Week 9 Assignment:
Data Visualization Manipulation

Information Visualization Theory and Techniques (2022)

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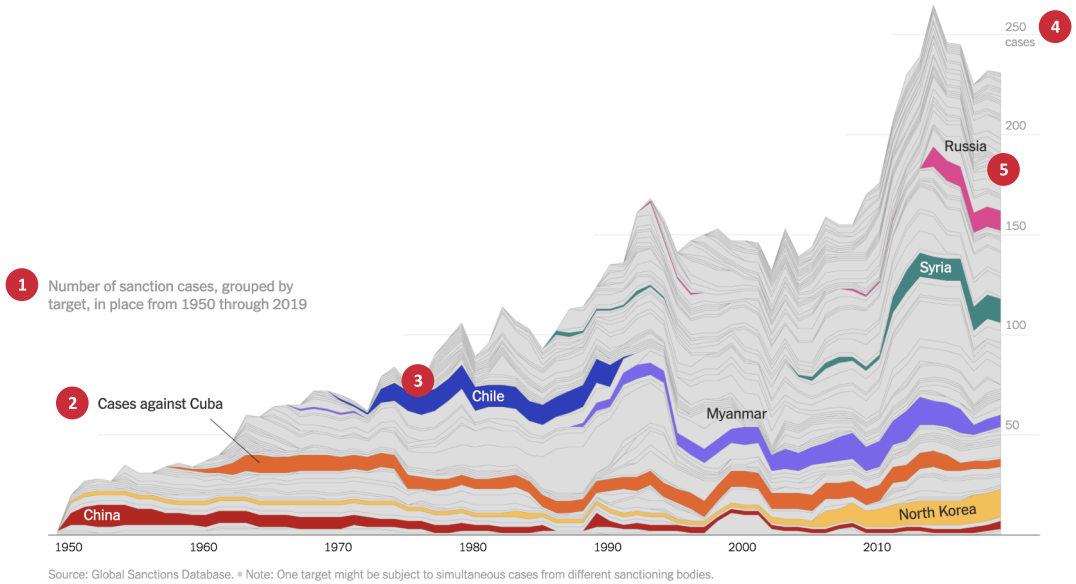
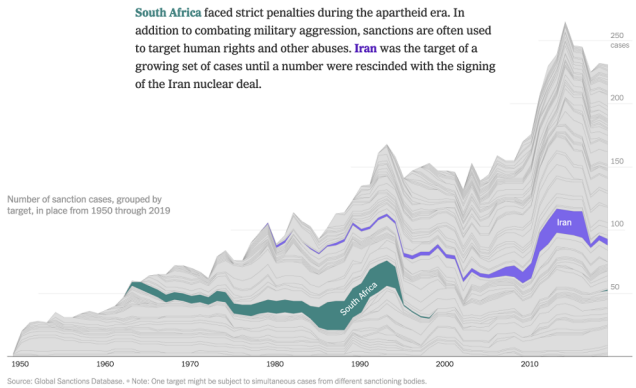
Original Graphic

Worldwide Sanction Cases Grouped by Target | Ella Koeze, New York Times (2022)



Context

The graphic above was published as a part of a recent interactive piece in the New York Times, Boycotts, Not Bombs: Sanctions Are a Go-To Tactic, With Uneven Results. The initial graphic attempts to portray the worldwide total of sanctions over time, but the colors and interactivity of the story instead focus on individual countries, as demonstrated in the screenshot to the right. Attempting to keep both contexts in the same graphic creates a situation where Russia appears to have more sanctions than it actually does in place.



Problematic elements which manipulate or misrepresent data

1. The original graphic does not have a clear title. The lower contrast and small size of this item suggests it is a caption (Knaflic, 2015), but it is actually the title, making it difficult to understand the full context of the data at a glance.

2. Understanding the total number of cases by country, and how they change over time, requires the reader to compare the size of areas with a constantly changing baseline. Area is more difficult to quantify than position (Few, 2013), while the relative change of the baseline exaggerates increases and decreases in Cuban sanctions over time. This has a similar effect to improperly starting a y-axis at a non-zero number (Wong, 2013).

3. Colors are used to group cases by country. However, as a preattentive visual attribute, color encourages the viewer to focus more heavily on country-specific cases (Few, 2013), changing the context of the data from total worldwide cases to total cases per country.

4. The label of the y-axis is not labeled clearly enough to overcome the country-specific context set by the color in annotation 3.

5. The combination of positioning, comparison of area, use of color to unintentionally change context of the data, and the unclear y-axis labeling leads to an incorrect appearance of sanctions on Russia going from nearly 200 in mid-2010 to 150 in 2019.

Improving the visualization

The original graphic uses a stacked area chart to attempt to represent both parts and the whole over time, but the story itself focuses on individual countries more closely, since the final story is actually about the results and reliability of sanctions in response to events. I followed the logic and process of Myles Harrison (2014) in redrawing a similar stacked area chart, and explored the idea of a trellis plot. Colors were then removed to simplify comparisons. As I explored removing the x-axis, I realized each chart could be simplified by showing year labels for only the key events which caused a major change in sanctions. The three countries represented match those discussed in the original story text, minimizing distracting or irrelevant data.

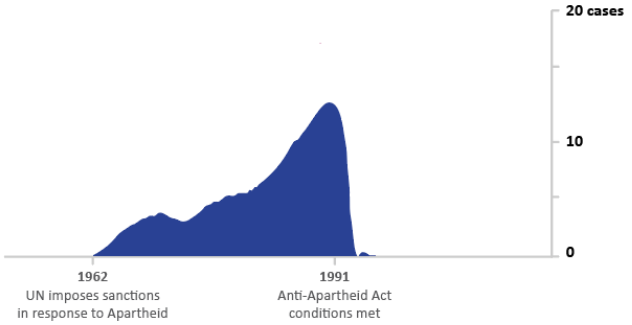
The total number of cases over time isn't helpful in understanding the effect of individual sanctions, so I removed it. To regain interactivity, this chart could be modified to only show the parts of the trellis plot which are immediately relevant to story text on scroll.

Important note: the data to the right is estimated based on the graph on the previous page and is not exact. It is only intended to demonstrate an alternate visualization method. Key events from other sources have been added to bring context to the data which is relevant to the original article's subject.

Additionally, all copy in the chart to the right was written by Ella Koeze (2022) and was sourced from the original article.

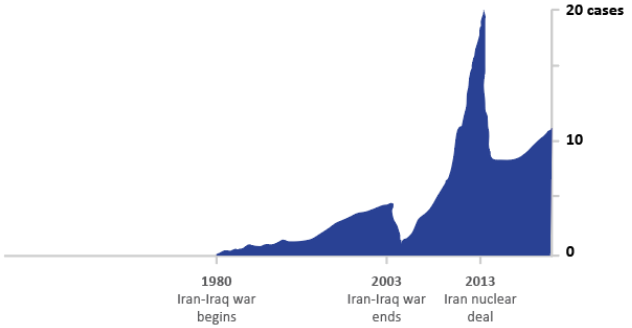
Resketched Graphic

Sanctions and Key Events Over Time | Ella Koeze, New York Times (2022)



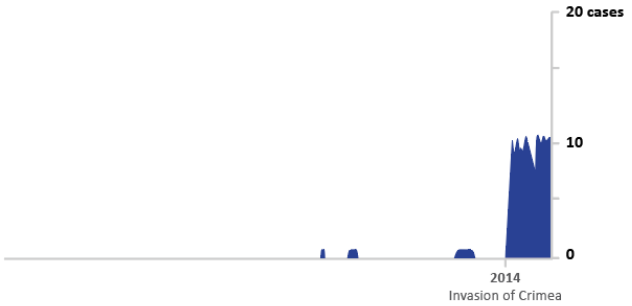
South Africa

South Africa faced strict penalties during the apartheid era. In addition to combating military aggression, sanctions are often used to target human rights and other abuses.



Iran

Iran was the target of a growing set of cases until a number were rescinded with the signing of the Iran nuclear deal.

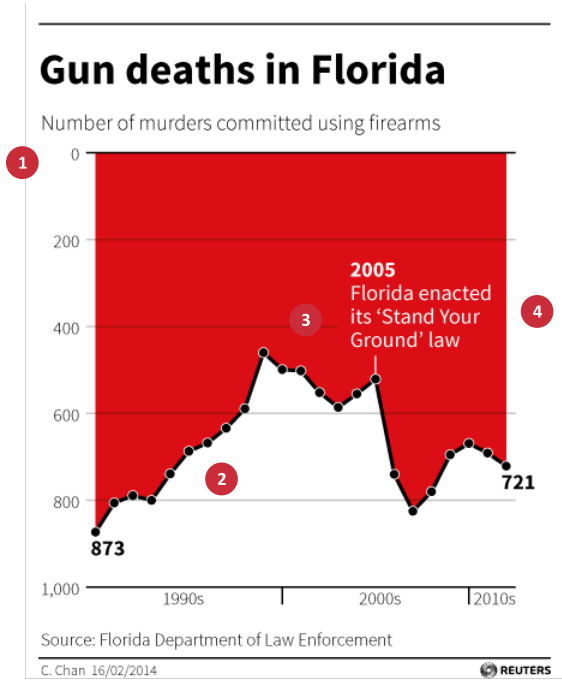


Russia

Russia was previously punished in 2014 when it invaded Crimea. Many of those provisions remain in place.

Original Graphic

Gun Deaths in Florida | Christine Chan, Reuters (2014)



Context

The graphic above is attributed to Christine Chan, and according to a Reddit thread started by wdr1 (2014), she explained in a now-deleted tweet that the graphic was inspired by the graphic *Iraq's Bloody Toll* by Simon Carr. Because it was released through Reuters, a news agency, this graphic was available to be used by other media outlets in their reporting. The credibility lent by the Reuters name, in combination with a graphic which at first glance suggests Stand Your Ground reduced gun deaths in Florida, gave this graphic the unsettling potential to lend undue credibility to media outlets and reporters who used this to argue in favor of Stand Your Ground laws.

Andy Cotgreave (2014) made an interesting point about *Iraq's Bloody Toll* by inverting it and coloring it blue, showing how even the original award-winning graphic's messaging was heavily influenced by color and orientation. The original relied on the metaphor of dripping blood and using upside down bars to clarify meaning. Without these cues, the viewer defaults to reading the data based on typical area chart conventions, implying the opposite trend.

Problematic elements which manipulate or misrepresent data

1. The y-axis is reversed from typical conventions, with 0 placed as the highest value and 1,000 placed as the lowest value. Y-axis scales which do not begin at 0 can exaggerate trends (Wong, 2013), or in this case, imply the opposite trend.

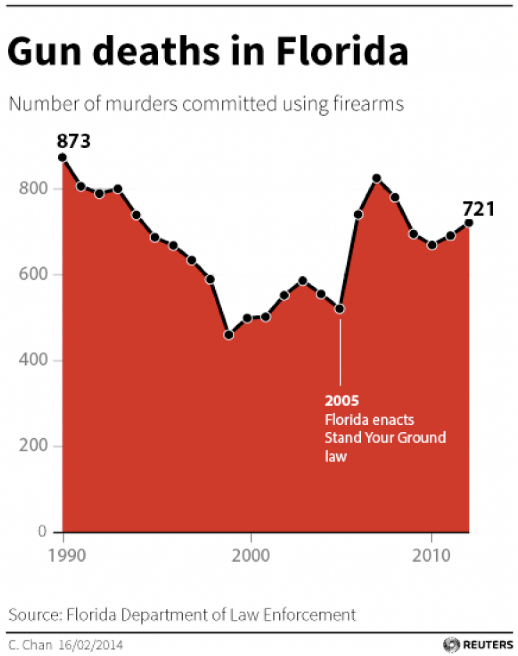
2. The use of the color red in a large area activates the gestalt principle of figure-ground, while the proximity of the data line to the x-axis activates the gestalt principle of closure (7 Gestalt Principles of Visual Perception, n.d.). The result is that the white area appears to be the figure, while the red area appears to be the ground, which was the opposite of the author's intent.

3. Because the data is represented by an area chart, there are no shape-based characteristics to differentiate the data above from the negative space below. This causes two problems: the unclear figure-ground relationship above, and a lack of shape-based cues to help the viewer understand the chart is using an unconventional y-axis orientation.

4. The placement of the caption inside the data, rather than outside as is typical, further reinforces to the viewer that the white area should be read as the data, leading to a visual which incorrectly associates the Stand Your Ground law with a drop in gun deaths, instead of an increase as the data actually reports.

Resketched Graphic

Gun Deaths in Florida | Christine Chan, Reuters (2014)



Improving the visualization

While the intent of the original graphic was to derive inspiration from an award-winning graphic, the graphic that originally inspired this had faults as well, and relied heavily on title and context to overcome those faults. As there is no way to fix the issues with clarity without copying *Iraq's Bloody Toll*'s idea of using bars and the word "bloody" in the title, it is best to work with existing area chart standards and patterns to avoid confusion. I reoriented both the y-axis and the data itself to follow a conventional 0 at the bottom scale. This reorients the red to meet viewer expectations and associates the red with the area chart data. I was able to simplify the x-axis labels as a result. I kept the caption inside the area chart, as there was not adequate negative space to be able to place the caption outside the chart. I also removed unnecessary grid lines to reduce the data-to-ink ratio on the page.

References

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