (elizabeth.walsh@kcmo.org). Contributors: Jinwen Cai, MD; Amanda Mason, MsC, CPH.

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