A Data Story: Cholera in 1854

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A Story of Patterns

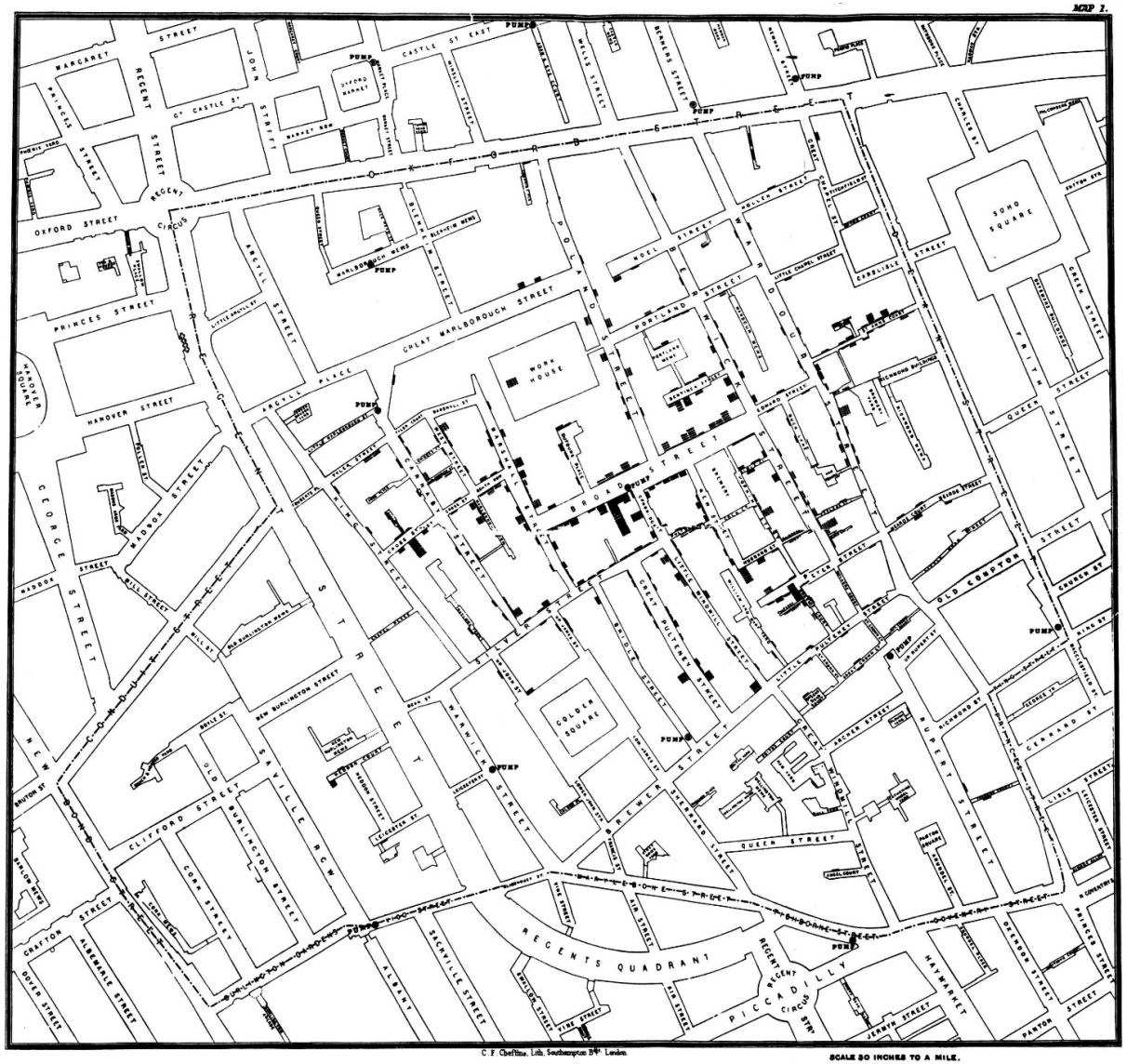
John Snow

Cholera outbreak on August 31, 1854

Data: 83 deaths from cholera

Motivating questions:

- Was there a pattern to the outbreak?
  Reduce uncertainty
- Could the pattern tell us anything about the cause of the outbreak?
  Look for exceptions
- Could impurities in water be to blame?
  Hypothesis testing



Commons

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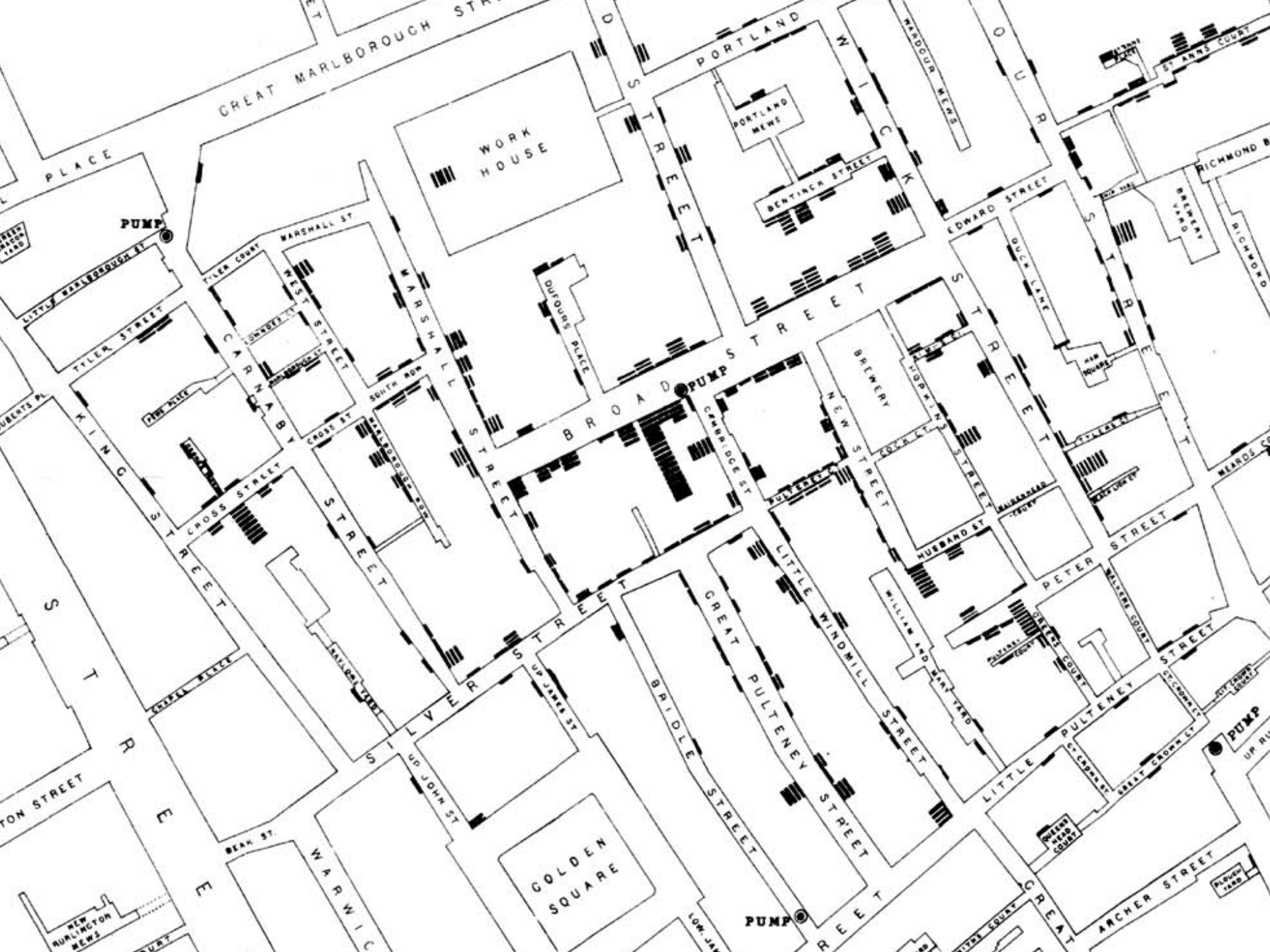
GREAT MARLBOROUGH STREET
PLACE
PUMP
LITTLE MARLBOROUGH ST
TYLER STREET
TYLER COURT
MARSHALL ST
WEST STREET
CHAPEL
KING STREET
CROSS STREET
CHAPEL PLACE
WORK HOUSE
DUFOURS PLACE
MARSHALL STREET
BROAD STREET
PUMP
CAMBRIDGE ST
PORTLAND STREET
PORTLAND MEWS
BENTINCK STREET
HARDGUR MEWS
WICK STREET
EDWARD STREET
BREWERY
NEW STREET
HOPKINS STREET
HUSBAND ST
PETER STREET
LITTLE PULTENEY STREET
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BRIDLE STREET
LITTLE WINDMILL STREET
SILVER STREET
UP JAMES ST
UP JOHN ST
GOLDEN SQUARE
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WARWICK
BEAK ST.
NEW BURLINGTON MEWS
ARCHER STREET
PLOUGH YARD
QUEEN HEAD COURT
GREAT CROWN CT
LITTLE PULTENEY STREET
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RICHMOND


GREAT MARLBOROUGH STREET
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PORTLAND STREET
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Finding Data

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Finding Data

Universities

- Syracuse University data resources

Government

- U.S. Government's open data
- U.S. climate data
  - Education/data (tab)
- NASA data portal

Others

- Kaggle
- Reddit datasets

Data clean-up

- U.S. Census Bureau (Construction Spending)

Distributions and Plot Dimensions

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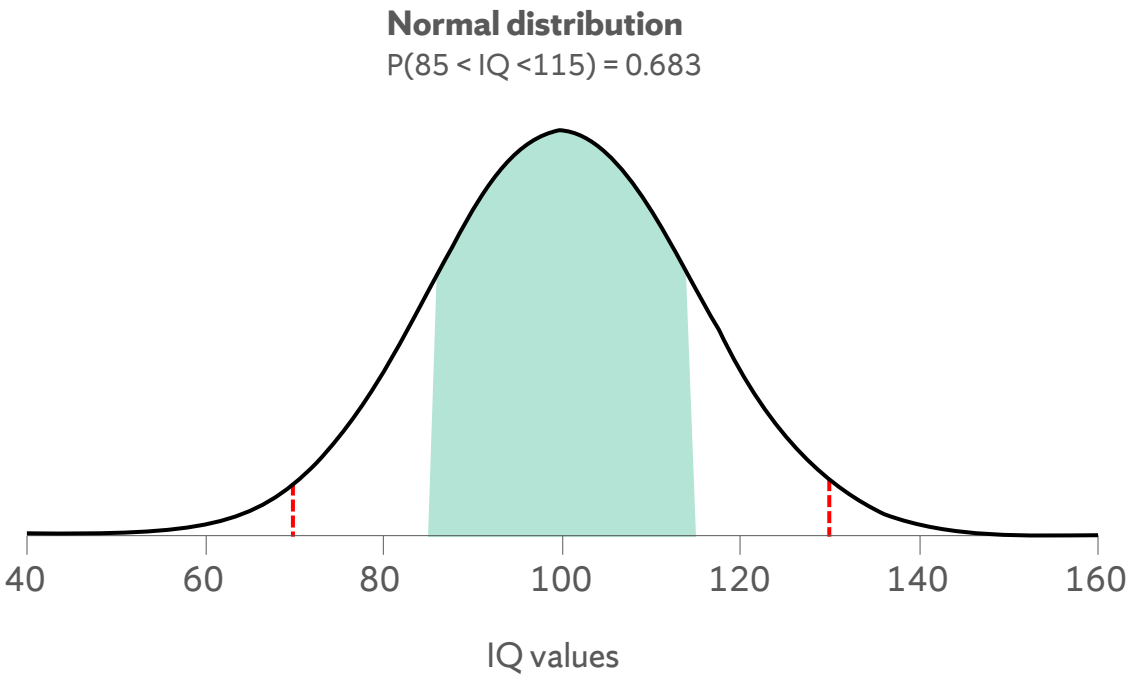
Normal Distribution

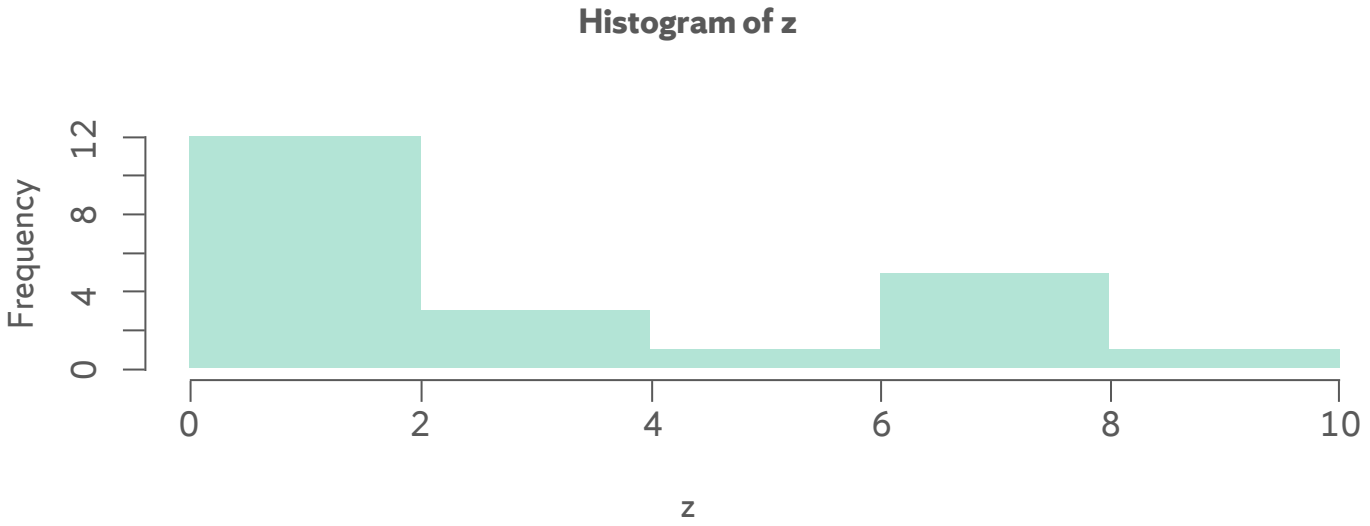


Distribution

Given a set of numbers, what is the central tendency? What is the shape?

1,5,0,3,8,8,1,2,1,8,7,2,1,2,10,3,2,8,1,0,3,0

0,0,0,1,1,1,1,1,2,2,2,2,3,3,3,5,7,8,8,8,8,10



Dimensions of Your Plots

An Informal Way to Talk About Plots

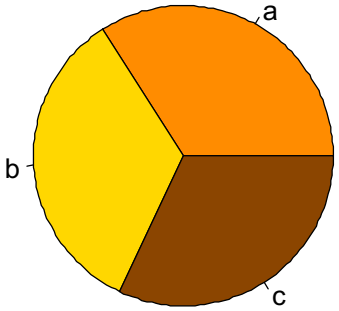
Single

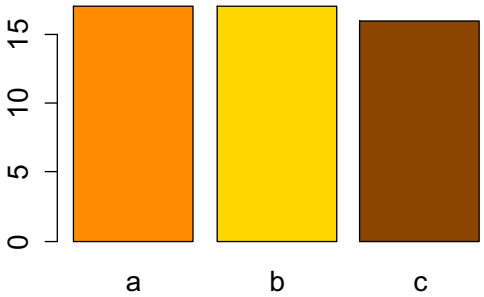
- Numeric or categorical
- Distribution within a single variable
- Frequency within a single variable

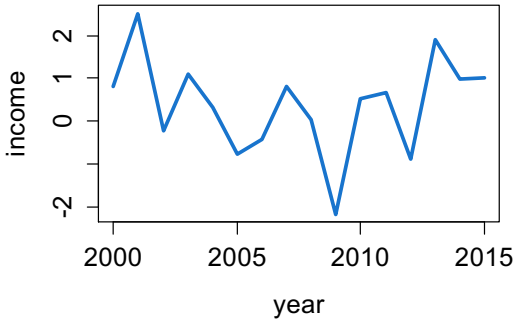
Multiple

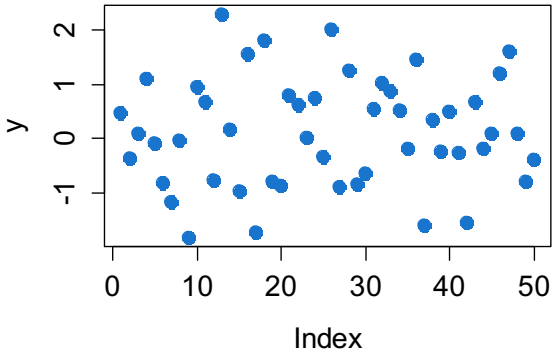
- Relating one variable to another
- Distribution of variable across categories
- Frequency of a categories across other categories

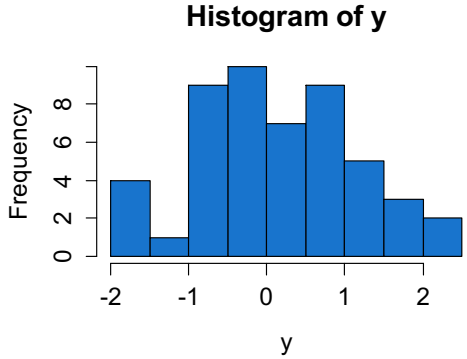
Single Dimension Plots

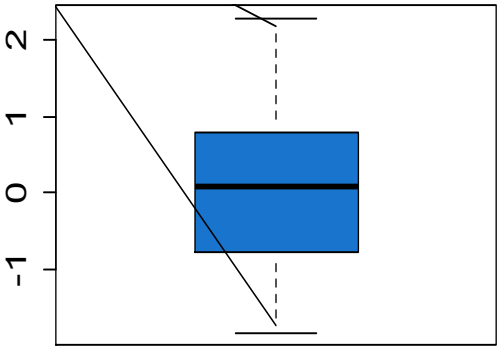




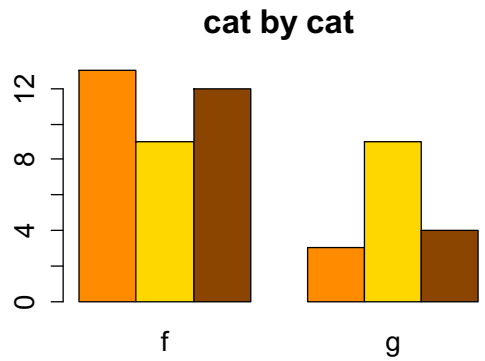


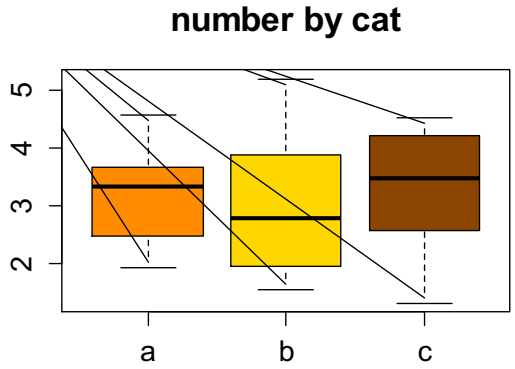


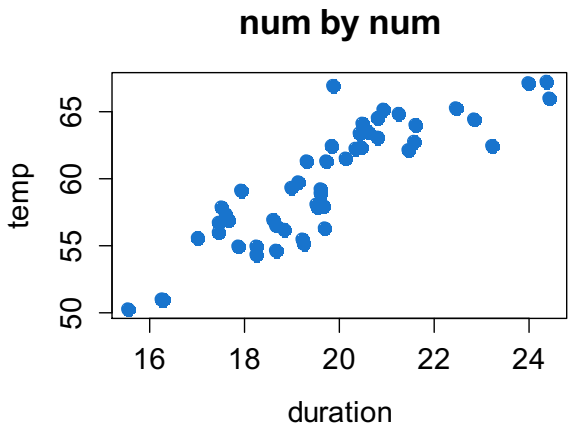


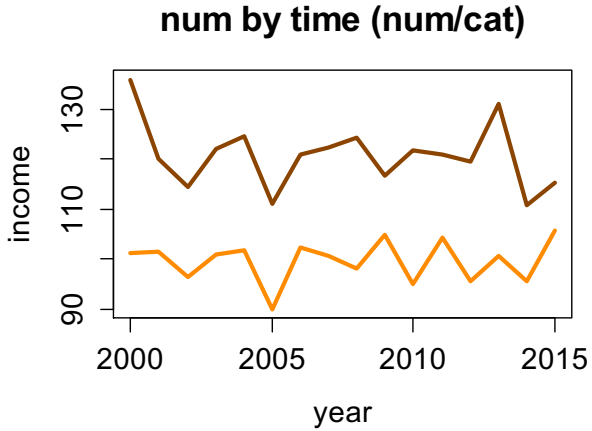


Multi-Dimension Plots









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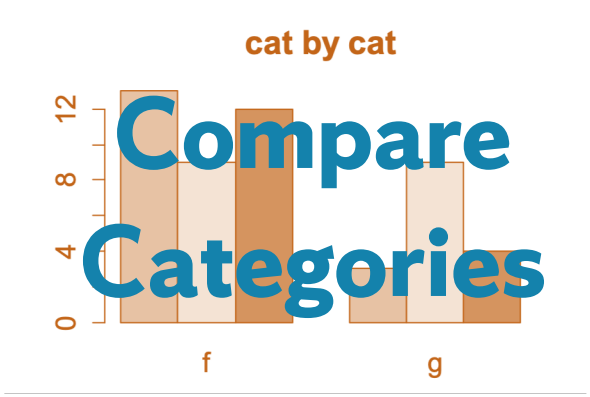

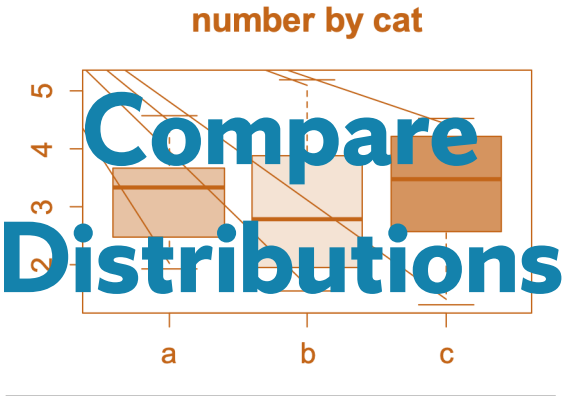

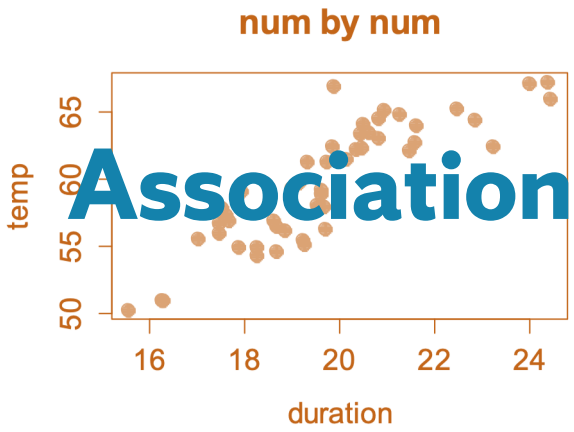

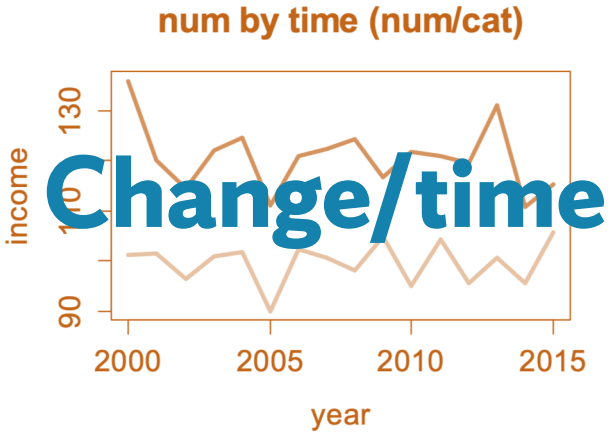

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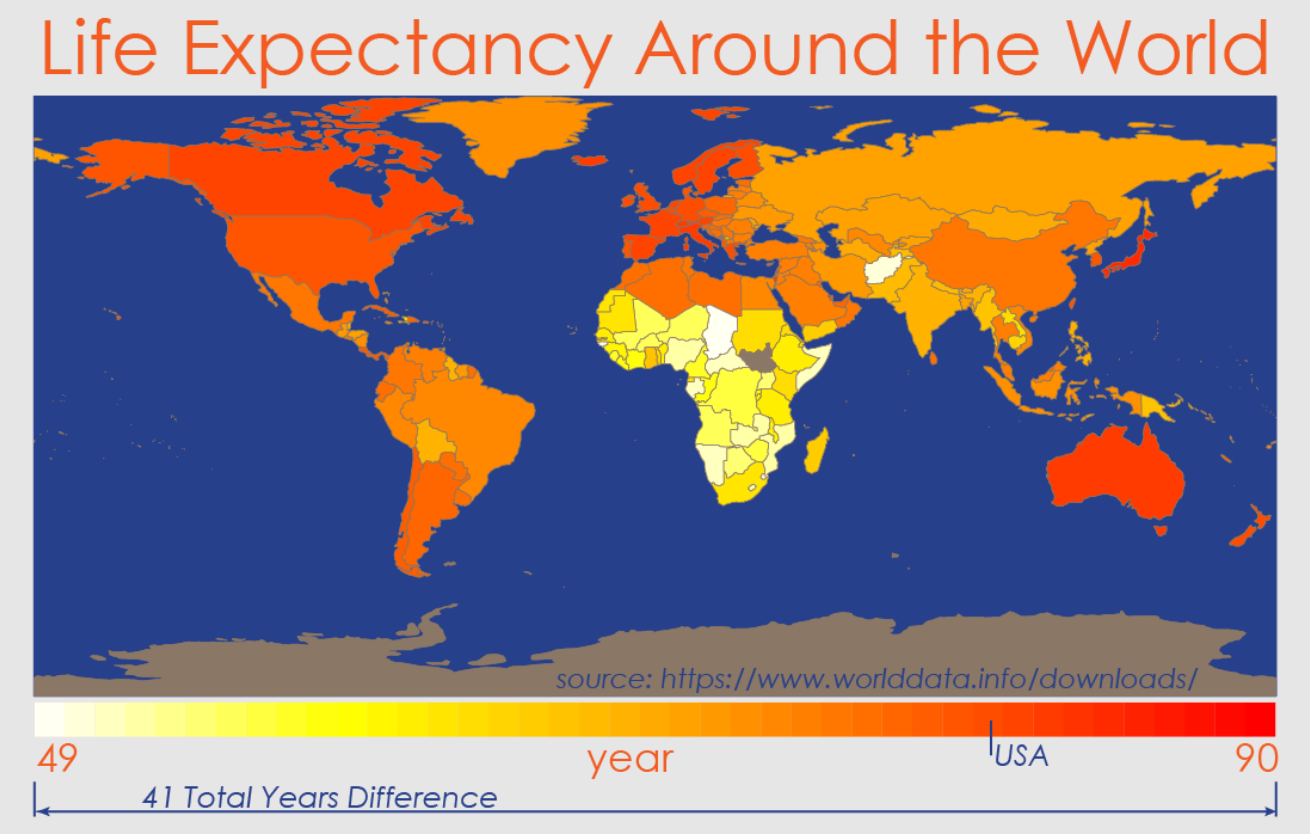

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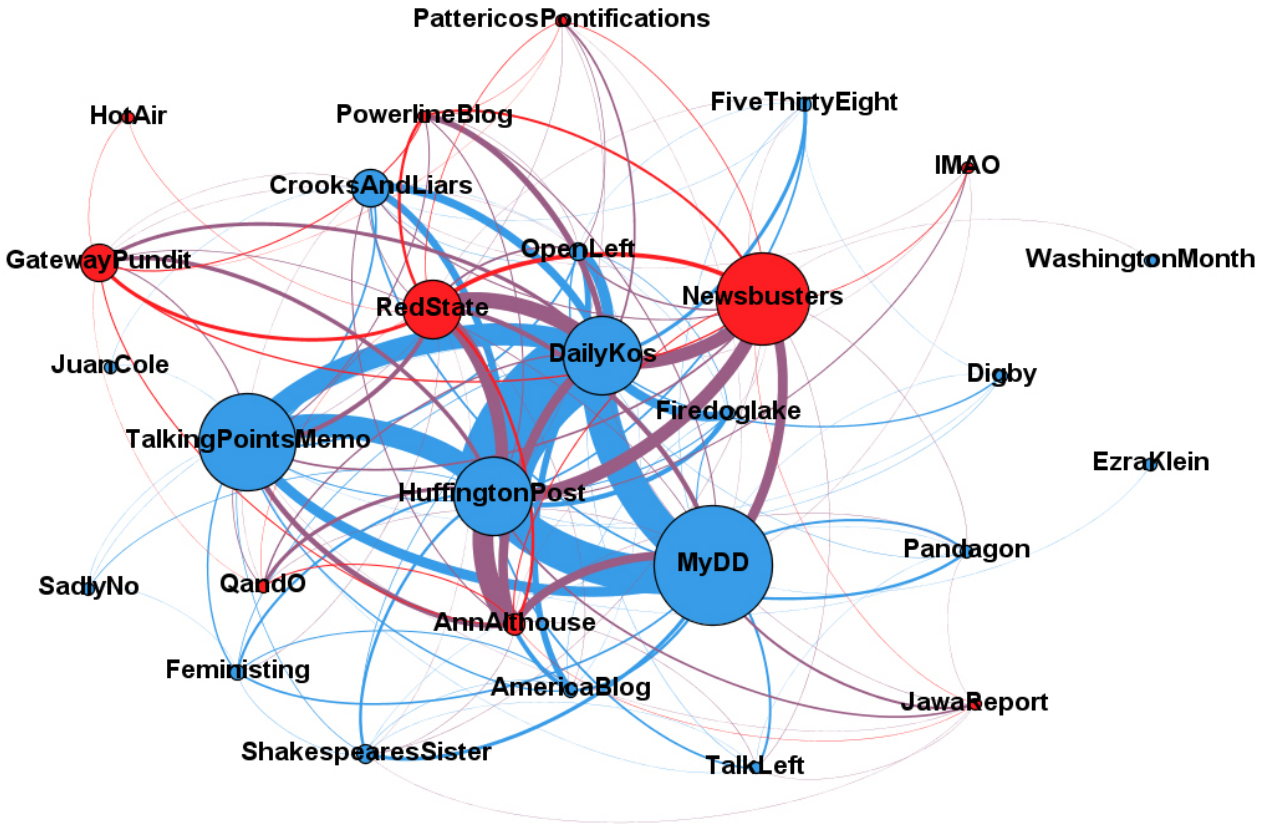

Comparisons

What kinds of comparisons?

Magnitude

- Nominal: no particular order, frequency
- Ranking: magnitude
- Parts-to-whole: proportions
- Deviation: differences between sets
- Time-series: change over time

Sorting

- Low to high

Position

- Maps

Strength of relationships

Data Story