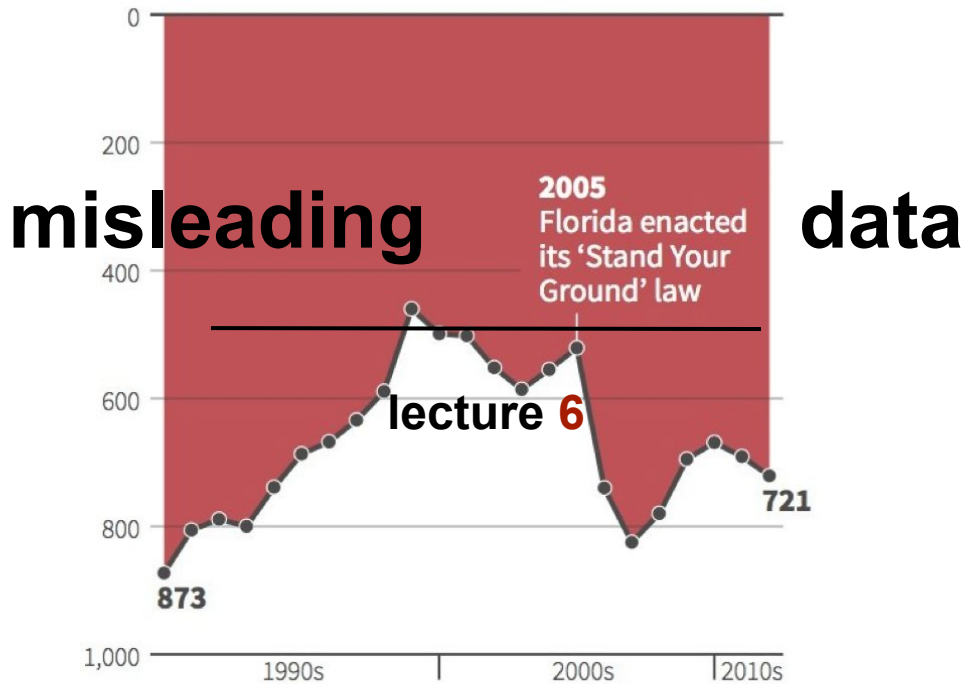


Gun deaths in Florida

Number of murders committed using firearms



Source: Florida Department of Law Enforcement

overview

how do you spot data fallacies?

how do you tell a story with data?

- 1. data / visualization fallacies**
- 2. reading Cronon**
- 3. reading COVID misinformation**
- 4. example Chicago maps**

cover image: Reuters graph on Florida gun deaths,
from [LiveScience](#); discussion: [Reddit](#)

“The New Deal planners in effect argued that the rising plot line of our earlier storytellers not only was false but was itself the principal cause of the environmental disaster that unfolded during the 1930s. The Dust Bowl had occurred **because people had been telling themselves the wrong story** and had tried to inscribe that story – the frontier – on a landscape incapable of supporting it.”

- “A Place for Stories” (Cronon)

common fallacies in data arguments (and visualizations)

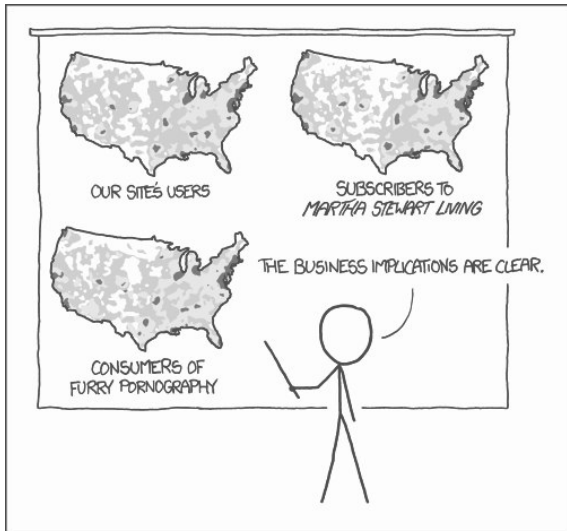
many examples from <https://venngage.com/blog/misleading-graphs/>

1. assuming causation from correlation
2. cherry-picking
3. inaccurate scale (x or y axis)
4. visual confusion
5. outliers

common fallacies in data arguments (and visualizations)

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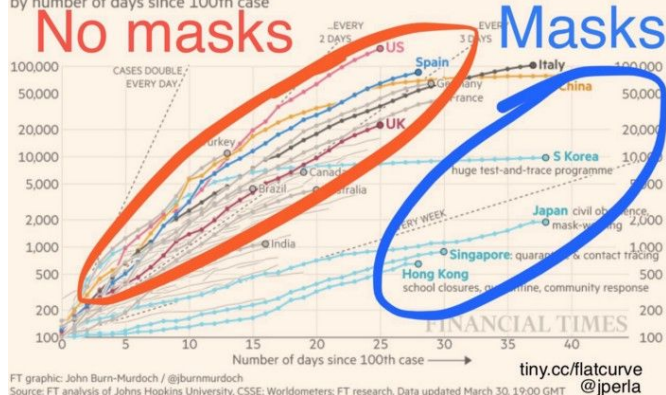
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PET PEEVE #208:
GEOGRAPHIC PROFILE MAPS WHICH ARE
BASICALLY JUST POPULATION MAPS

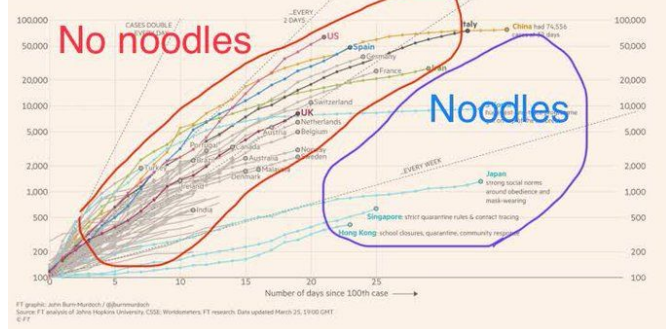
Country by country: how coronavirus case trajectories compare

Cumulative number of confirmed cases,
by number of days since 100th case



Country by country: how coronavirus case trajectories compare

Cumulative number of confirmed cases, by number of days since 100th case



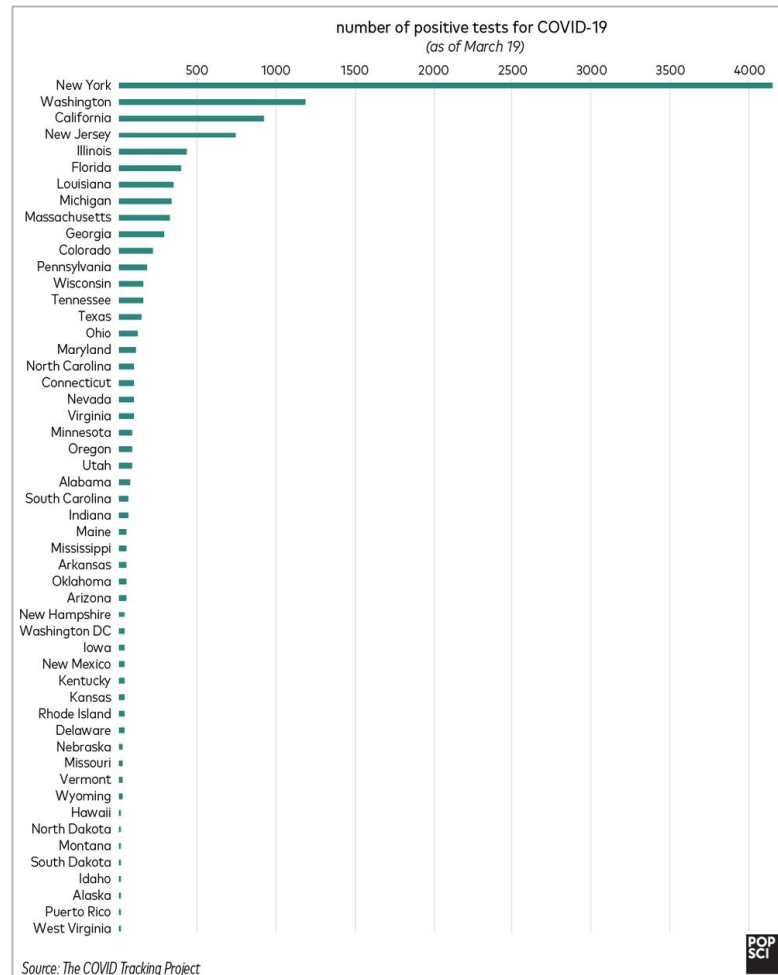
left source: xkcd
right source: twitter

common fallacies in data arguments (and visualizations)

many examples from <https://venngage.com/blog/misleading-graphs/>

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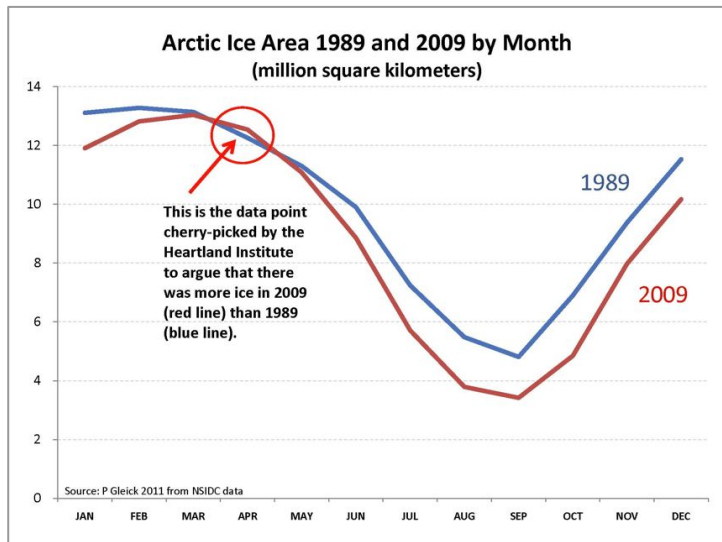
positive tests vs. actual cases



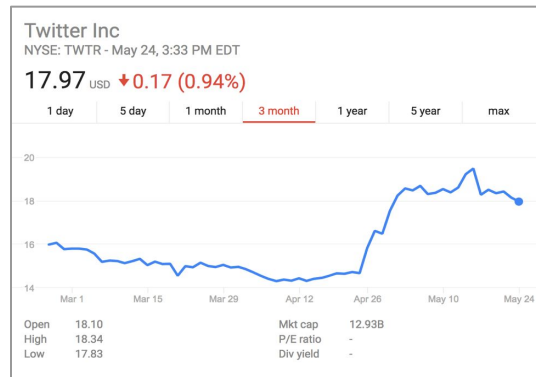
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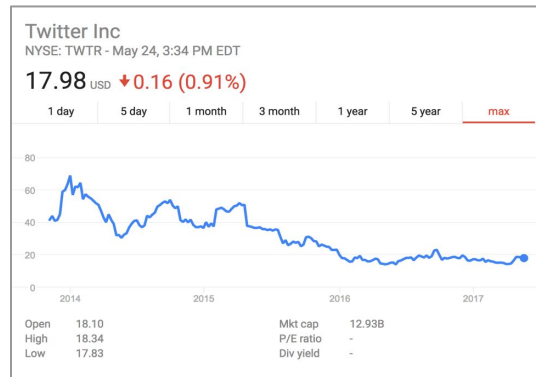
1. assuming causation from correlation
2. **cherry-picking**
3. inaccurate scale (x or y axis)
4. visual confusion
5. outliers



limited part of time frame used



limited time frame

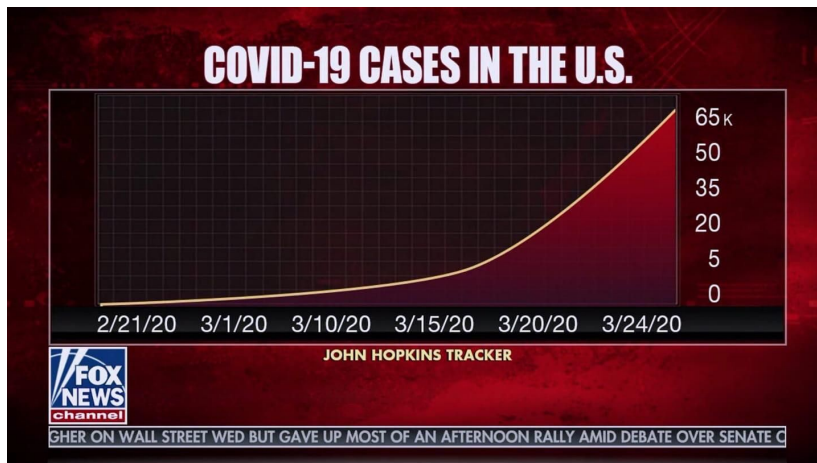


full time frame

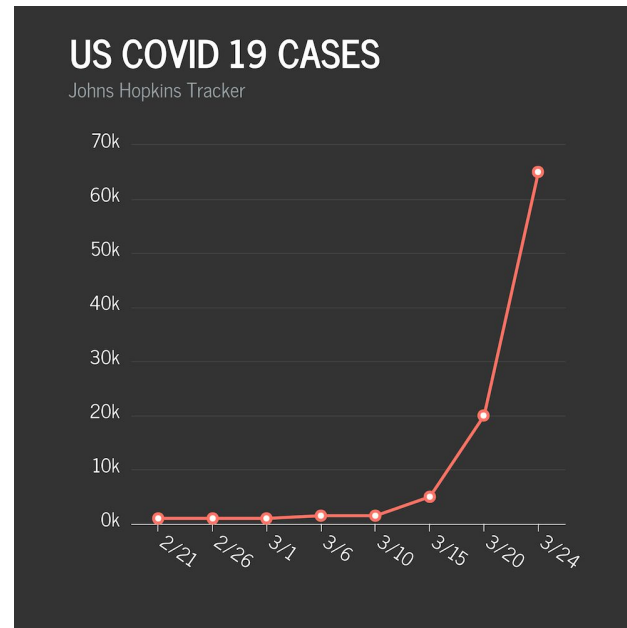
common fallacies in data arguments (and visualizations)

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inaccurate

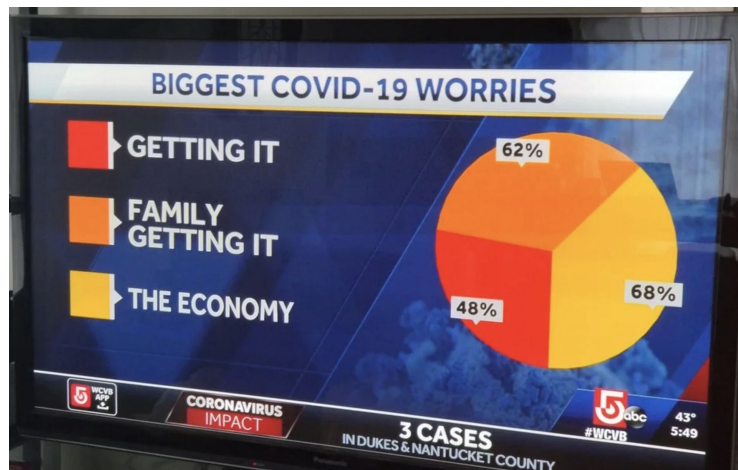


accurate

common fallacies in data arguments (and visualizations)

many examples from <https://venngage.com/blog/misleading-graphs/>

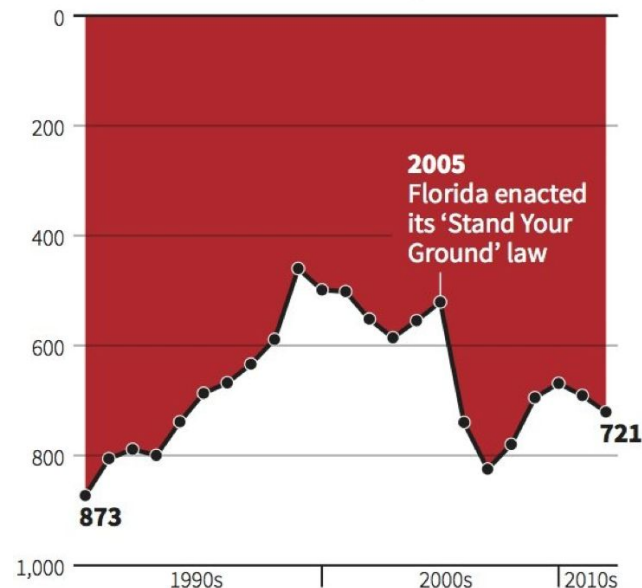
1. assuming causation from correlation
2. cherry-picking
3. inaccurate scale (x or y axis)
4. **visual confusion**
5. outliers



wrong kind of graph

Gun deaths in Florida

Number of murders committed using firearms



Source: Florida Department of Law Enforcement

C. Chan 16/02/2014

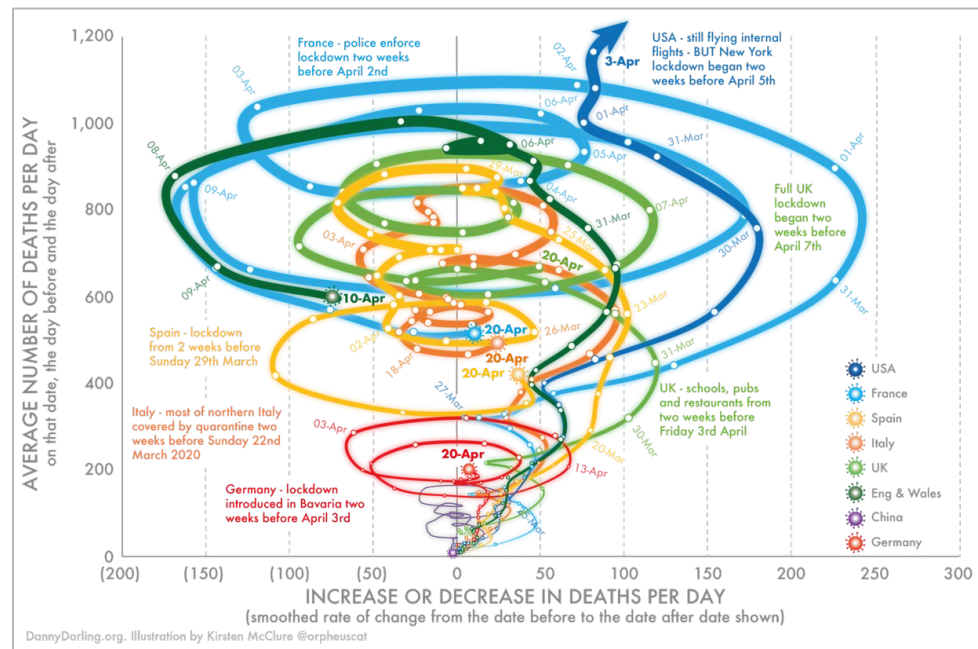
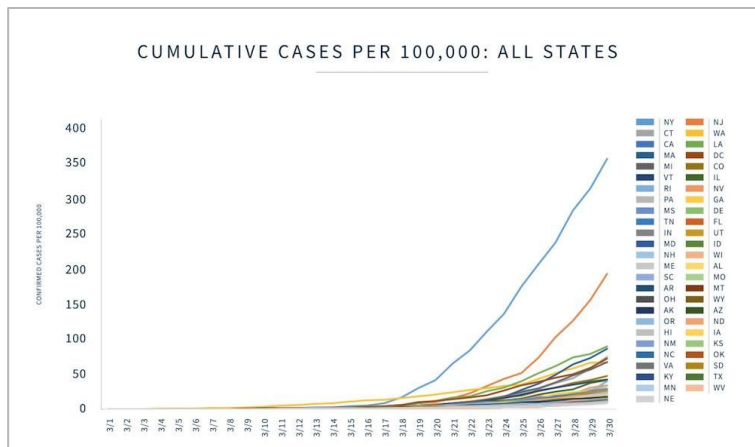
REUTERS

upside down graph

common fallacies in data arguments (and visualizations)

many examples from <https://venngage.com/blog/misleading-graphs/>

1. assuming causation from correlation
2. cherry-picking
3. inaccurate scale (x or y axis)
4. **visual confusion**
5. outliers



real

satire

“On the one hand, we can narrate Plains history as a story of improvement, in which the **plot line gradually ascends** toward an ending that is somehow more positive - happier, richer, freer, better - than the beginning. On the other hand, we can tell stories in which the **plot line eventually falls** toward an ending that is more negative - sadder, poorer, less free, worse - than the place where the story began.

...

“The very different scenes that progressive and declensionist narrators choose as the settings for their Great Plains histories bring us to another key observation about narrative itself: **where one chooses to begin and end a story profoundly alters its shape and meaning.**”

- “A Place for Stories” (Cronon)

“...[people who spread COVID misinformation] believe that science has been corrupted by profit motives and by progressive politics hellbent on increasing social control...simply increasing access to raw data or improving the quality of data visualizations will not bolster public consensus about scientific findings.
Making and interpreting data visualizations are not objective or dispassionate processes; they are social and political endeavors...”

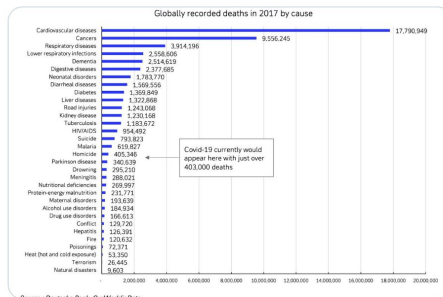
- “The Data Visualizations Behind COVID-19 Skepticism”, MIT (2021)

example: anti-maskers

Anonymous User

This tweet is from a user in the anti-mask network (which may not necessarily reflect their stance on COVID-19). Some or all of the information may conflict with guidance from public health experts regarding COVID-19; it may also be an instance of direct engagement between anti-maskers and orthodox narratives about the pandemic.

For reference, this chart shows COVID deaths (ie everyone who died with it, not of it) compared to all deaths from all causes. <https://t.co/RA3czRoWL4>



14:51 PM · 20 Jun, 2020

♥ 335 ↻ 2,150

COVID-19 update: Check out Sweden's actual day of death chart. No lockdowns. No masks. We are all being taken for an absolute ride. There is precisely zero evidence that masks and/or lockdowns have had any benefit worldwide. <https://t.co/VFFwpdRSkt>
<https://t.co/oeFFD67LsE>



16:44 PM · 31 Jul, 2020

♥ 606 ↻ 4,080



05:05 AM · 10 Jul, 2020

♥ 0 ↻ 0

The Data Visualizations Behind COVID-19 Skepticism

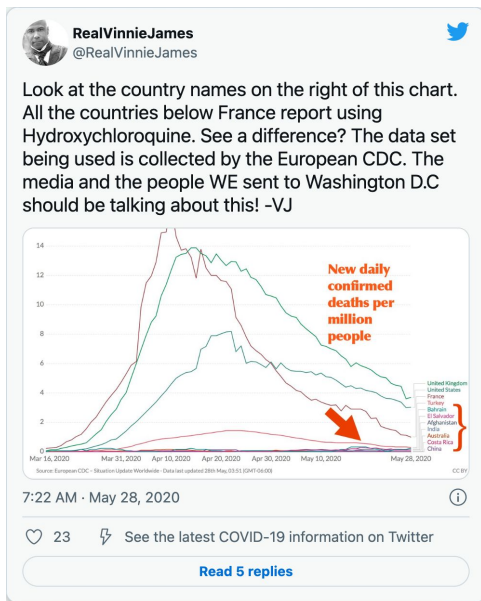
MIT, March 1, 2021

“...we conducted a six month-long study to understand what makes anti-mask groups tick. We discovered how activist networks of anti-mask users leverage the **rhetoric of scientific rigor** in order to oppose public health measures like mask mandates or indoor dining bans. It’s certainly tempting to characterize COVID skeptics as simply “anti-science”... but this would make it impossible to meaningfully understand **what they mean when they say “science.”** To understand this in more depth, we examined how these groups discuss, interpret, or conduct their own data analysis in order to come to entirely different conclusions.

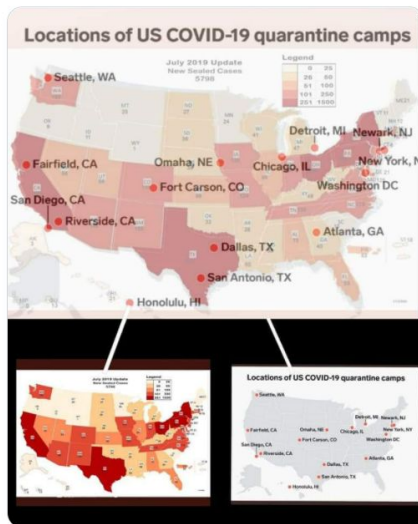
...

“Most fundamentally, anti-mask groups mistrust the scientific establishment because **they believe that science has been corrupted**.... Tobacco companies, they rightly argue, historically funded science that misled the public about whether or not smoking caused cancer. Pharmaceutical companies are therefore in a similar boat: companies like Moderna and Pfizer stand to profit billions from the vaccine, so it is in their interest to inflate the pandemic’s death toll as much as possible.”

example: anti-maskers



Well, that's a coincidence....the Virus outbreak map matches the INDICTMENTS list map almost perfectly. What are the odds? 🤔🙏 #QAnon
<https://t.co/Ps6hCFTHBJ>



11:21 AM · 10 Mar, 2020

210 1,600

The Data Visualizations Behind COVID-19 Skepticism

MIT, March 1, 2021

“While academic science is traditionally a system for producing knowledge within a laboratory, validating it through peer review, and sharing results within subsidiary communities, anti-maskers reject this hierarchical social model, as they espouse a vision of science that is radically egalitarian and individualist... **simply increasing access to raw data or improving the quality of data visualizations will not bolster public consensus about scientific findings.**

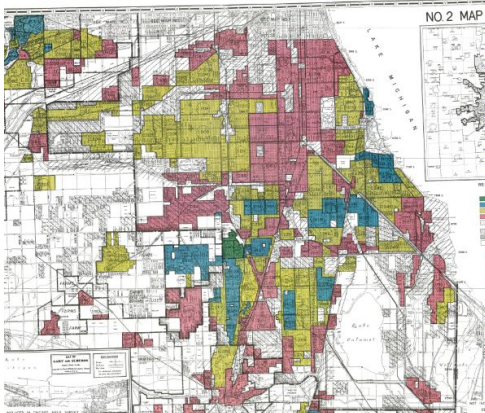
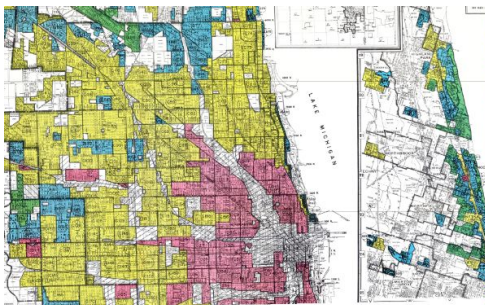
...

“This story is about how a public health crisis—refracted through seemingly objective numbers and data visualizations—is part of a broader battleground about **scientific epistemology and democracy** in modern American life.”

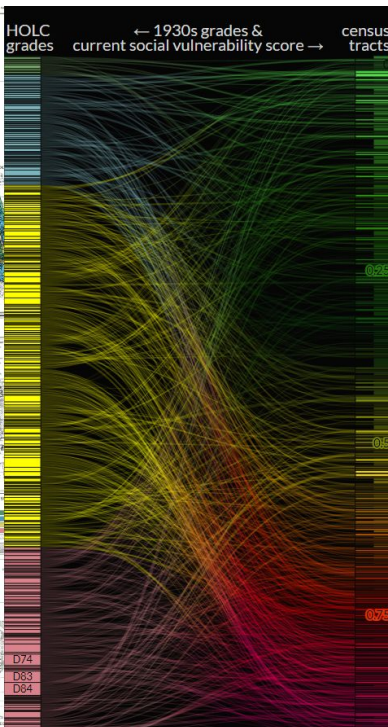
example: maps of inequality in Chicago

- [redlining and SVI](#)

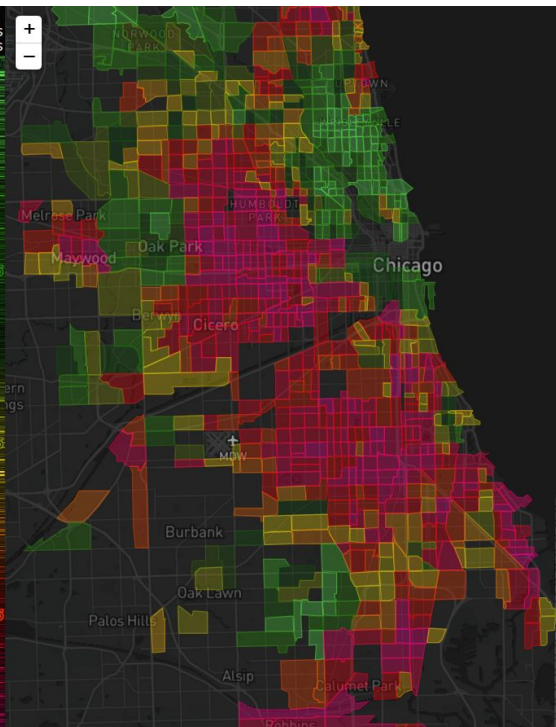
Redlining map (1930s)



compared with social vulnerability score today



SVI map (2020)



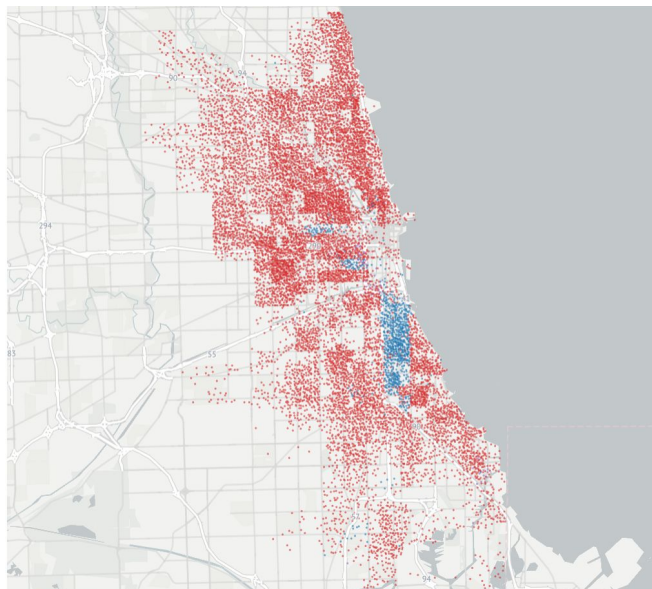
“Without some plot to organize the flow of events, everything becomes much harder - even impossible - to understand.”

- “A Place for Stories” (Cronon)

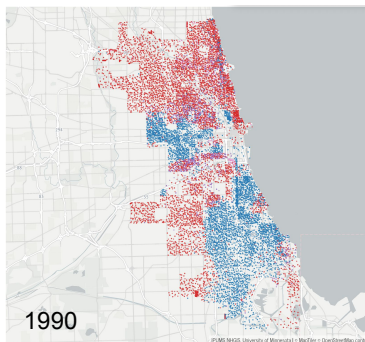
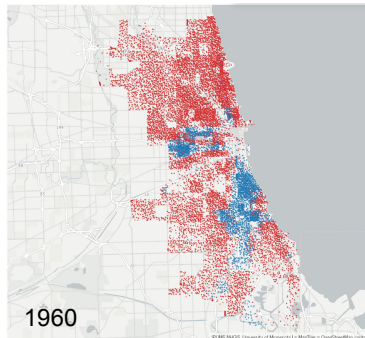
example: maps of inequality in Chicago

- [racial segregation](#)

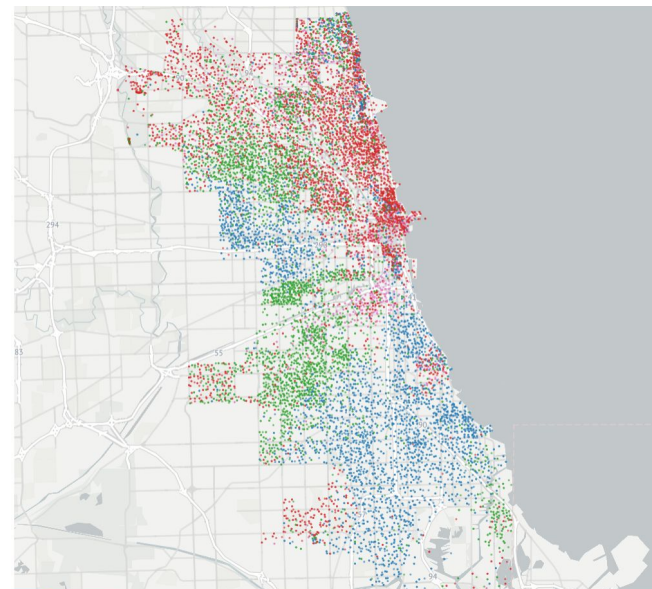
Chicago census race data: red is White, blue is African American, green is Latino (not tracked before 1990)



1930



1990



2020

“...where one chooses to begin and end a story profoundly alters its shape and meaning.”

- “A Place for Stories” (Cronon)

example: maps of inequality in Chicago

- [Chicago million dollar blocks](#)

Million dollar blocks in Chicago: drug-related offenses



“The New Deal planners in effect argued that the rising plot line of our earlier storytellers not only was false but was itself the principal cause of the environmental disaster that unfolded during the 1930s. The Dust Bowl had occurred **because people had been telling themselves the wrong story** and had tried to inscribe that story-the frontier-on a landscape incapable of supporting it.”

- “A Place for Stories” (Cronon)

Additional References

History of dangerous data visualization errors:

<https://studentwork.prattsi.org/infovis/labs/a-history-of-dangerously-misleading-data-visualization/>

“From Coronavirus to Bushfires: Misleadings Maps”:

<https://firstdraftnews.org/articles/from-coronavirus-to-bushfires-misleading-maps-are-distorting-reality/>

Jill Lepore article about the history of policing in the US (also includes an audio version):

<https://www.newyorker.com/magazine/2020/07/20/the-invention-of-the-police>