

# The Use and Misuse of Statistics

## Learning goals

- determine validity of reported statistics

Oct 21-3:28 PM



Nov 14-8:17 AM

### Valid Conclusion

- unbiased data
- interpreted appropriately
- is there any bias? ↗ in question
- sample size was big enough? ↗ collection method
- questions were phrased properly?
- were measurements accurate?
- are graphs drawn accurately? ↗ may be accurate but the scale can be misleading

Handout

Oct 21-3:47 PM

### (4.2) & (4.5) The Use and Misuse of Statistics

Review the CASE STUDY on page 224 of your textbook.

*Is this conclusion valid? Why or why not?*

Axes should be switched.

∴ due to increasing # of single parent families more women need to work.

Apr 18-3:07 PM

Review the following graph used by a government agency in the United States to report on leading causes of death:

### Comparative Causes of Annual Deaths in the United States

Cause	Number of Deaths (thousands)
AIDS	30
Alcohol	105
Motor Vehicle	46
Fires	4
Homicide	25
Illegal Drugs	9
Suicide	31
Smoking	418

Note: All mortality data are for 1990, except alcohol, which is for 1987.  
 Source: HIV/AIDS Surveillance Report; National Safety Council Accident Facts; Monthly Vital Statistics Report; SAMMEC; Alcohol-Related Death Index.

What does this graph appear to show?  
*smoking is terrible.  
 It is going to kill you.*

Think about the graph and what it contains. Do you have any concerns or questions?  
*cancer, heart disease...  
 are missing from the graph*

Apr 18-3:09 PM

Consider these complaints about airlines published in US News and World Report on February 5, 2001:

Most complaints, Nov. '00	
United Airlines	252
American Airlines	162
Delta Air Lines	119
Fewest	
Alaska Airlines	13
Southwest Airlines	22
Continental Airlines	60

Can we conclude that United, American, and Delta are the worst airlines and Alaska, Southwest, and Continental are the best?

*NO*  
*- maybe more people use them*  
*→ include # of people using air lines*  
*→ use %*

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### Assessing Statistical Data

Again, ask the key questions:

1. Was the **sample size** large enough?
2. Was the **sample representative**?
3. Were the survey **questions unbiased**?
4. Was the **collection method** appropriate?

↳ random

- 10% represent the population

And add the question:

5. Is the **graph constructed** accurately or do they mislead the viewer?

→ all data included

→ presented correctly

Apr 18-3:12 PM

### Article Assignment

- groups of 2
- everyone reads the article
- discuss the statistics mentioned
- answer the 10 questions

Oct 21-3:33 PM

# Seatwork

pg 229 # 1-10

Oct 30-9:44 AM