TECHNOLOGICAL INSTITUTE OF THE PHILIPPINES
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ITE 405 – APPLIED PLOTTING, CHARTING, DATA REPRESENTATION
Summer SY: 2024-2025
Prelim Period

Laboratory Exercise 2.2 Exploring Relationships and Trends in Play Golf Dataset

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Activity 3.1 Lie Factor Effect

Find two (2) graphs showing the Lie Factor effect. Compute the Lie Factor of each graph.

Include discussion or explanation of the result.

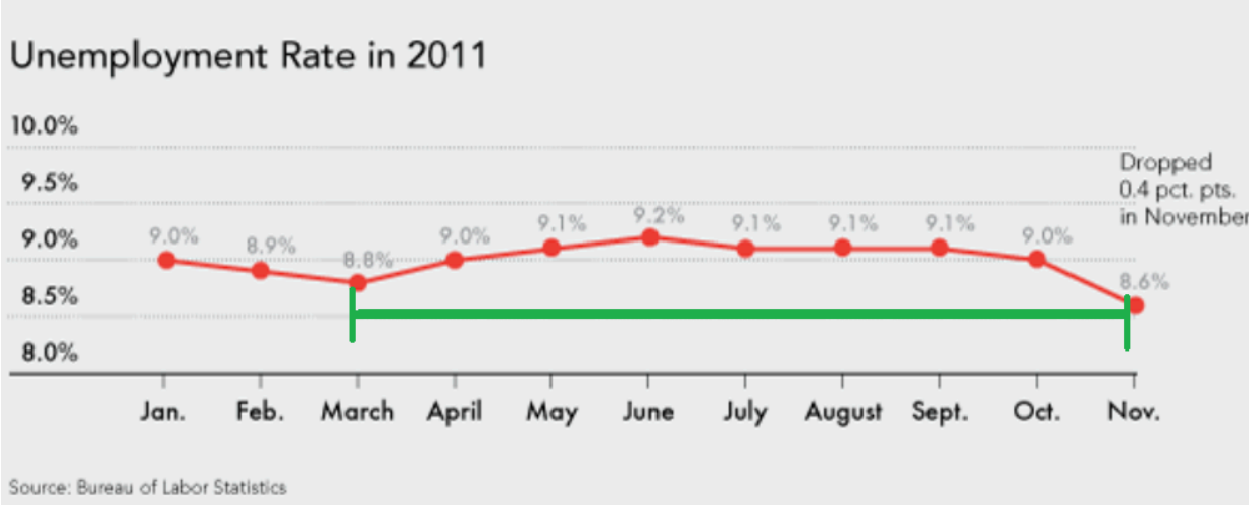
Indicate your graph source.

Example 1: Fox News Unemployment Chart (Dec 2011)

https://flowingdata.com/2011/12/12/fox-news-still-makes-awesome-charts/#:~:text=Fox%20News%20isn%E2%80%99t%20doing%20themselves,change

Figure: Fox News on-screen unemployment chart, as critiqued by analystsflowingdata.com. It uses a truncated baseline and misplotted points, making a small decline look like a rise.

- **Actual data:** In March 2011 the U.S. unemployment rate was 8.8%, and by November 2011 it had fallen to 8.6%, which is a drop of 0.2 percentage points.
- **Graph values:** The Fox chart nevertheless plots the November point above the March point (at about 9.0%), implying an **increase** of +0.2 points. In effect, the chart shows unemployment rising from 8.8% to ~9.0%, a +0.2 change.



- **Lie Factor:** Using Tufte's, the "size of effect" in the graphic (0.2) divided by the true data effect (0.2) gives a lie factor of about 1.0. (Since the chart turned a –0.2 drop into a +0.2 rise, but it kept the lie factor at 100%.)

This results in the following formula:

$$Lie\ Factor = \frac{\text{size of effect shown in graphic}}{\text{size of effect in data}}$$

where

$$size\ of\ effect = \frac{|\text{second value - first value}|}{\text{first value}}$$

$$\text{Lie Factor} = \frac{\text{graphic}}{\text{data}} = \frac{\frac{9.0 - 8.8}{8.8}}{\frac{8.8 - 8.6}{8.6}} = \frac{0.2}{0.2} = 1.0$$

- **Implications:** The visual exaggeration dramatically misrepresents reality—viewers see a sharp rise instead of a small decline. The chart's distortion could mislead the audience about trends in employment
- A Lie Factor of **1.0** suggests the magnitude of change (0.2 points) is fairly represented.

Example 2: OECD Mortality Bubble Chart (2015)

https://www.athoughtabroad.com/2018/04/07/misleading-infographics-how-not-to-bubble-chart#:~:text=The%20biggest%20bubble%20shown%20for,bubble

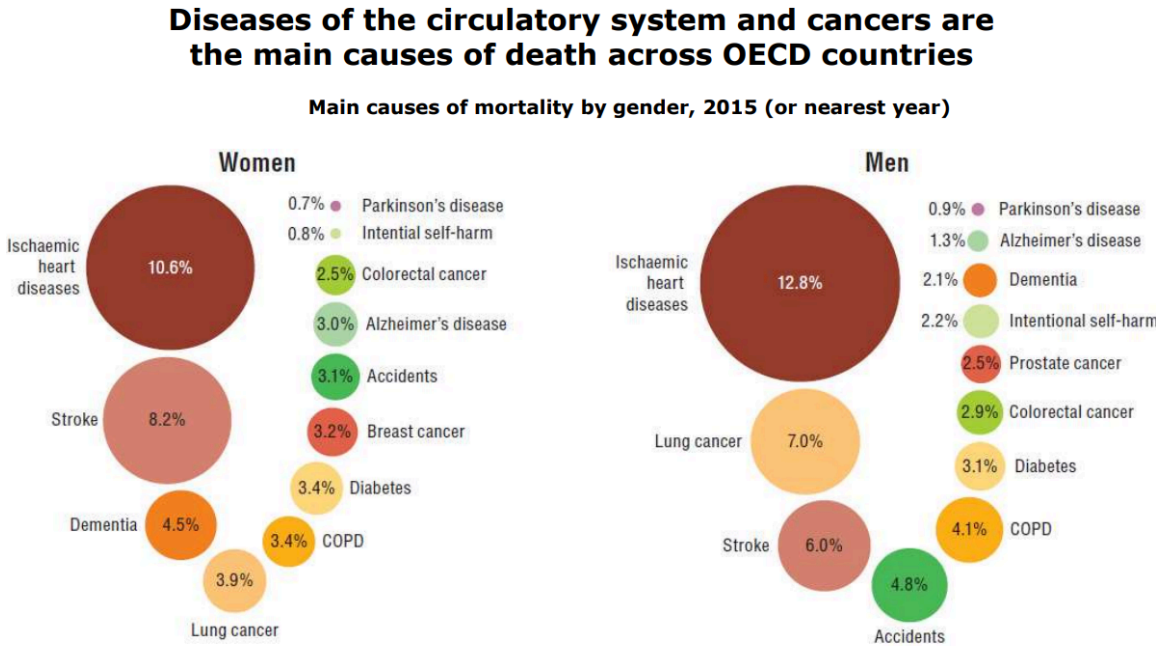


Figure: Bubble infographic of top mortality causes by gender (OECD data). The largest bubble (12.8%) is drawn about 4× the area of the 7.0% bubble, far more than proportional

- **Actual data:** For men, *ischemic heart disease* accounts for 12.8% of deaths, and *lung cancer* 7.0%athoughtabroad.com. The true ratio of these values is 12.8/7.0 ≈ 1.83 (the heart-disease rate is about 1.8× the lung-cancer rate).

- **Graphic effect:** In the bubble chart, the 12.8% bubble is drawn with roughly **4× the area** of the 7.0% bubbleathoughtabroad.com. (In terms of diameter, that's about 2× larger since area scales with radius².)

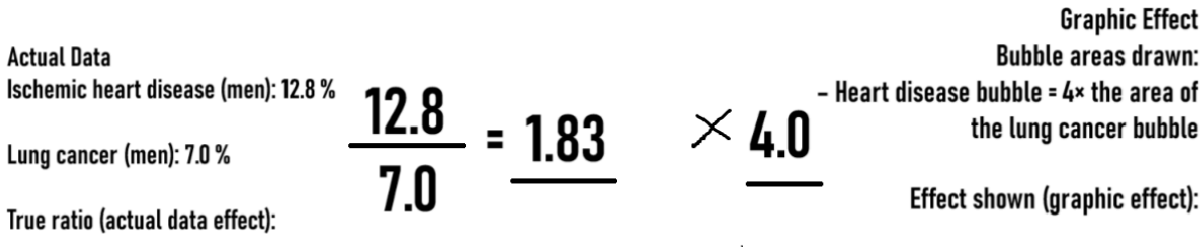
This results in the following formula:

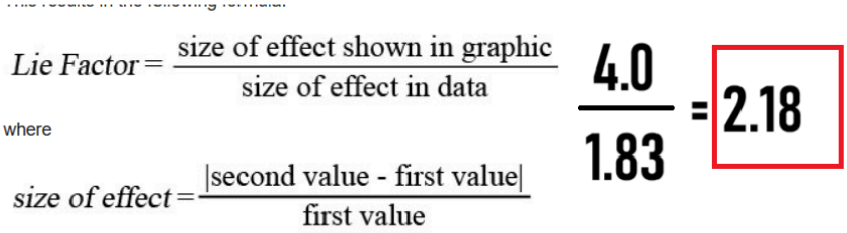
$$Lie\ Factor = \frac{\text{size of effect shown in graphic}}{\text{size of effect in data}}$$

where

$$size\ of\ effect = \frac{|\text{second value - first value}|}{\text{first value}}$$

- **Lie Factor:** The size ratio shown is ~4.0, while the true data ratio is ~1.83. So Lie Factor ≈ 4.0/1.83 ≈ **2.18**. This significantly exceeds 1, indicating the chart **overstates** the difference by about 2.18×.





- **Implications:** The visual makes heart disease appear vastly more deadly than lung cancer, even though the true rates differ by less than a factor of two. The inflated area exaggerates the disparity, misleading readers about the relative severity of causes.

Honor Pledge for Graded Assignments (Recommended):

“I affirm that I have not given or received any unauthorized help on this assignment, and that this work is my own.”