




# Coming next...

- Online News Discussion (Makala & Josh)
  - Guest speaker this Wednesday & next Monday (Dr. Hurt)
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# Healthy Living Tips



# Warm Up: U.S. Census Data

- Visit the website of the U.S. Census Bureau, [www.census.gov/quickfacts](https://www.census.gov/quickfacts).
- What is the population of your city or town?
  - Is it increasing or decreasing?
- How does the age distribution of your city or town compare with that of the U.S. overall?
- How does the ethnic composition compare?
- How does the education level of the population compare with that of the U.S. overall?

# The U.S. Census

Mandated by the Constitution every 10 years

Denominator for most public health data

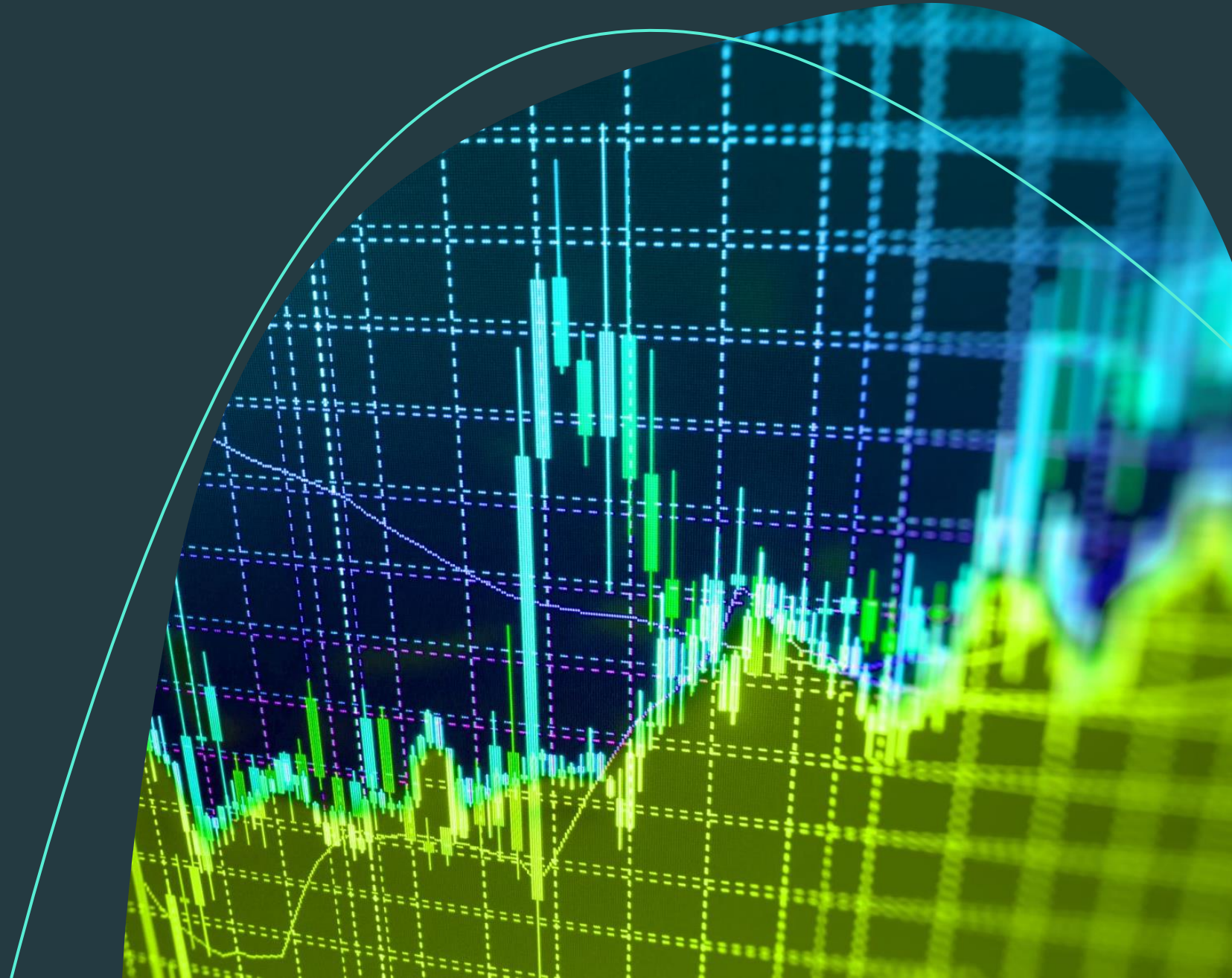
- Age, sex, race, ethnicity

Determines political composition of US Congress

Use American Community Survey (ACS) between census years and is ongoing

# Statistics and Role of Data

Chapter 7 & 8

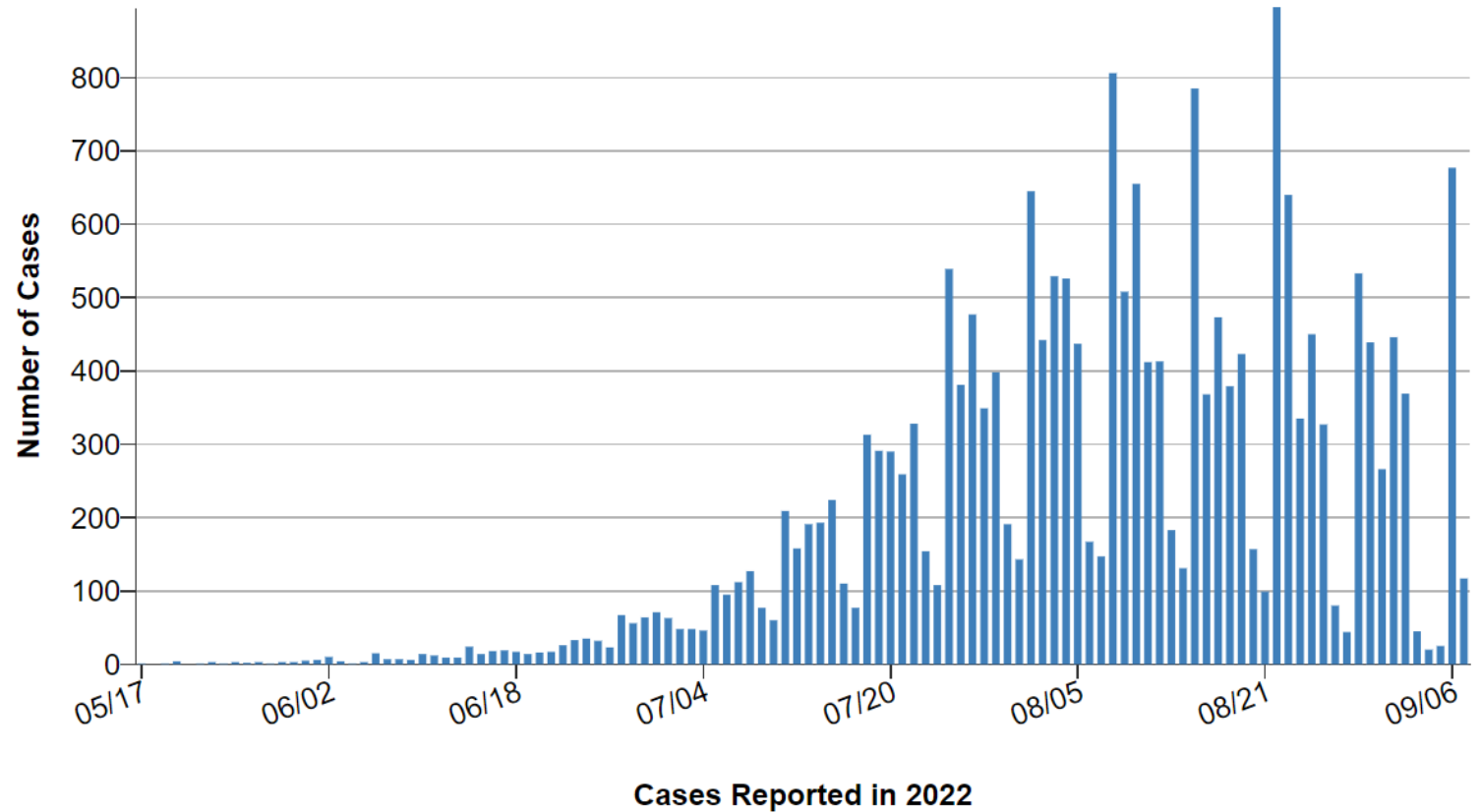




# Statistics (in PH)

- The numbers describing a population
- The science that helps interpret those numbers

U.S. Monkeypox Case Trends Reported to CDC



# The Uncertainty of Science

- Most science is of a probable nature.
- In many cases, there is not enough data to give us a degree of certainty, or the existing data is too ambiguous to allow a valid conclusion.
- Science is ongoing; studies may contradict each other.
- The science of statistics can quantify the degree of uncertainty.

# Probability (Experiments)

- The probable is what usually happens.
- Probabilities are used to describe the variety and frequency of past outcomes under similar conditions as a way of predicting what should happen in the future.
- A  $p$ -value:
  - When  $p \leq 0.05$ , it usually means that a result is statistically significant.
  - When  $p = 0.05$ , there is still a 5% chance that the result is wrong.
- Key concepts are:
  - Confidence interval



**Table 2.** Age-and sex-adjusted hazard ratios for incident diabetes in older people – Hefei cohort study, China.

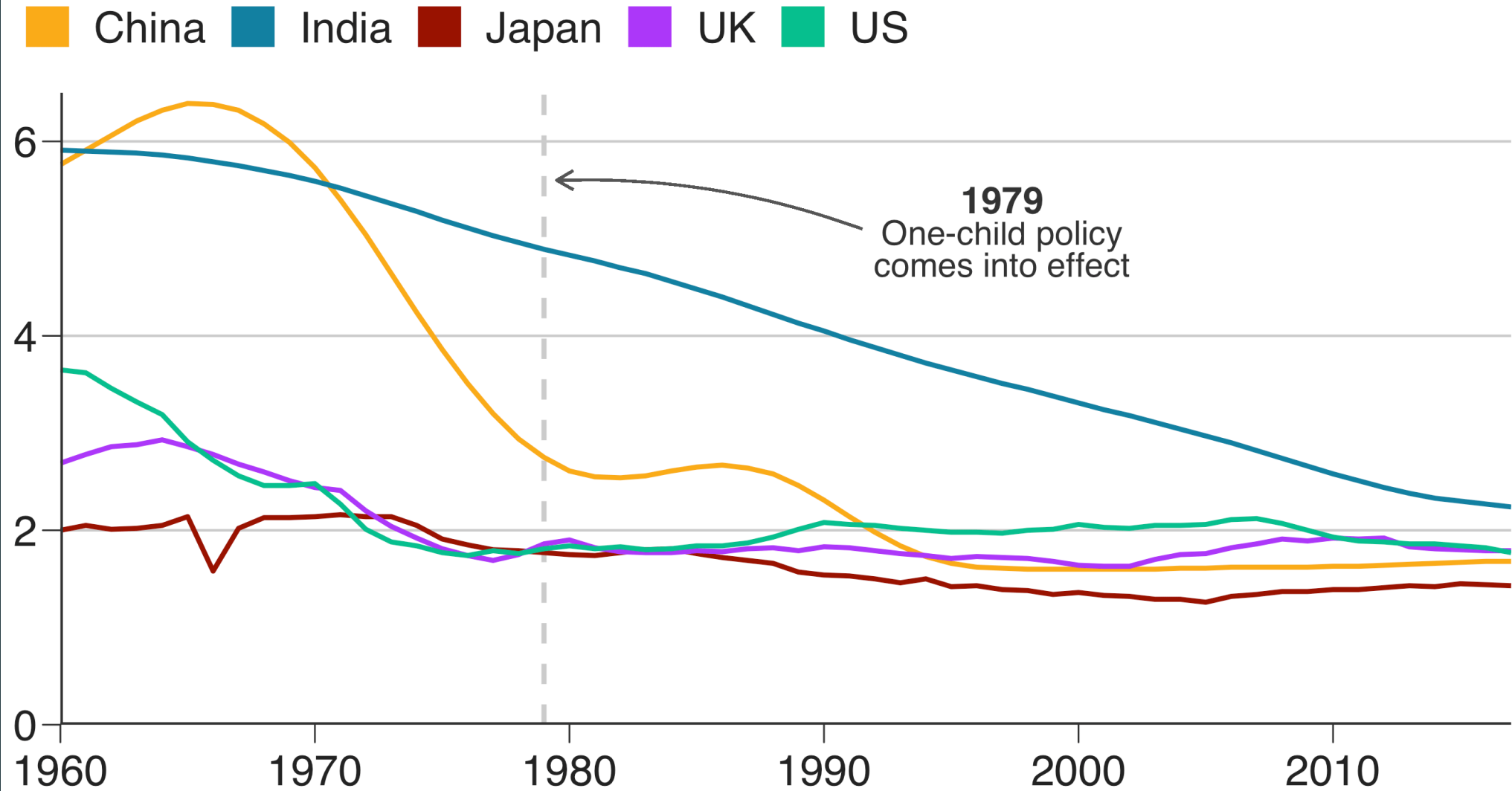
| Variable   | HR   | 95% CI      | P      |
|--|------|-------------|--------|
| <i>Basic characteristics</i>                       |      |             |        |
| <b>Age (years)</b>                                 |      |             |        |
| 65–69  | 1.00 |             |        |
| 70–74  | 1.60 | (1.04–2.48) | 0.034  |
| 75–79  | 1.27 | (0.74–2.18) | 0.378  |
| ≥80  | 1.65 | (0.90–3.03) | 0.104  |
| <b>Sex</b>   |      |             |        |
| Women  | 1.00 |             |        |
| Men  | 1.28 | (0.89–1.84) | 0.183  |
| <b>Weight (kg)</b>                                 |      |             |        |
| Mean (SD)  | 1.03 | (1.02–1.05) | <0.001 |
| <b>Waist circumference (cm)</b>                    |      |             |        |
| Mean (SD)  | 1.03 | (1.01–1.04) | <0.001 |
| <b>BMI (kg/m<sup>2</sup>) (Chinese definition)</b> |      |             |        |
| <18.5  | 0.76 | (0.27–2.13) | 0.604  |
| 18.5–23.9  | 1.00 |             |        |
| 24.0–27.9  | 1.89 | (1.26–2.82) | 0.002  |
| ≥28  | 1.92 | (1.08–3.40) | 0.026  |

# Rates

- Rates relate raw numbers to the size of the population being considered.
  - Birth rates
  - Mortality rates
- Other rates commonly used as indicators of community health are:
  - Infant mortality rate
  - Maternal mortality rate
- Crude rates
- Adjusted rates
  - Age adjusted (FL's death rate is higher than Alaska)
- Group specific rates
  - Gender specific

# How China's fertility rate compares

Total number of births per woman (1960-2017)



Source: The World Bank

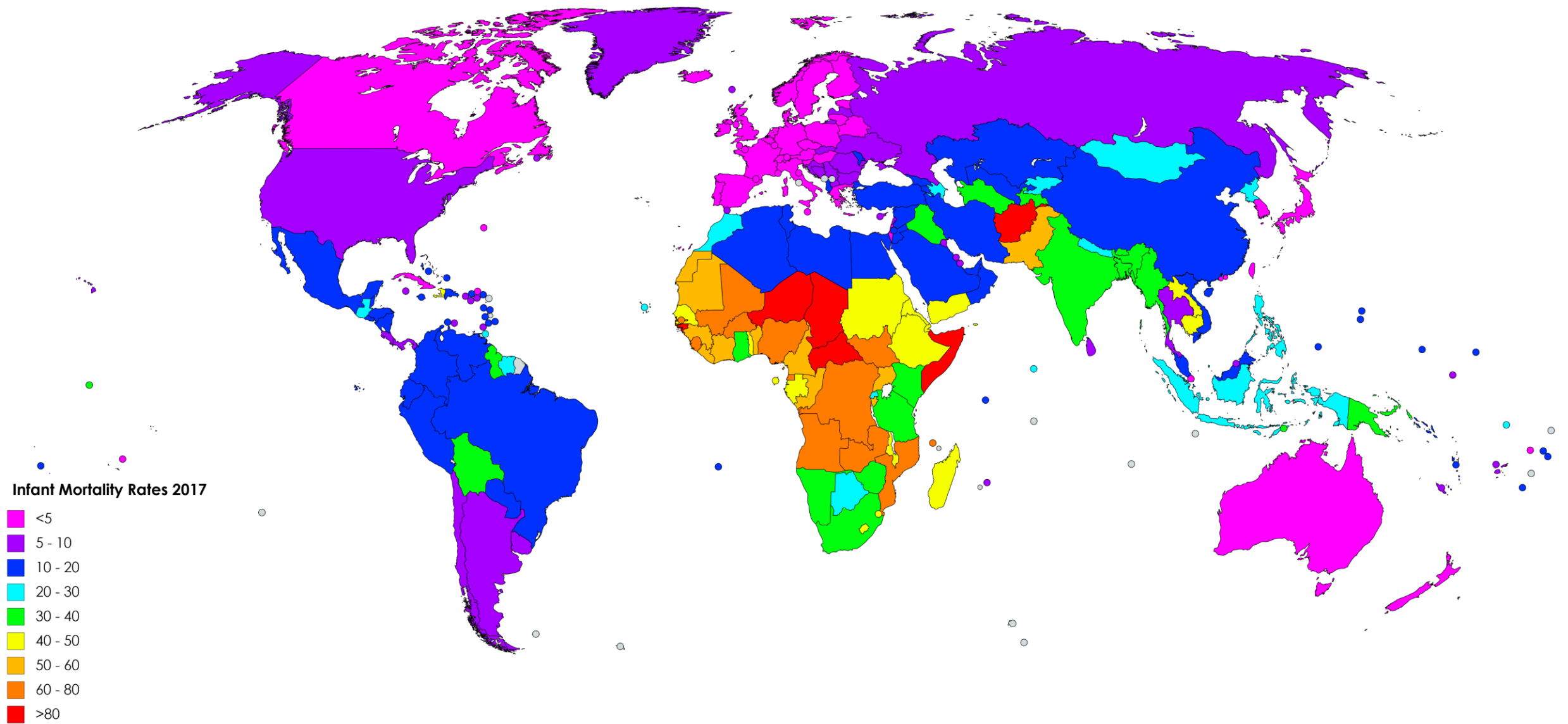
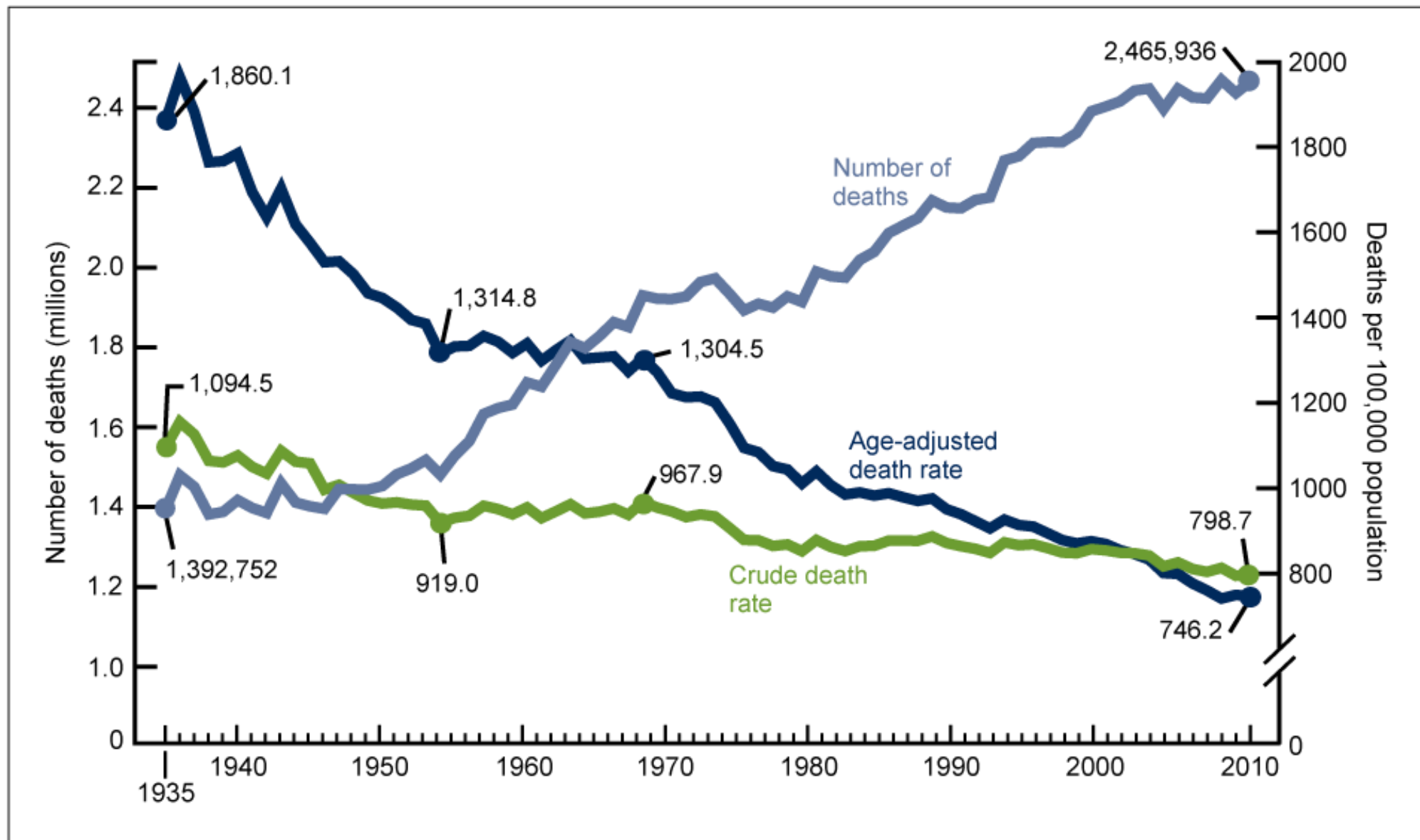


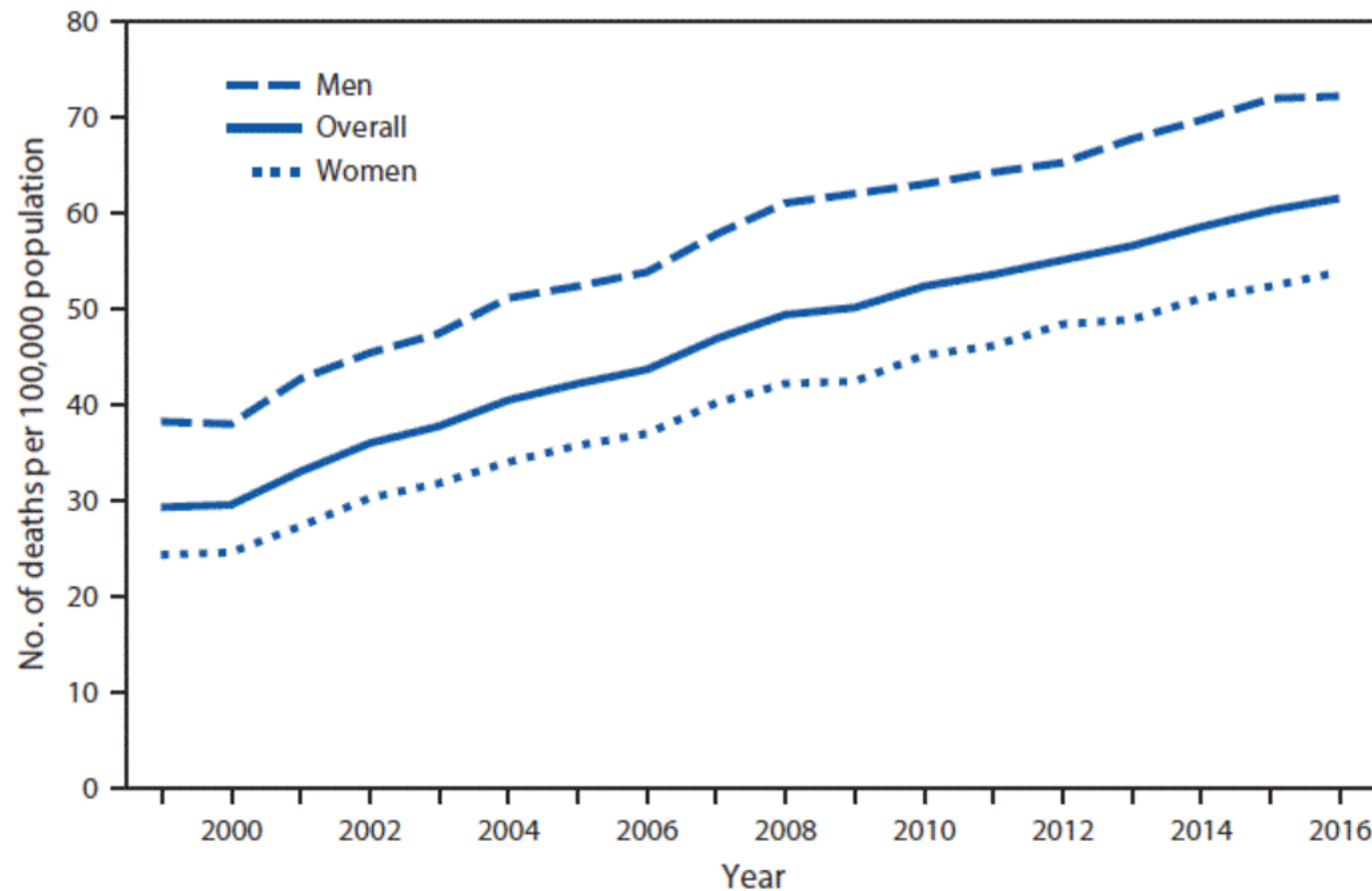
Figure 1. Number of deaths, crude and age-adjusted death rates: United States, 1935–2010



NOTES: 2010 data are preliminary. Crude death rates on an annual basis are per 100,000 population; age-adjusted rates are per 100,000 U.S. standard population. Rates for 2001–2009 are revised and may differ from rates previously published.

SOURCE: CDC/NCHS, National Vital Statistics System, Mortality.

# Age-Adjusted Death Rates\* from Unintentional Falls† Among Adults Aged ≥65 Years, by Sex – National Vital Statistics System, 1999–2016 (CDC)



\* Deaths per 100,000 population, age-adjusted to the 2000 U.S. standard population.

† As underlying cause of death, unintentional fall-related deaths are identified with the *International Classification of Diseases, Tenth Revision* codes W00–W19.



# Risk Assessment & Risk Perception (p93)

## **Assessment**

- Identifies events and exposures that may be harmful
- Estimates probabilities of their occurrence and extent of harm they may cause

## **Perception**

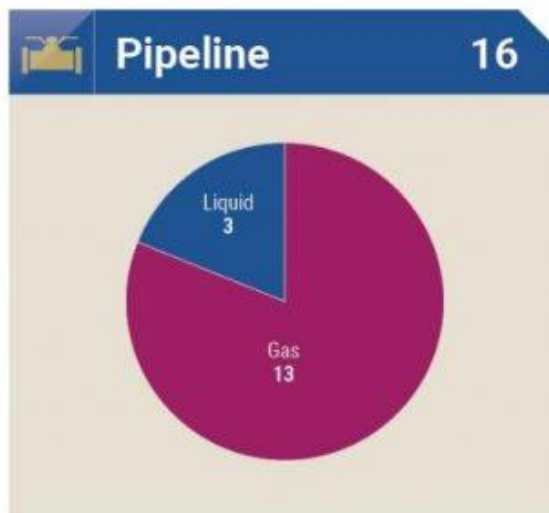
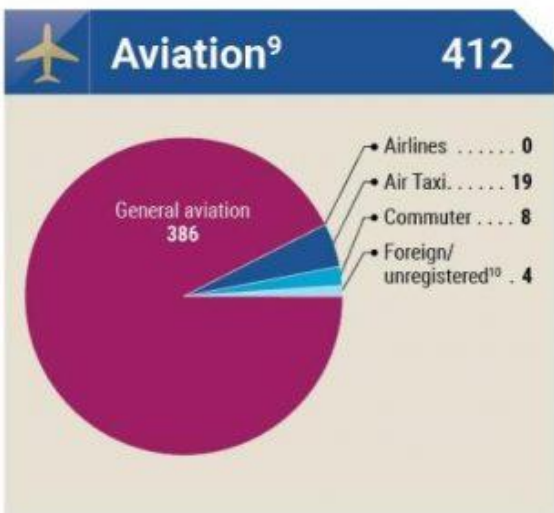
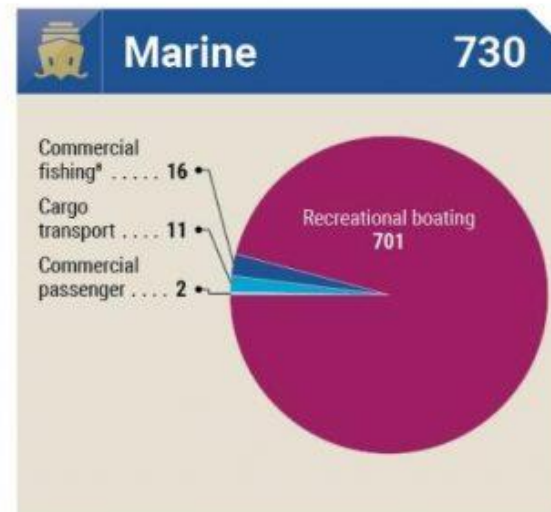
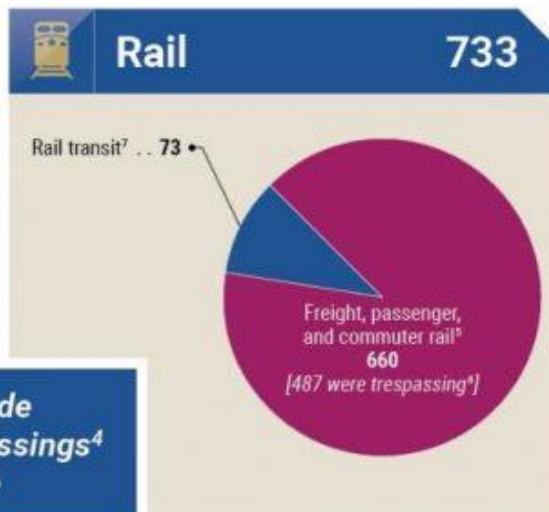
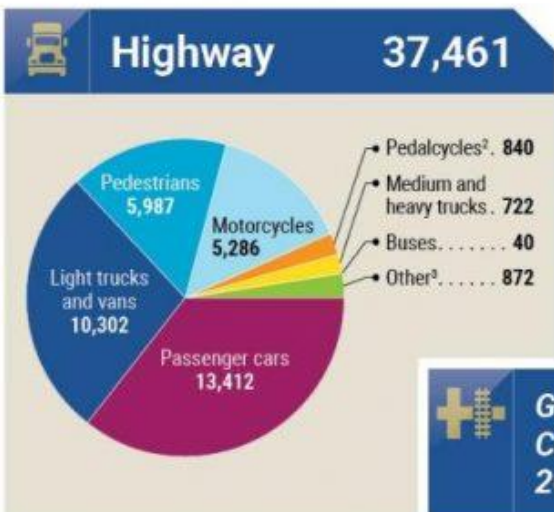
- Subjective judgements that people make about the characteristics and severity of a risk



## National Transportation Safety Board

# US Transportation Fatalities in 2016<sup>1</sup> – by Mode

**Total: 39,339**




### Footnotes

- <sup>1</sup> Numbers for 2016 are preliminary estimates. Aviation data are from the NTSB; marine data are reported by the US Department of Homeland Security; all other data are reported by the US Department of Transportation.
- <sup>2</sup> Pedalcycles include bicycles and other cycles.
- <sup>3</sup> Other refers to non-occupants (excluding pedestrians and pedalcyclists) and occupants in other or unknown vehicle types.
- <sup>4</sup> Grade crossing fatalities are reported as a separate category but should not be added to the total because they are included in the highway and rail fatalities as appropriate.
- <sup>5</sup> Freight, passenger, and commuter rail data are reported by the Federal Railroad Administration.
- <sup>6</sup> Trespassing fatalities are reported as a separate category but should not be added to the total because they are included in the freight, passenger, and commuter rail fatalities. Trespassing fatalities are not available for rail transit.
- <sup>7</sup> Rail transit data are reported by the Federal Transit Administration and include fatalities involving heavy rail, light rail, cable car, inclined plane, monorail/automated guideway, streetcar rail, and hybrid rail.
- <sup>8</sup> Commercial fishing refers to operational fatalities.
- <sup>9</sup> Total fatalities may not equal the sum of each category because accidents may involve multiple categories.
- <sup>10</sup> Foreign/unregistered includes non-US registered aircraft involved in accidents in the United States.



# Uses of Data

- Assessment of the health of a community
  - Raw material for research
  - Identification of special risk groups
  - Detection of new health threats
  - Planning of public health programs and evaluation of their success
  - Preparation of government budgets
- 

# Collection of Data

- Local records are sources of data:
  - Birth certificates
  - Death certificates
  - Other vital statistics
- Data is transmitted:
  - From local governments to states
  - From states to National Center for Health Statistics (NCHS is part of CDC)
- Surveys are sources of data.
- NCHS set up a computer system to link vital records of infants because infant mortality is an important public health issue.

# The Census

- Is mandated by the U.S. Constitution
- Serves as the denominator for most public health data:
  - Age, sex, race, ethnicity
- Is conducted every 10 years
- Determines the political composition of the U.S. Congress
  - The citizenship status question excluded from 2020 census
  - New household categories included for 2020 census
- American Community Survey is done on an ongoing basis in between censuses:
  - Education, housing, health insurance

# Surveys

- National Health Interview Survey (NHIS)
- National Health and Nutrition Examination Survey (NHANES)
- National Health Care Survey
- Behavioral Risk Factor Surveillance Survey (BRFSS)
  - State-by-state, with results transmitted to NCHS
- Surveys done by other government agencies



# Accuracy and Availability of Data

- Data collection is imperfect.
- Census is most accurate.
  - Still, there are overcounts and undercounts.
- Information technology increases accuracy and availability.
- Public health informatics has vastly improved the accessibility of public health information for public health workers and the general public.
- The CDC and most other federal and state public health agencies make information available over the Internet.

# Confidentiality of Data

- Governments have safeguards to protect information on individuals.
- Use of data may involve removal of information identifying individuals.
- Use of data requires permission granted by an institutional review board or data protection committee.



## Activity: Youth Mental Health & COVID

- How has COVID impacted the mental health of youth?
- Particularly girls?
- What are some data that are available (global, national and local)?