Get
every one
in the picture

Causes of Death

Data analysis and Report writing workshop for Civil registration and vital statistics data.

UNITED NATIONS
ESCAP
Economic and Social Commission for Asia and the Pacific

Cause of death

- There are many ways to look at the distribution of causes of death in a population.

  - data must be comparable over time and between countries.

- We should also be able to disaggregate data sufficiently to identify vulnerable populations.

- Common measures used for COD include:

  - Numbers

  - Rates

  - Proportional mortality

ICD General mortality list

- ICD provides a framework that allows comparisons to be made at a lot of different levels: from broad chapters to more specific causes.

- ICD General Mortality List and GBD provides a good level of disaggregation to allow sufficient detail for planning while avoiding most of the problems created by disaggregating to categories that are too small.

Aggregation by age

- There are many ICD codes. If numbers of deaths by cause, age group, and sex get too small they may not be meaningful.

- We can deal with this:
  - Having the appropriate level of cause disaggregation
  - Using slightly broader age groups (<5, 5-14, 15-59, 60+ etc.)
  - Not as necessary to disaggregate by sex for children <5 (as causes do not differ greatly).
  - If numbers are really small, aggregate over 3-5 years

Leading causes of death

- Most commonly reported but not particularly meaningful when deaths are grouped across all ages and both sexes.

- Nonetheless, as decision makers will request this information, it is likely that you will at some point want to present your data this way.

- Tips for making your leading cause of death tables more useful are:

  - Make sure the total number of deaths is reported

  - Consider reporting separately for males and females; and by broad age group

  - Lists are only comparable if they use the same level of categorisation. It is recommended that you tabulate and report your deaths using the General mortality list 1.

  - It is useful to always report the proportion of deaths for which cause of death data was known alongside your tables.

US NCHS 2016

Rank[1]	Cause of death (based on the *International Classification of Diseases, Tenth Revision*), Hispanic origin, race, sex, and age	Number	Percent of total deaths	Rate
...	All causes	2,744,248	100.0	849.3
1	Diseases of heart (I00-I09,I11,I13,I20-I51)	635,260	23.1	196.6
2	Malignant neoplasms (C00-C97)	598,038	21.8	185.1
3	Accidents (unintentional injuries) (V01-X59,Y85-Y86)	161,374	5.9	49.9
4	Chronic lower respiratory diseases (J40-J47)	154,596	5.6	47.8
5	Cerebrovascular diseases (I60-I69)	142,142	5.2	44.0
6	Alzheimer's disease (G30)	116,103	4.2	35.9
7	Diabetes mellitus (E10-E14)	80,058	2.9	24.8
8	Influenza and pneumonia (J09-J18)	51,537	1.9	15.9
9	Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27)	50,046	1.8	15.5
10	Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	44,965	1.6	13.9
11	Septicemia (A40-A41)	40,613	1.5	12.6
12	Chronic liver disease and cirrhosis (K70,K73-K74)	40,545	1.5	12.5
13	Essential hypertension and hypertensive renal disease (I10,I12,I15)	33,246	1.2	10.3
14	Parkinson's disease (G20-G21)	29,697	1.1	9.2
15	Pneumonitis due to solids and liquids (J69)	19,715	0.7	6.1
...	All other causes (residual)	546,313	19.9	169.1

All races and origins, both sexes, all ages

Source: https://www.cdc.gov/nchs/data/dvs/lcwk/lcwk1_hr_2016.pdf

Disaggregation

- Note: Cause of death is always more meaningful when reported by age group, and for adults by sex as the causes of deaths in these groups is very different. It is recommended that you use the following groups
    - < 5 years (combined sexes)
    - 5-14 years (combined sexes)
    - 15-59 years – in 5 year age groups by male and female if data supports
    - 60+ years - by male and female

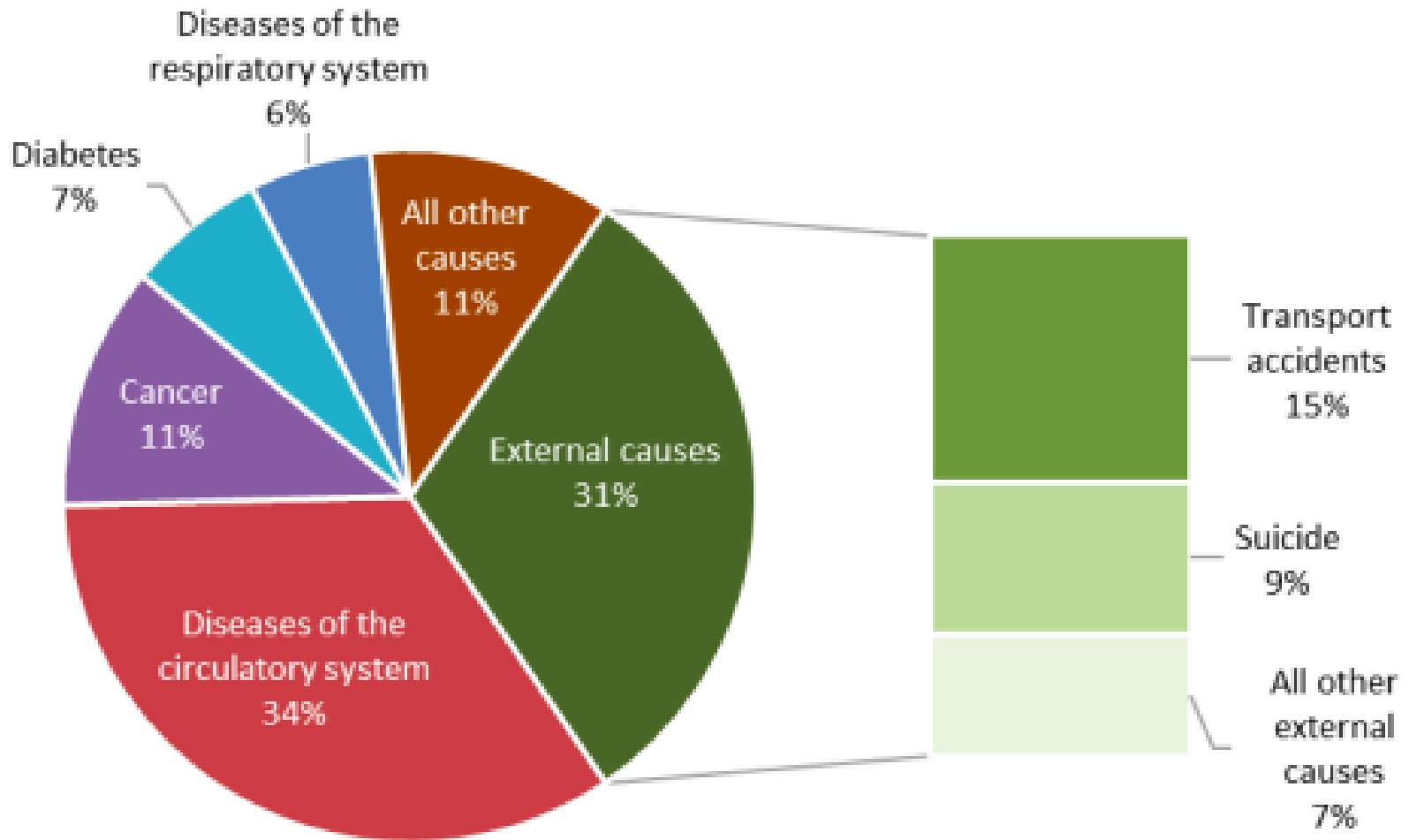- Adult groups may also be split into other smaller groupings, such as 15 year age groups from age 15 upwards.

Ill-defined

- Always make sure that you report the proportion of deaths for which no cause of death data was available, or for which the cause of death was ill-defined.

- Ill-defined deaths are those which either do not provide enough information to assign a cause or the cause assigned does not actually lead to death.

- Examples include:
  - Senility and old age
  - Symptoms (cough, fever etc)
  - Injury without how the injury happened
  - Mode of death where no cause is reported - i.e. caridopulmonary arrest
  - Depression

Proportional mortality

- The proportional mortality is simply the number of deaths from that cause divided by the total number of deaths.

- Number of deaths from that cause are divided by the number of deaths which had a known cause of death.

- Again, proportional mortality should be reported by age, and by sex in adults.

Figure 13: Mortality in adults aged 15-59: main causes of death, % distribution: 2009 – 2013

Diseases of the respiratory system 6%

Diabetes 7%

All other causes 11%

Cancer 11%

External causes 31%

Diseases of the circulatory system 34%

Transport accidents 15%

Suicide 9%

All other external causes 7%

Cause-specific mortality rates

- Number of deaths from a cause in a specific age group divided by the total population in the same age group multiplied by 100,000.

  - Again these would usually be calculated separately by males and females.

$$\frac{Number\ of\ deaths\ due\ to\ road\ traffic\ accidents\ in\ males\ aged\ 15-19}{Number\ of\ males\ aged\ 15-19}\ x\ 100,000$$

Cause-specific mortality rates

- Although we are reporting by broad age group, if using wide adult age groupings rates will still be affected by the age distribution of the population,

- The older the population, the higher we would expect the rate of NCDs to be.

- Cause-specific mortality is often age-standardised for age groups such as 15-59 year olds in order to account for this influence.

- Note; it is important that under count has been adequately corrected for in the number of deaths assigned to each cause for rates to be meaningful.

US NCHS

LCWK1. Deaths, percent of total deaths, and death rates for the 15 leading causes of death in 5-year age groups, by race and Hispanic origin, and sex: United States, 2016

[Rates per 100,000 population in specified group. Rates are not shown for age groups over 85 years. Rates for "all ages" include deaths for age "Under 1 year." Figures for "age not stated" are included in "all ages" but are not distributed among age groups. Race and Hispanic origin are reported separately on the death certificate. Persons of Hispanic origin may be of any race. Data for Hispanic persons are not tabulated by race; data for non-Hispanic persons are tabulated by race. Data for racial and ethnic groups other than non-Hispanic white and non-Hispanic black should be interpreted with caution because of misreporting of race and Hispanic origin on death certificates]

Rank[1]	Cause of death (based on the *International Classification of Diseases, Tenth Revision*), Hispanic origin, race, sex, and age	Number	Percent of total deaths	Rate
	All races and origins, both sexes, 15-19 years			
...	All causes	10,812	100.0	51.2
1	Accidents (unintentional injuries) (V01-X59,Y85-Y86)	4,152	38.4	19.6
2	Intentional self-harm (suicide) (*U03,X60-X84,Y87.0)	2,117	19.6	10.0
3	Assault (homicide) (*U01-*U02,X85-Y09,Y87.1)	1,816	16.8	8.6
4	Malignant neoplasms (C00-C97)	596	5.5	2.8
5	Diseases of heart (I00-I09,I11,I13,I20-I51)	293	2.7	1.4
6	Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99)	197	1.8	0.9
7	Chronic lower respiratory diseases (J40-J47)	80	0.7	0.4
8	Cerebrovascular diseases (I60-I69)	62	0.6	0.3
9	Diabetes mellitus (E10-E14)	54	0.5	0.3
9	Influenza and pneumonia (J09-J18)	54	0.5	0.3
11	Septicemia (A40-A41)	42	0.4	0.2
12	In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown behavior (D00-D48)	37	0.3	0.2
12	Anemias (D50-D64)	37	0.3	0.2
14	Legal intervention (Y35,Y89.0)	26	0.2	0.1
15	Pregnancy, childbirth and the puerperium (O00-O99)	24	0.2	0.1
...	All other causes (residual)	1,225	11.3	5.8

Source: https://www.cdc.gov/nchs/data/dvs/lcwk/lcwk1_hr_2016.pdf