

Data Presentation: Showcasing Your Data With Charts and Graphs

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Guilford College



Friday, July 15, 2016, 12-1pm

Image source: <https://pixabay.com/en/bar-chart-columns-graph-diagram-297122/>



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raise hand
polling

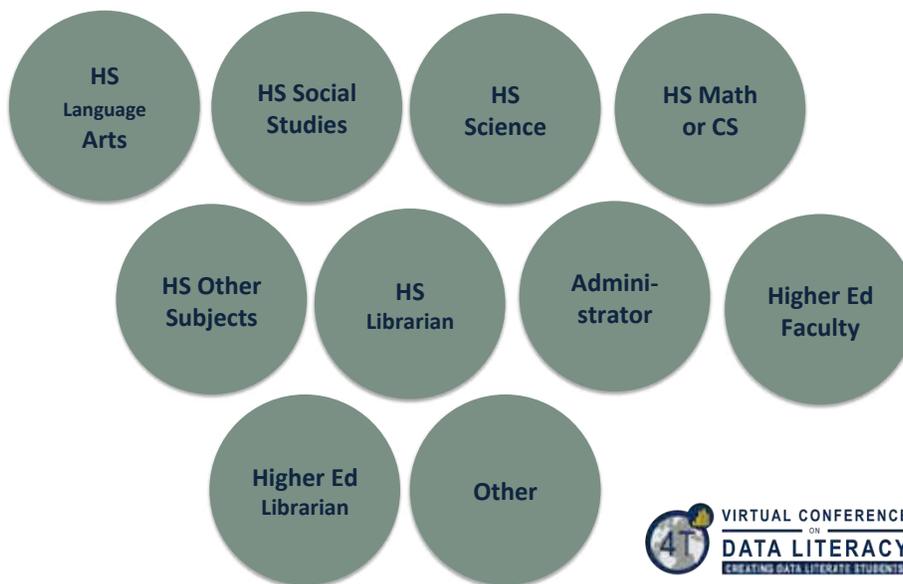
magic wand

chat

4T VIRTUAL CONFERENCE ON DATA LITERACY
CREATING DATA LITERATE STUDENTS



What Do You Teach?



Data Presentation: Showcasing Your Data With Charts and Graphs



Image source: <https://pixabay.com/en/bar-chart-columns-graph-diagram-297122/>



What do you think of the way this data is presented?

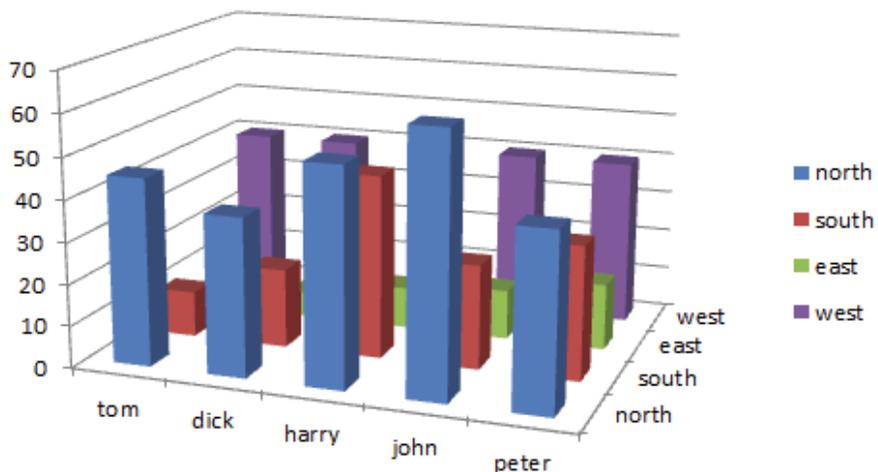


Image source: <http://www.forbes.com/sites/naomirobins/2012/06/07/trellis-plot-alternative-to-three-dimensional-bar-charts/>



General Rules of Thumb



Image source: https://commons.wikimedia.org/wiki/File:Symbol_thumbs_upzel.svg (color edited)



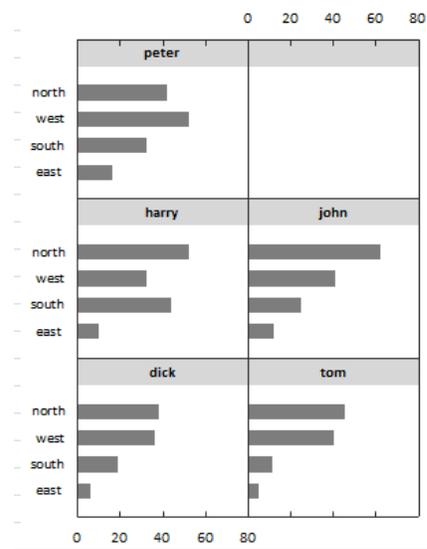
1. Clarity and simplicity are key.



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- Keep it simple: avoid unnecessary ornamentation.
- Split things up into multiple charts if the display starts getting crowded.

Image source: <http://www.forbes.com/sites/naomirobbins/2012/06/07/trellis-plot-alternative-to-three-dimensional-bar-charts/>

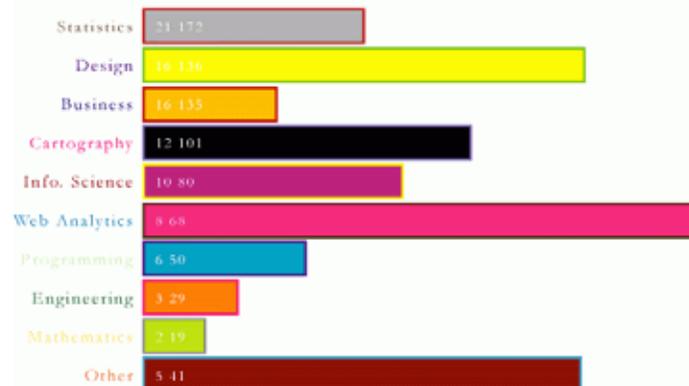


2. Make it easy to read and interpret.



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Poll Results: What Data-related Area Are You Most Interested In?

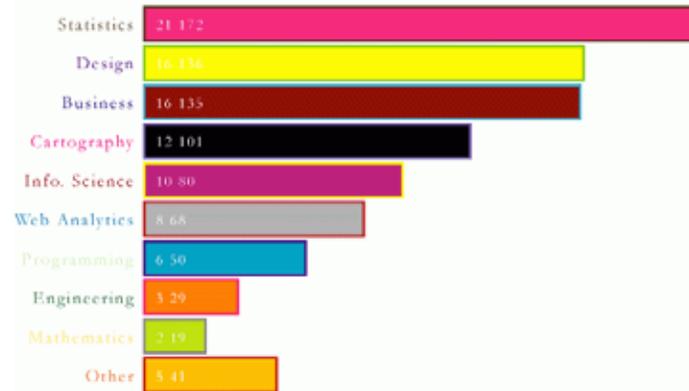


What's wrong with this picture?

Image source: <http://flowingdata.com/2009/06/15/6-easy-steps-to-make-your-graph-really-ugly/>

2. Make it easy to read and interpret.

Poll Results: What Data-related Area Are You Most Interested In?

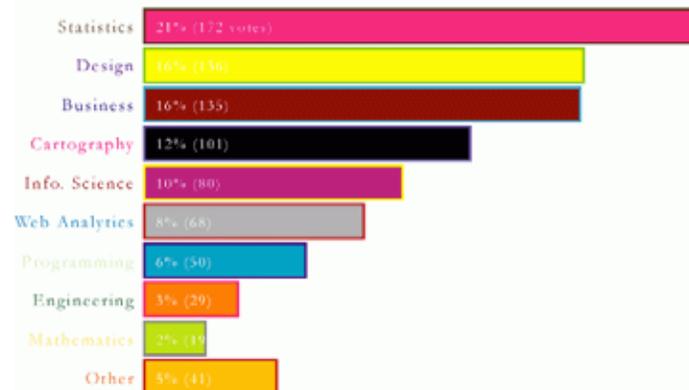


Organize values in a meaningful order.

Image source: <http://flowingdata.com/2009/06/15/6-easy-steps-to-make-your-graph-really-ugly/>

2. Make it easy to read and interpret.

Poll Results: What Data-related Area Are You Most Interested In?

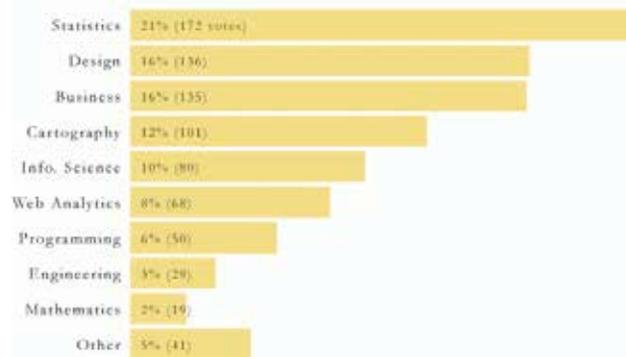


Provide a legend and labels. Clarify units.

Image source: <http://flowingdata.com/2009/06/15/6-easy-steps-to-make-your-graph-really-ugly/>

2. Make it easy to read and interpret.

Poll Results: What Data-related Area Are You Most Interested In?



Use a simple color scheme. Avoid using color combinations that are difficult to distinguish.

Image source: <http://flowingdata.com/2009/06/15/6-easy-steps-to-make-your-graph-really-ugly/>

3. Respect visual and mathematical principles.

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Size two-dimensional shapes proportionally according to their area.

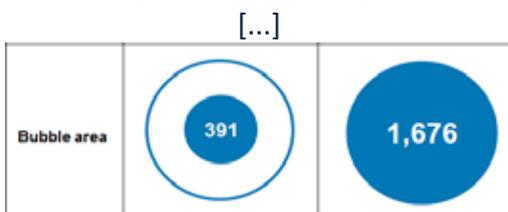
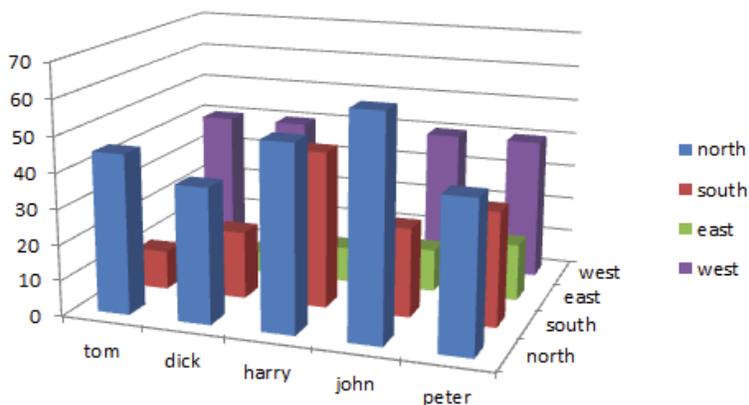


Image source: <http://viz.wtf/post/131758708391/does-the-big-circle-show-391-connections-656-or> (cropped for clarity)

3. Respect visual and mathematical principles.

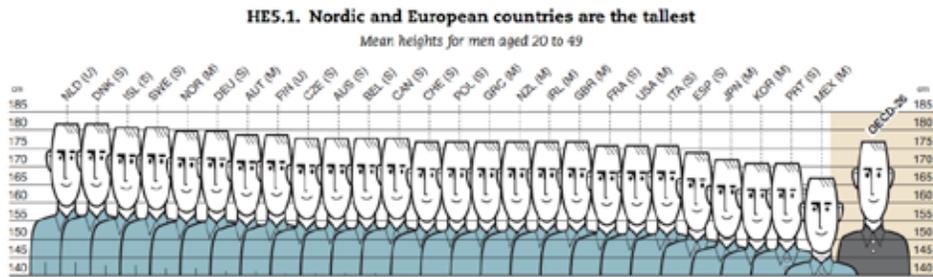


Keep things in two dimensions.

Image source: <http://www.forbes.com/sites/naomirobbins/2012/06/07/trellis-plot-alternative-to-three-dimensional-bar-charts/>



3. Respect visual and mathematical principles.

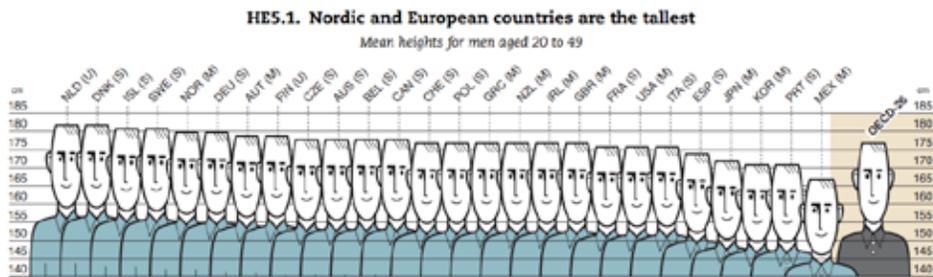


Do these icons add to the visualization?

Image source: OECD via WTF Visualizations (<http://viz.wtf/image/131032061255>).



3. Respect visual and mathematical principles.



In general, forego icons in the data visualization itself.

Image source: OECD via WTF Visualizations (<http://viz.wtf/image/131032061255>).



4. Play around with your data!



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Try out different charts and graphs, using software readily at your disposal: it's as easy as the click of a button.

Microsoft Excel



Google Sheets



Image sources: https://commons.wikimedia.org/wiki/File:Microsoft_Excel_2013_logo.svg and <http://eci511-emarsh-blog.blogspot.com/>



5. Cite your sources – or even provide your dataset.

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Source is missing:
what would
context provide?

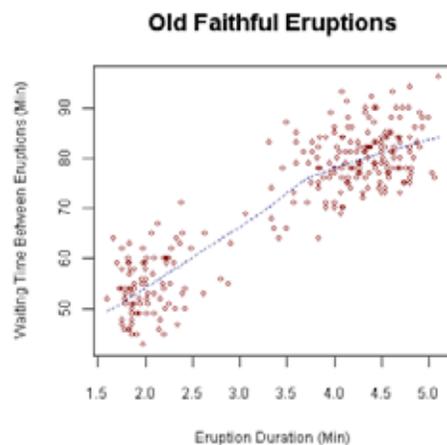


Image source: <https://en.wikipedia.org/wiki/File:Oldfaithful3.png>

Data Presentation – Rules of Thumb

1. Clarity and simplicity are key.
2. Make it easy to read and interpret.
3. Respect visual and mathematical principles.
4. Play around with your data!
5. Cite your sources or provide your dataset.

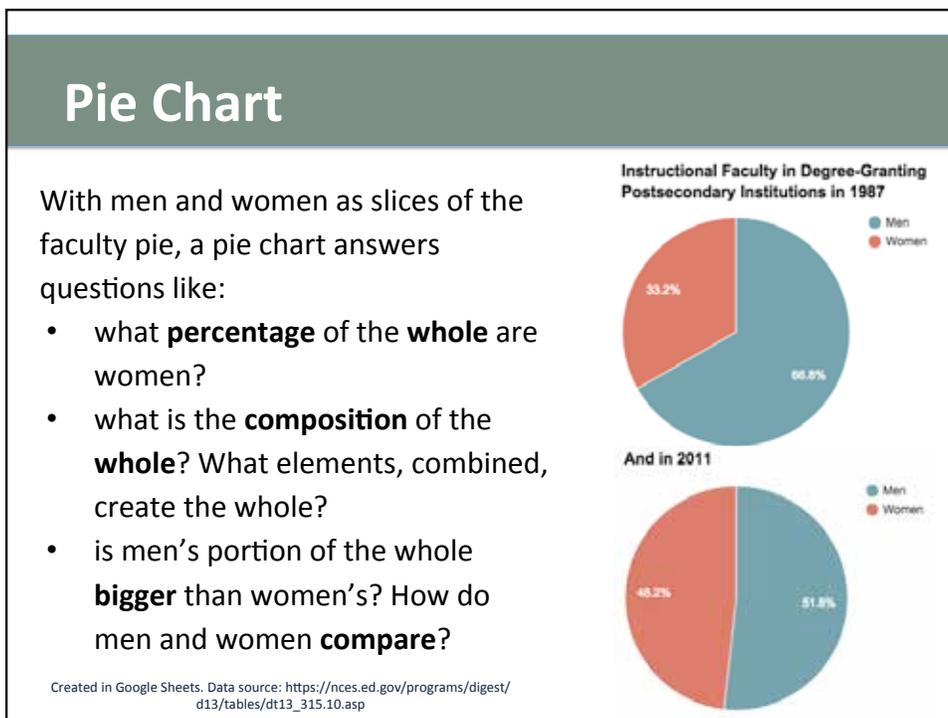
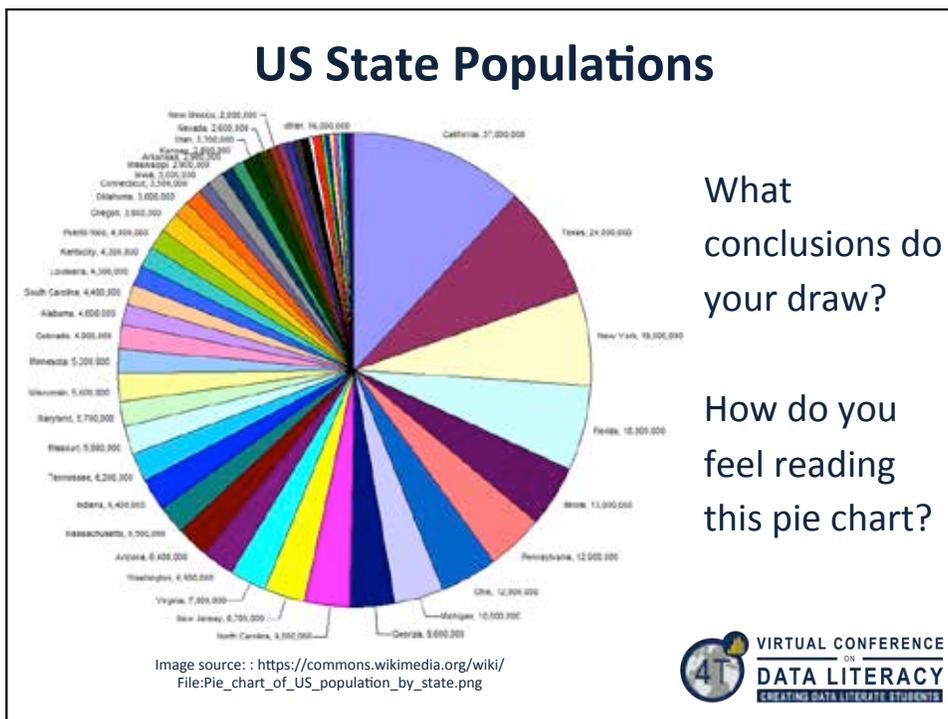


Handy Charts & Graphs – and the Questions They Can Answer

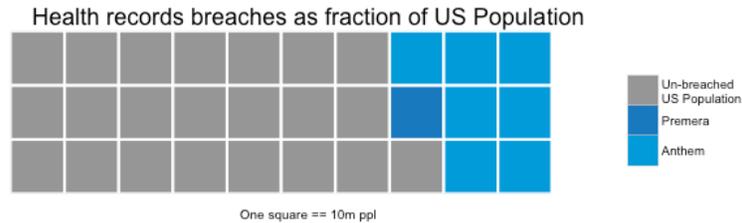


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Waffle Chart (aka Square Pie Chart)



With the Anthem and Premera breaches as segments, a waffle chart answers questions like:

- what **fraction** of the **whole** is Anthem?
- what is the **composition** of the **whole**? What elements, combined, create the whole?
- is Anthem's portion of the whole **bigger** than Premera's? How do Anthem and Premera **compare**?

Image source: <http://rud.is/b/2015/03/18/making-waffle-charts-in-r-with-the-new-waffle-package/>

Bar Chart

With healthcare enrollment as a variable, a bar chart answers questions like:

- which category has the **highest** or **lowest** enrollment?
- how does enrollment **vary** across different categories?
- how do multiple categories **compare** to one another?



Image source: : Fox News, via Flowing Data (<https://flowingdata.com/2014/04/04/fox-news-bar-chart-gets-it-wrong/>)

Dot Plot

With x and y as two different variables, a dot plot answers questions like:

- which company has the **highest** or **lowest** profit? and revenue?
- how does profit **compare** to revenue?
- how do profit and revenue **vary** across **different** companies?

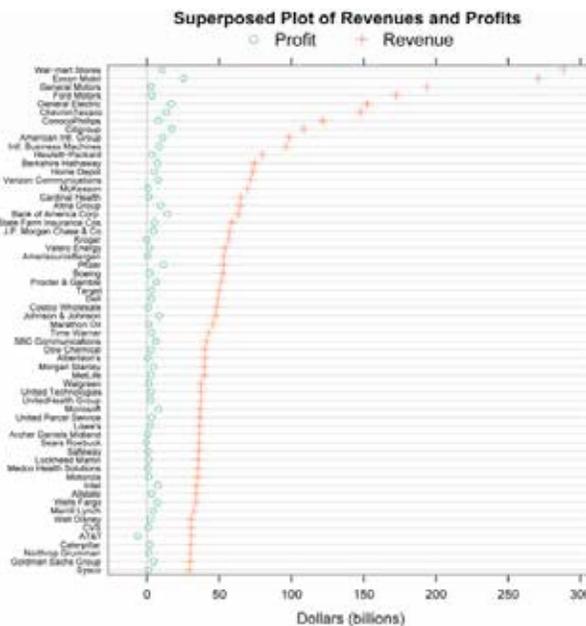


Image source: Naomi Robbins via <http://www.b-eye-network.com/view/2468>

Revenues and Profits Dot Plot (Clipped)

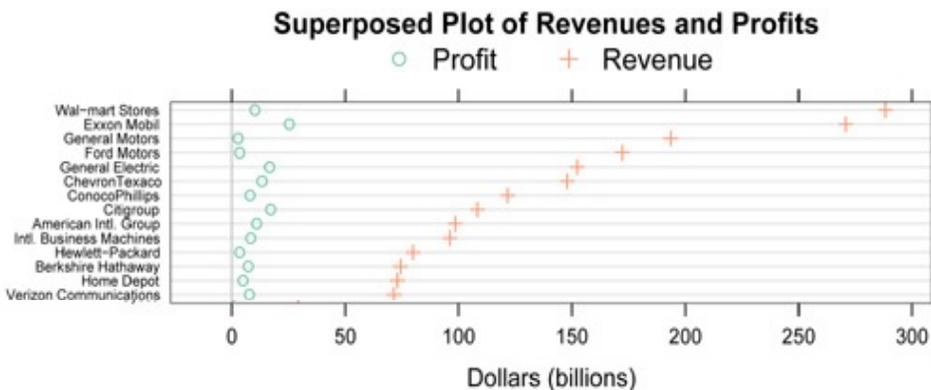


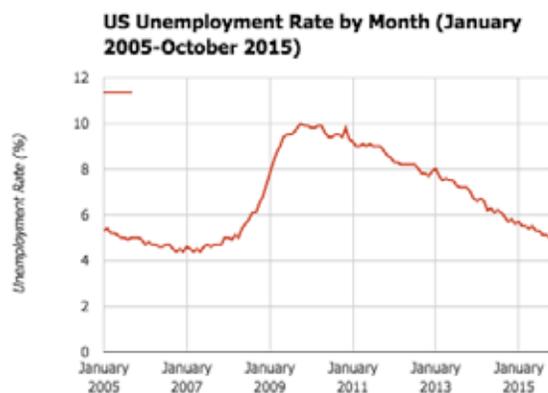
Image source: Naomi Robbins via <http://www.b-eye-network.com/view/2468>



Line Chart

With unemployment as a quantitative variable, a line chart answers questions like:

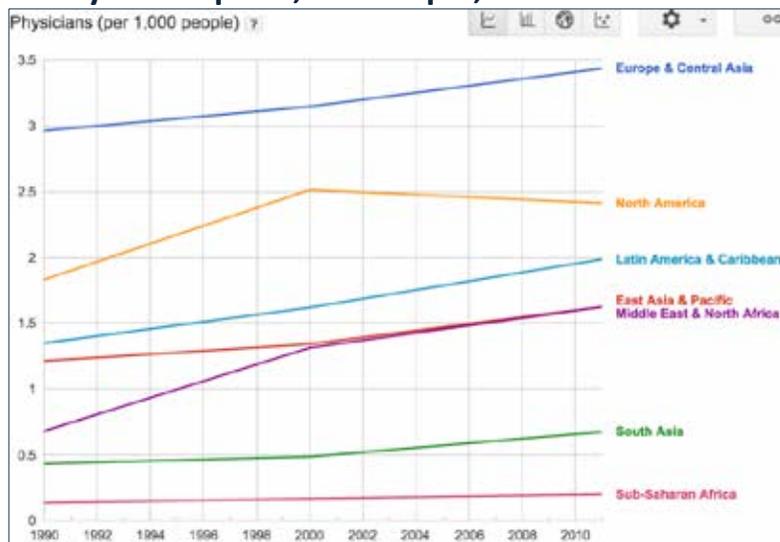
- how does unemployment **evolve** over time?
- when was it **highest** or **lowest**?
- does it rise or fall in a seeming **pattern**?



Created in Google Sheets. Data source: <http://data.bls.gov/timeseries/LNS14000000>



Google Public Data Explorer: Physicians per 1,000 People, Across the World



Created with Google Public Data Explorer.

Histogram

A histogram answers questions like:

- what are the **patterns** in my data?
- in what **intervals** do data points have the highest **frequency** (i.e., in what intervals are data points most concentrated)?
- what is the **distribution** of my data? Does it **skew** a certain way?

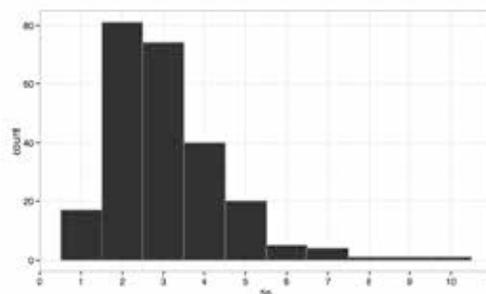


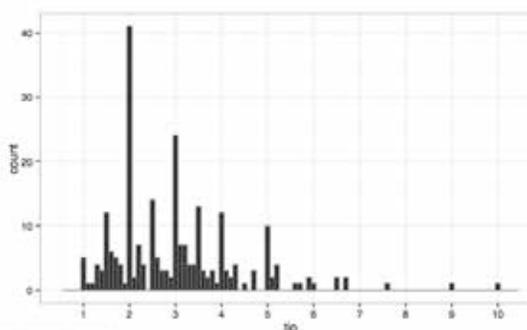
Image source: <https://en.wikipedia.org/wiki/File:Tips-histogram1.png>



Histogram Bin Width: Tips at a Restaurant

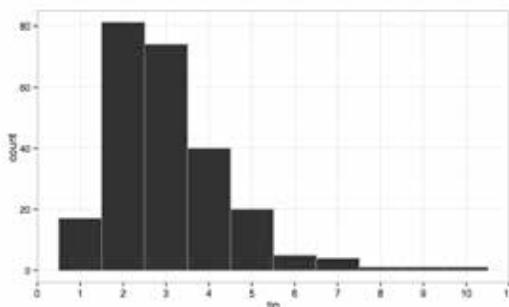
\$1 Bin Width ↓

Image source: <https://en.wikipedia.org/wiki/File:Tips-histogram1.png>



↑ 10¢ Bin Width

Image source: <https://en.wikipedia.org/wiki/File:Tips-histogram2.png>



Further Reading

Blogs:

- Flowing Data: <http://flowingdata.com/>
- Junk Charts: <http://junkcharts.typepad.com/>

Books:

- *Data Points: Visualization That Matters* (Nathan Yau, 2013)
- *Creating More Effective Graphs* (Naomi Robbins, 2005)
- *The Visual Display of Quantitative Information* (Edward Tufte, 1983)



Recap:

1. Clarity and simplicity are key.
2. Make it easy to read and interpret.
3. Respect visual and mathematical principles.
4. Play around with your data!
5. Cite your sources or provide your dataset.

Different charts and graphs convey different things: pick the one that's right for you.

Questions?

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steelbergtc@guilford.edu



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Evaluation:
<http://bit.ly/4TDL-datapresentation>

