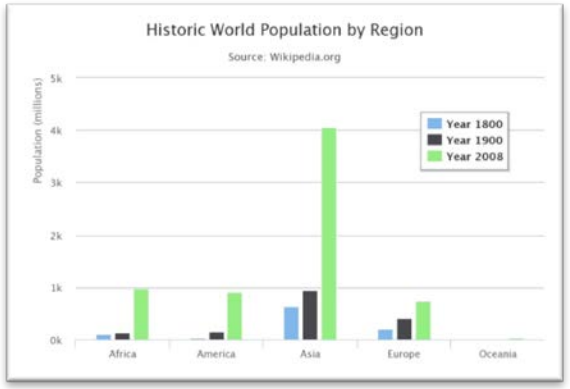
Module 3
Visualization

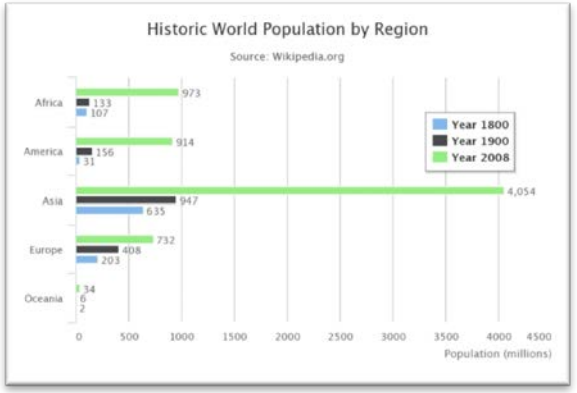
Reporting through Visualization

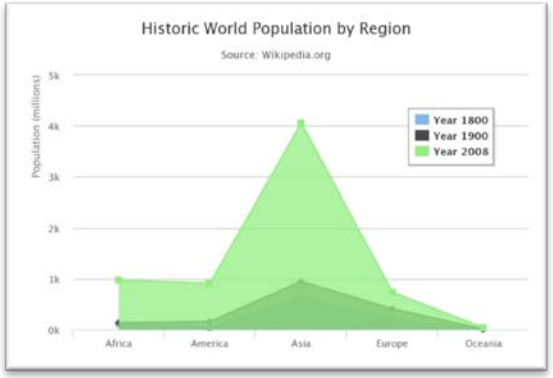
- **Data visualization involves the creation and study of the visual representation of data or metrics.**
- **Visualization technics include:**
  - Basic charts
  - Time series charts
  - Scatter plots
  - Bubble charts
  - Maps
  - Dashboards

Basic Charts

- X Axis: Metrics titles
- Y Axis : Metrics values
- Line, bar, area or column charts are interchangeable.

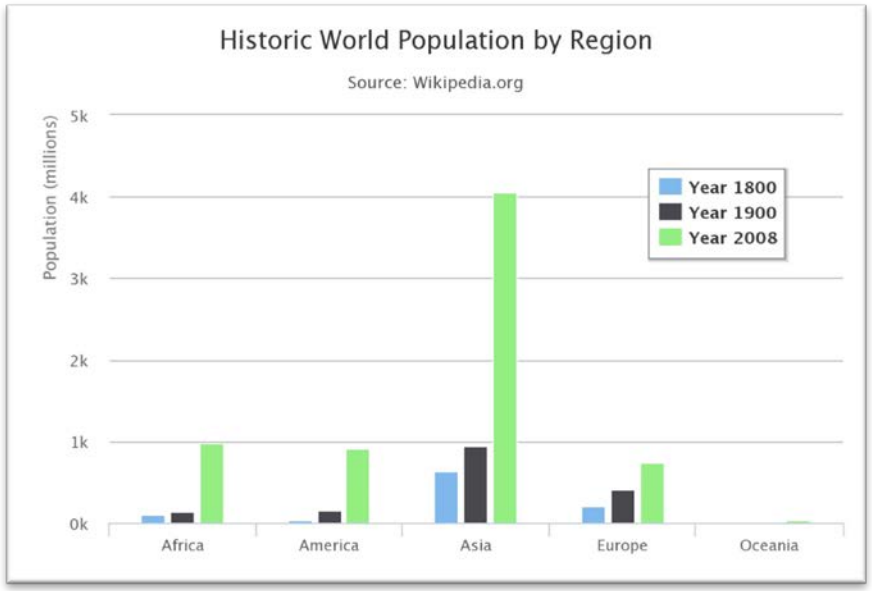


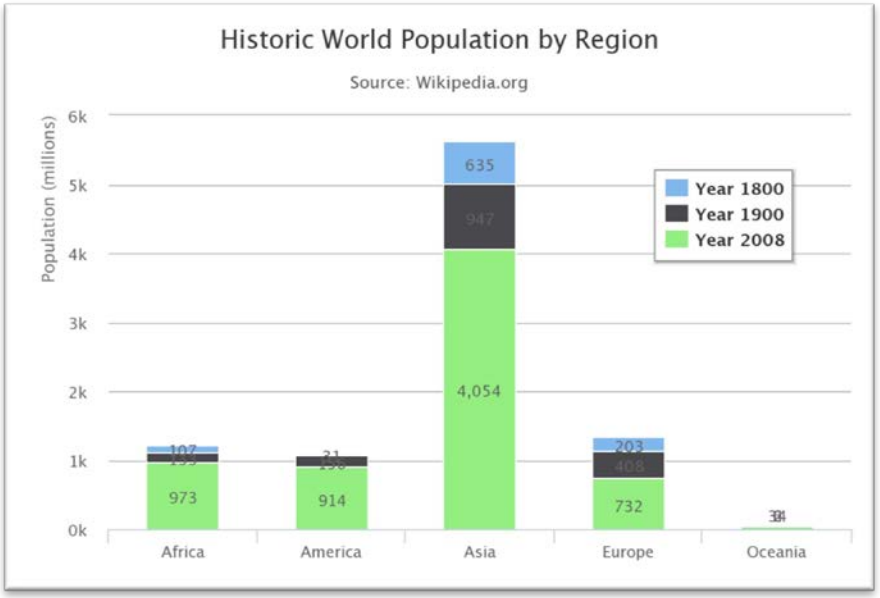




Stacking

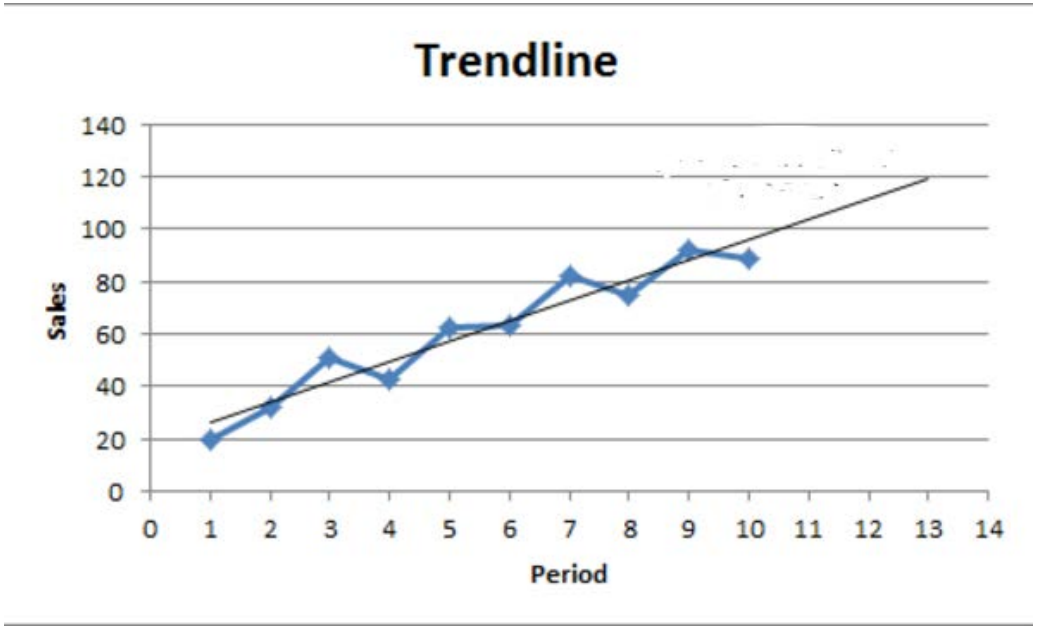
- Stacking can be used when we need to add (calculate the sum of) the metrics.
- Stacking saves space, but is less clear.





Time Series

- Time series are a type of column or line chart.
- Time series charts can include trend lines.

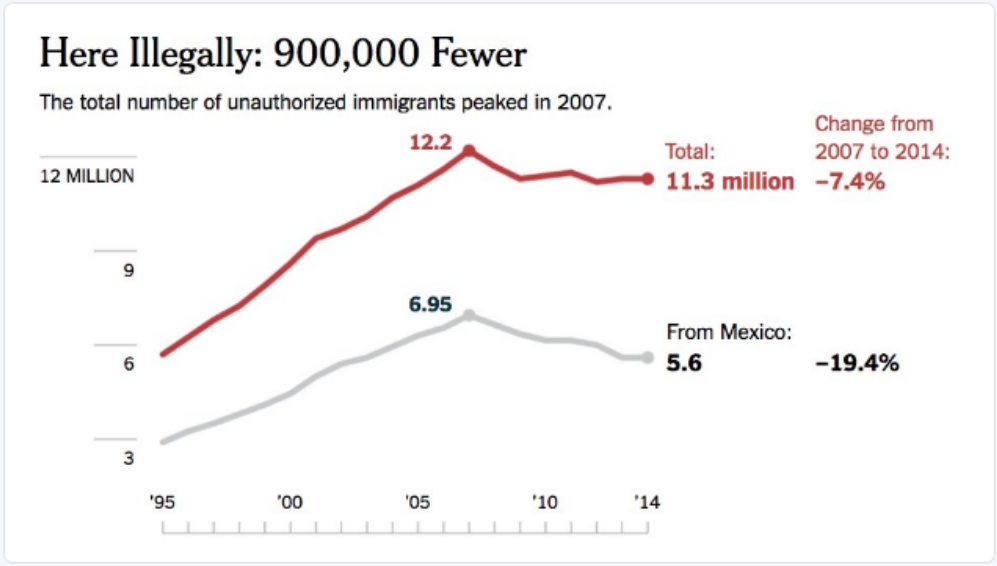


Time Series

NYT Graphics @nytgraphics · Jan 4

2016 in Charts. (And Can Trump Deliver in 2017?)

nytimes.com/2017/01/03/opi …



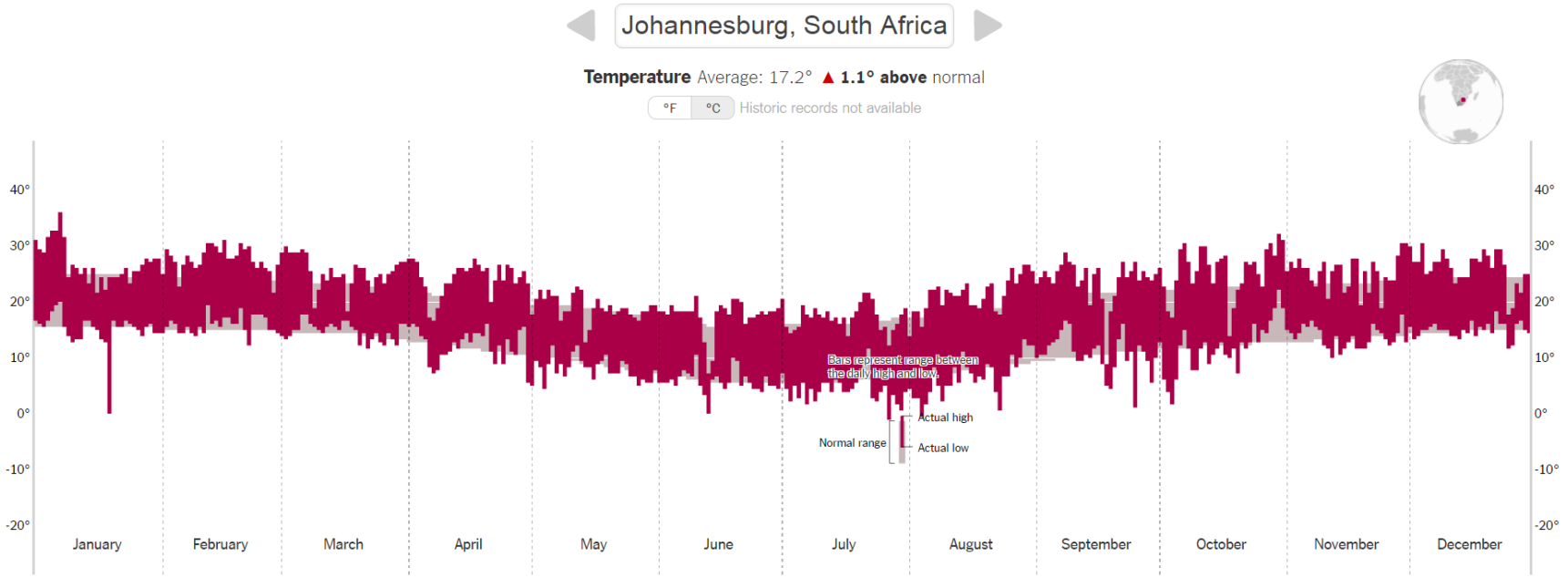
11 12

Time Series

How Much Warmer Was Your City in 2016?

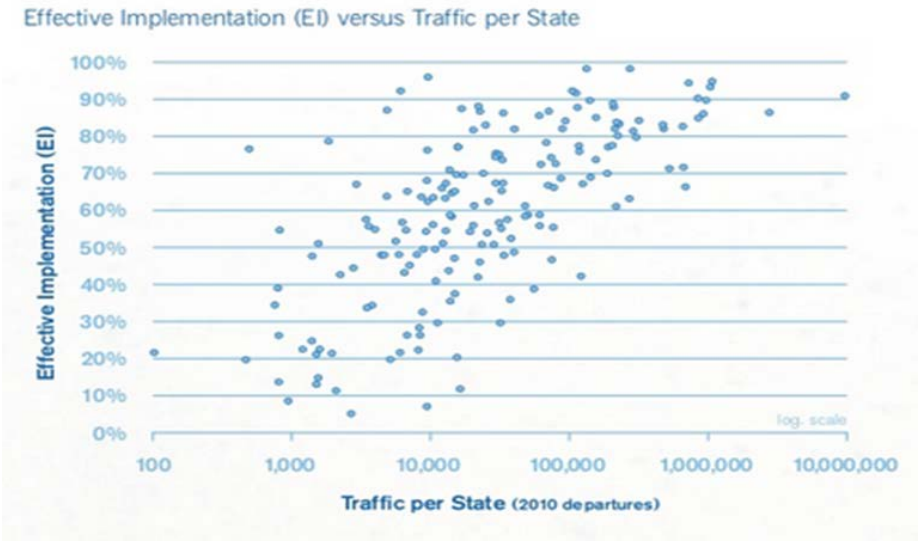
By K.K. REBECCA LAI JAN. 18, 2017

Last year is the hottest year on record for the third consecutive year. In a database of more than 5,000 cities provided by AccuWeather, about 90 percent recorded annual mean temperatures higher than normal. Enter your city below to see how much warmer (or cooler) it was.

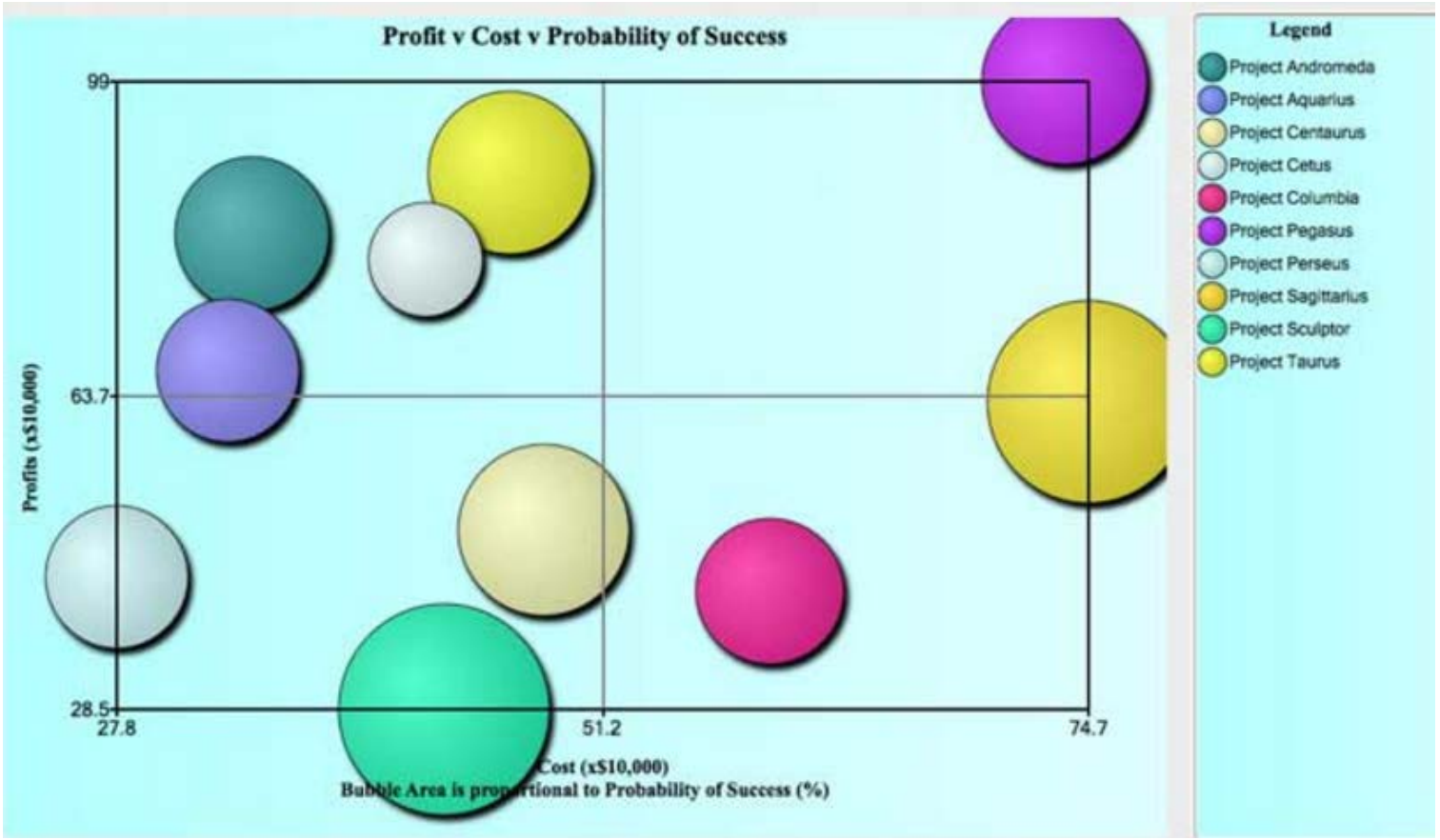


Scatter Plots

- Scatterplots are 2 dimensional graphs, representing 2 metrics.
- Each dot represents a record.
- Scatter plots are useful for correlations, but may be difficult to use otherwise.



Bubble Charts

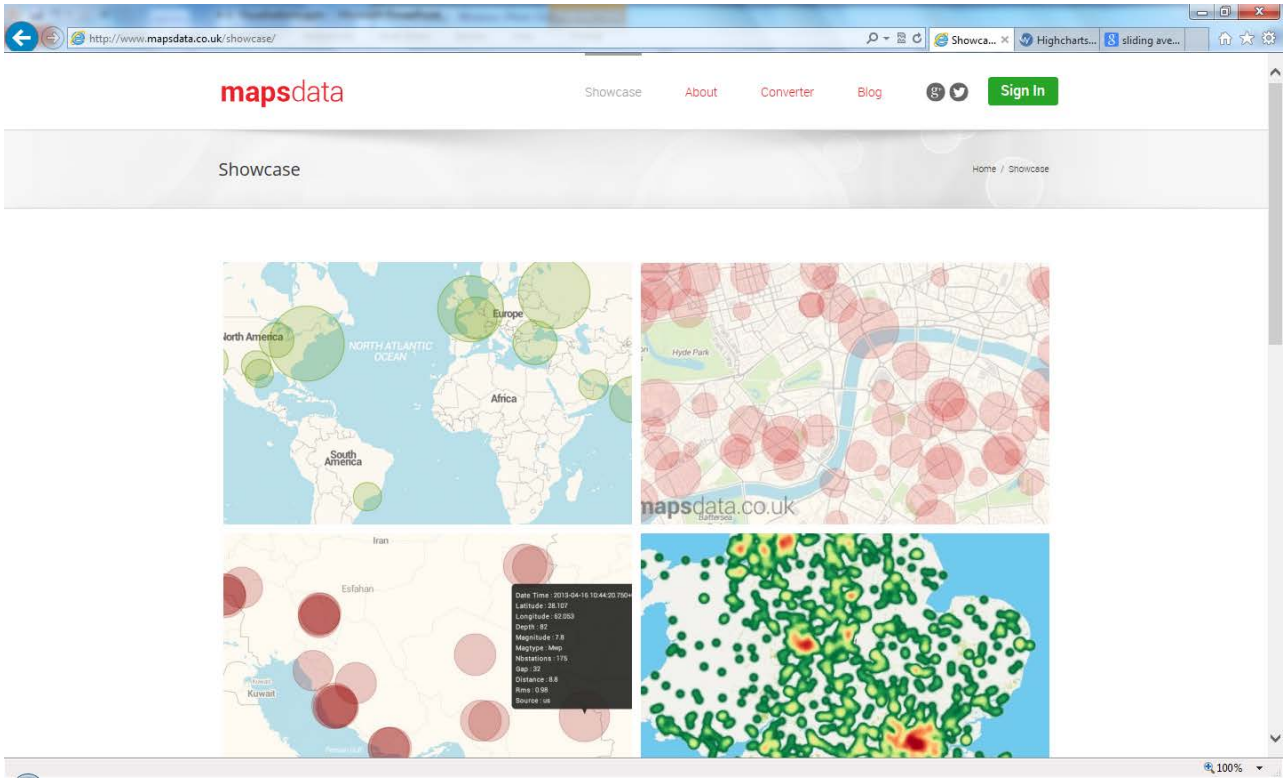


Bubble Charts

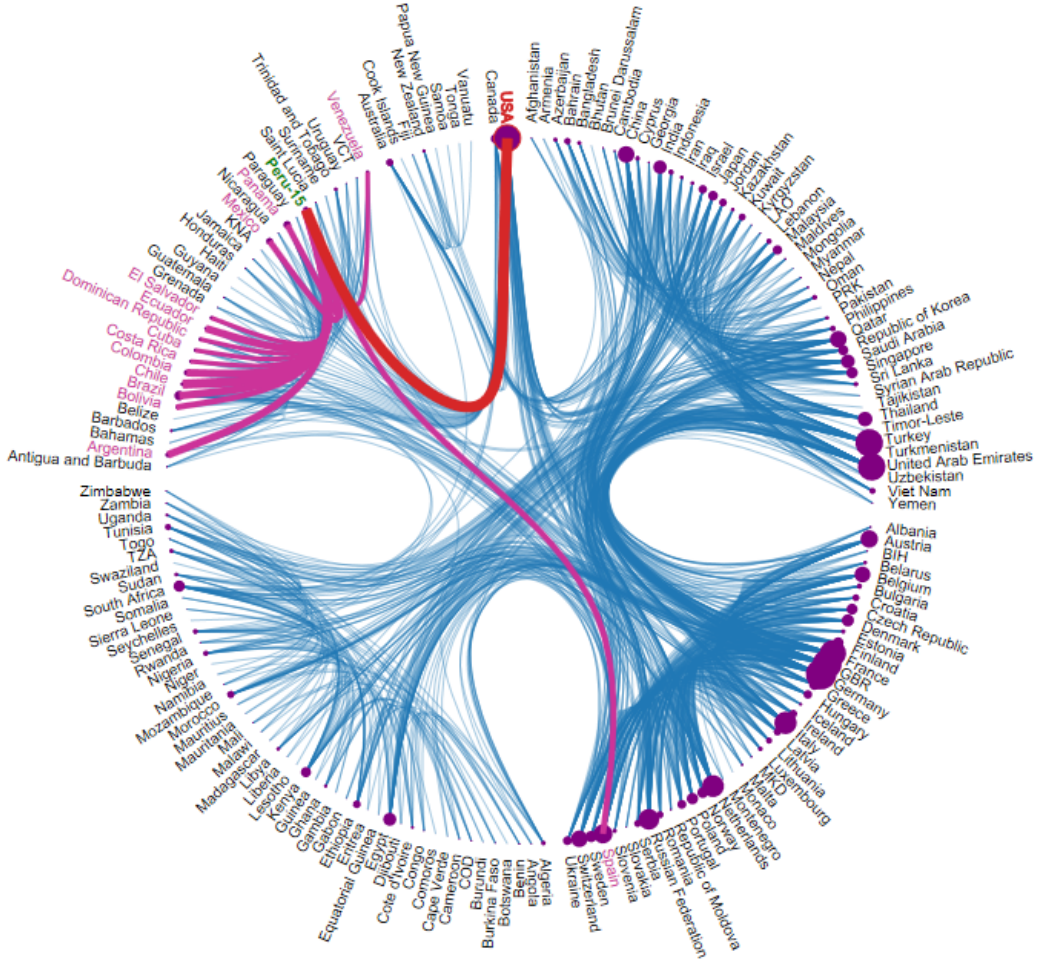
- Bubble charts are extremely useful for comparing the relationships between data in 3 data dimensions: the X-axis data, the Y-axis data and data represented by the bubble size.
- Bubble charts are like XY scatter graphs, except that each point on the scatter graph has an additional data value associated with it that is represented by the size of a “bubble” centered around the XY point.

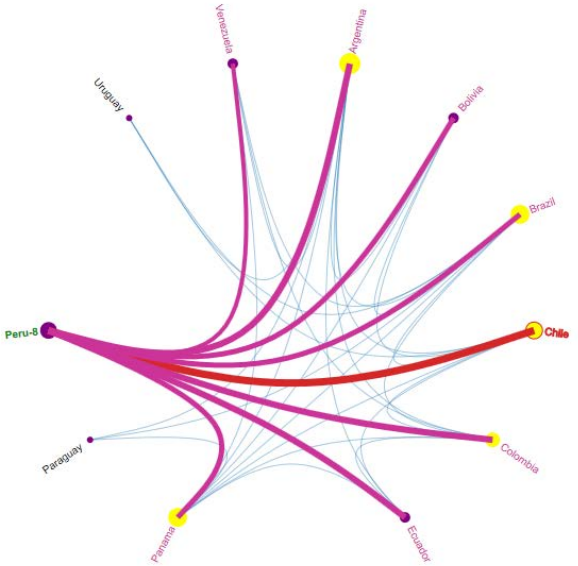
Maps

- **Maps are powerful representations, if the data is geo-referenced.**

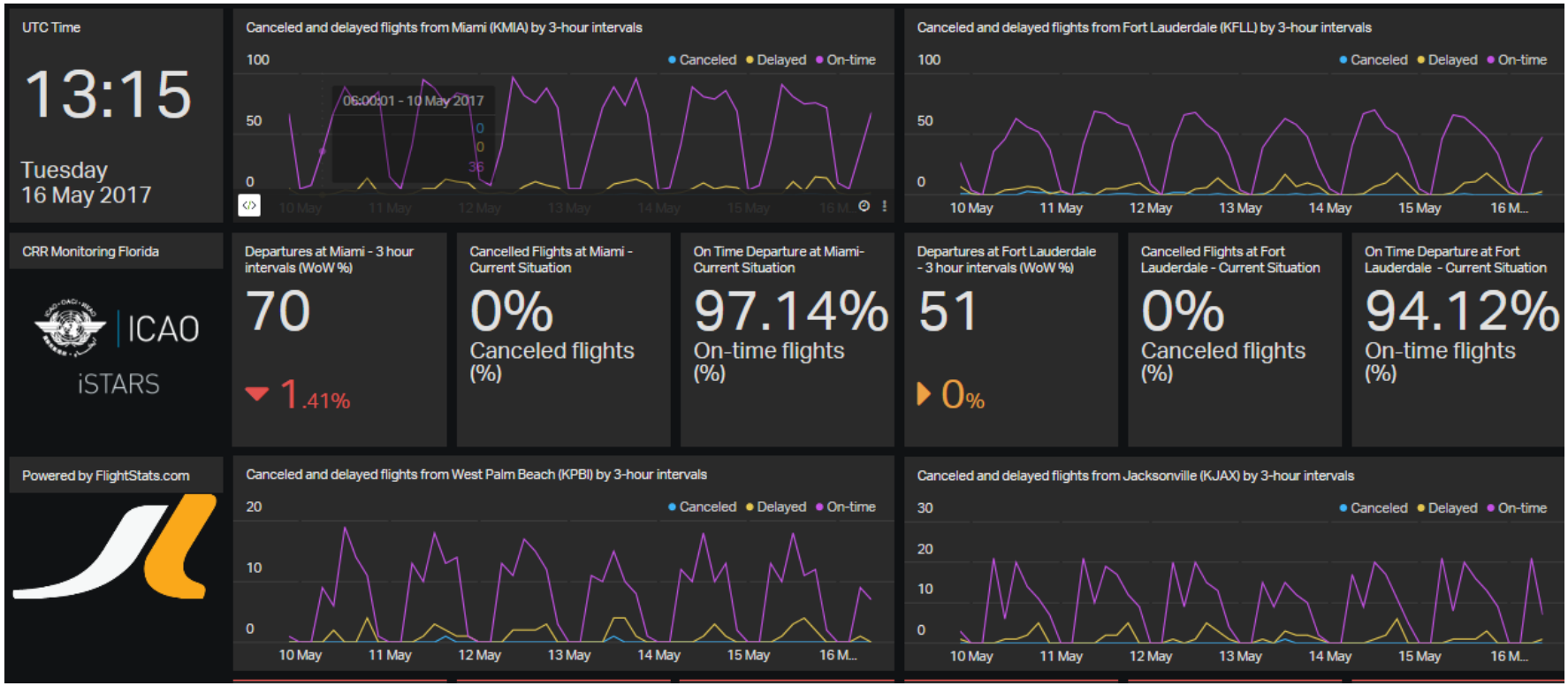


Connections





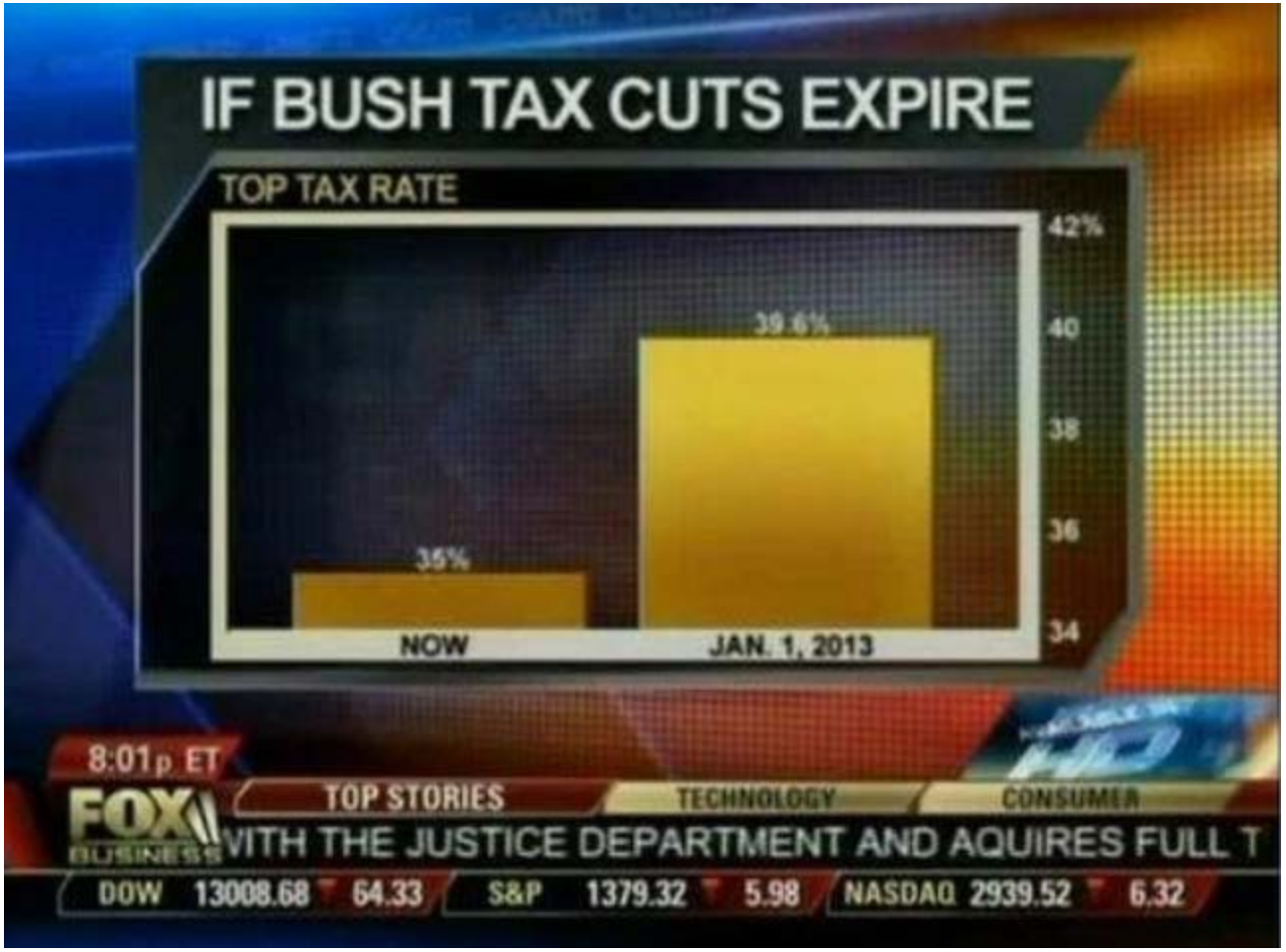
Dashboards


UTC Time
13:15
Tuesday
16 May 2017
Canceled and delayed flights from Miami (KMIA) by 3-hour intervals
100
50
0
Canceled
Delayed
On-time
06:00:01 - 10 May 2017
0
0
36
10 May
11 May
12 May
13 May
14 May
15 May
16 M...
Canceled and delayed flights from Fort Lauderdale (KFLL) by 3-hour intervals
100
50
0
Canceled
Delayed
On-time
10 May
11 May
12 May
13 May
14 May
15 May
16 M...
CRR Monitoring Florida
ICAO
iSTARS
Departures at Miami - 3 hour intervals (WoW %)
70
1.41%
Cancelled Flights at Miami - Current Situation
0%
Canceled flights (%)
On Time Departure at Miami- Current Situation
97.14%
On-time flights (%)
Departures at Fort Lauderdale - 3 hour intervals (WoW %)
51
0%
Cancelled Flights at Fort Lauderdale - Current Situation
0%
Canceled flights (%)
On Time Departure at Fort Lauderdale - Current Situation
94.12%
On-time flights (%)
Powered by FlightStats.com
Canceled and delayed flights from West Palm Beach (KPBI) by 3-hour intervals
20
10
0
Canceled
Delayed
On-time
10 May
11 May
12 May
13 May
14 May
15 May
16 M...
Canceled and delayed flights from Jacksonville (KJAX) by 3-hour intervals
30
20
10
0
Canceled
Delayed
On-time
10 May
11 May
12 May
13 May
14 May
15 May
16 M...

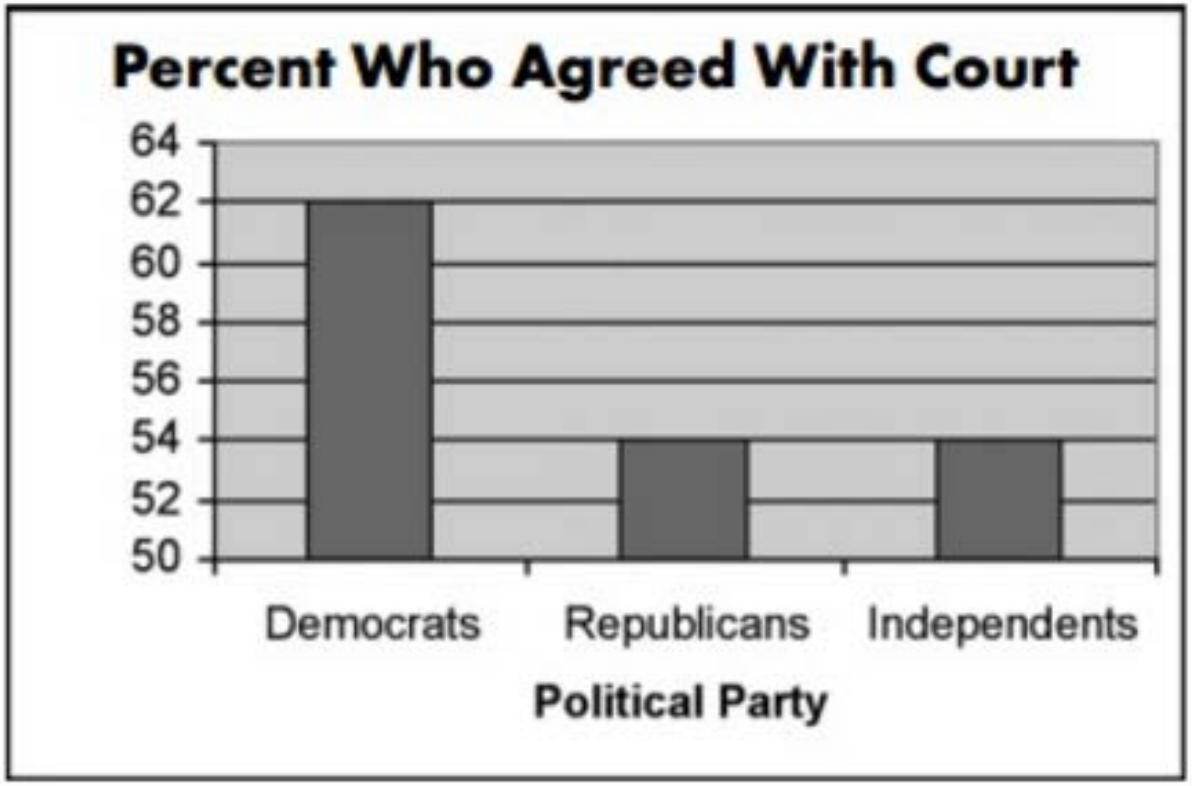
Dashboards

- Dashboards are an easy to read and real-time graphical presentation of key indicators.
- Often, a dashboard is displayed on a web page that is linked to a database which allows the report to be constantly updated.

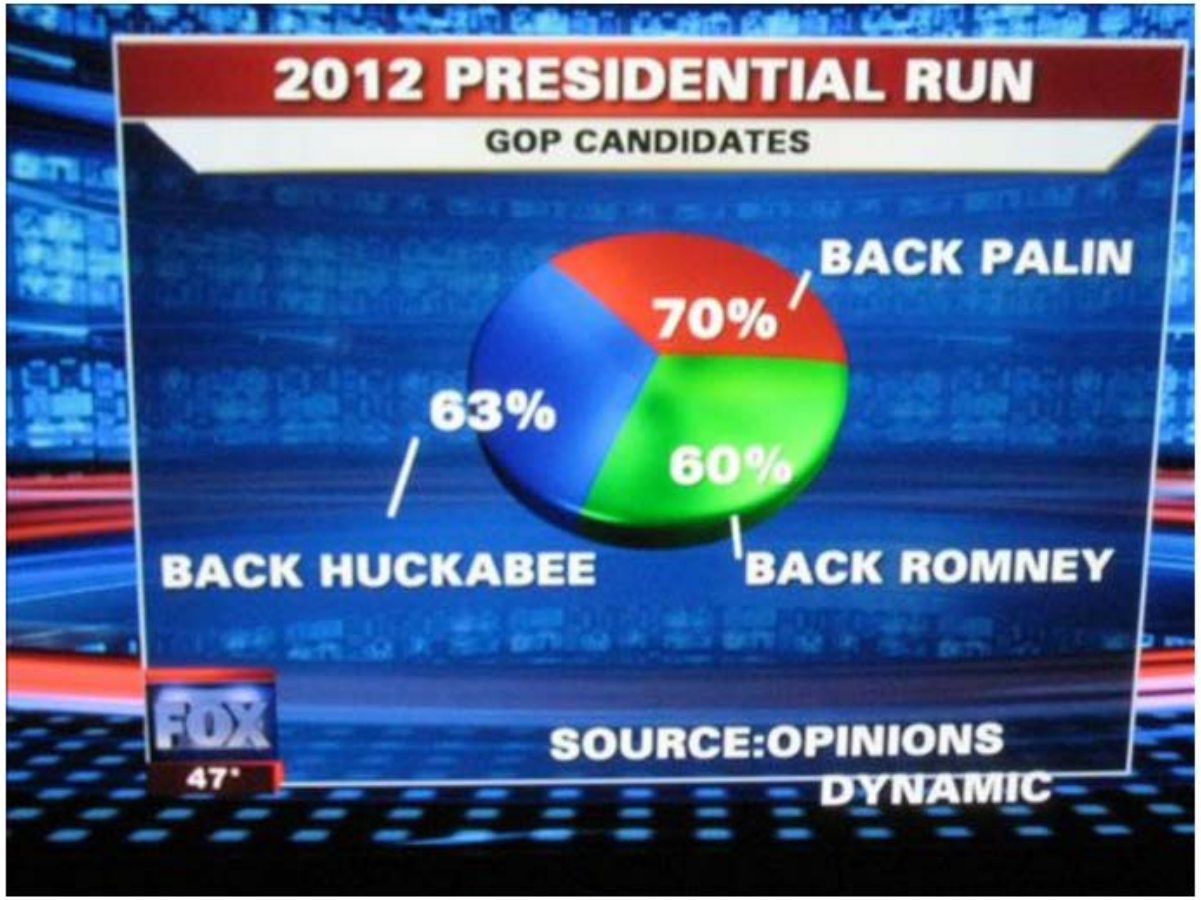
Misinterpretation



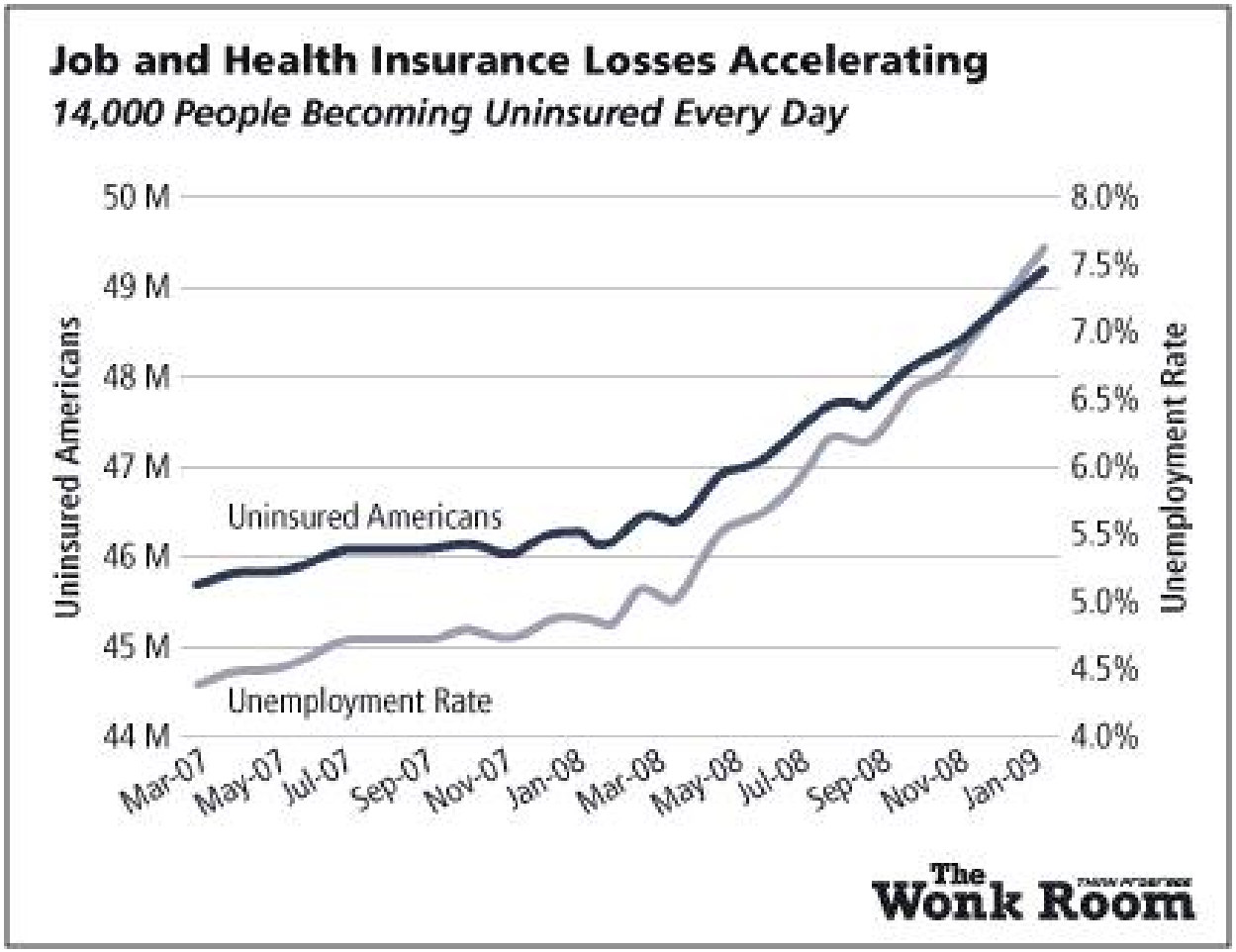
Misinterpretation



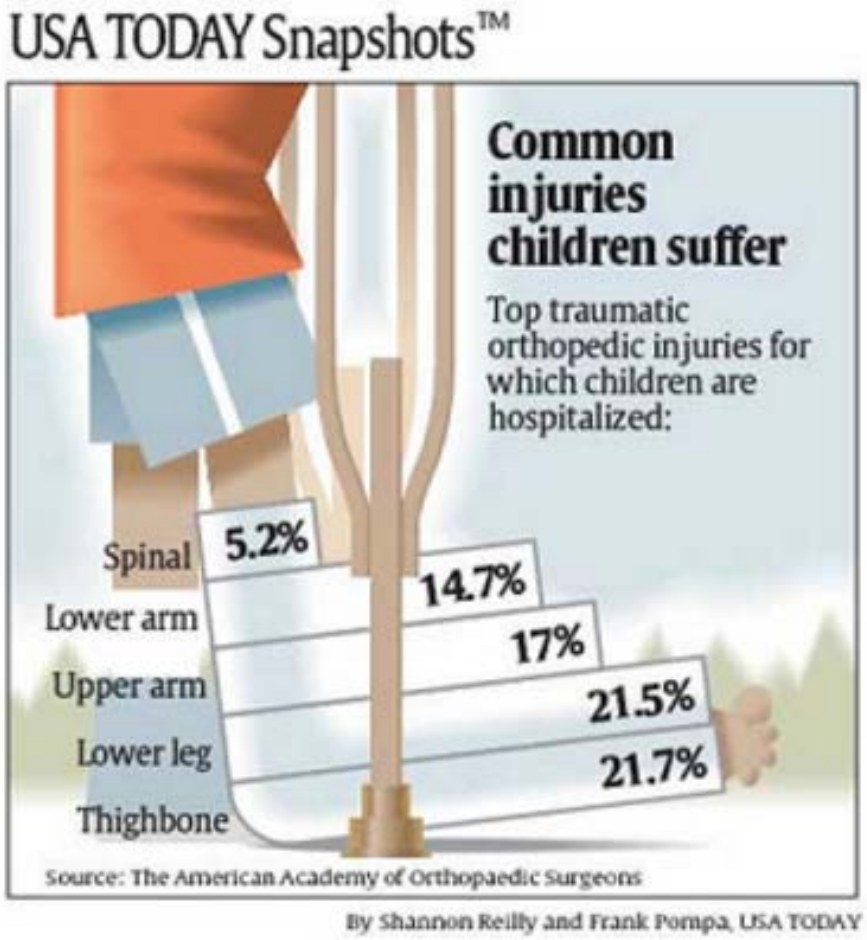
Misinterpretation



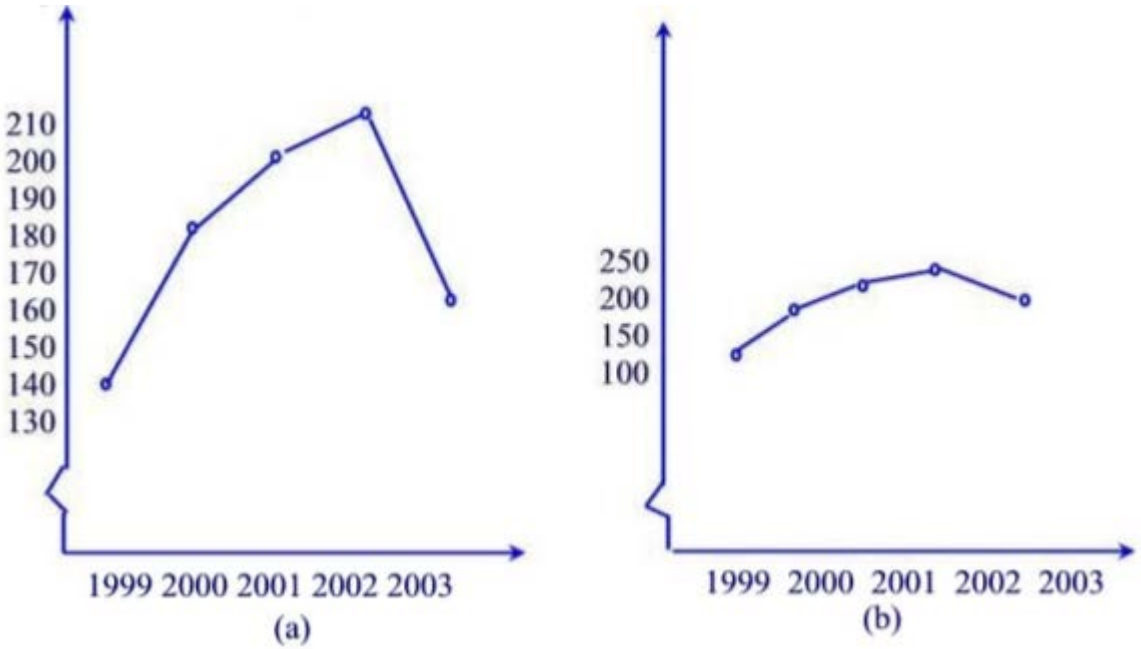
Misinterpretation



Misinterpretation



Misinterpretation



A Few Rules

- Do not use color as the only mean to encode a value (7% of the population is colour blind).
- Always provide a legend.
- Each graph, by itself, should provide all relevant information.
- Use only one unit per graph. Avoid multiple vertical axes.
- Always start your graph at 0.
- Avoid 3D graphics.
- Simple bar charts are easier to interpret than pie charts.

ICAO

THANK YOU