

Communicate Results with Effective Data Visualization

November 7, 2023

Presenters:

Mary Pat Campbell, FSA, MAAA

Moderator:

Patrick Wiese, ASA



SOA Antitrust Compliance Guidelines

Active participation in the Society of Actuaries is an important aspect of membership. While the positive contributions of professional societies and associations are well-recognized and encouraged, association activities are vulnerable to close antitrust scrutiny. By their very nature, associations bring together industry competitors and other market participants. The United States antitrust laws aim to protect consumers by preserving the free economy and prohibiting anti-competitive business practices; they promote competition. There are both state and federal antitrust laws, although state antitrust laws closely follow federal law. The Sherman Act, is the primary U.S. antitrust law pertaining to association activities. The Sherman Act prohibits every contract, combination or conspiracy that places an unreasonable restraint on trade. There are, however, some activities that are illegal under all circumstances, such as price fixing, market allocation and collusive bidding.

There is no safe harbor under the antitrust law for professional association activities. Therefore, association meeting participants should refrain from discussing any activity that could potentially be construed as having an anti-competitive effect. Discussions relating to product or service pricing, market allocations, membership restrictions, product standardization or other conditions on trade could arguably be perceived as a restraint on trade and may expose the SOA and its members to antitrust enforcement procedures.

While participating in all SOA in person meetings, webinars, teleconferences or side discussions, you should avoid discussing competitively sensitive information with competitors and follow these guidelines:

- **Do not** discuss prices for services or products or anything else that might affect prices
- **Do not** discuss what you or other entities plan to do in a particular geographic or product markets or with particular customers.
- **Do not** speak on behalf of the SOA or any of its committees unless specifically authorized to do so.
- **Do** leave a meeting where any anticompetitive pricing or market allocation discussion occurs.
- **Do** alert SOA staff and/or legal counsel to any concerning discussions
- **Do** consult with legal counsel before raising any matter or making a statement that may involve competitively sensitive information.

Adherence to these guidelines involves not only avoidance of antitrust violations, but avoidance of behavior which might be so construed. These guidelines only provide an overview of prohibited activities. SOA legal counsel reviews meeting agenda and materials as deemed appropriate and any discussion that departs from the formal agenda should be scrutinized carefully. Antitrust compliance is everyone's responsibility; however, please seek legal counsel if you have any questions or concerns.

Presentation Disclaimer

Presentations are intended for educational purposes only and do not replace independent professional judgment. Statements of fact and opinions expressed are those of the participants individually and, unless expressly stated to the contrary, are not the opinion or position of the Society of Actuaries, its cosponsors or its committees. The Society of Actuaries does not endorse or approve, and assumes no responsibility for, the content, accuracy or completeness of the information presented. Attendees should note that the sessions are audio-recorded and may be published in various media, including print, audio and video formats without further notice.

Communicating Results

What **THEY NEED** to know

not

what you want to say

Respect Conventions

Templates

Standards

Shared context

Professionalism

ASOP 41: Actuarial Communications

<http://www.actuarialstandardsboard.org/asops/actuarial-communications/>

ASOP 56: Modeling

Section 4: Communications and Disclosures

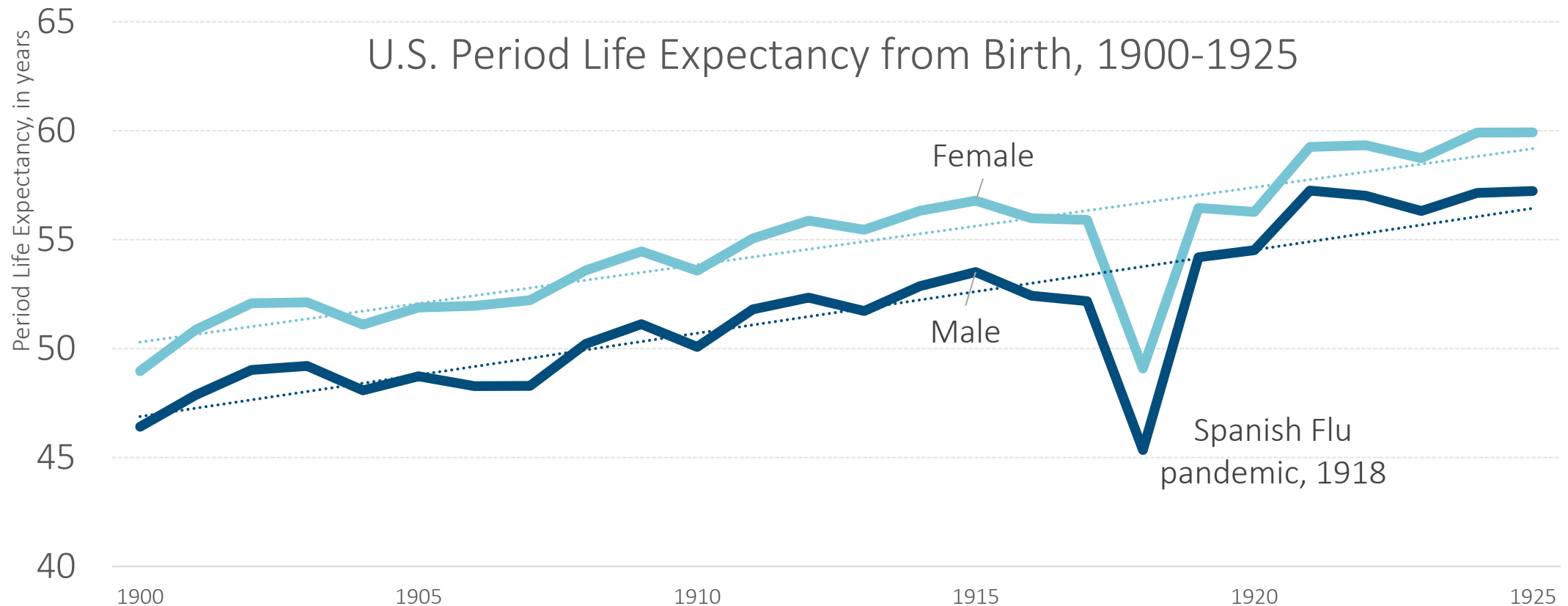
<http://www.actuarialstandardsboard.org/asops/modeling-3/>

Data Visualizations

Can be extremely effective in making a point

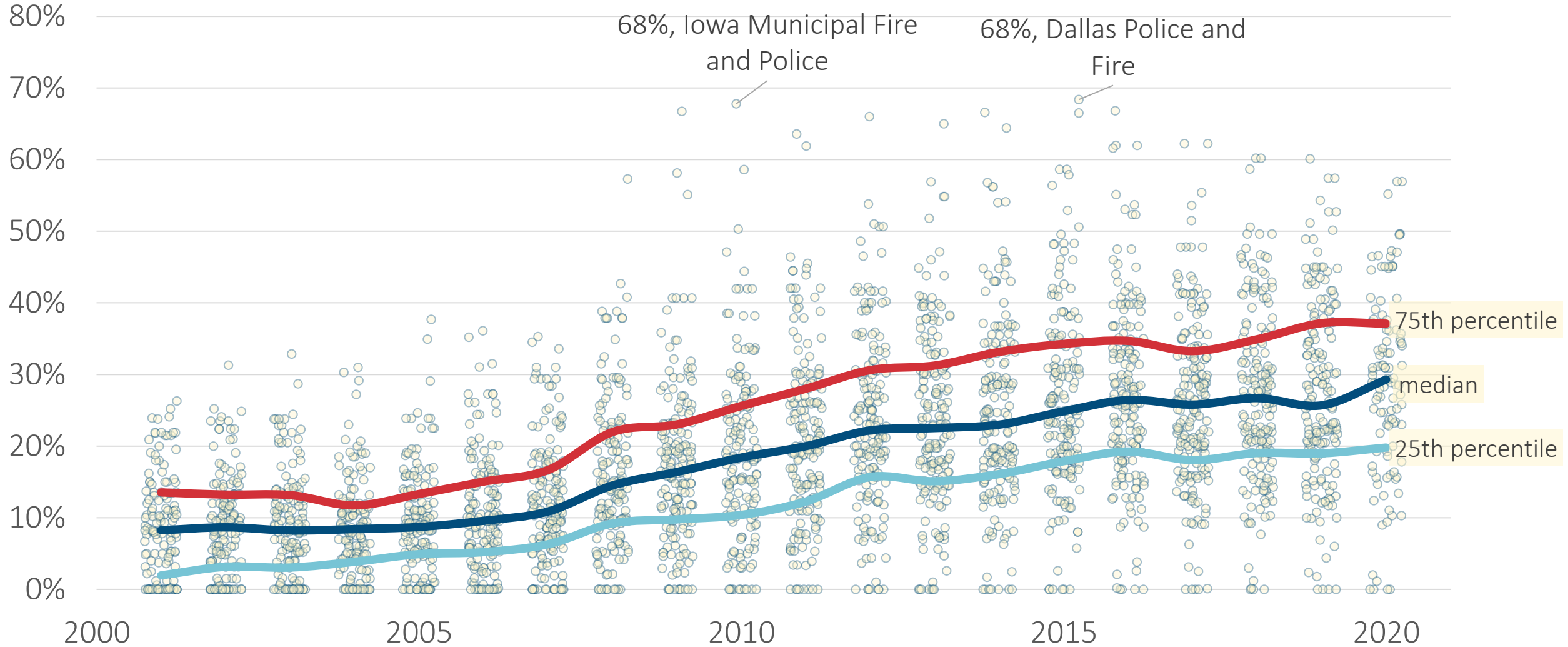
Do not be afraid of communicating the same results multiple ways

Life expectancy continued to increase after flu pandemic, recovered after a year



Source: Life Tables life tables for the United States Social Security Area, 1900-2100, Actuarial Study no. 120, Table 10, https://www.ssa.gov/OACT/NOTES/as120/LifeTables_Tbl_10.html#wp1041324 accessed 30 June 2021

Public Pension Plan Allocations to Alternative Assets, 2001-2020



Source: Public Pensions Database, <https://publicplansdata.org/public-plans-database/download-full-data-set/> accessed 11 May 2021.

Source spreadsheet: <https://www.dropbox.com/s/ino4e19tza38440/Allocation%20to%20Alternative%20Assets%20and%20Investment%20Returns.xlsx?dl=0>

Themes

MetBrewer

Source: <https://github.com/BlakeRMills/MetBrewer>

And

The Metropolitan Museum of Art:

<https://www.metmuseum.org/art/the-collection>

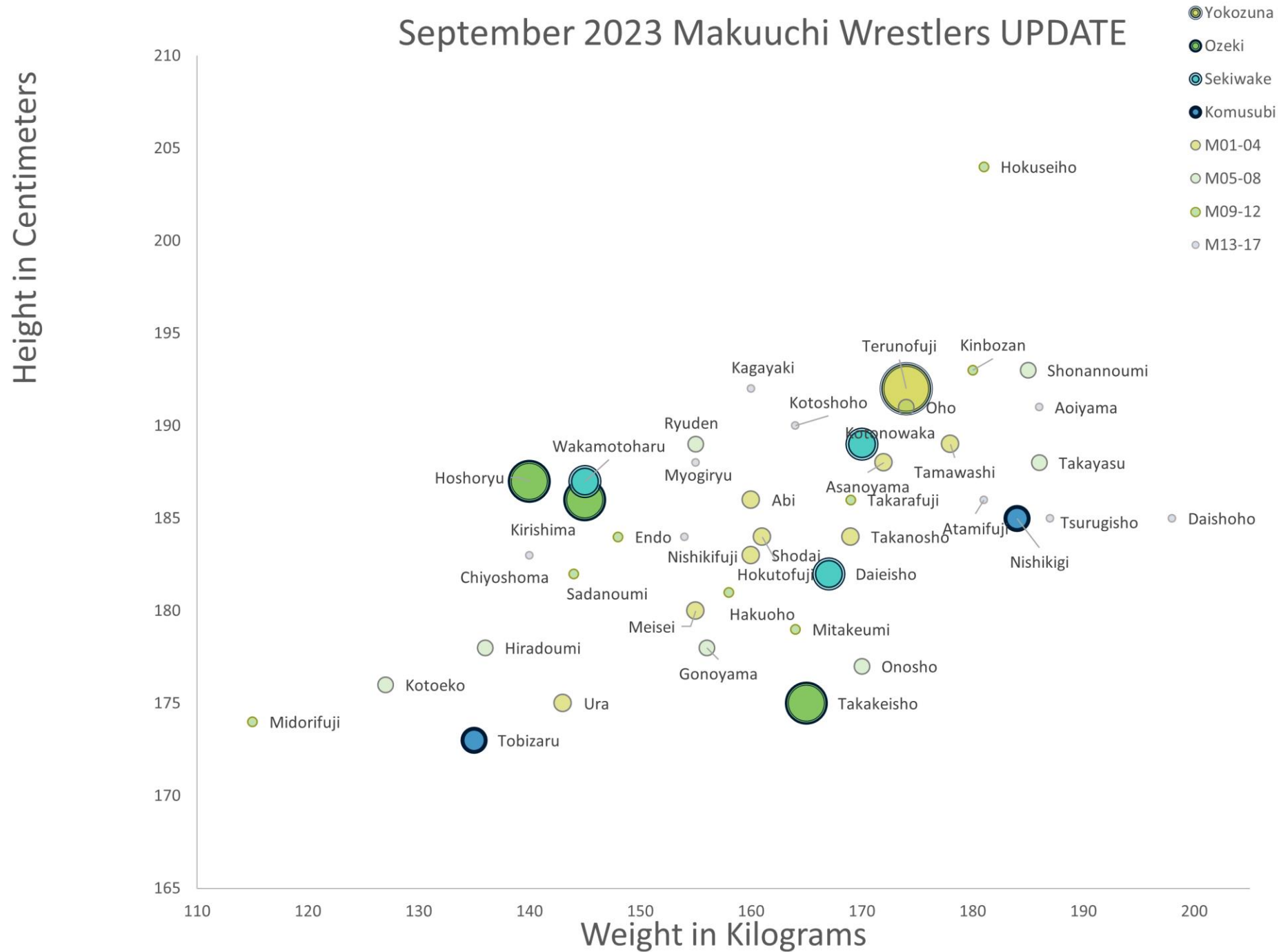
Hokusai3



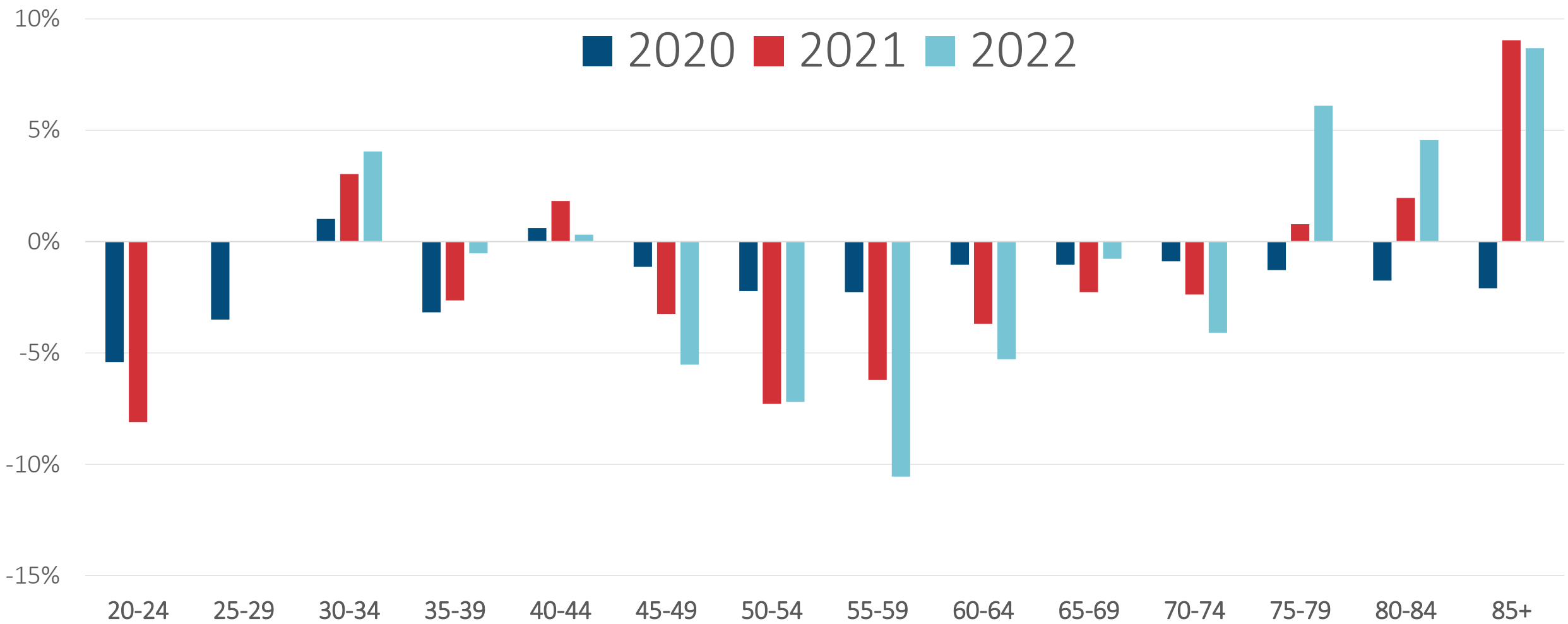
Yōrō Waterfall in Mino Province (Mino no Yōrō no taki), from the series A Tour of Waterfalls in Various Provinces (Shokoku taki meguri), 1832, Katsushika Hokusai, Japanese, [Link](#)

Colorblind-Friendly

September 2023 Makuuchi Wrestlers UPDATE



Percentage Difference in Death Rate v 2019 by Age Group Cancer – US



Source: CDC Wonder, data as of 12 May 2023, provisional data, primary cause of death

Theme Links

Creating a Custom Excel Theme

<https://youtu.be/swHSI6trWwg?si=eeDJqWMDWMMoTnSK6>

Loading Custom Excel Themes

https://youtu.be/SJB5d_JMrU0?si=0xfP93hKyC23jOAJ

Some MetBrewer Themes to Download:

<https://www.dropbox.com/s/62ouurpl403edq9/Excel%20MetBrewer.zip?dl=0>

Templates

Chart Templates

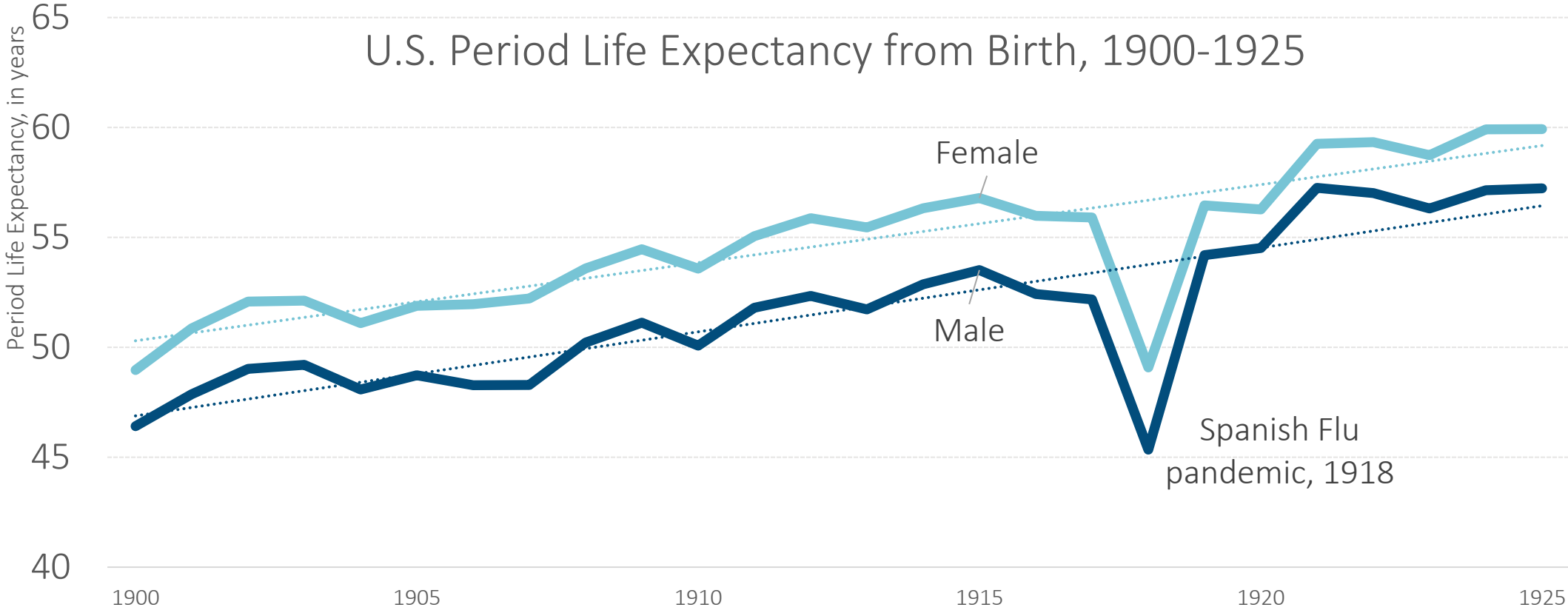
Can setting up good defaults

Create a chart

Save as a template – apply to other charts

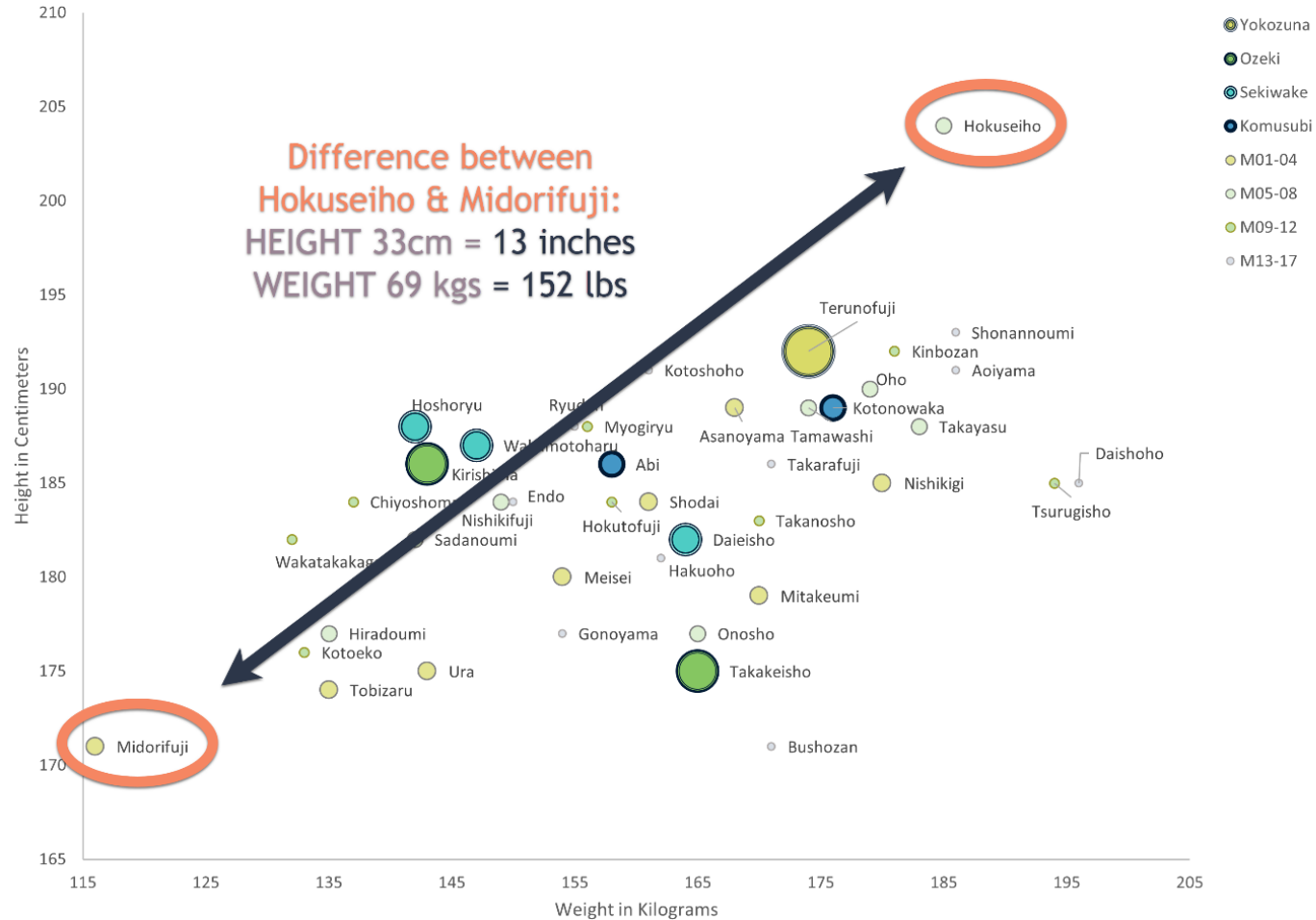
Annotating Graphs

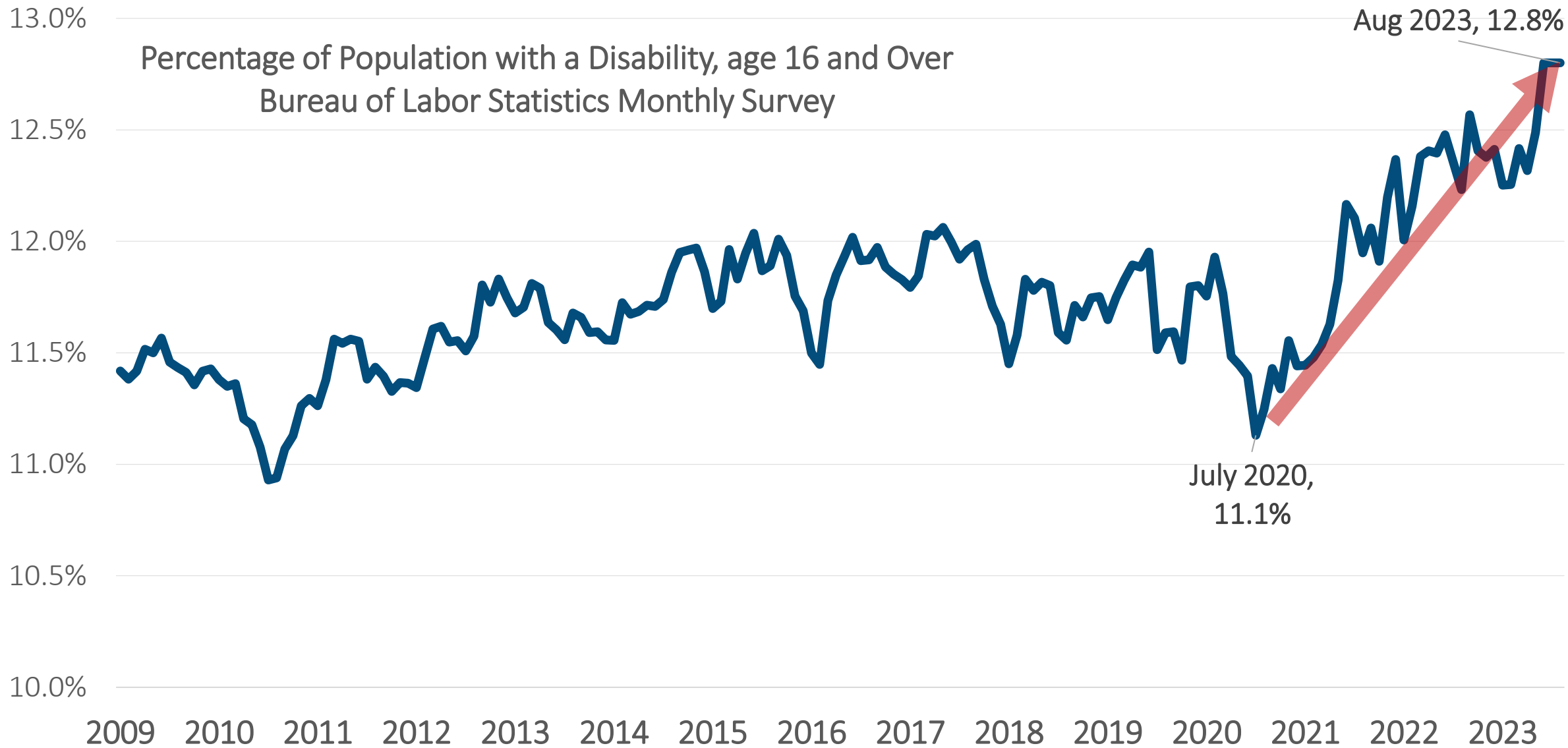
Using data labels instead of legends



Highlight important data points

July 2023 Makuuchi Wrestlers

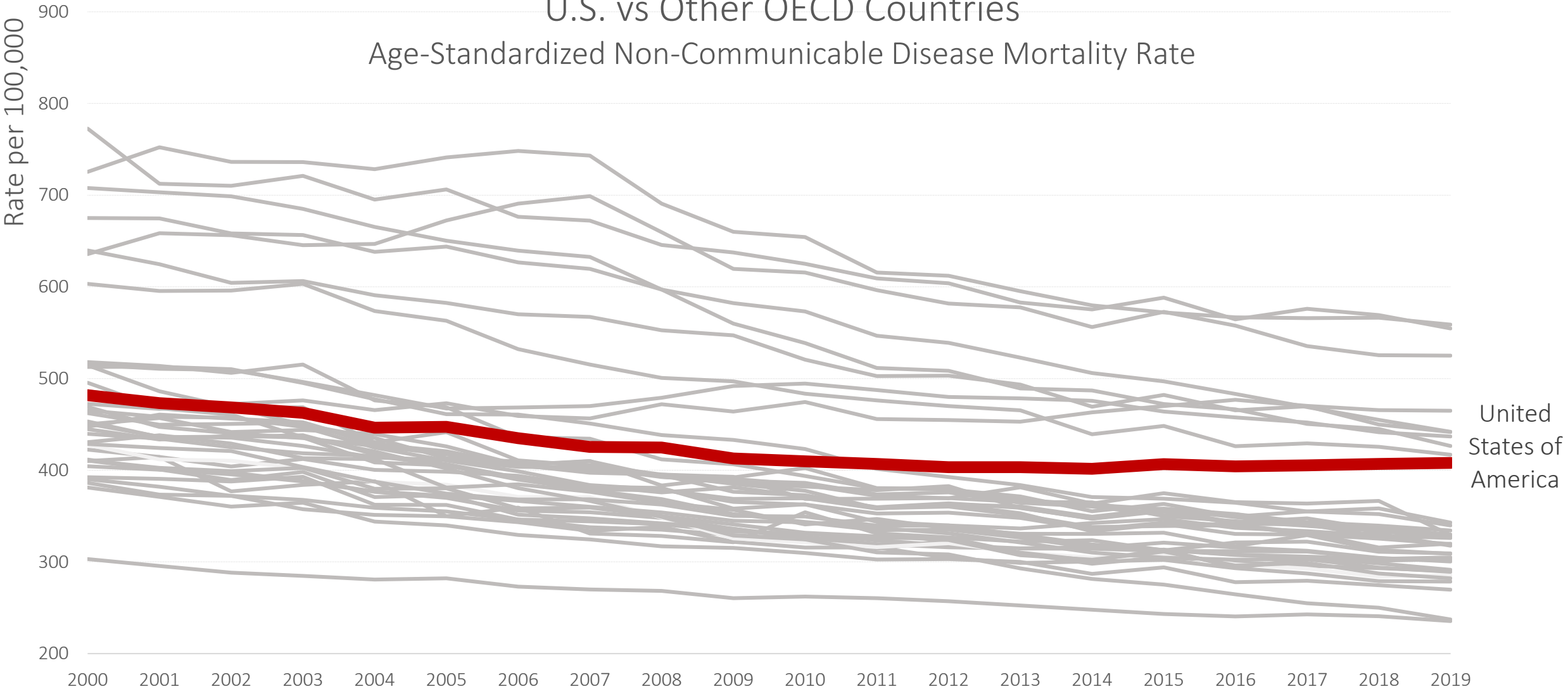




SOURCES: U.S. Bureau of Labor Statistics, Population - With a Disability, 16 Years and over [LNU00074597], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/LNU00074597>, Sept 7, 2023 and U.S. Bureau of Labor Statistics, Population Level [CNP16OV], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/CNP16OV>, Sept 7, 2023.

U.S. vs Other OECD Countries

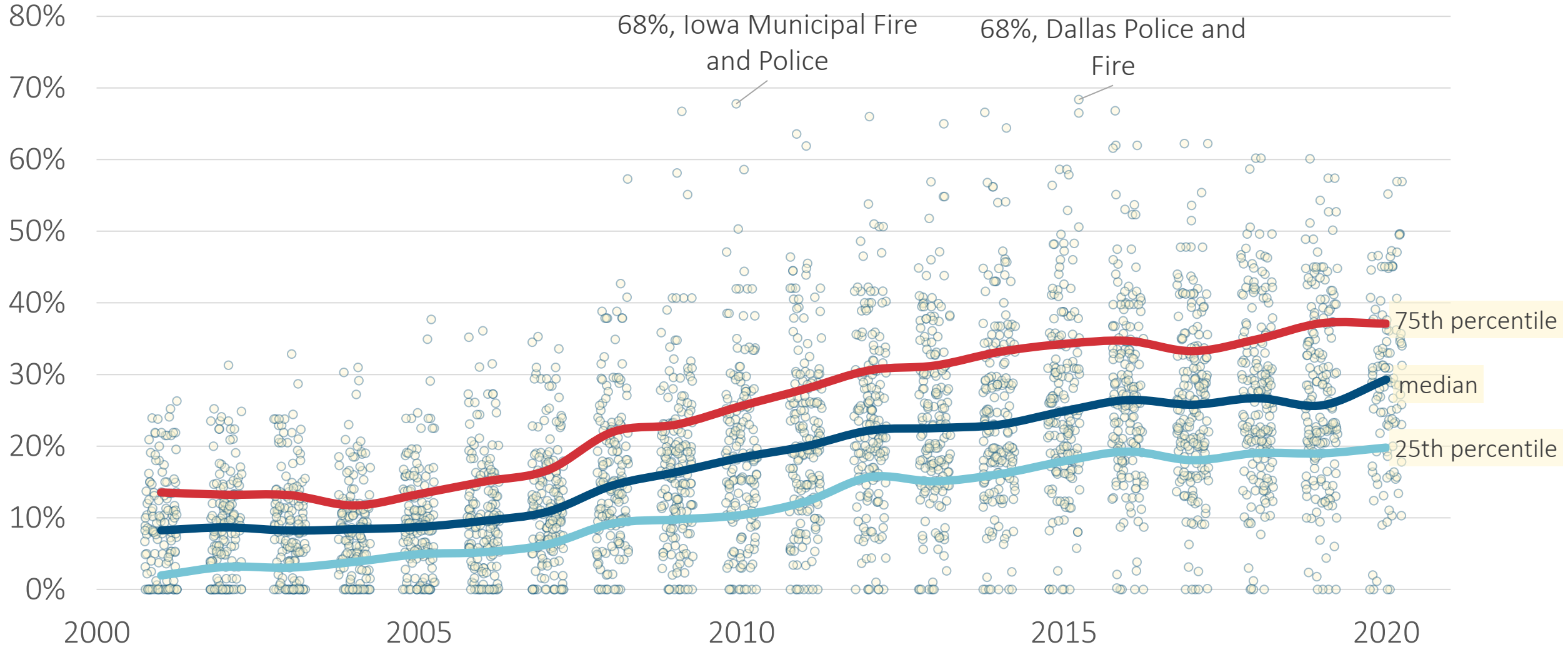
Age-Standardized Non-Communicable Disease Mortality Rate



Source: WHO Global Health Estimates, accessed 15 August 2023, <https://www.who.int/data/gho/data/indicators/indicator-details/GHO/gho-ghe-ncd-mortality-rate>
Excludes communicable diseases like the flu and external causes of death such as homicide and car accidents.

Jitter graph

Public Pension Plan Allocations to Alternative Assets, 2001-2020



Source: Public Pensions Database, <https://publicplansdata.org/public-plans-database/download-full-data-set/> accessed 11 May 2021.

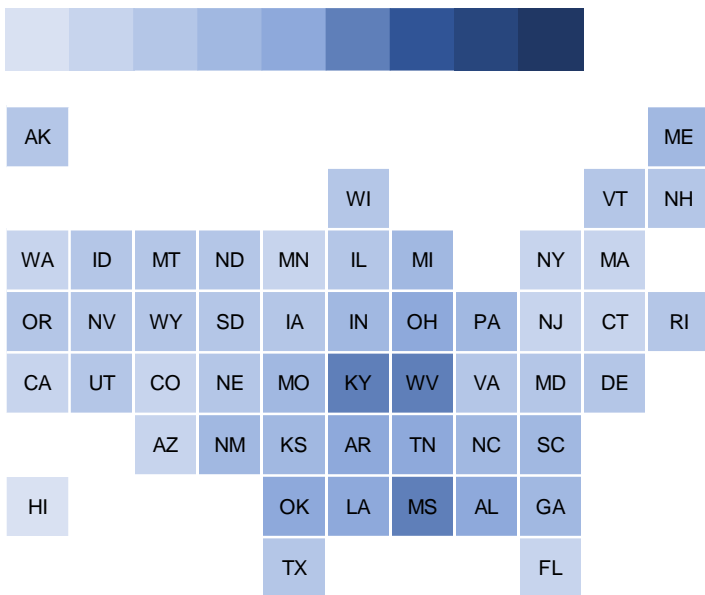
Source spreadsheet: <https://www.dropbox.com/s/ino4e19tza38440/Allocation%20to%20Alternative%20Assets%20and%20Investment%20Returns.xlsx?dl=0>

How-to demonstration

Tile grid maps

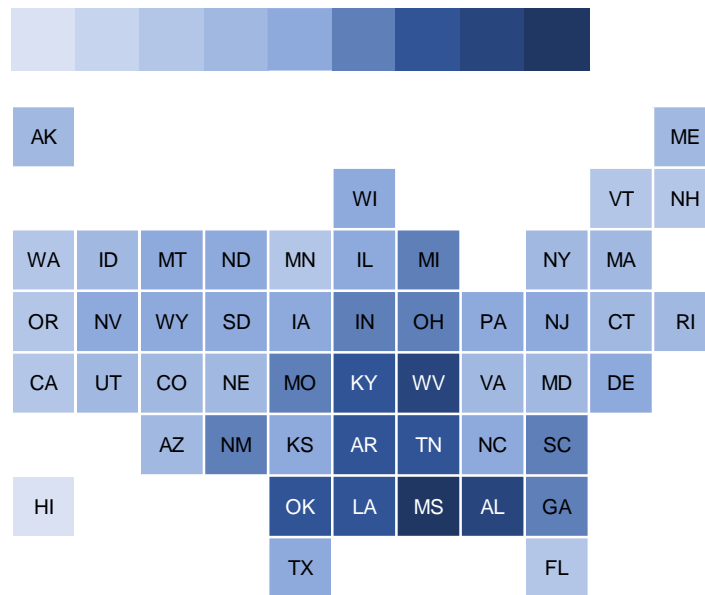
Age-Adjusted Death Rates, 2019, All Causes of Death

<600 600 675 750 825 900 975 1050 >1125
 -675 -750 -825 -900 -975 -1050 -1125



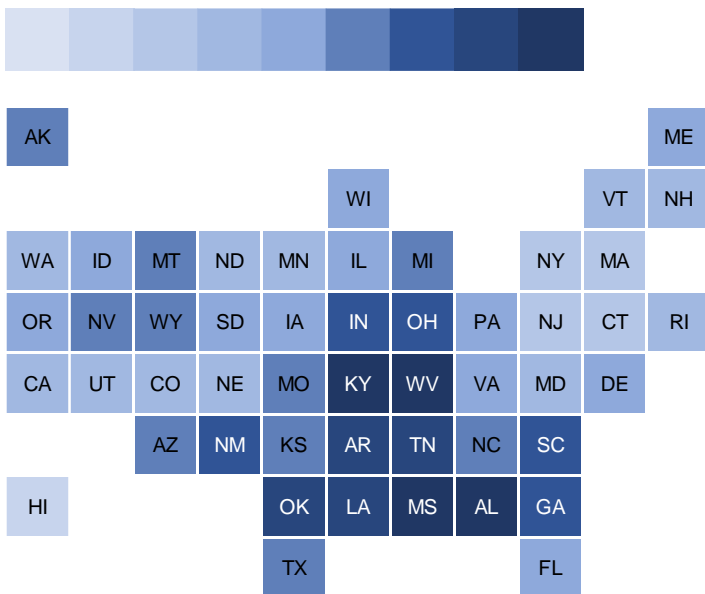
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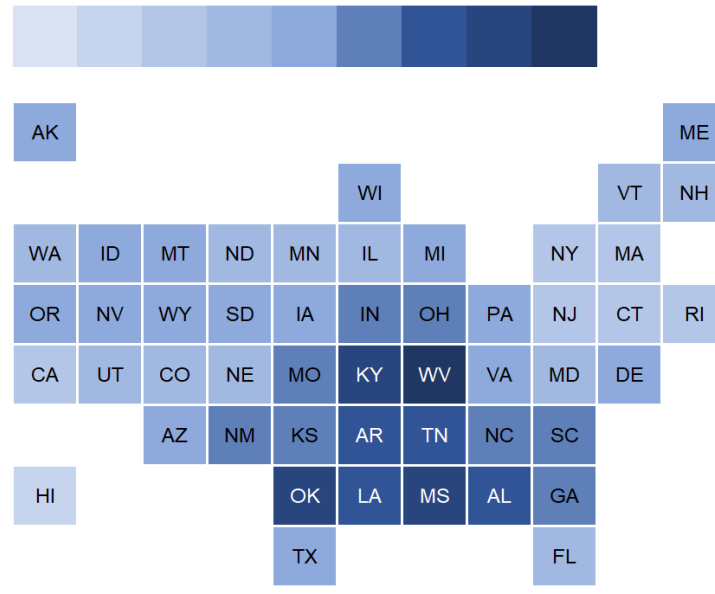
Age-Adjusted Death Rates, 2021, All Causes of Death

<600 600 675 750 825 900 975 1050 >1125
 -675 -750 -825 -900 -975 -1050 -1125



Age-Adjusted Death Rates, 2022, All Causes of Death

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 -675 -750 -825 -900 -975 -1050 -1125



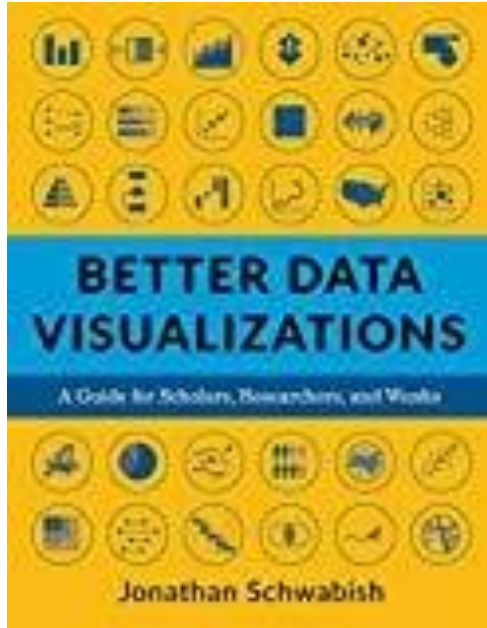
How-to demonstration

Resources

Remember

Focus on what THEY NEED to know,
not what you want to say.

Additional Resources

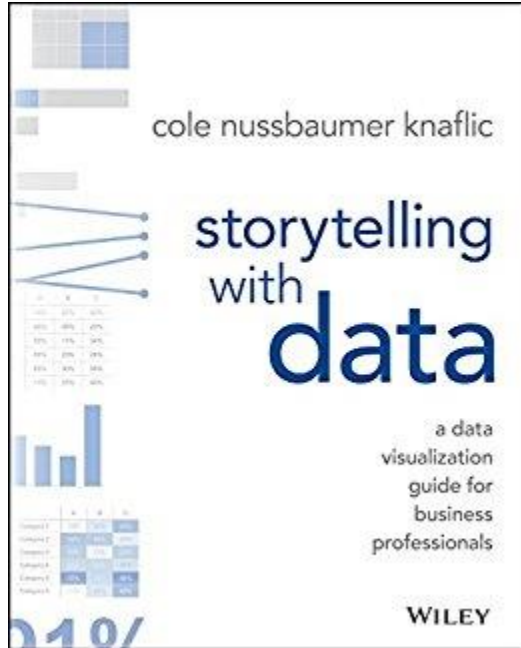


[Better Data Visualizations: A Guide for Scholars, Researchers, and Wonks](#)

Most of the graphs are made (or can be made) in Excel, but not all.

Focuses primarily on simple chart types, because generally – that’s what you need.

Additional Resources



Storytelling with Data

Looks at how to design graphs and other displays for maximum effect

Most can be done in Excel...but doesn't explain how to do it

Data Visualization Articles

The Why of Data Visualization

<https://www.soa.org/news-and-publications/newsletters/compact/2016/march/com-2016-iss-52/the-why-of-data-visualization/>

The Who of Data Visualization

<https://www.soa.org/news-and-publications/newsletters/compact/2016/may/com-2016-iss-53/the-who-of-data-visualization/>

The Where of Data Visualization

<https://www.soa.org/news-and-publications/newsletters/compact/2016/december/com-2016-iss-54/the-where-of-data-visualization/>

The What of Data Visualization

<https://www.soa.org/globalassets/assets/library/newsletters/compact/2017/october/2017-compact-iss56-campbell.pdf>

The How of Data Visualization

<https://www.soa.org/globalassets/assets/library/newsletters/compact/2018/april/2018-compact-iss57-campbell.pdf>

Mary Pat Campbell Links

Substack: <https://marypatcampbell.substack.com/>

LinkedIn: <https://www.linkedin.com/in/marypatcampbell/>

Twitter: <https://twitter.com/meepbobeep>

YouTube: <https://www.youtube.com/user/meepsmathmatters>

New Substack site!

<https://sumostats.substack.com/>



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Evaluation and
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Credits

