

time and timelines

# recall – early visualization history (900s)

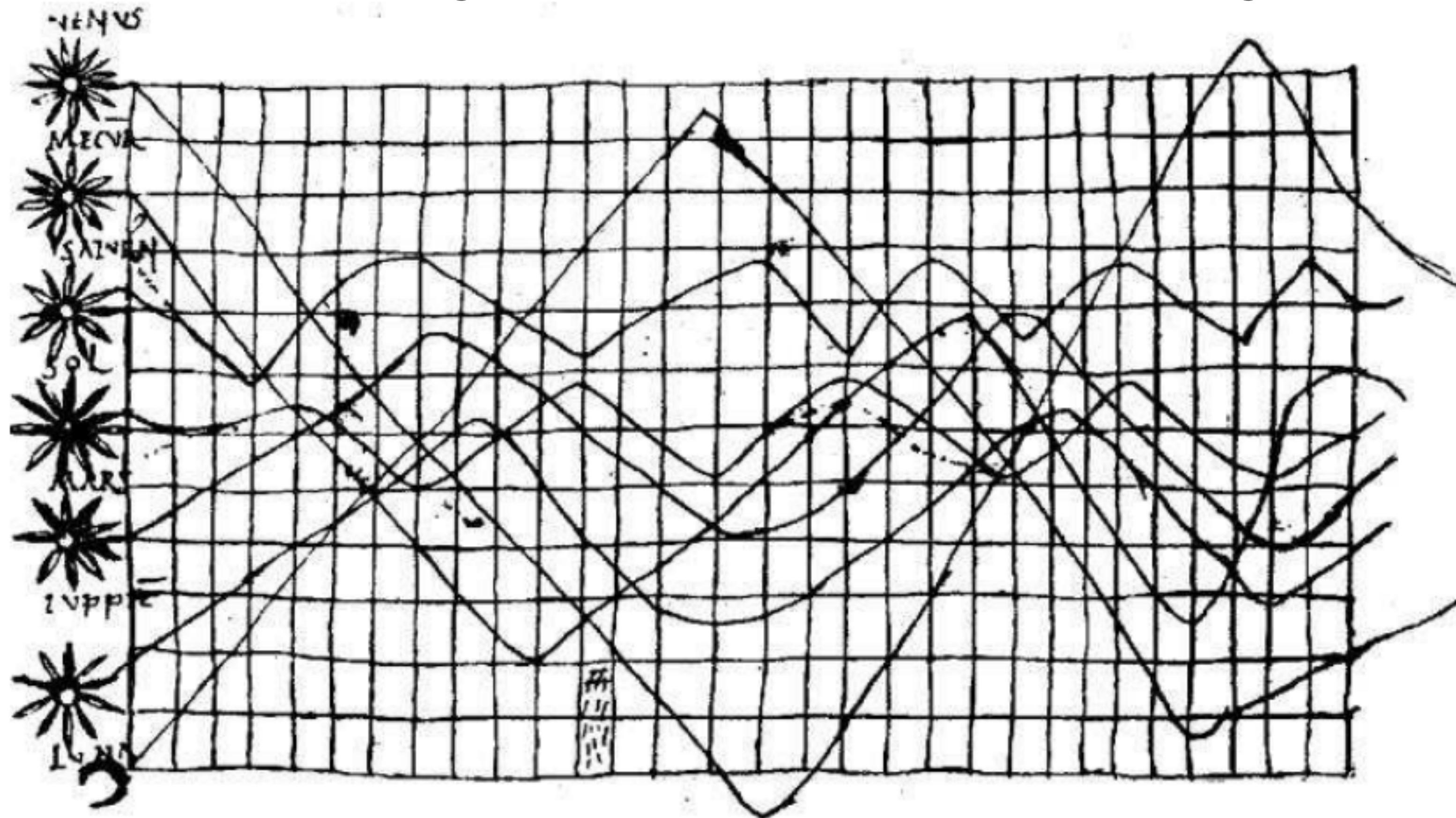
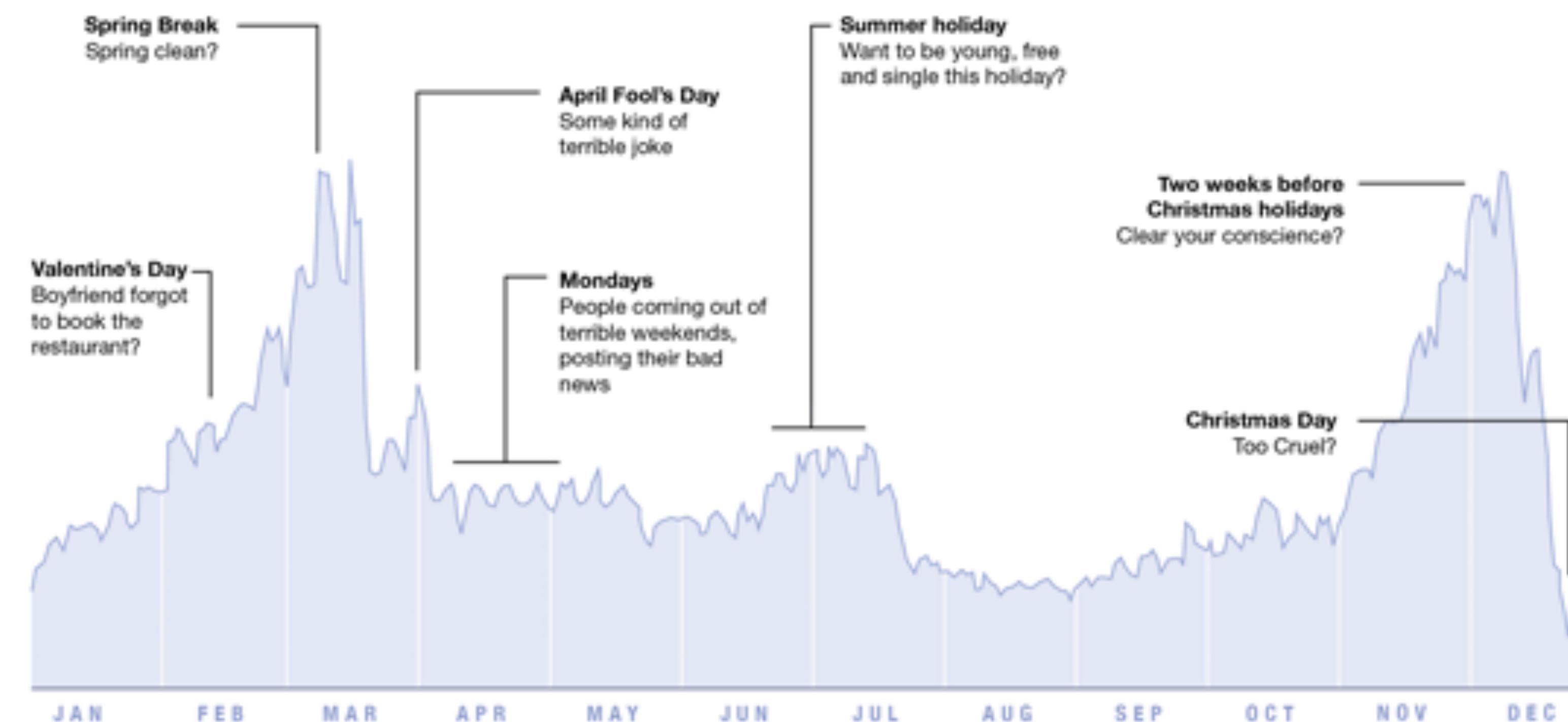


Figure 2: Planetary movements shown as cyclic inclinations over time, by an unknown astronomer, appearing in a 10<sup>th</sup> century appendix to commentaries by A. T. Macrobius on Cicero's *In Somnium Scipionis*. Source: [Funkhouser \(1936, p. 261\)](#).

# Peak Break-up Times

According to Facebook status updates

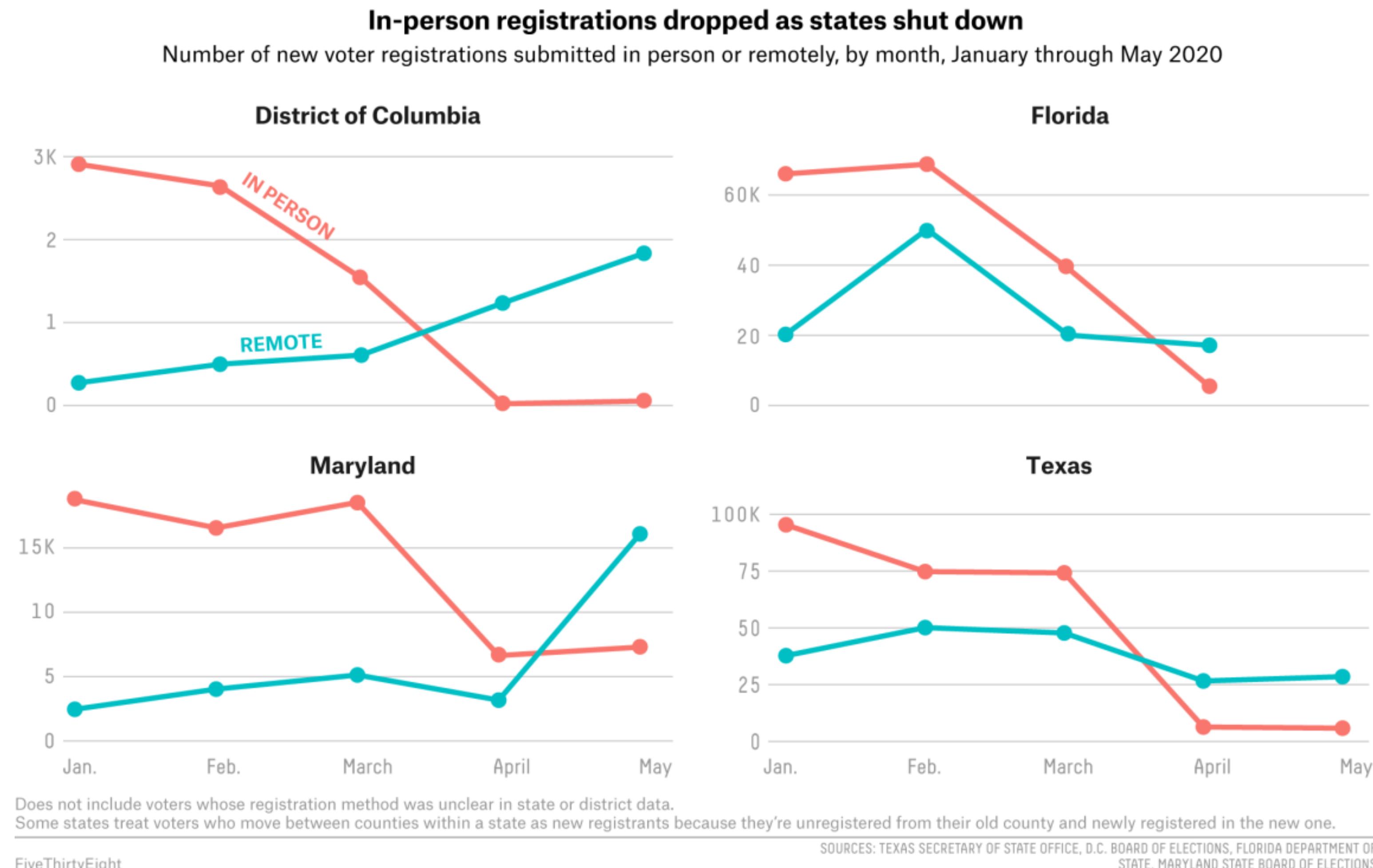
InformationIsBeautiful.net



David McCandless & Lee Byron  
InformationIsBeautiful.net / LeeByron.com

source: Facebook Lexicon 2008

# Time series— time as the x-axis



DOUBLE ISSUE

JULY 20 / JULY 27, 2020

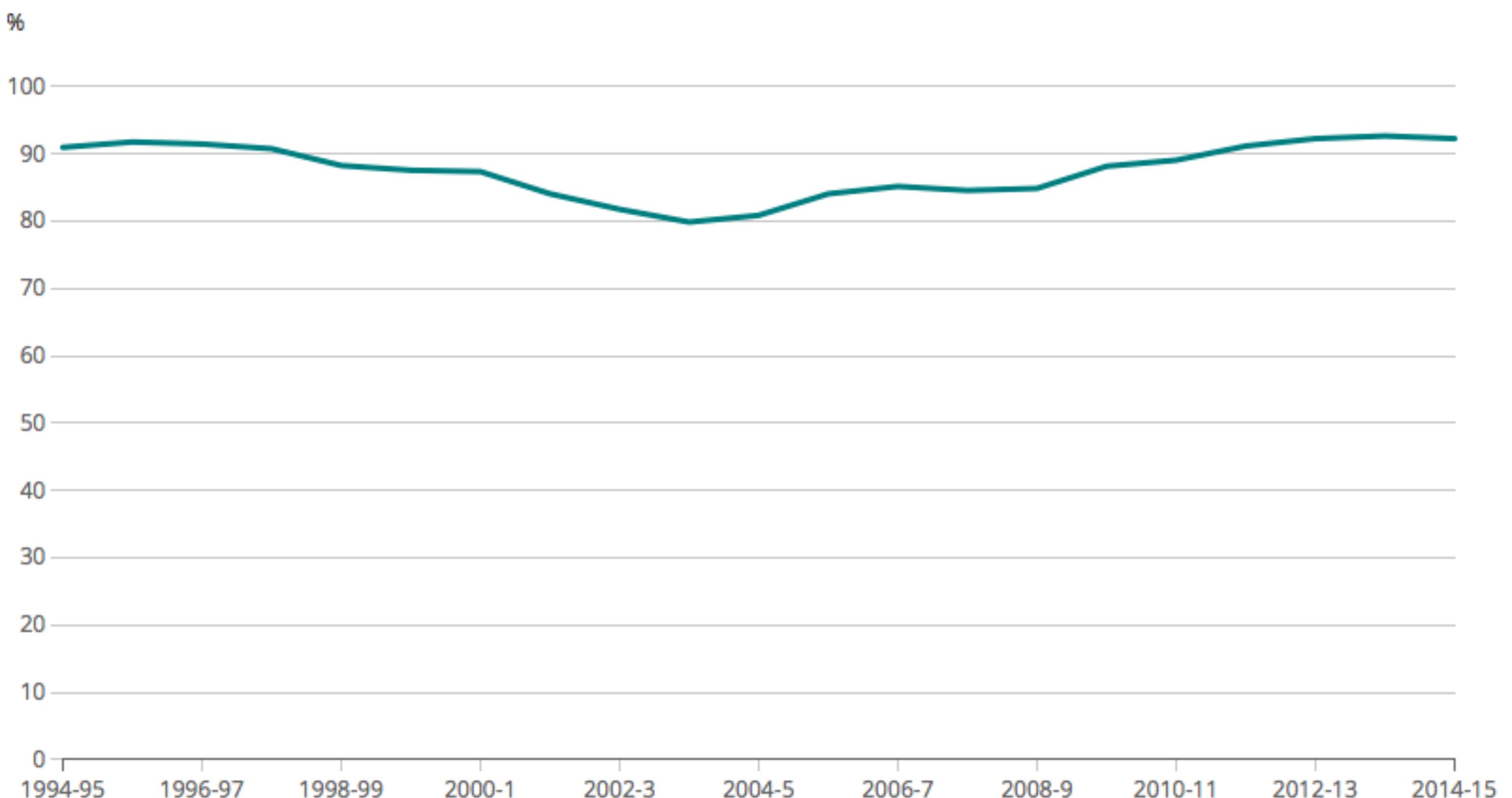
# ONE LAST CHANCE

THE DEFINING YEAR FOR THE PLANET **BY JUSTIN WORLAND**

PLUS THE DALAI LAMA, GRETA THUNBERG, VANESSA NAKATE, OLIVER JEFFERS, STACEY ABRAMS, ANGELINA JOLIE & MORE

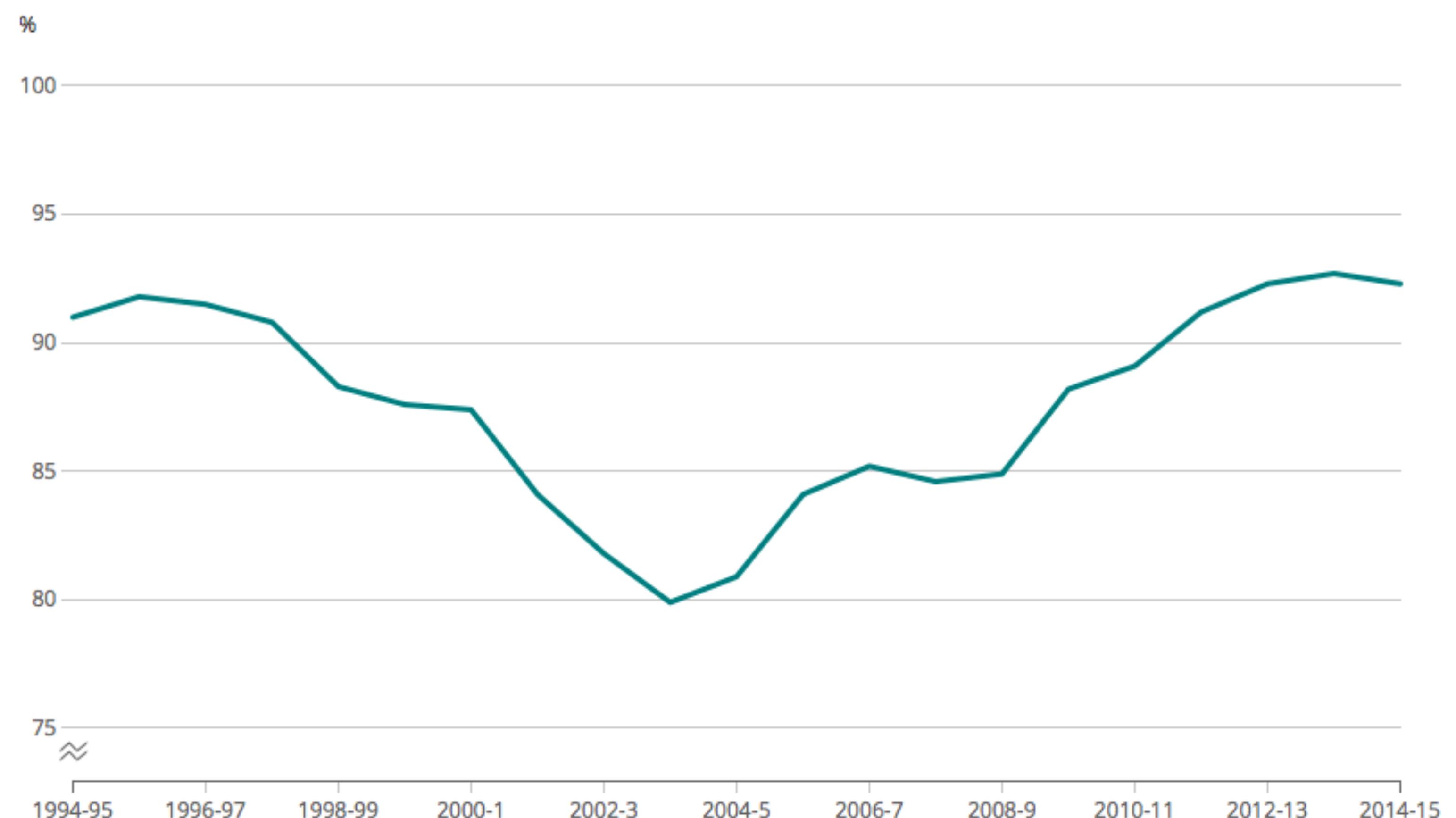


# Does the y-axis have to start at 0?



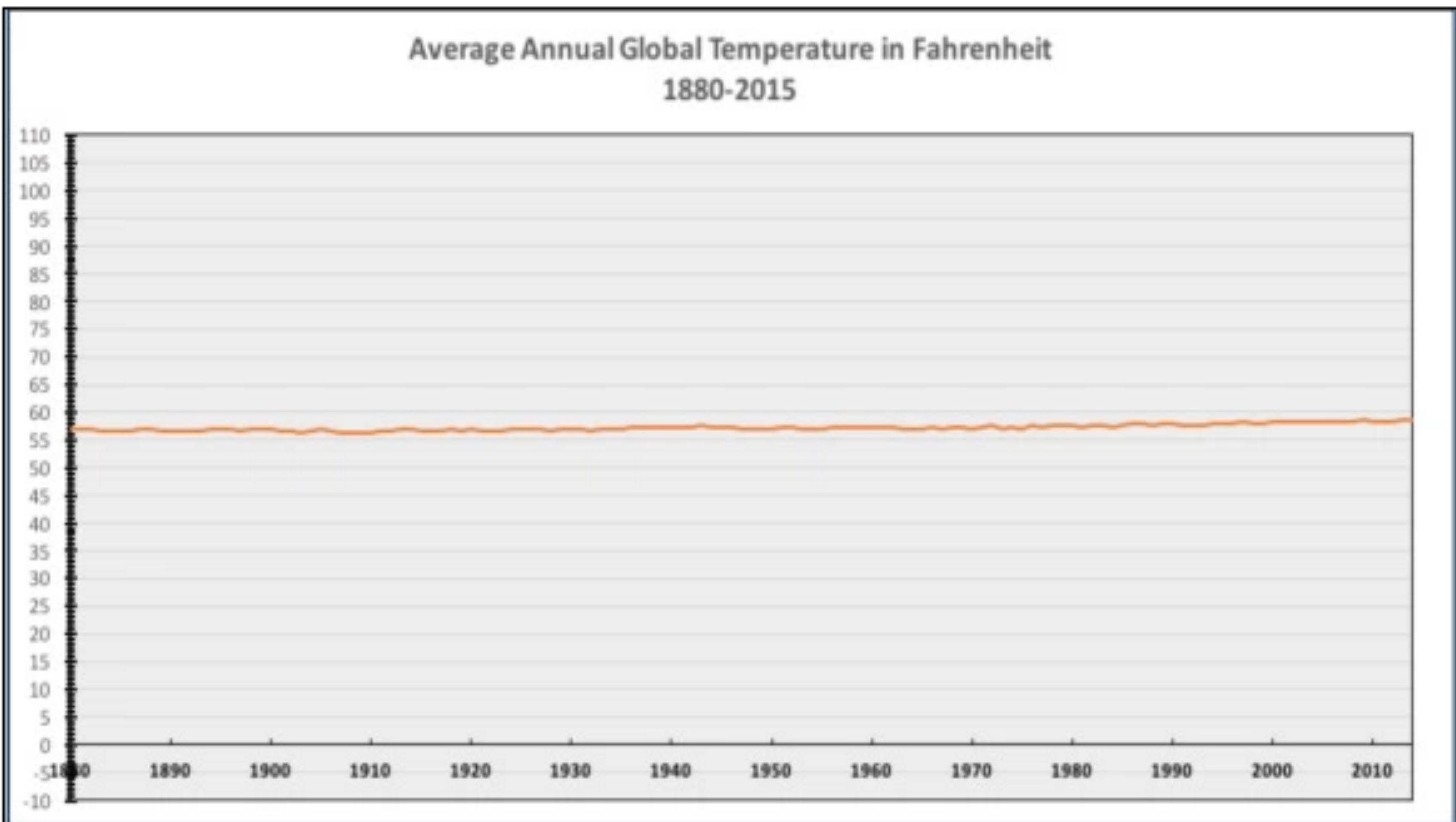
Source: NHS Immunisation Statistics - England, 2014-15, Table 8 and 9, HSCIC

# Does the y-axis have to start at 0?



Source: NHS Immunisation Statistics - England, 2014-15, Table 8 and 9, HSCIC

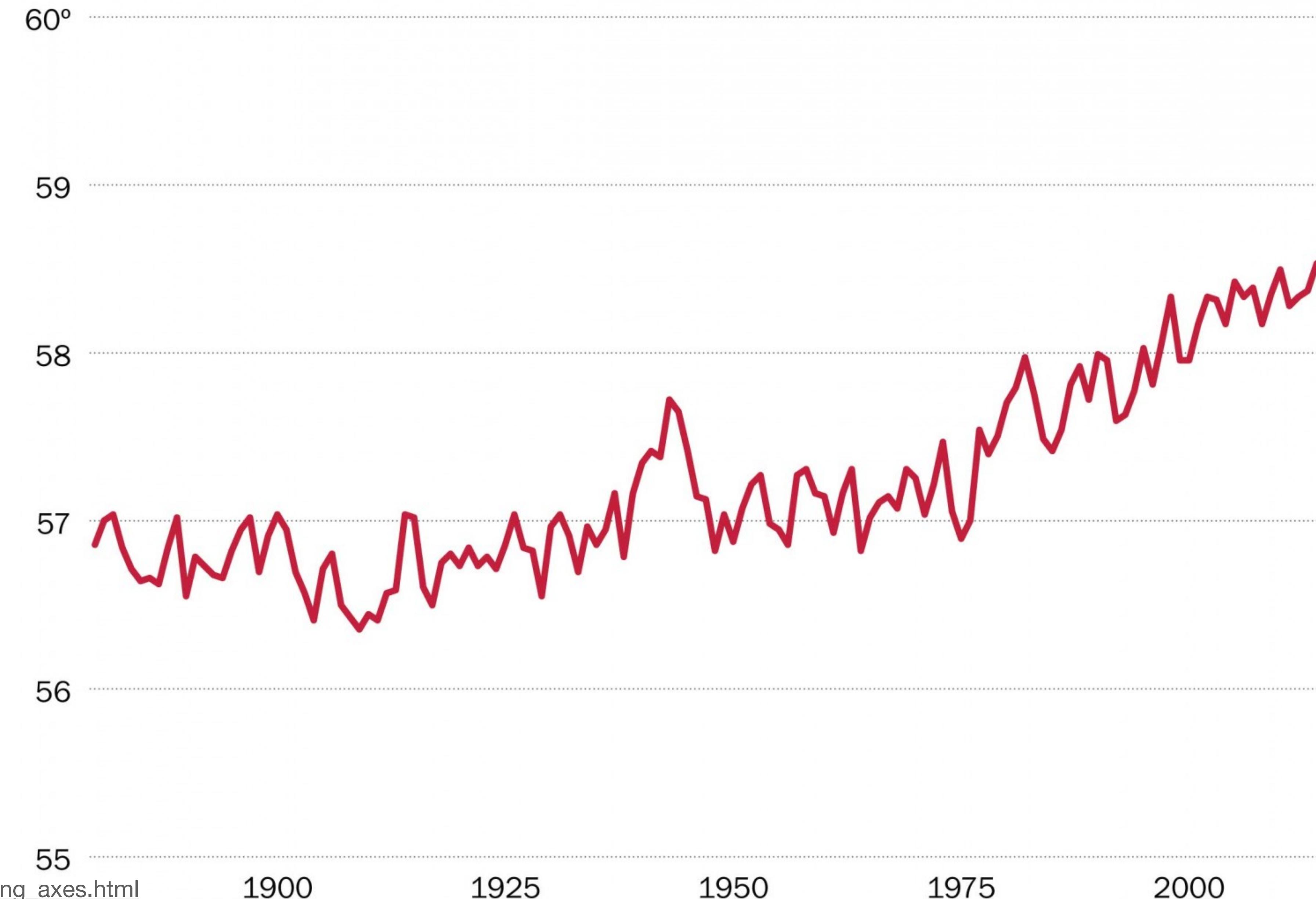
# Does the y-axis have to start at 0?



**Does the  
y-axis have  
to start at  
0?**

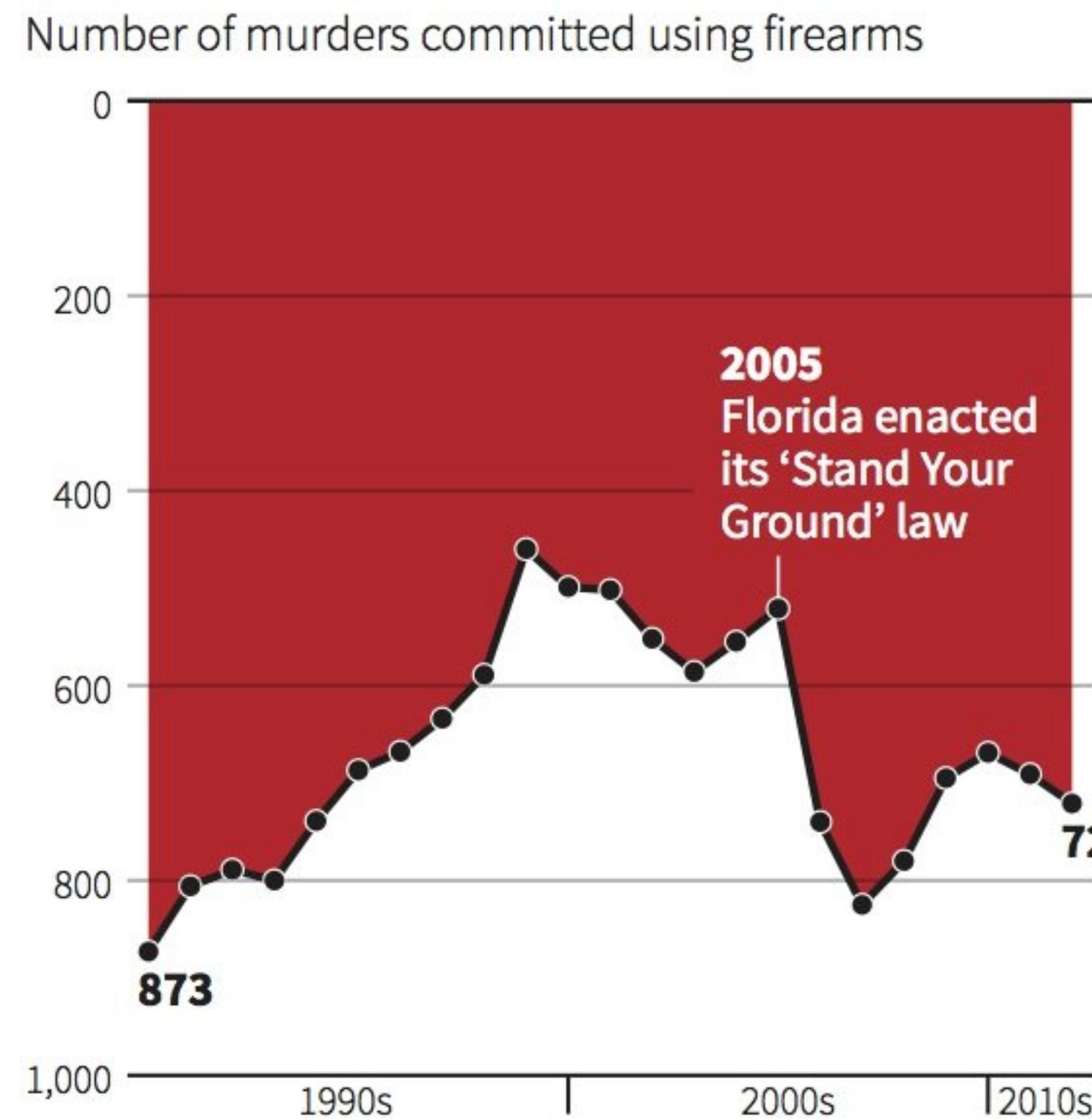
## Average global temperature by year

Data from NASA/GISS.



# Does the y-axis have to start at 0?

## Gun deaths in Florida

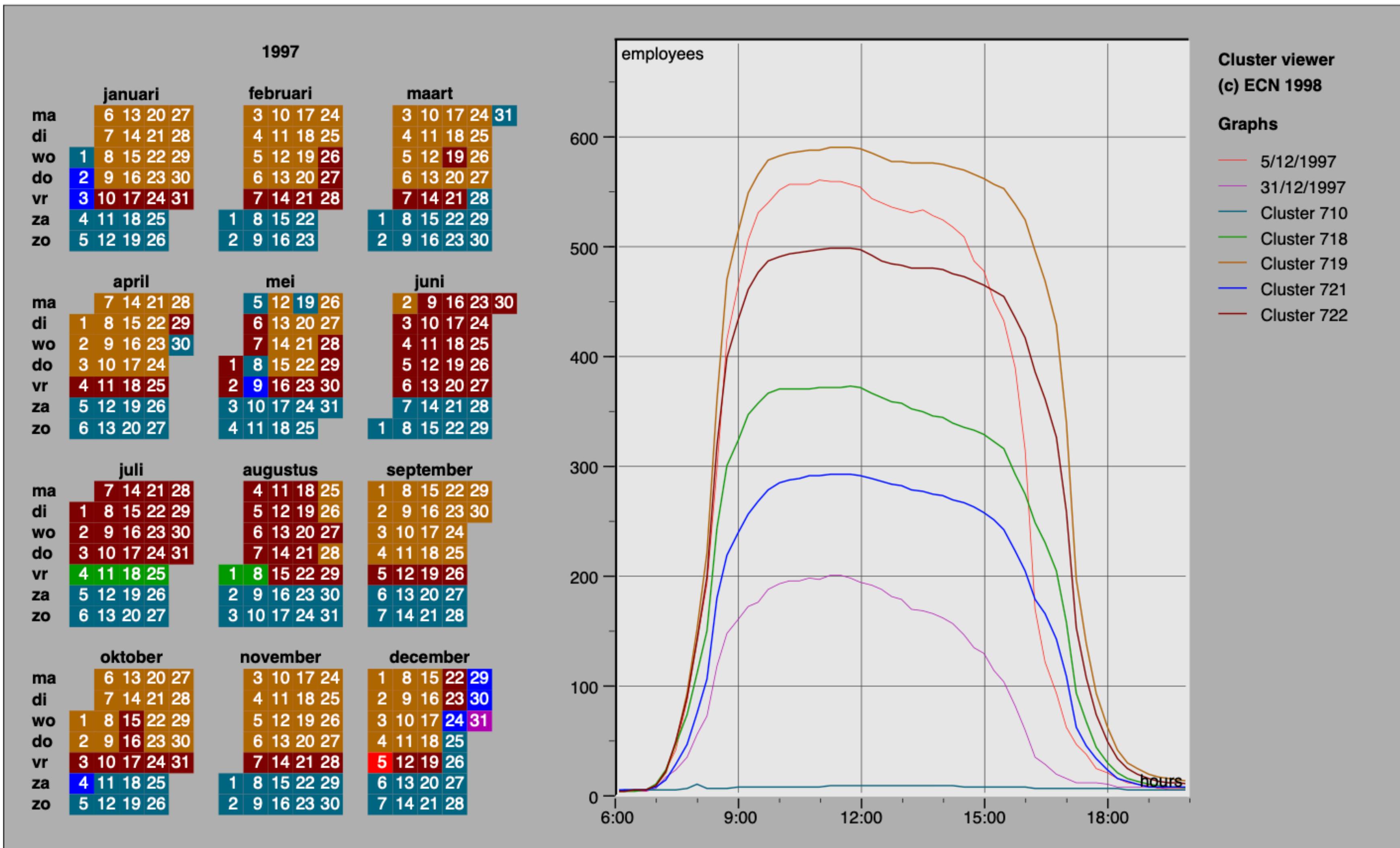


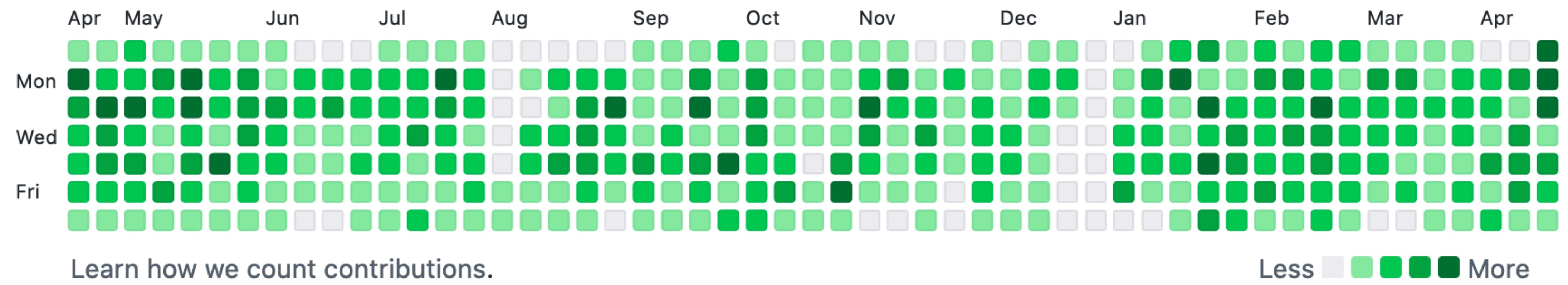
Source: Florida Department of Law Enforcement

C. Chan 16/02/2014

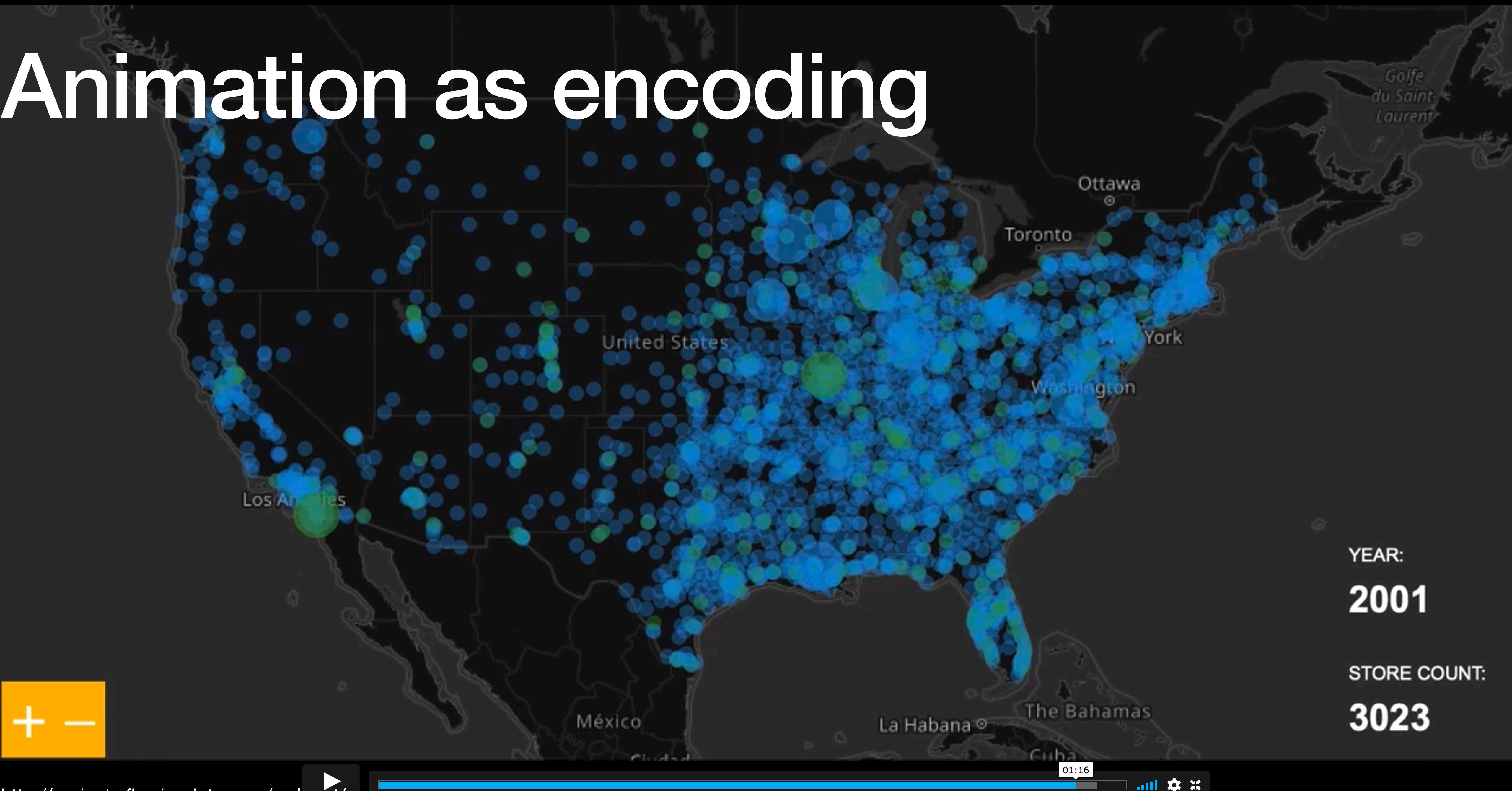
REUTERS

# Calendar visualization

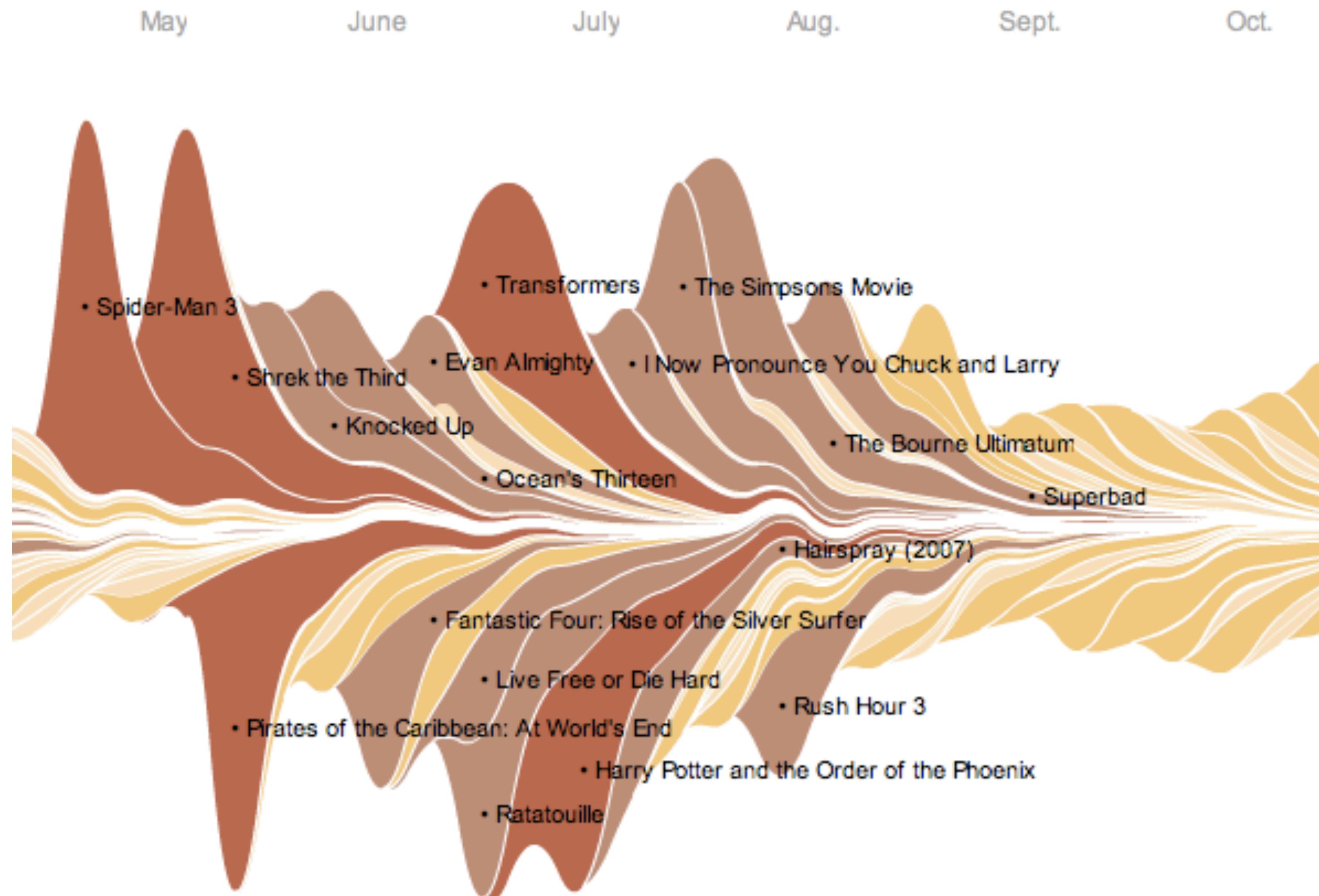


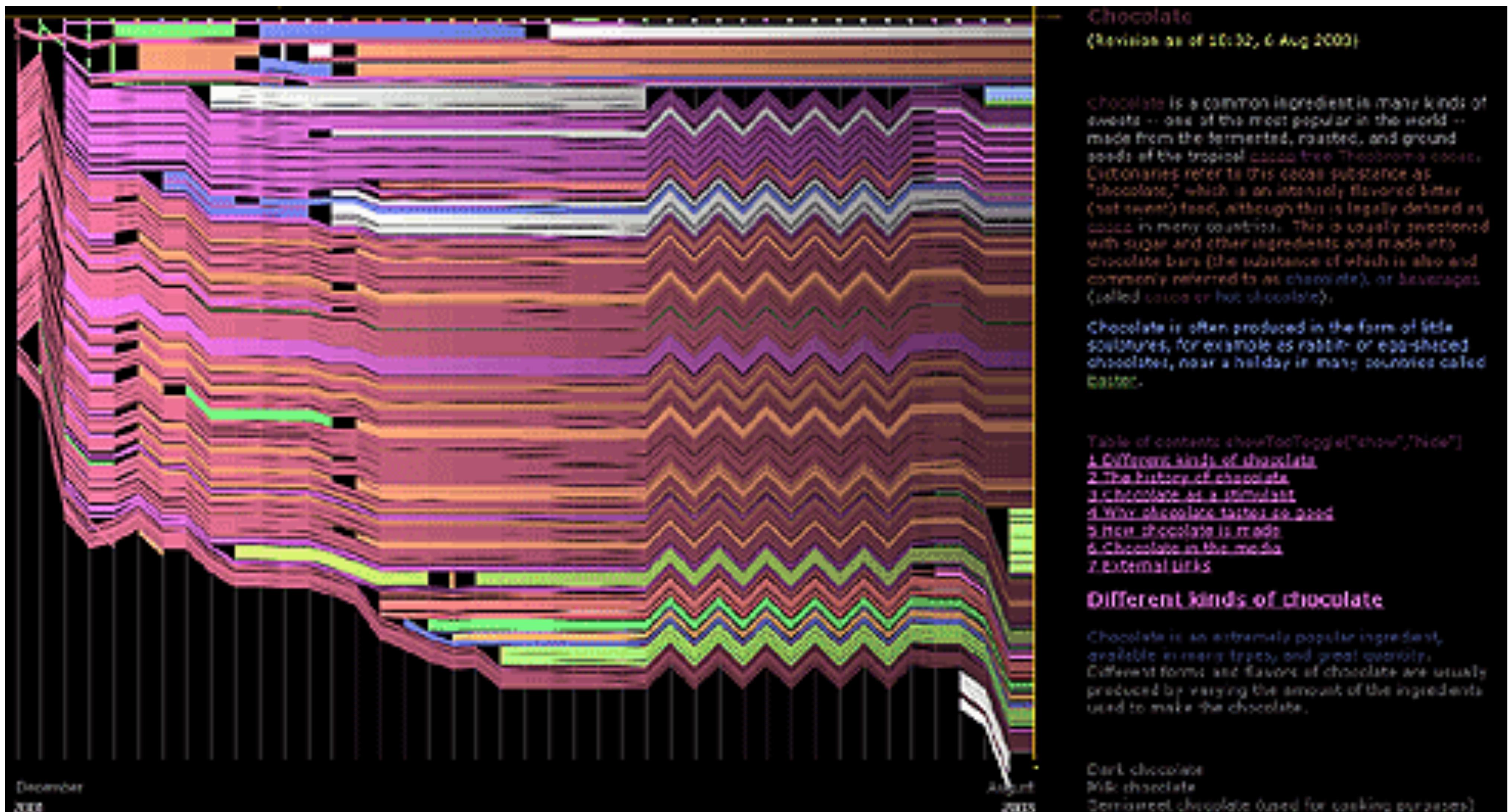


# Animation as encoding

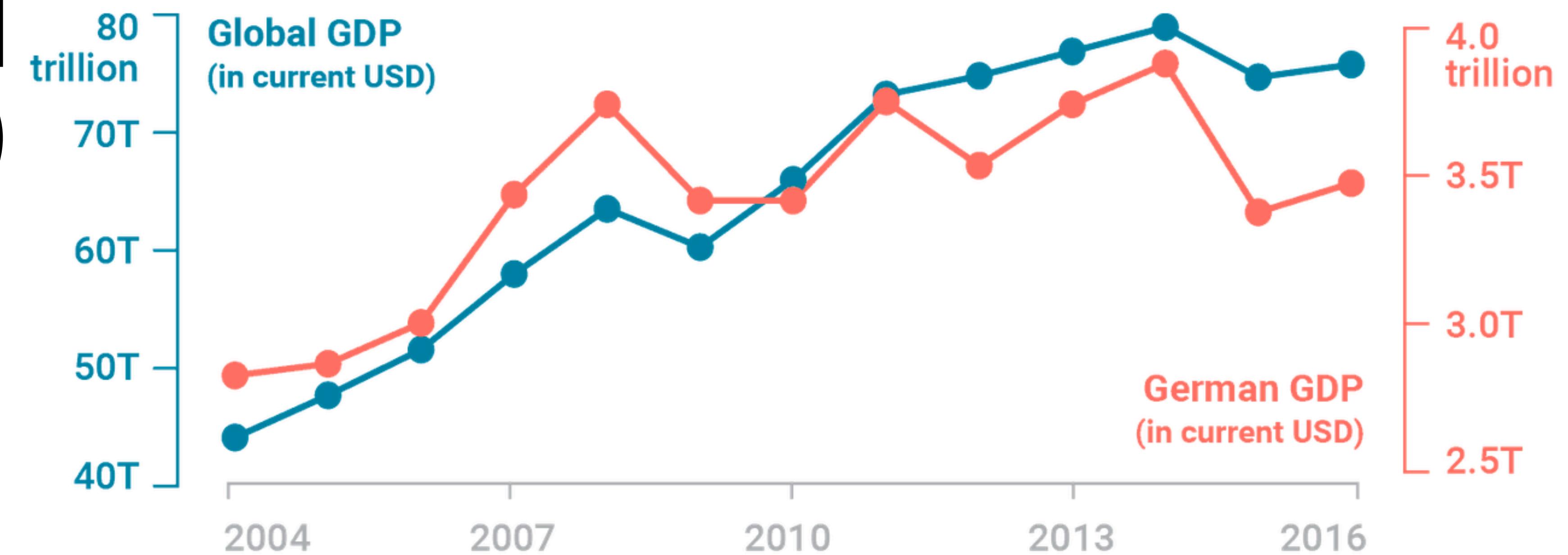


# Streamgraphs

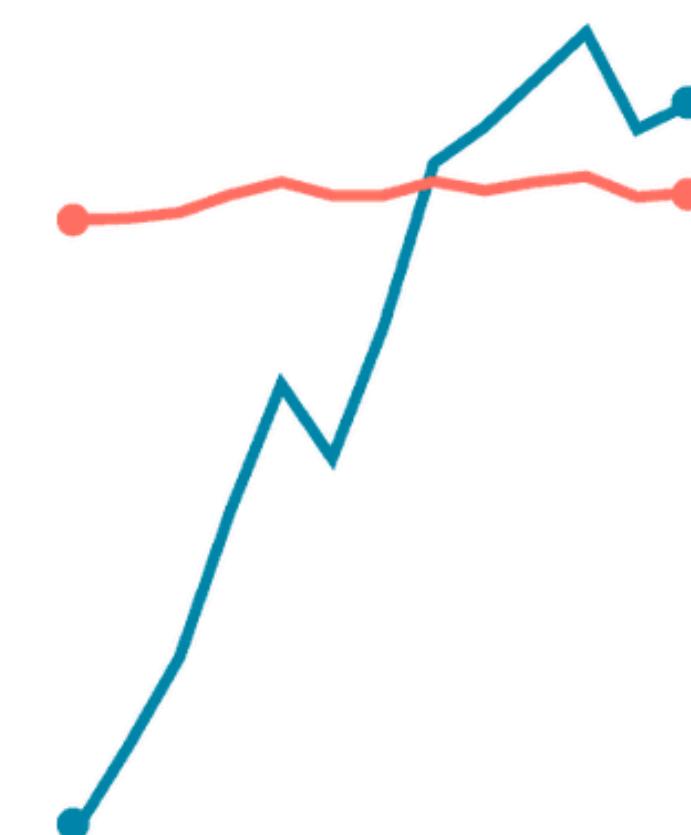




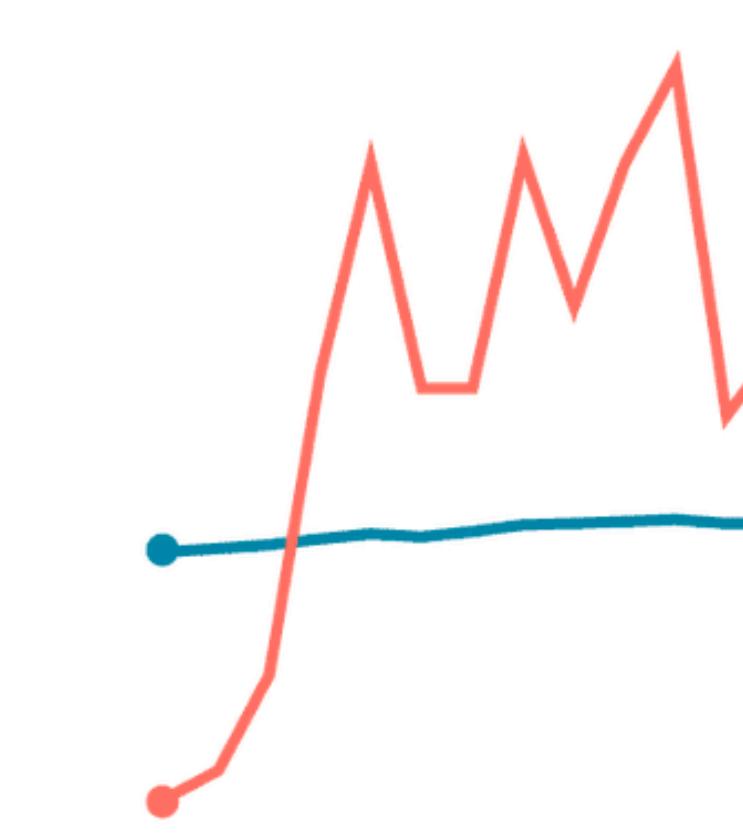
# More than two variables: could make a dual-axis plot (but, bad practice)



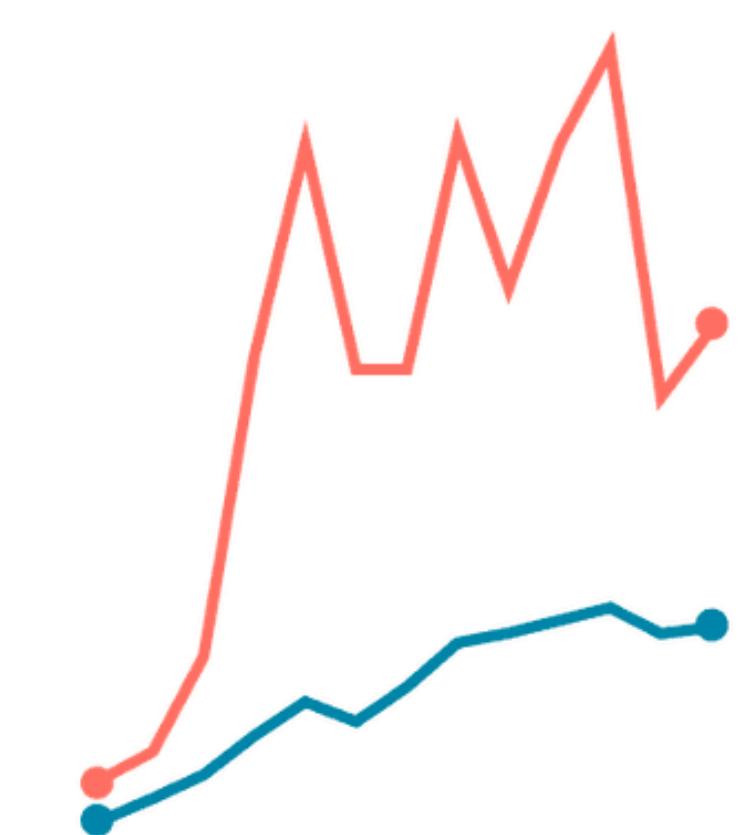
# More than two variables: could make a dual-axis plot (but, bad practice)



Orange steady,  
Blue massively increasing.



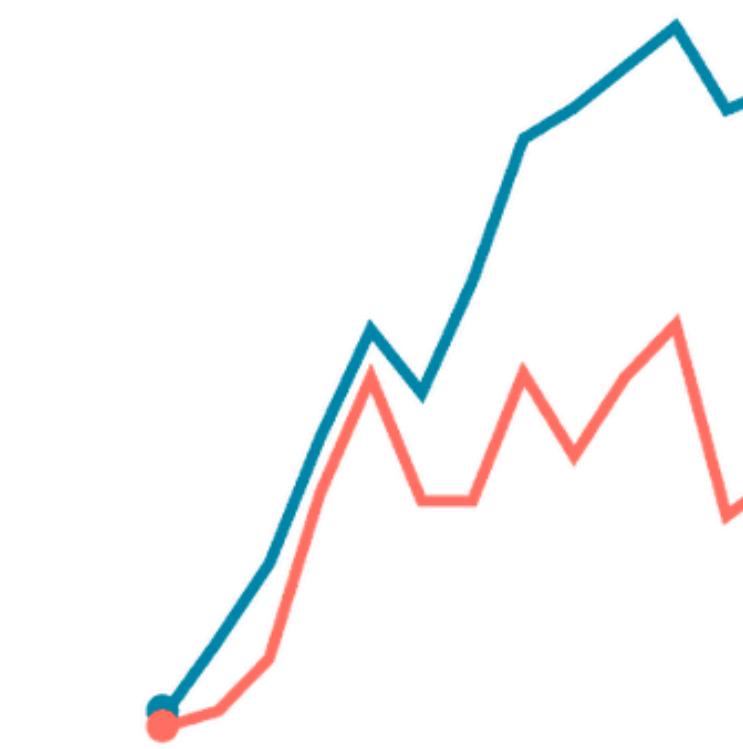
Blue steady,  
Orange increasing.



Both started at the same  
level, but Orange increased  
far more than Blue.



Both started at the same  
level, but Blue increased far  
more than Orange.

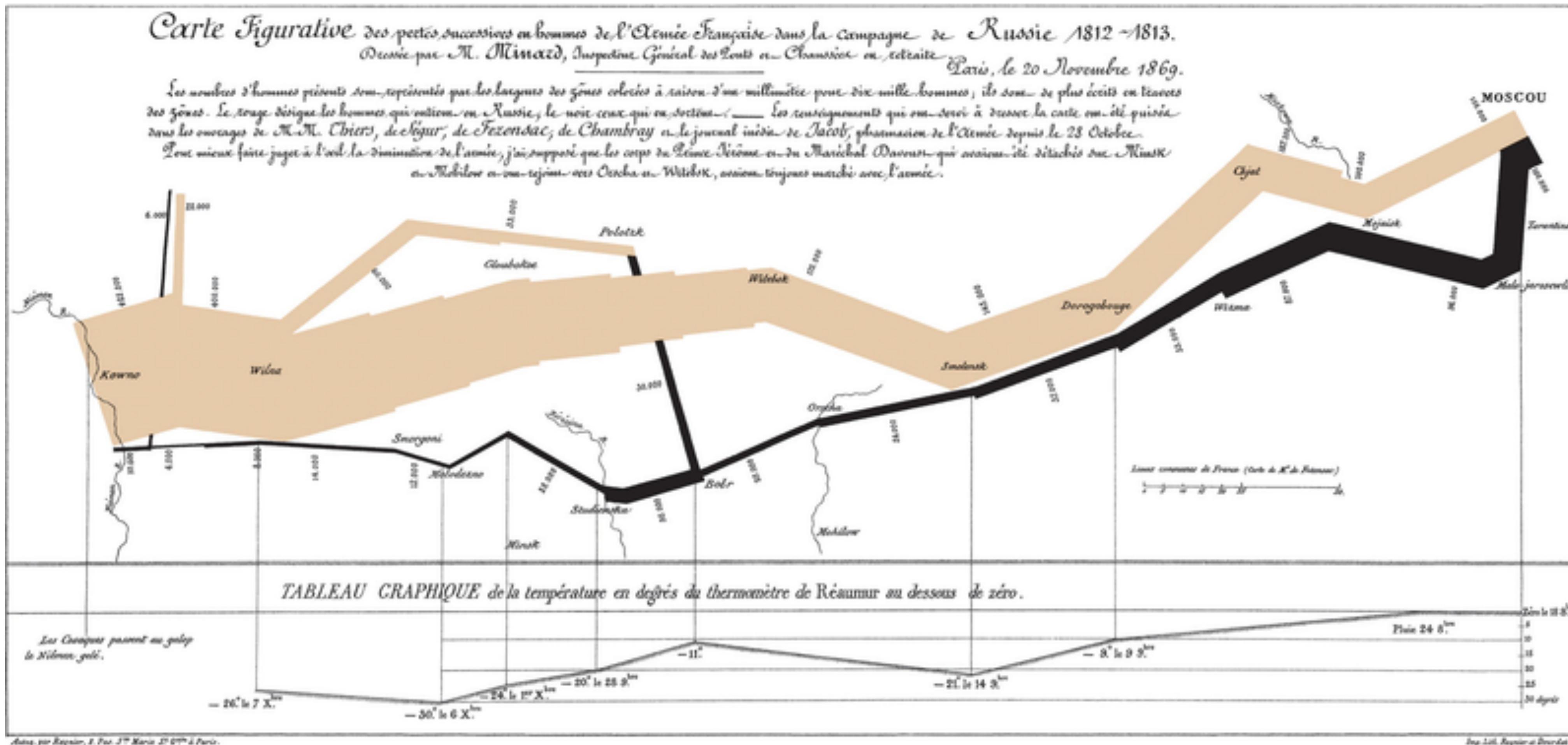


Both started with the  
same increase, then Blue  
raced to the top.

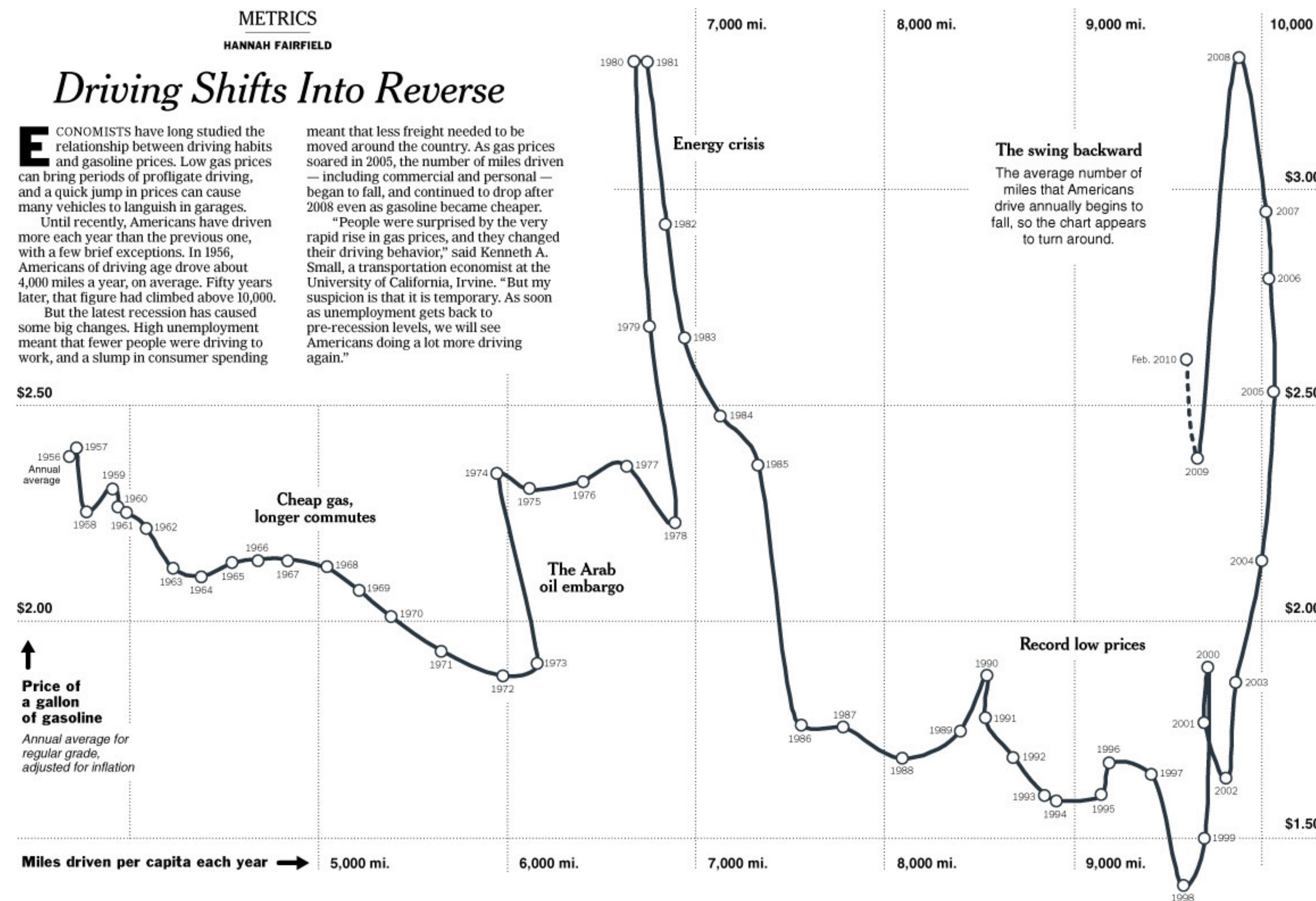


Both steady.

# recall—Napoloen's march on Russia



# Connected scatterplot – time is connection

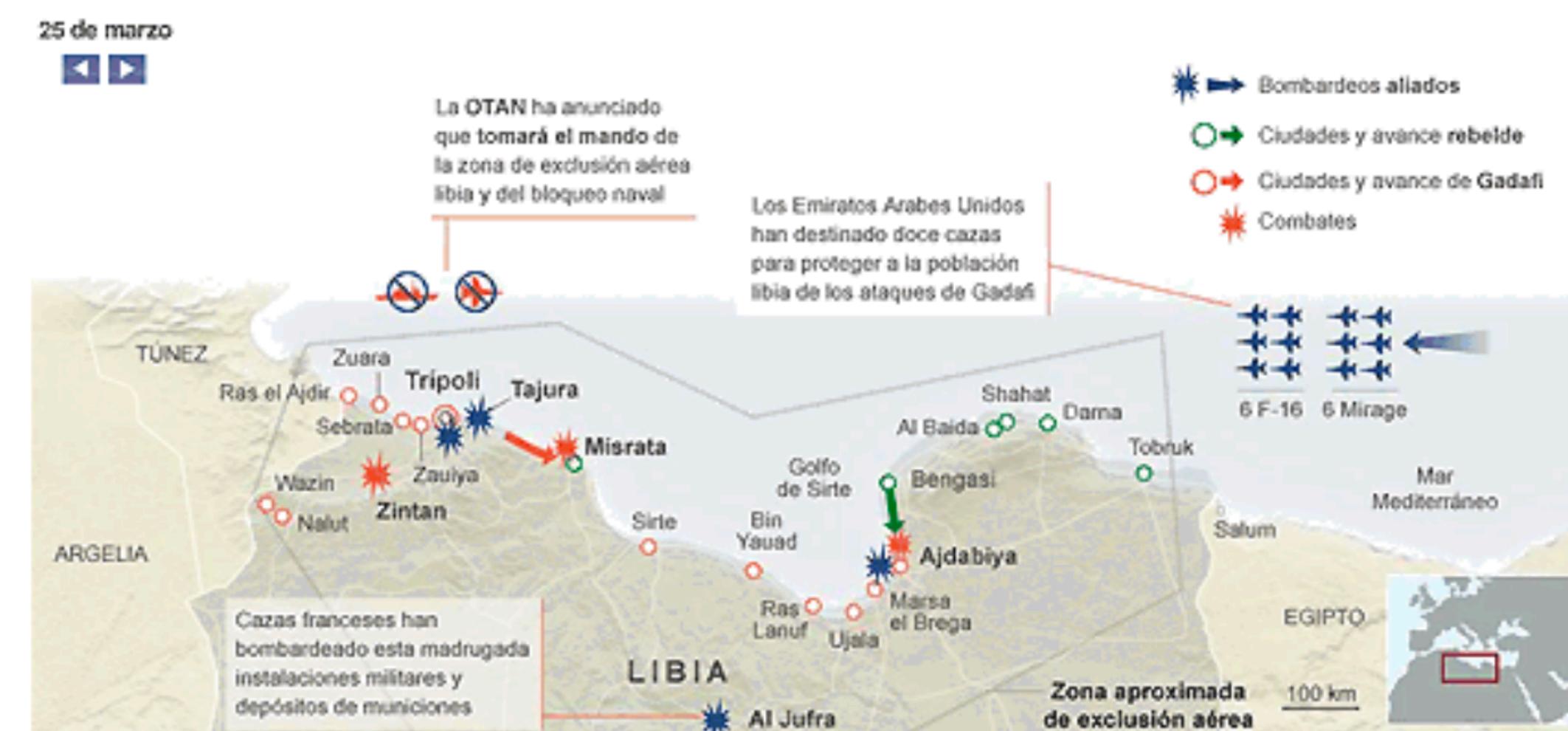


# timelines

# Chronology or timeline?

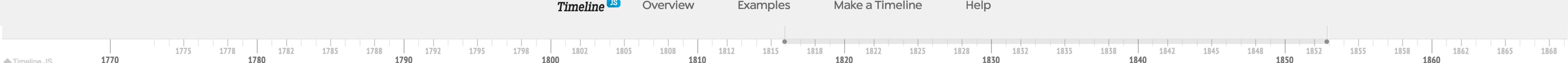
Sometimes a [timeline](#) is not a timeline, according to Len de Groot, a longtime graphics journalist. A **timeline** shows actual spans of time, with proportional measurements for decades, years, days or hours, depending on the total time involved. “The space between events should be as important [as] or more important than the events themselves,” he says. A **chronology**, on the other hand, shows the momentum of a series of events. It might be more effective if presented as a list, or as an illustrated slideshow.

Here's an excellent chronology about Operation Odyssey Dawn on Libya, from El País:

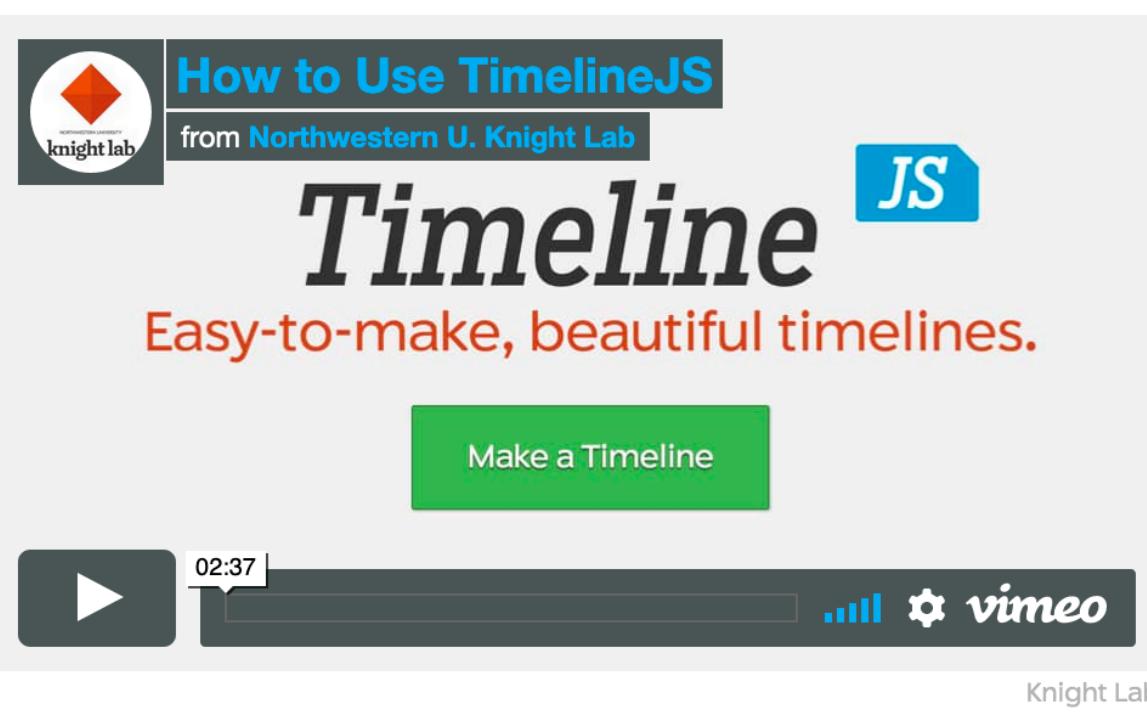


## **Here are some questions we can ask before we sketch our timeline ideas:**

- Is this a story about hours, days, years or decades?
- Should equal periods of time be represented with equal space? (Example: 100 pixels equals one year.)
- Are parallel time periods required? (Example: While this was happening in India, this was happening in China.)
- Does it make sense to combine the timeline with a map or a line graph?
- Should photos or other images be added to the timeline to help tell the story?
- How much text is necessary to make the story understandable – and satisfying?



TimelineJS is an open-source tool that enables anyone to build visually rich, interactive timelines. Beginners can create a timeline using nothing more than a Google spreadsheet, like the one we used for the Timeline above. Experts can use their JSON skills to create custom installations, while keeping TimelineJS's core functionality.



## Examples



**TIME**

Mandela: A Life of Purpose



**Le Monde.fr**

Chronology of the French Presidential Race



**THE MANEATER**

Historic Fall at University of Missouri



**CNN**

North Korea's Nuclear Ambitions

## Tips & tricks

- 1 Keep it short. We recommend not having more than 20 slides for a reader to click through.
- 2 Pick stories that have a strong chronological narrative. It does not work well for stories that need to jump around in the timeline.
- 3 Write each event as a part of a larger narrative.
- 4 Include events that build up to major occurrences – not just the major events.

## Media sources

TimelineJS can pull in media from a variety of sources. Twitter, Flickr, YouTube, Vimeo, Vine, Dailymotion, Google Maps, Wikipedia, SoundCloud, Document Cloud and more!

# Examples

**TIME**

Mandela: A Life of Purpose

**Le Monde.fr**

Chronology of the French Presidential Race

**THE MANEATER**

Historic Fall at University of Missouri

**CNN**

North Korea's Nuclear Ambitions

**90.9wbur**  
Boston's NPR® news station

Bulger on Trial

**The Center for Public Integrity**

The Decline of IRS Nonprofit Regulation

**THE DENVER POST**

Aurora, Colorado Movie Theater Shooting

**engadget**

The Collapse of Microsoft and Nokia's Mobile Business

**IBT**

How ISIS Spread to 10 Countries

**KSAT 12**  
abc

Reported Sexual Assault Cases by Texas Educators

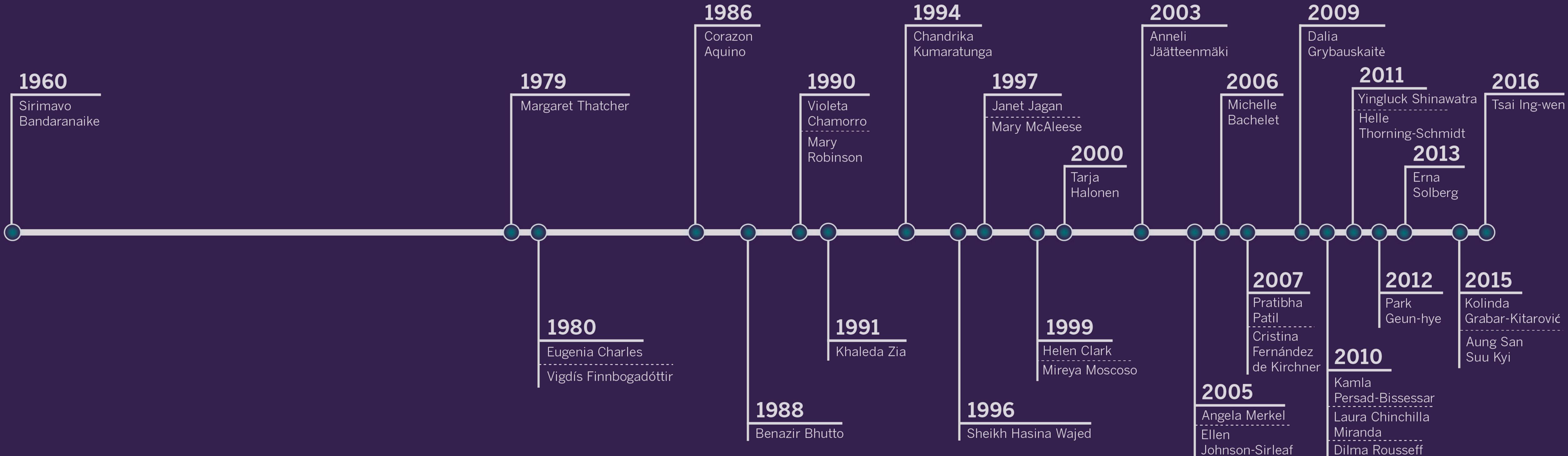
**VINEPAIR**

A History of Wine Around the World

**Mashable**

The Mystery of Malaysia Airlines Flight 370





## When the rest of the world elected women leaders

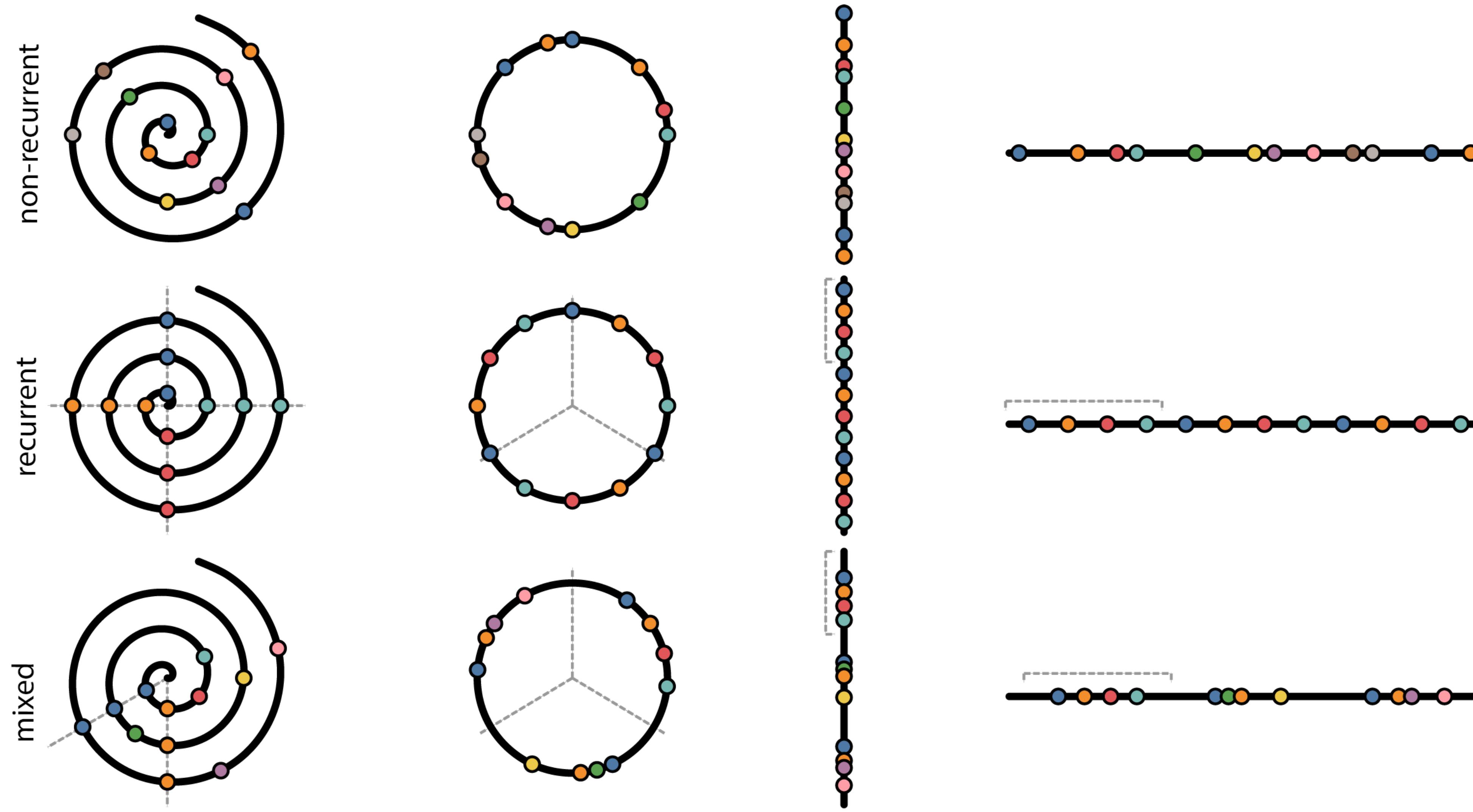
By CHRISTINE ZHANG AND ANDREA ROBERSON

NOV. 14, 2016

After her loss to Donald Trump, Hillary Clinton noted that it will fall to some other woman to become the nation's first female president. "We have still not shattered that highest and hardest glass ceiling, but someday, someone will," she said.

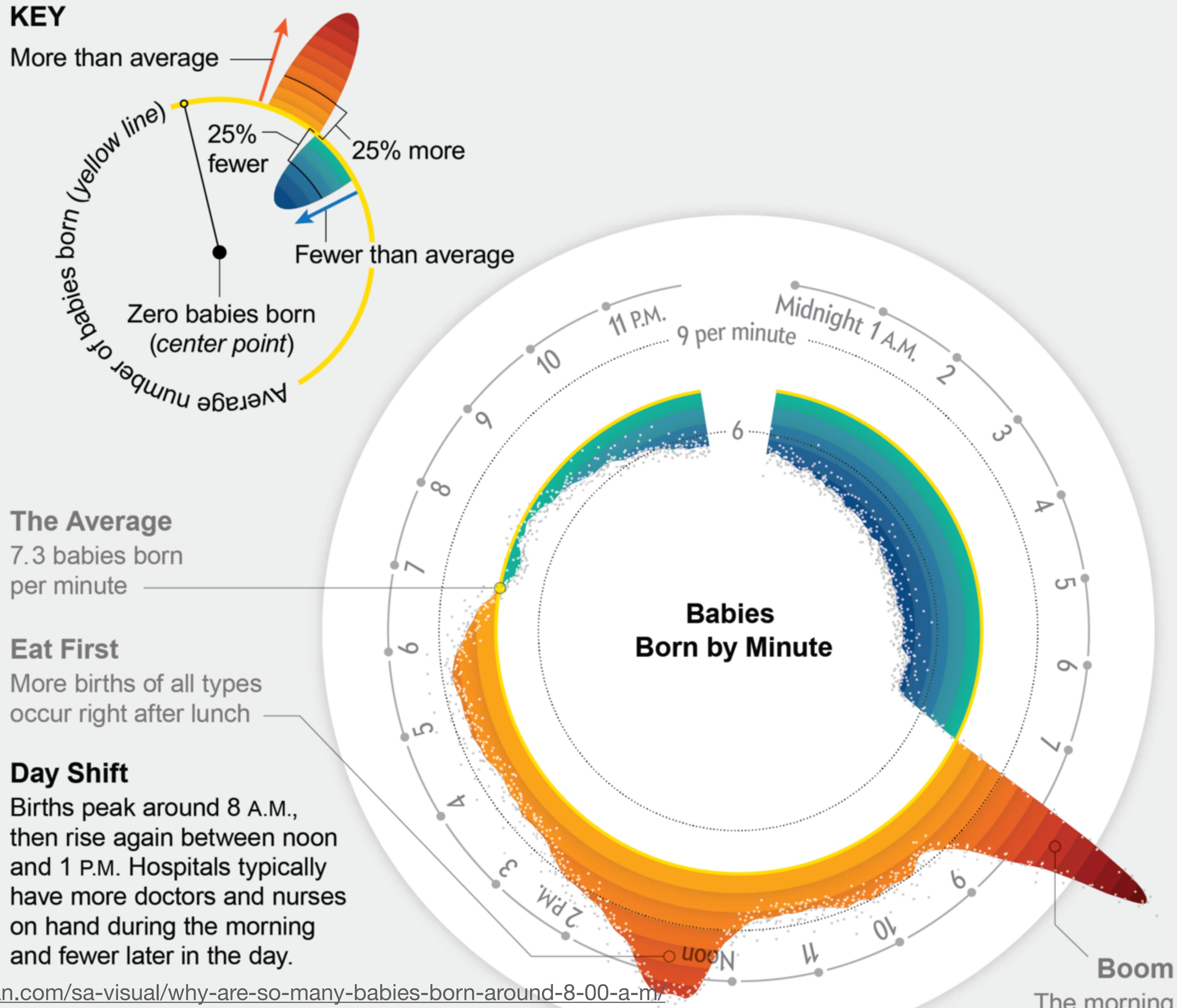
By [our tally](#), only 33 women have reached their nation's top office in an outright election, rather than through succession or appointment. Some well-known female leaders, such as Argentina's first female president, Isabel Perón, inherited the position, and India's first female prime minister, Indira Gandhi, was chosen by her party to fill a vacancy before being elected. Israel's Golda Meir rose to the office of prime minister the same way.

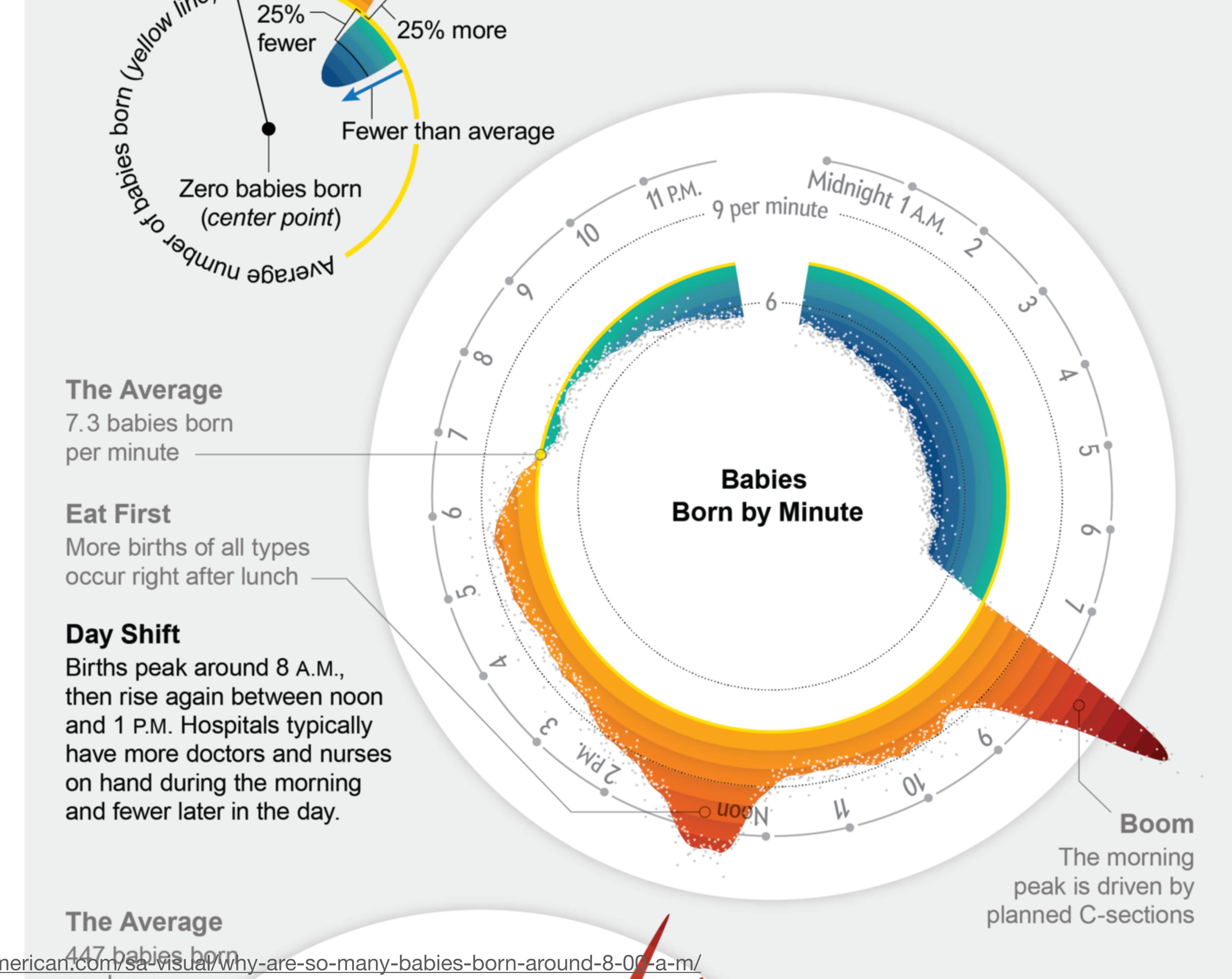
# Should a timelines always be a line?



## Design recommendations

- Considering the findings of our experiment, we formulated some design recommendations for timelines using one of the data set types we took into account. Here is a list of recommendations regarding timeline readability:
- Use linear vertical timelines for situations which require fast data lookup.
- Avoid spiral timelines when the task requires fast lookup.
- If you use a more creative, expressive shape, such as a spiral timeline, also include a tutorial or visual cues to assist the user in learning and understanding.

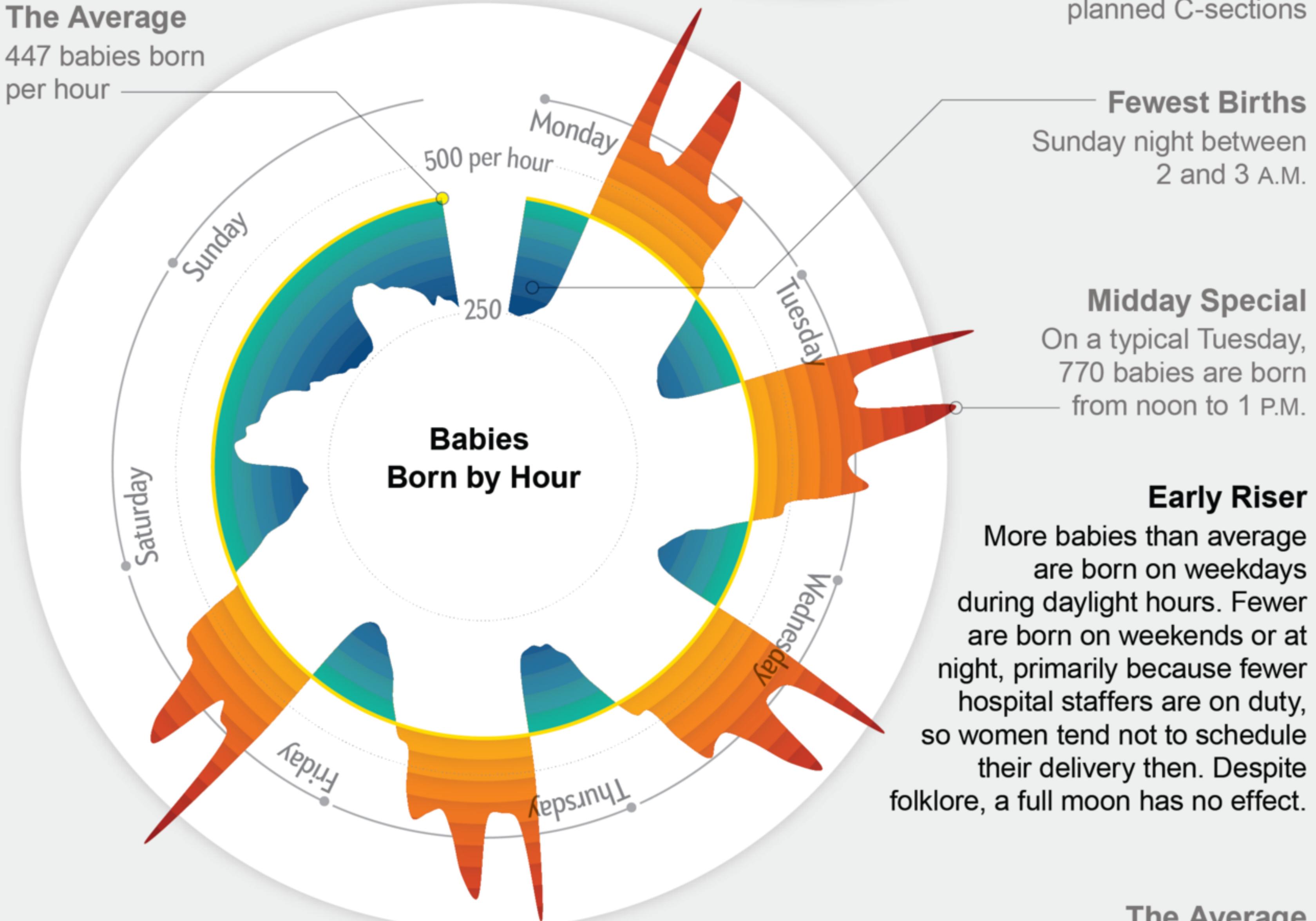




on hand during the morning and fewer later in the day.

### The Average

447 babies born per hour



### Boom

The morning peak is driven by planned C-sections

### Fewest Births

Sunday night between 2 and 3 A.M.

### Midday Special

On a typical Tuesday, 770 babies are born from noon to 1 P.M.

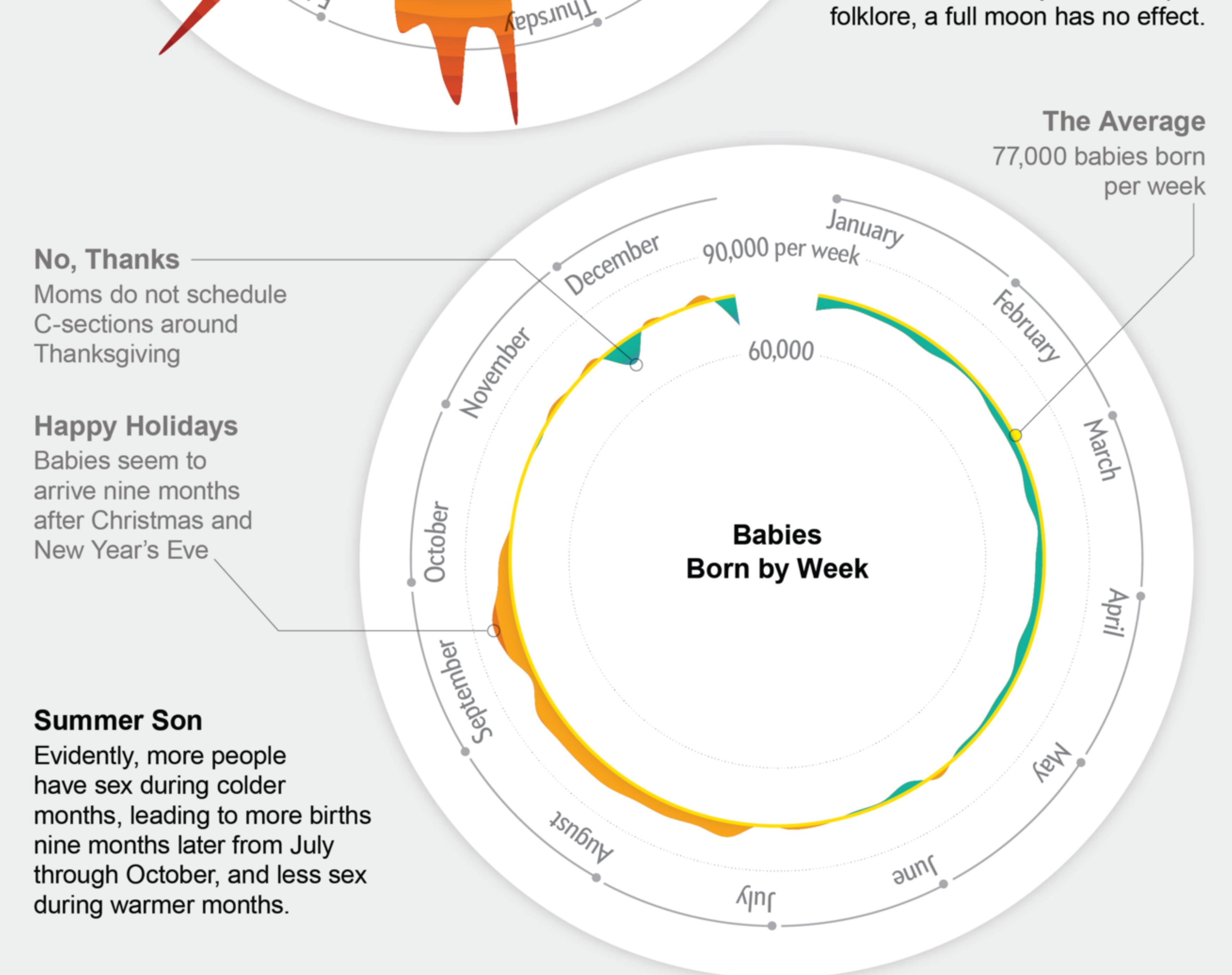
### Early Riser

More babies than average are born on weekdays during daylight hours. Fewer are born on weekends or at night, primarily because fewer hospital staffers are on duty, so women tend not to schedule their delivery then. Despite folklore, a full moon has no effect.

### The Average

77,000 babies born

folklore, a full moon has no effect.



# The TimeViz Browser

A Visual Survey of Visualization Techniques for Time-Oriented Data

by Christian Tominski and Wolfgang Aigner

# of Techniques: 115

Search:

How to use filters:

Want: Show me!

Indifferent: I don't care.

Hide: I'm not interested!

Data

Frame of Reference

Abstract



Spatial



Number of Variables

Univariate



Multivariate



Time

Arrangement

Linear



Cyclic



Time Primitives

Instant



Interval



Visualization

Mapping

Static



Dynamic



Dimensionality

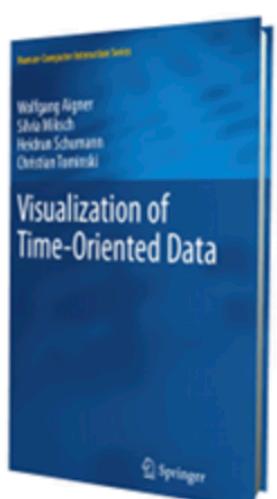
2D



3D



Our book:



Contact:

[www.timeviz.org](http://www.timeviz.org)