6. Elements of Storytelling

Practical Definition of a Story

To paraphrase U.S. judge Potter Stewart: "I may not be able to define what a story is, but I know one when I see one".

We could say that a **story** consists of:

- context,
- series of events, and
- outcome, result, consequence, or resolution.

Storytelling Goals

Cultural Stories

- entertain, inform, teach, explore, shock

Data (Scientific) Stories

- describe, diagnose, predict, prescribe, persuade

Any overlap?

Anything missing?

FLATTENING THE CURVE

A look at the importance of slowing the spread of a virus, so that the rate of infection doesn't outpace the resources to fight against it.

No intervention

HEALTHCARE SYSTEM CAPACITY

With intervention

Daily new cases

Days since first case

SOURCE: CDC

THE CANADIAN PRESS
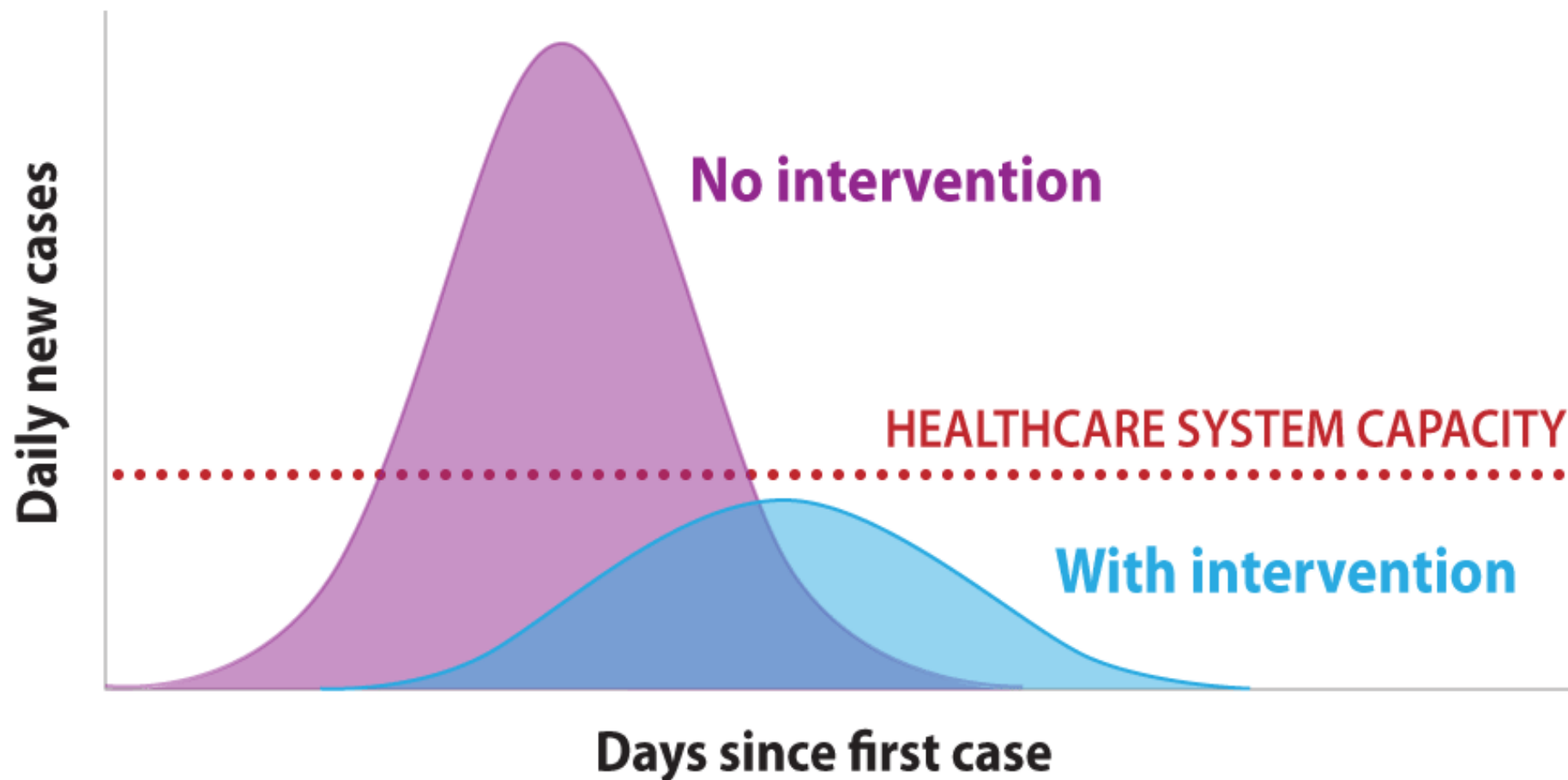
Storytelling Audiences

Storytelling requires a **teller** and a **story**, but also an **audience.**

The **teller**'s job is to convince the audience to accept:

1. the premise ("I'm about to tell you a really interesting story, so listen up!")

2. the contents ("All these things happened, honest!")

3. the conclusion ("And that's why you should never put peanut butter in your laundry.")

The **story**'s must first and foremost not come in the way of the teller's job.

Storytelling Audiences

The **audience** is a more nebulous entity.

In many cases, the teller never interacts directly with the audience. For all they know, the audience could be a single child, or the entire nation of Finland.

This **ambiguity** typically leads to storytellers imagining the largest possible audience. A story for the ages, which will be all things to all people.

This is a common mistake: **less is more**. It pays to know the audience (we will discuss this further at a later stage).

Storytelling Audiences

What is required of a storytelling audience?

What is expected of a storytelling audience?

What kind of audiences exist for stories?

For storytelling with data? (we will discuss this again at a later stage)

Storytelling Context

A given action may be seen as positive or as negative by audiences with different pre-existing feelings/knowledge concerning the agent/situation.

- Would you be able to recognize nobility in a political enemy's actions?
- Could a fan of the Maple Leafs/Habs ever have something worthy to say about hockey?

Similarly, a story may have different **outcomes/impacts** in different contexts.

[https://www.lowdownonline.com/post/wakefield-nurse-fires-up-freedom-convoy]

Wakefield nurse fires up Freedom Convoy

Wakefield's Bethan Nodwell is known in the Gatineau Hills for many things: being the hospital's former head nurse, singing onstage at the Black Sheep Inn, and more recently, disseminating debatable facts and anti-vax sentiments on social media. Now she's running the main stage at the Freedom Convoy in downtown Ottawa, firing up the crowd as seen here Feb. 4. Trevor Greenway photo

Bethan Nodwell had thousands of demonstrators in Ottawa hanging onto her every word.

What might lead one to view the **subject** of this article in a positive light?

A negative light? A neutral light?

What might lead one to view the **author** of this article in a positive light?

A negative light? A neutral light?

[Illustrations: V. Jaskina]

Storytelling Universality

There once was a shepherd boy who was bored as he sat on the hillside watching the village sheep. To amuse himself he took a great breath and sang out, "Wolf! Wolf! The Wolf is chasing the sheep!"

The villagers came running up the hill to help the boy drive the wolf away. But when they arrived at the top of the hill, they found no wolf. The boy laughed at the sight of their angry faces. "Don't cry 'wolf', shepherd boy," said the villagers, "when there's no wolf!" They went grumbling back down the hill.

Later, the boy sang out again, "Wolf! Wolf! The wolf is chasing the sheep!" To his naughty delight, he watched the villagers run up the hill to help him drive the wolf away.

When the villagers saw no wolf they sternly said, "Save your frightened song for when there is really something wrong! Don't cry 'wolf' when there is NO wolf!"

Storytelling Universality

But the boy just grinned and watched them go grumbling down the hill once more.

Later, he saw a REAL wolf prowling about his flock. Alarmed, he leaped to his feet and sang out as loudly as he could, "Wolf! Wolf!" But the villagers thought he was trying to fool them again, and so they didn't come.

At sunset, everyone wondered why the shepherd boy hadn't returned to the village with their sheep. They went up the hill to find the boy. They found him weeping.

"There really was a wolf here! The flock has scattered! I cried out, "Wolf!" Why didn't you come?"

An old man tried to comfort the boy as they walked back to the village. "We'll help you look for the lost sheep in the morning," he said, putting his arm around the youth, "Nobody believes a liar ... **even when they are telling the truth**/**so don't get caught telling the same lie twice**."

Data Stories

Data storytelling is the ability to effectively communicate insights from a dataset using narratives and visualizations. It can be used to put data insights into context for and inspire action from the audience.

There are 3 key components:

1. **data:** foundation of data story (descriptive, diagnostic, predictive, prescriptive analysis)

2. **narrative:** storyline used to communicate the insights gleaned from data and context, and recommended actions

3. **visuals:** representations of data, analysis results, and narratives, which are used to communicate stories clearly and memorably (charts, graphs, diagrams, pictures, or videos)
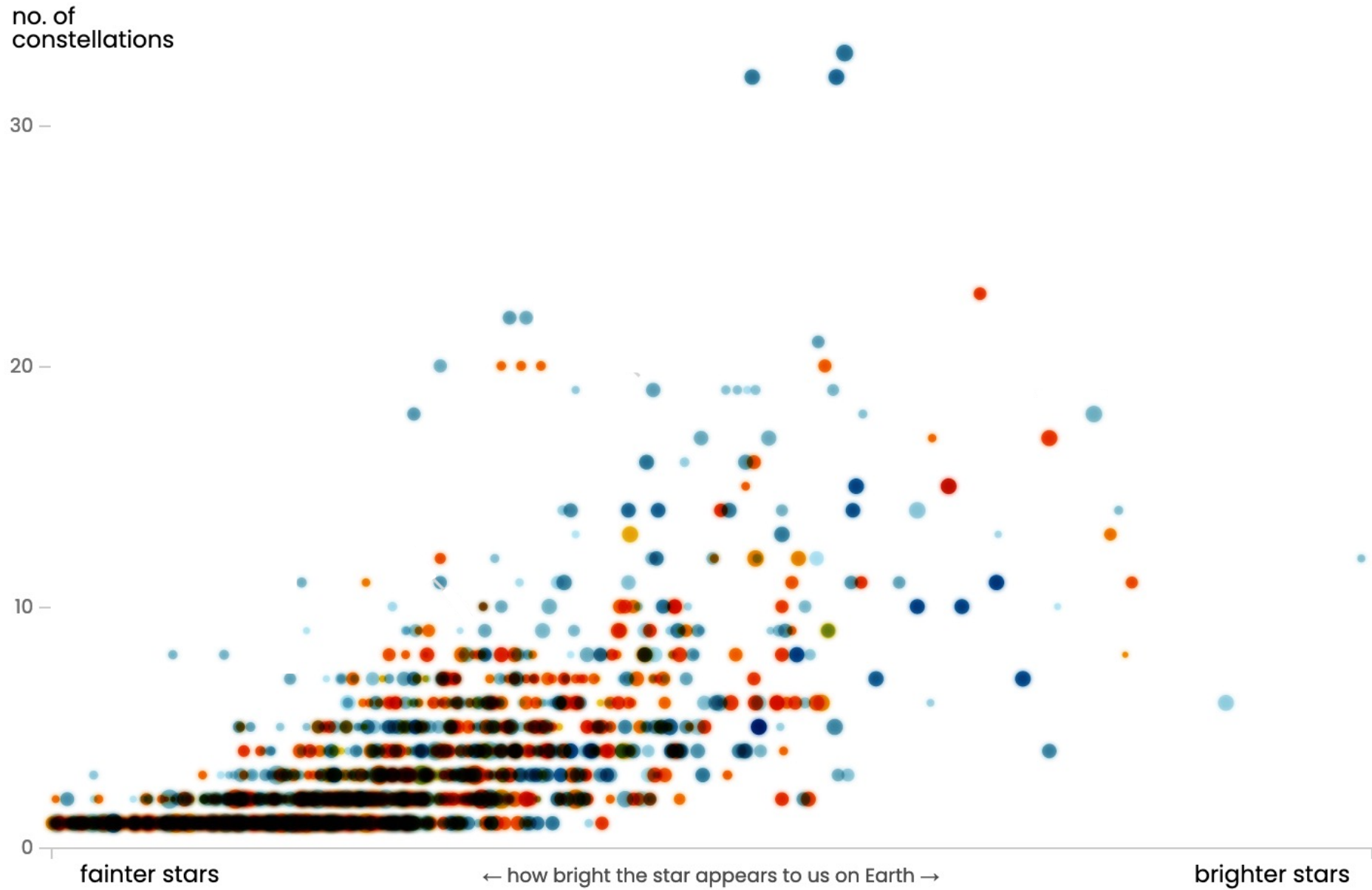
no. of
constellations

30 —

20 —

10 —

0 —

fainter stars   ← how bright the star appears to us on Earth →   brighter stars

no. of constellations

Orion's belt

The 3 stars that make up 'Orion's belt' are used in a constellation across most cultures. Some even more than once per culture

Pleiades

These 9 tightly packed stars are used in constellations more often than expected for their brightness. Most likely due to their ease of recognition

30 —

Betelgeuse and Rigel, Orion's two bright corner stars

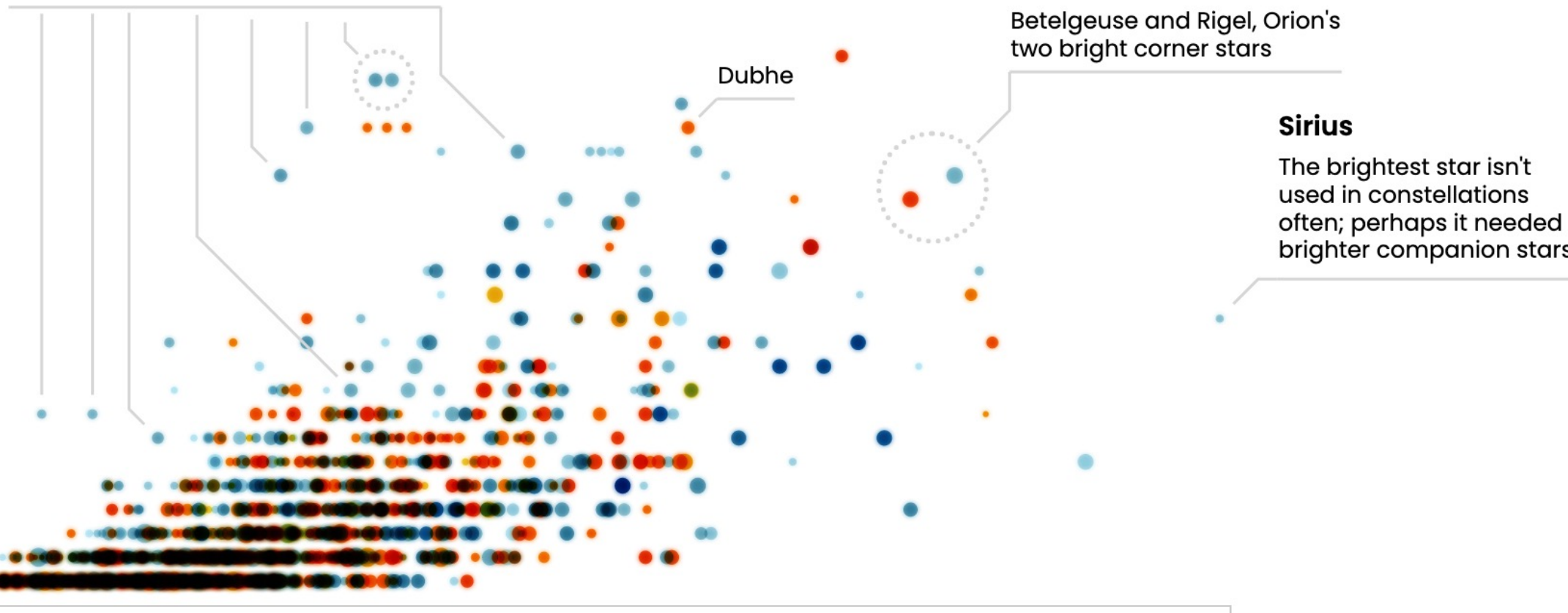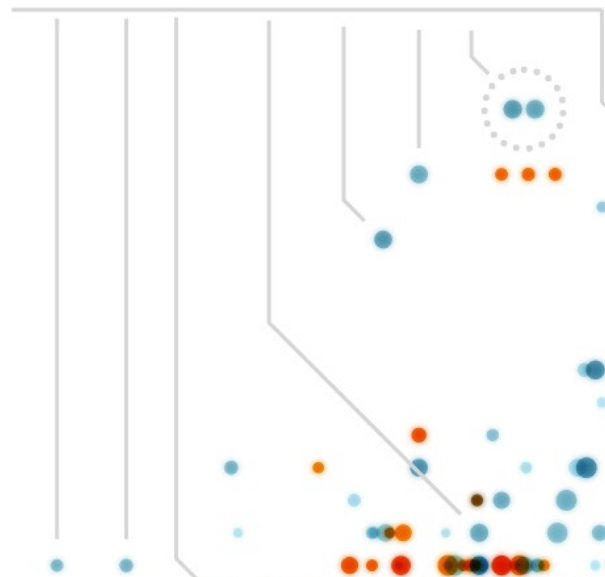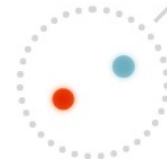Dubhe

Sirius

The brightest star isn't used in constellations often; perhaps it needed brighter companion stars

20 —

10 —

0 —

fainter stars   ← how bright the star appears to us on Earth →   brighter stars

Storytelling Risks
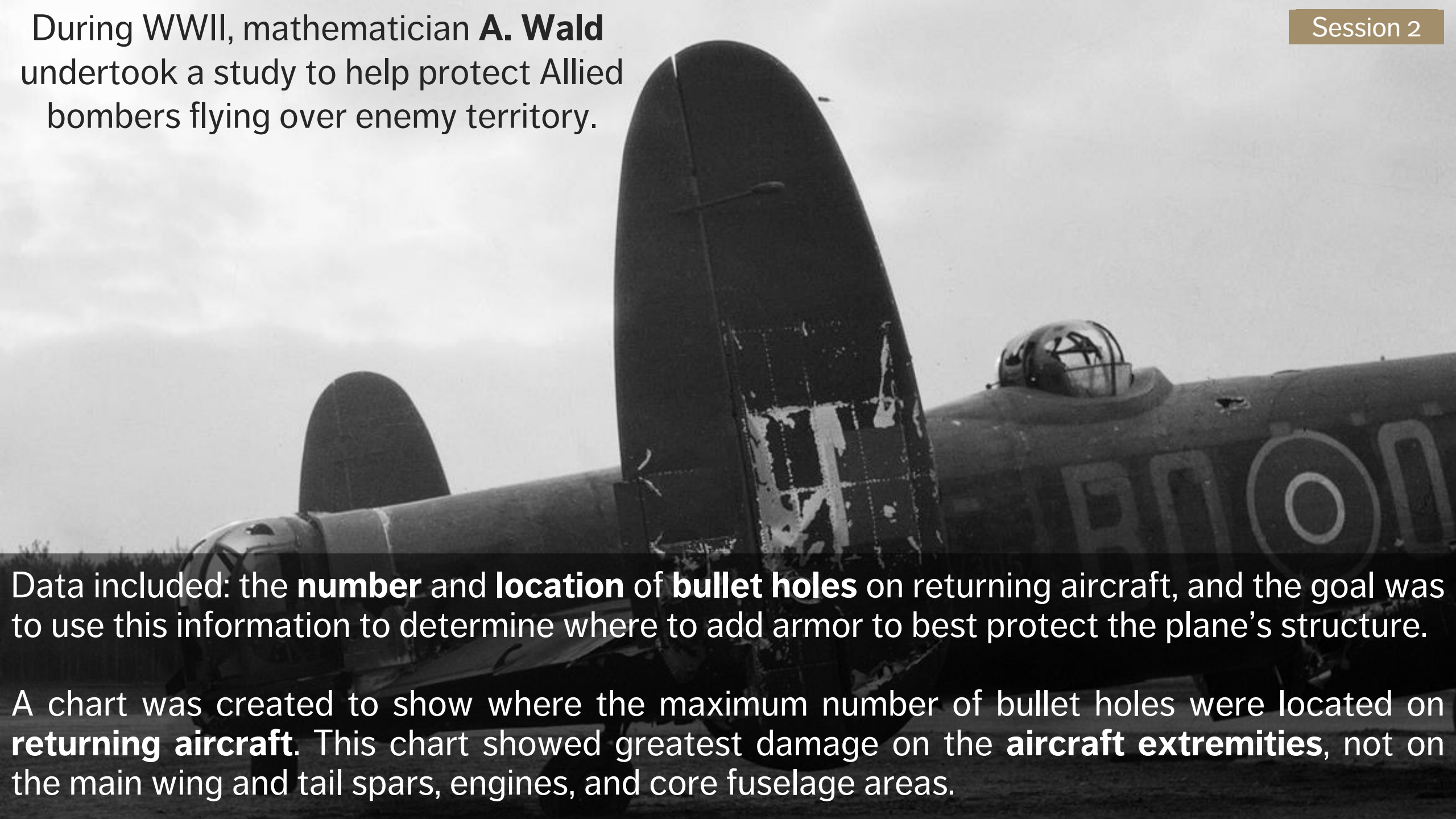
A good story can help shed insights on a situation, but storytelling requires **choices**; the outcome is affected by what is **included** and what is **omitted**.

It is easy to mislead by **accident**; it is also easy to mislead by **design**.

With data stories, there is an additional complication: we usually only have access to the **available data**. The data that was not collected is, by definition, not available. Some of the data that was collected may also be unavailable for a variety of reasons.

This implicit bias can lead to compelling (yet **flawed**) data stories.

During WWII, mathematician **A. Wald** undertook a study to help protect Allied bombers flying over enemy territory.

Data included: the **number** and **location** of **bullet holes** on returning aircraft, and the goal was to use this information to determine where to add armor to best protect the plane's structure.

A chart was created to show where the maximum number of bullet holes were located on **returning aircraft**. This chart showed greatest damage on the **aircraft extremities**, not on the main wing and tail spars, engines, and core fuselage areas.

Storytelling Risks

As such, the Air Ministry wanted to add armor to the **extremities**. Wald suggested they were **dead wrong**.

To avoid **"survivorship bias",** armor should be added to the areas with the **fewest holes**: if no returning planes had holes in their wing spars and engines, then even a few holes in those locations were **deadly**.

Take-Away: the data that is missing may be as important to story than the data that is there. Storytelling is not always an obvious endeavour.
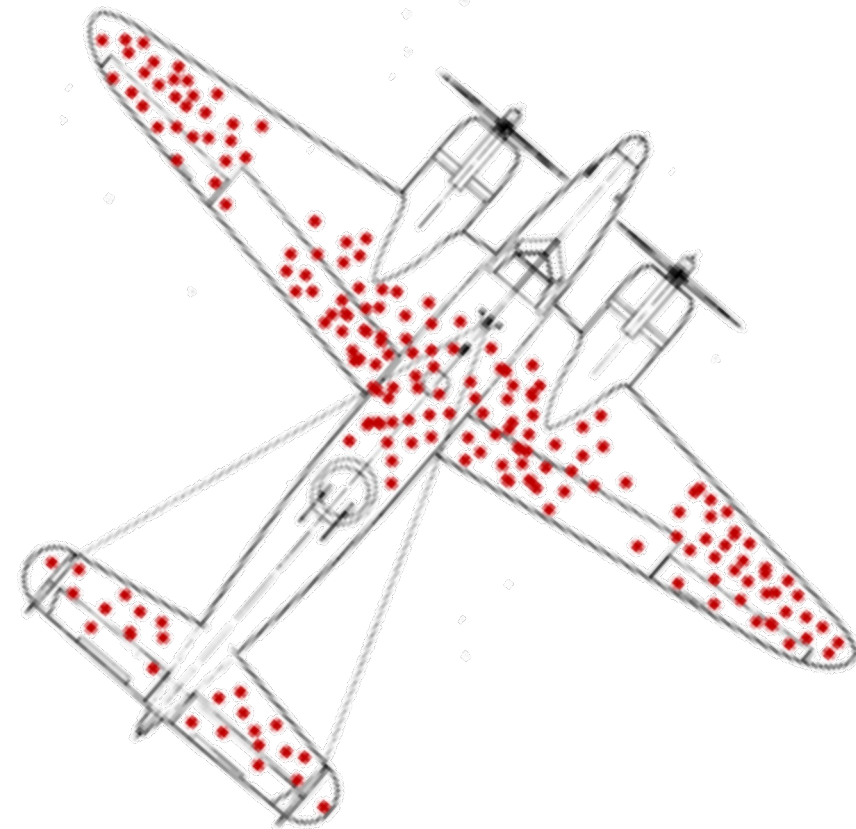
Hospitalized with Covid

Un-vaccinated

Vaccinated

More vaccinated than unvaccinated people in the hospital

Hospitalized with Covid

Un-vaccinated

Vaccinated

Source: Twitter.com/MarcRummy

More vaccinated than unvaccinated people in the hospital

But look at the rate of each group in the total population

Hospitalized with Covid

Vaccinated population

Un-vaccinated population

Hospitalization rate is 5x higher in unvaccinated population (50% vs 10%)
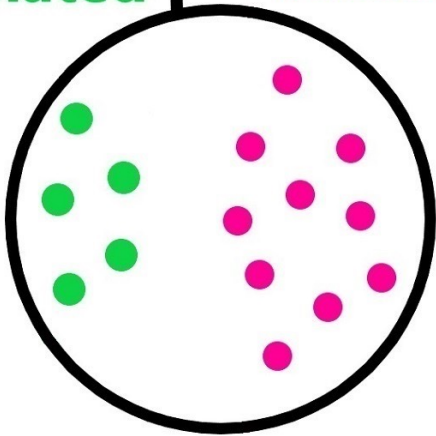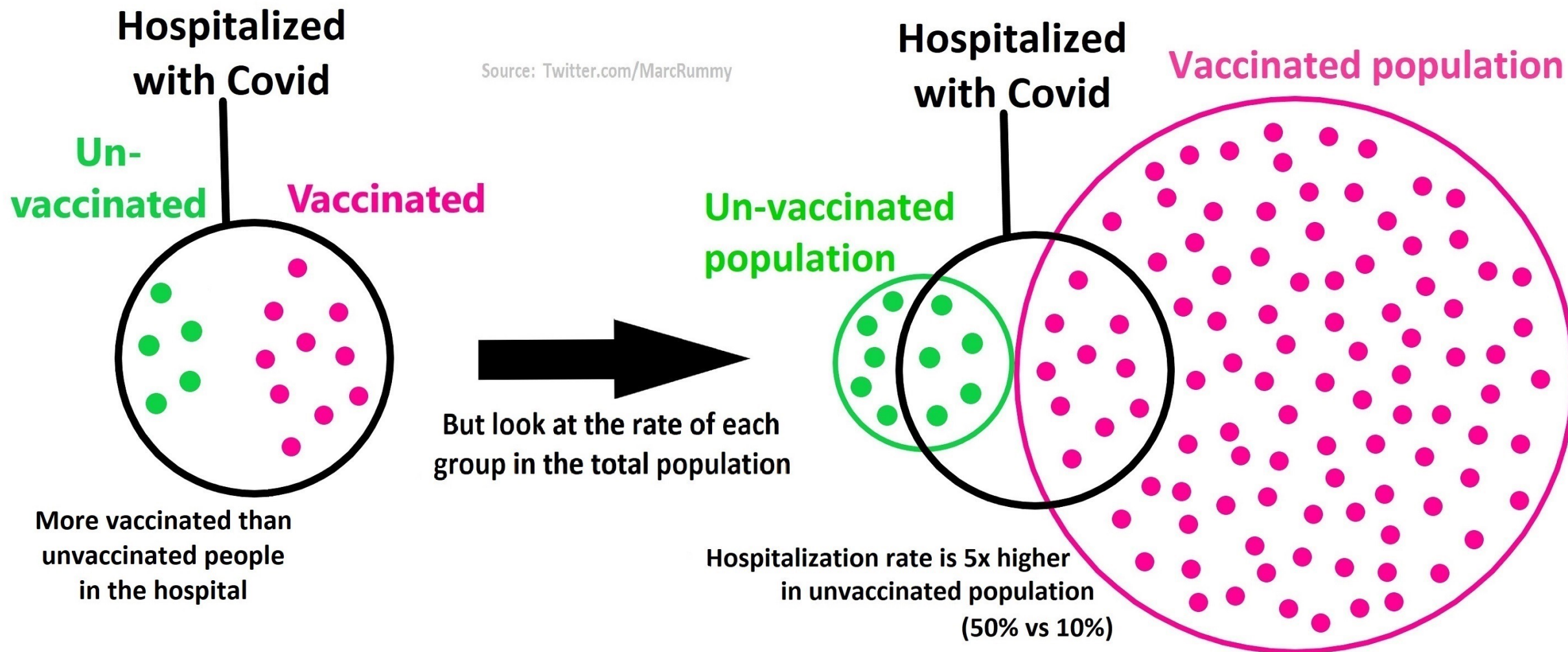
Note: The ratios presented are made to illustrate the concept of the base rate fallacy when the vaccination rate is high

Data Story Universality

Ambiguity can also occur in data stories.

What is the **take-away** here?

Is increased eggplant consumption linked to:
- increased cancer incidence, or
- diminishing mortality rates?

Cancer Cases

Incidence
Mortality

Eggplant consumption, per week
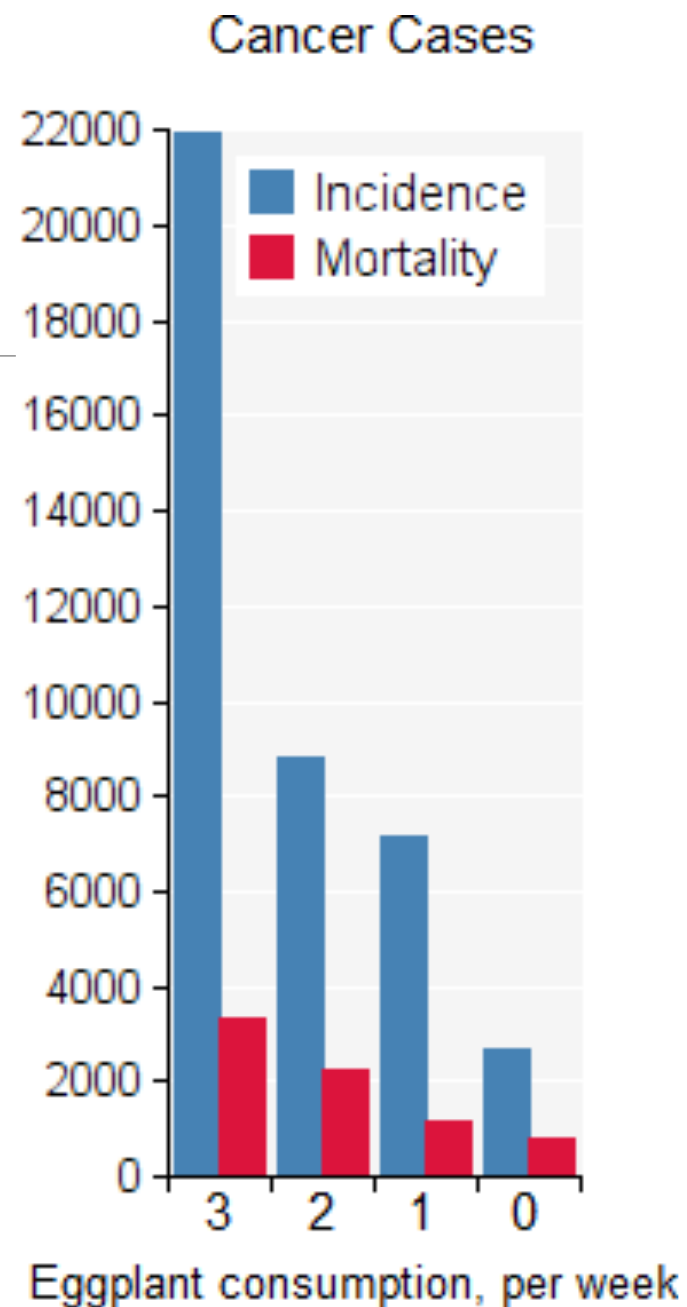
Suggested Reading

Elements of Storytelling

The Practice of Data Visualization
Visualization and Storytelling

Stories and Storytelling

- What are Stories?

- Elements of Storytelling

- Forms and Structures

- How to Tell a Story

Exercises

Elements of Storytelling

1. Are the following stories?

   a. Two identical infants lay in a cradle. "One you bore, the other is a Changeling. Choose wisely," the Fae's voice echoed from the shadow. "I'm taking both my children," the mother said defiantly.

   b. Solomon was required to decide which of two women was the mother of a baby, when each of them claimed parenthood. Both had recently given birth, but one child had died. Solomon announced that the child should be cut in two, so that each mother should have half. The real mother, unable to bear her son being killed, immediately offered it to the other woman, to save the child's life, whereas the other agreed to the proposal. The false mother was thus exposed, and Solomon returned the living child to its real mother.
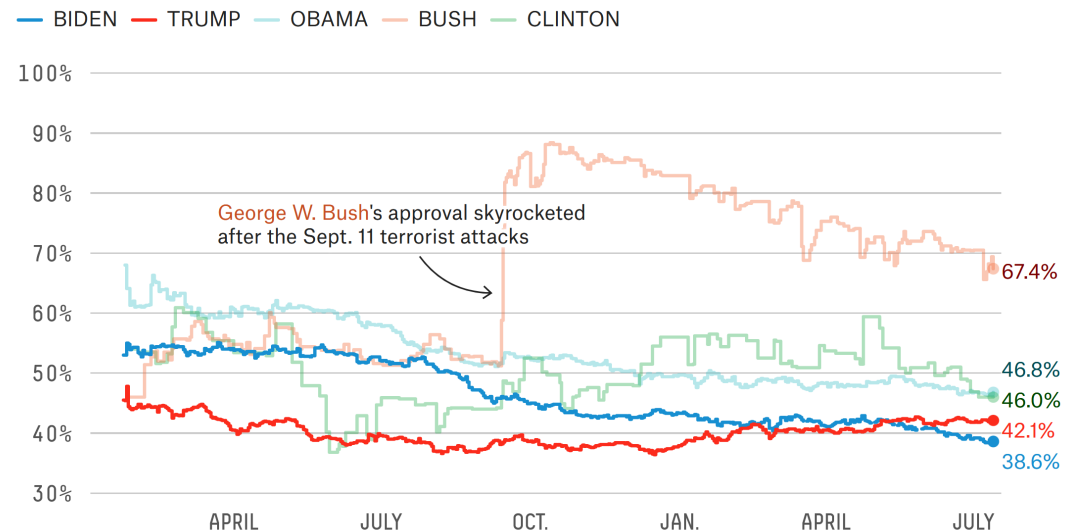
Exercises

Elements of Storytelling

1. Are the following stories?

   c. For sale: baby shoes. Never worn.

   d. Spiritualist medium claims cure for cancer.

   e. Sens rally and beat Leafs to gain on Habs.

   f. Macbeth and his wife
      Want to become the royals
      So they kill 'em all.

   g. **Biden could have the lowest midterm approval rating**
   FiveThirtyEight's historical presidential approval ratings for Biden and the four most recent presidents in their first 18 months in office, 1993-2022
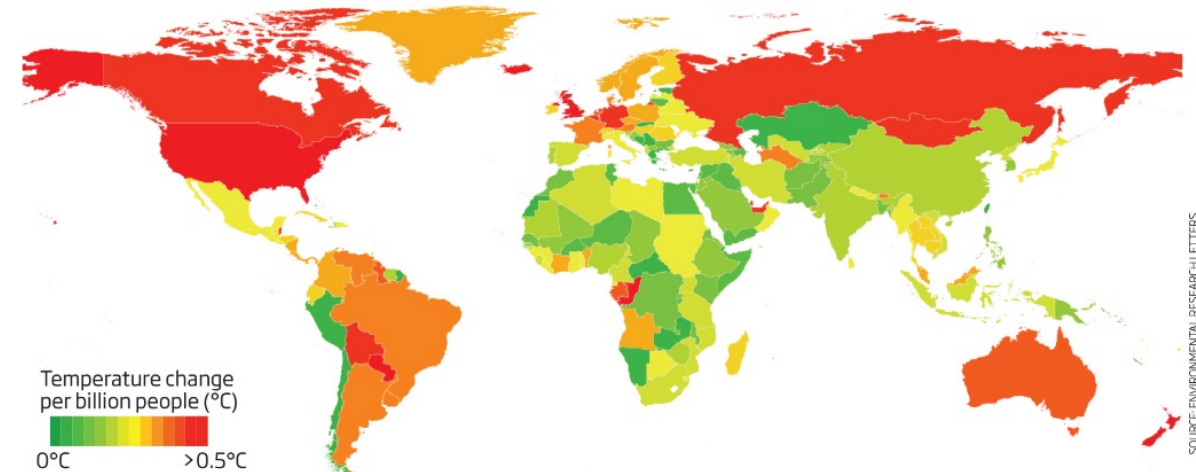

The first data point for each president reflects when there was enough polling data to produce an average. All data is current as of July 13, 2022, at 5 p.m. Eastern.

FiveThirtyEight

Exercises

Elements of Storytelling

2. In your organization, who makes up the audience? Is there only one audience? What are the storytelling goals? Is the storytelling context clear? Constant? Universal?

3. In the following charts, who is the intended audience? What are the goals? Are the outcomes universal?

   a.

Global warming culprits, judged by population

Countries that have caused more global warming per billion people are coloured red and low-emitters are dark green

Temperature change per billion people (°C)
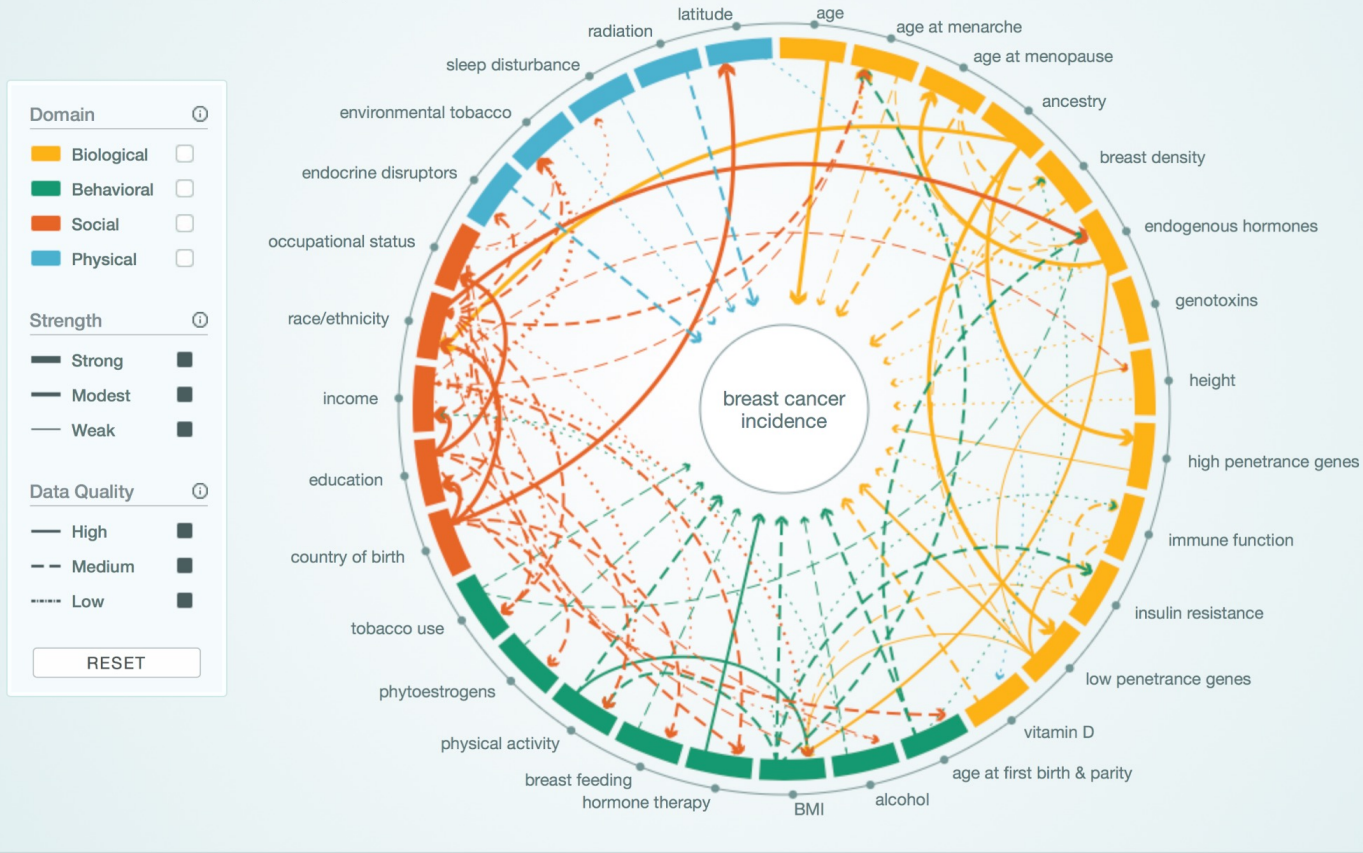
0°C   >0.5°C

SOURCE: ENVIRONMENTAL RESEARCH LETTERS

Exercises

Elements of Storytelling

3. In the following charts, who is the intended audience? What are the goals? Are the outcomes universal?

b.

Exercises

Elements of Storytelling

3. In the following charts, who is the intended audience? What are the goals? Are the outcomes universal?

c.

Top 5 Counties with the Greatest Number of Confirmed COVID-19 Cases

The chart below represents the most impacted counties over the past 15 days and the number of cases over time. The table below also represents the number of deaths and hospitalizations in each of those impacted counties.