Data-driven strategies for enhancing healthcare delivery: the important role of NHS analysts

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“Without data, you’re just another person with an opinion.” – W. Edwards Deming

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What is data

Data is essentially raw, unpr ation. It can be anything from numbers text and images. In its unorganized state much meaning on its own. But once it's terpreted, it can become incredibly

Stuff about our patients

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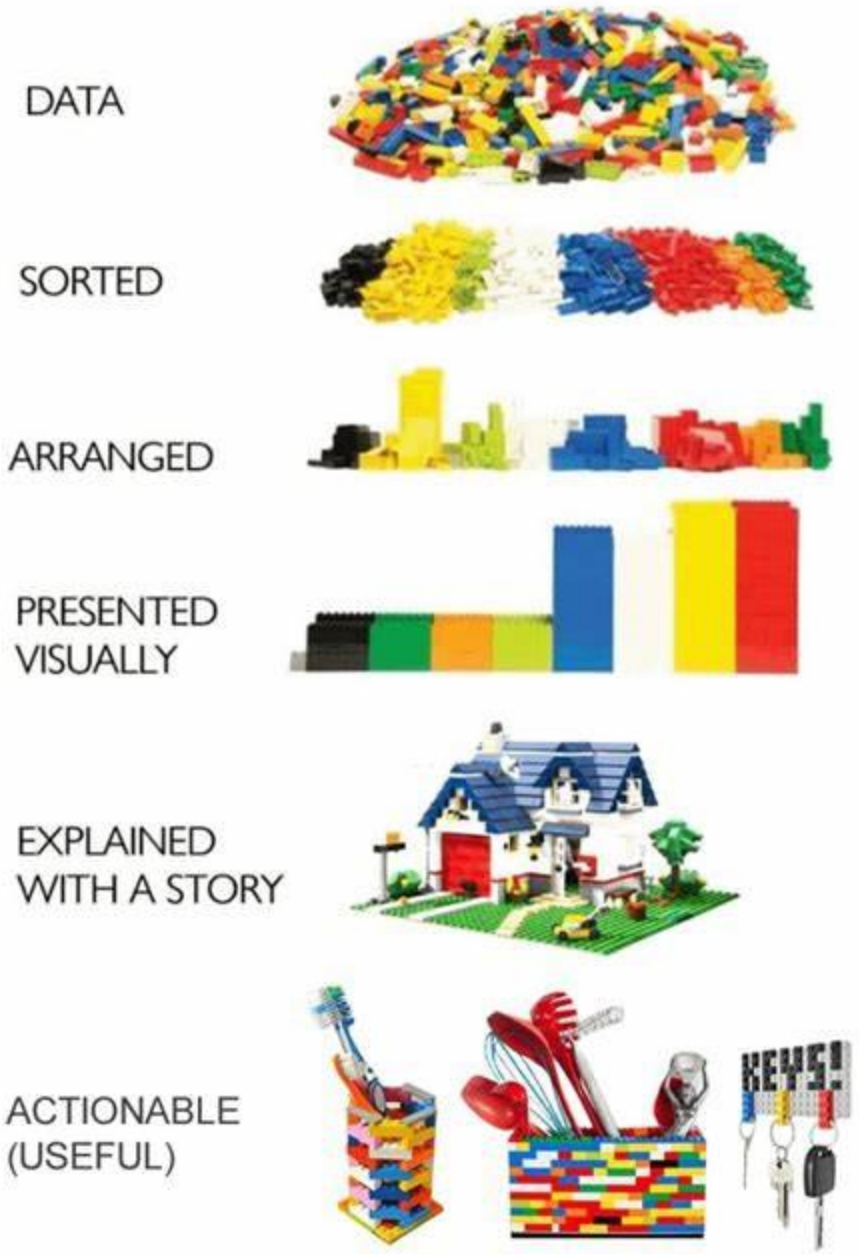
What is analytics

Data by itself isn't very useful. It's like a bunch of puzzle pieces without a picture of what the puzzle should look like. When data is processed and analyzed, it becomes information. This information can be used to make informed decisions, and gain insights.

How we can use that stuff about patients to improve patient care



Where does data become insight and help answer the so what?

So what...

Engage the sowhatometer!

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A case study

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What does bad look like

(may be based on something
I did 3 weeks ago)

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(or may not be)

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(but it is)

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I think there is a problem with Ambulance response times. SWAST are telling me the problem is due to handover delays.

Give me a chart on Ambulance Response times in the South West

Give me a chart of Hospital Handover delays in the South West

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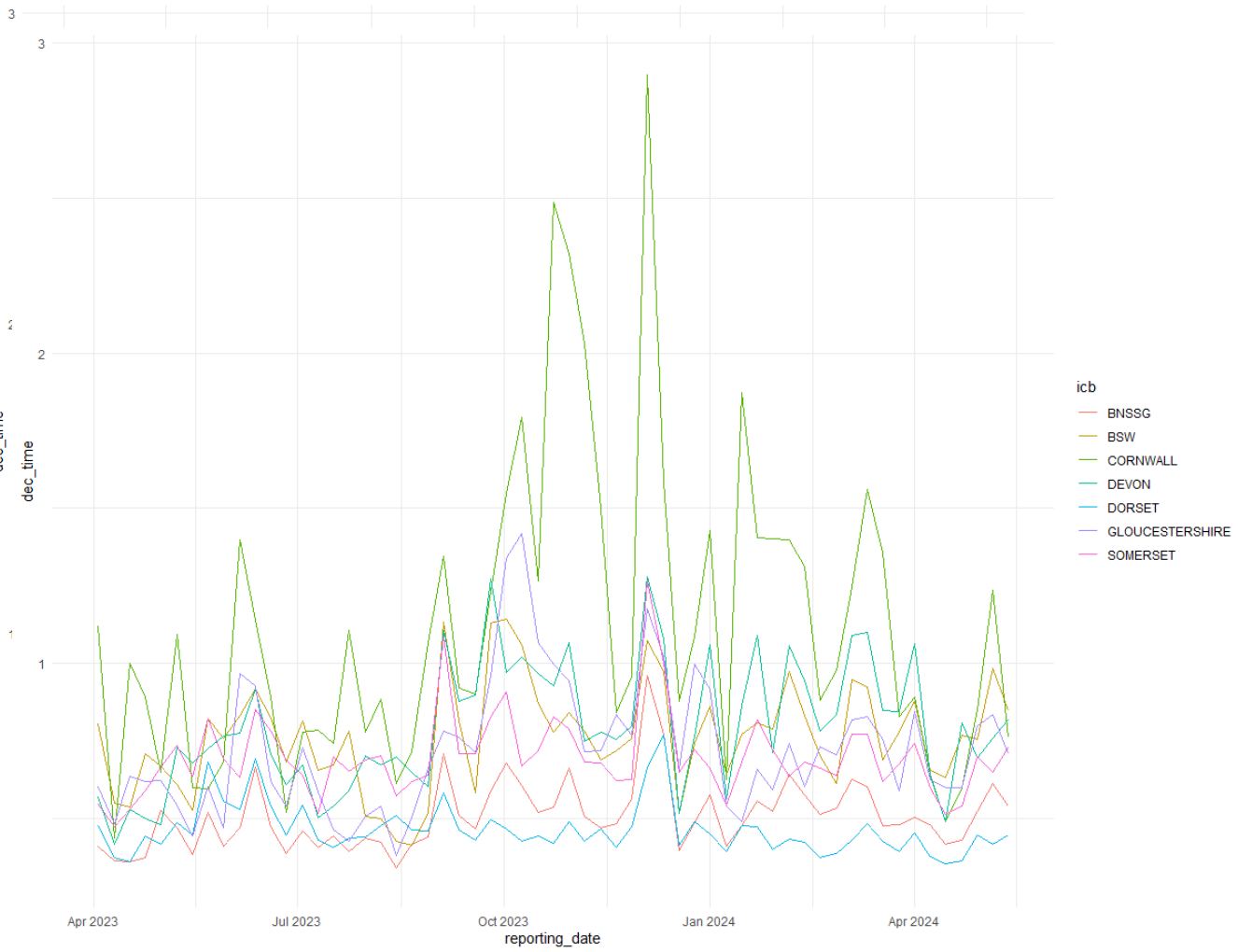

Give me a chart on Ambulance Response times in the South West

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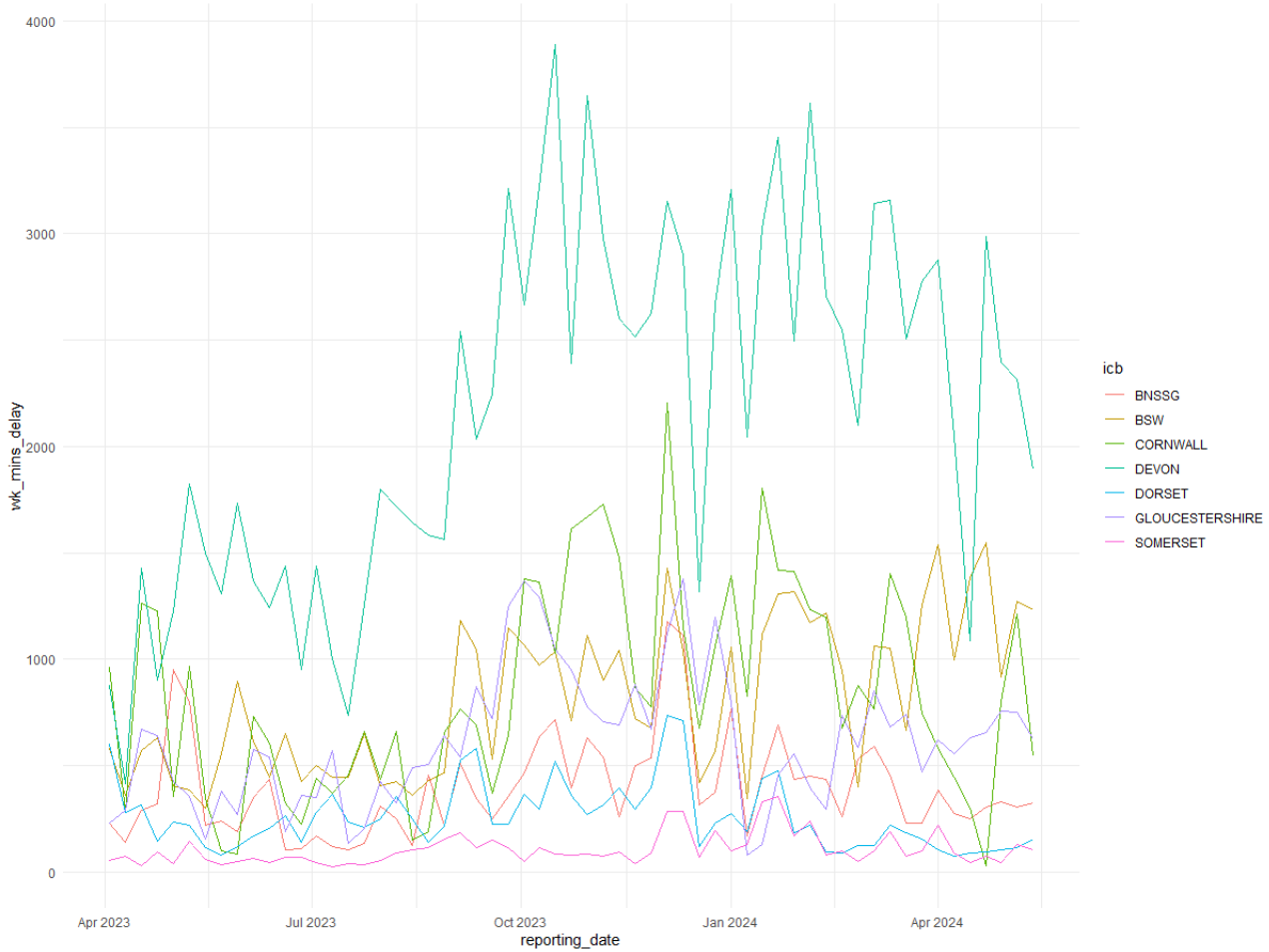
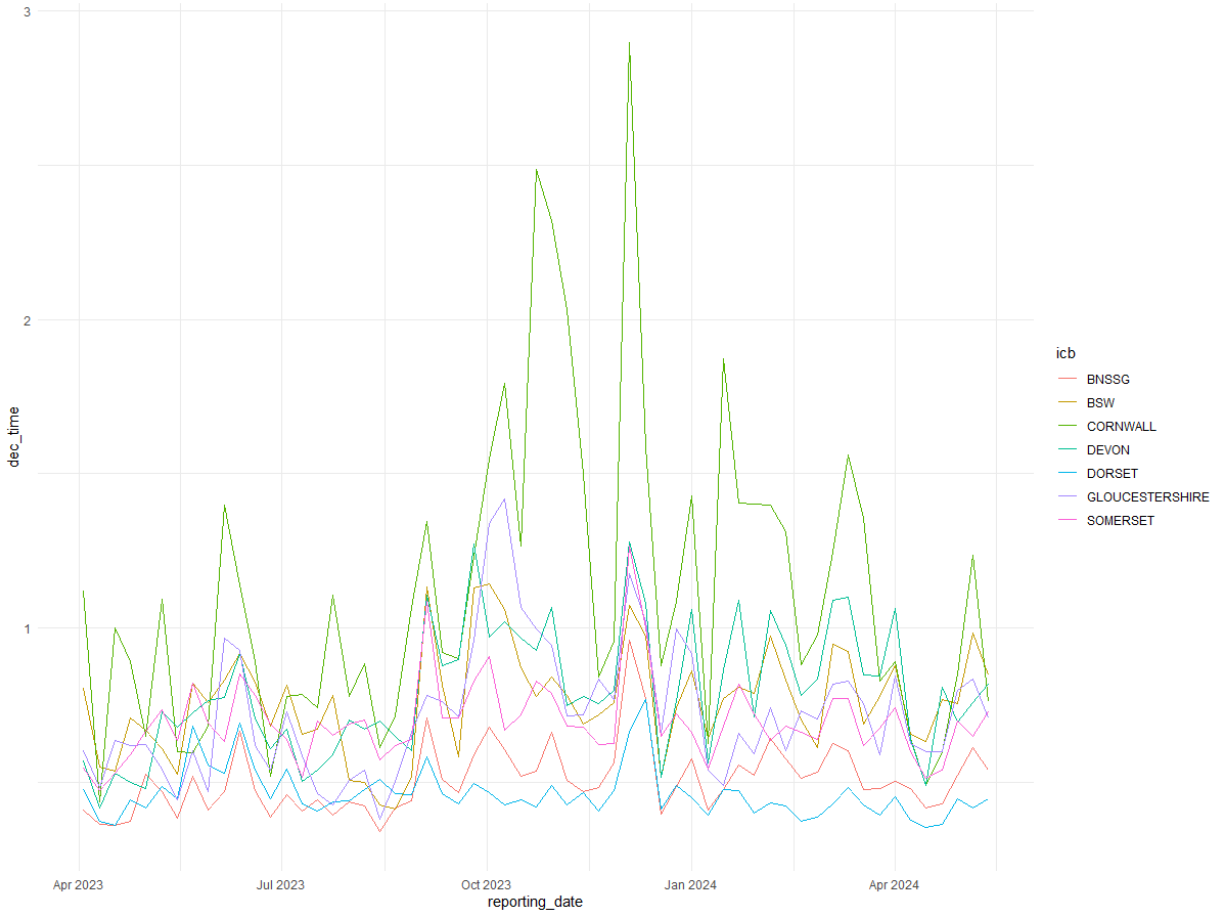


Give me a chart of Hospital Handover delays in the South West

Give me a chart on Ambulance Response times in the South West



Give me a chart of Hospital Handover delays in the South West

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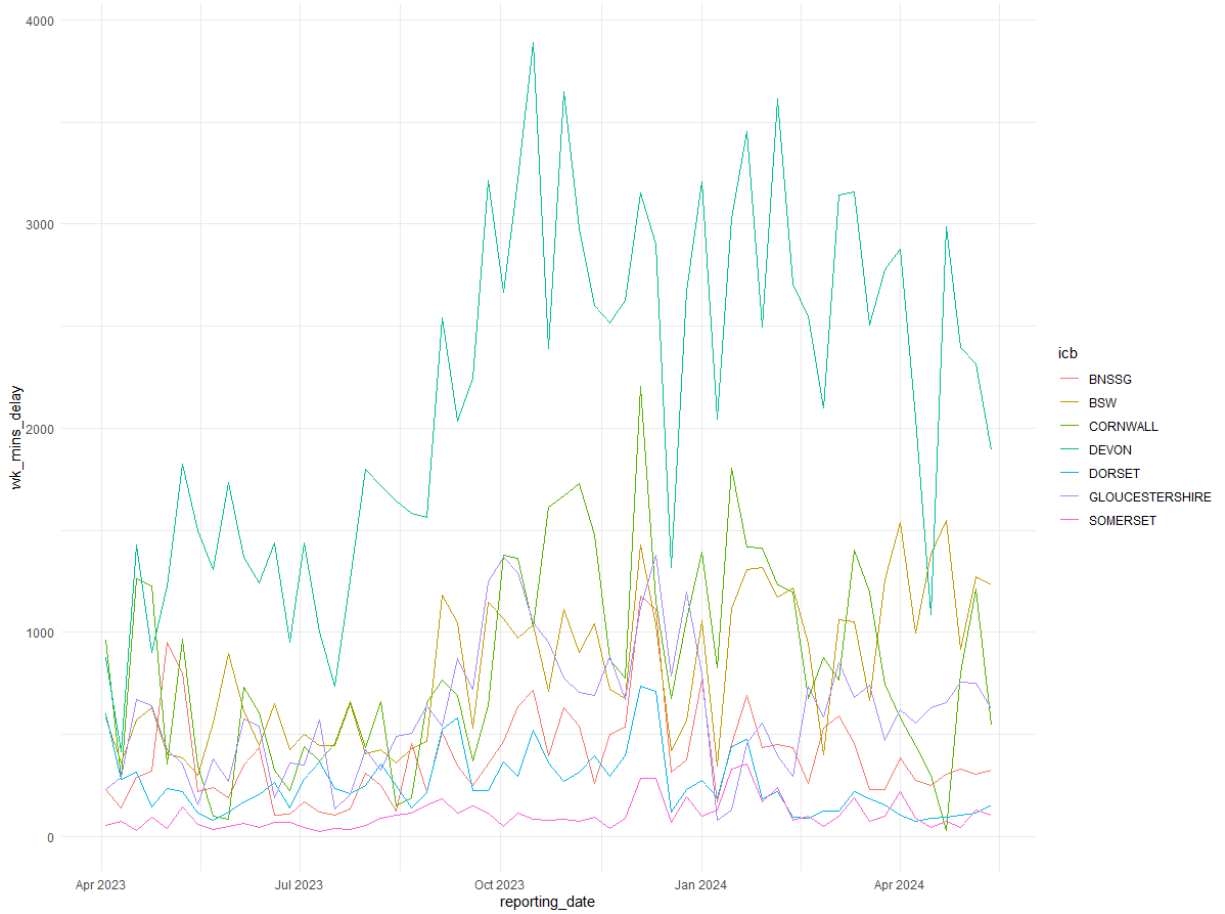

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What is the analytical question?

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I want to know if handover delays affect response times

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So you don't just want the data on response times, you want to know if there is a correlation with handovers?

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Ah, yes but correlation is not causation!

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...well yes, but also no

A quick tangent on correlation and causation

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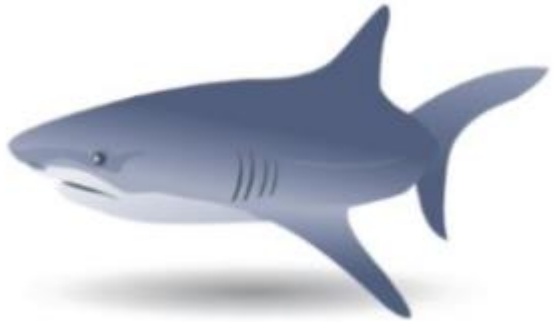
If you eat ice cream are you more likely to be attacked by a shark?

Show of hands please



A quick tangent on correlation and causation

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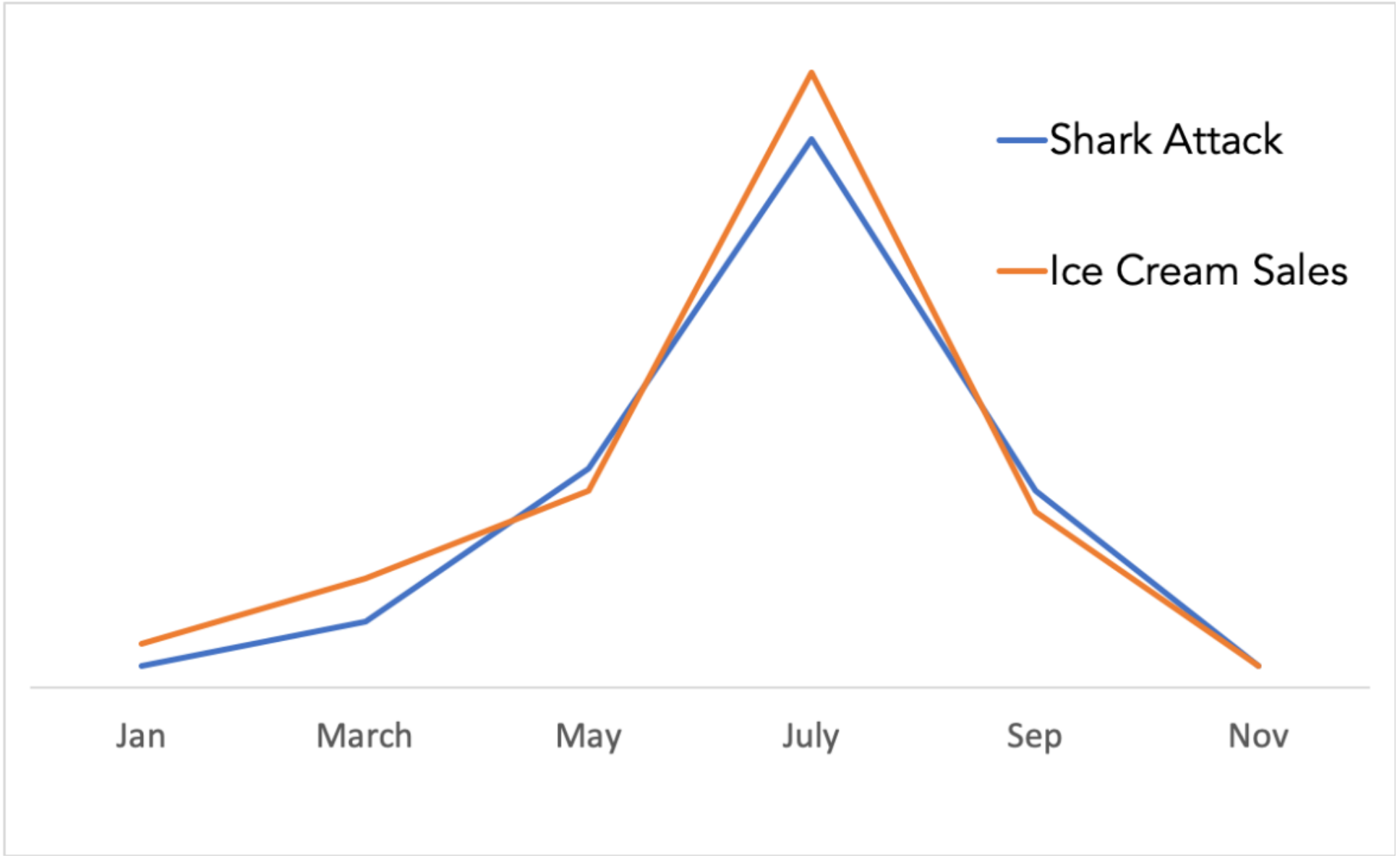

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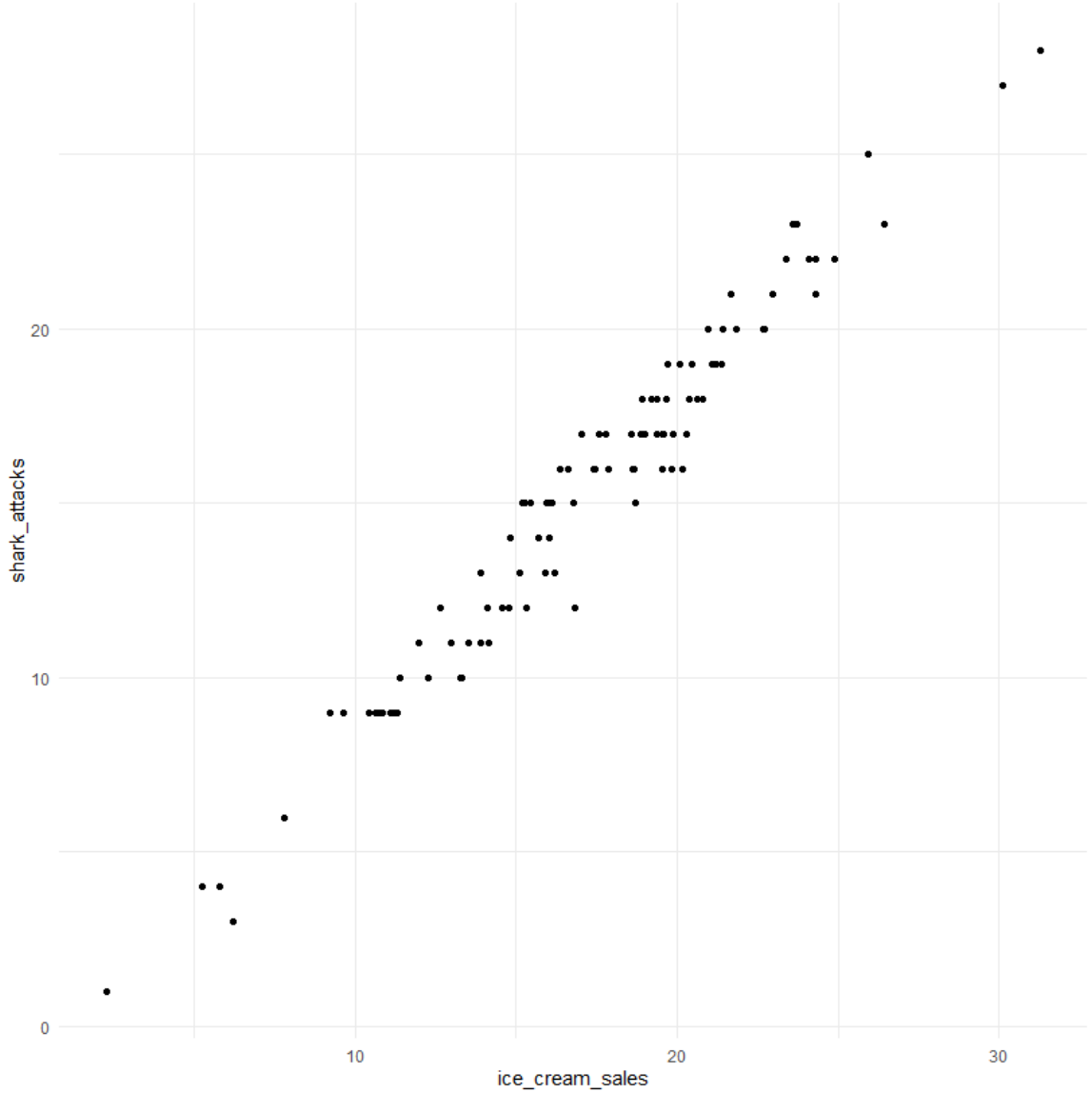

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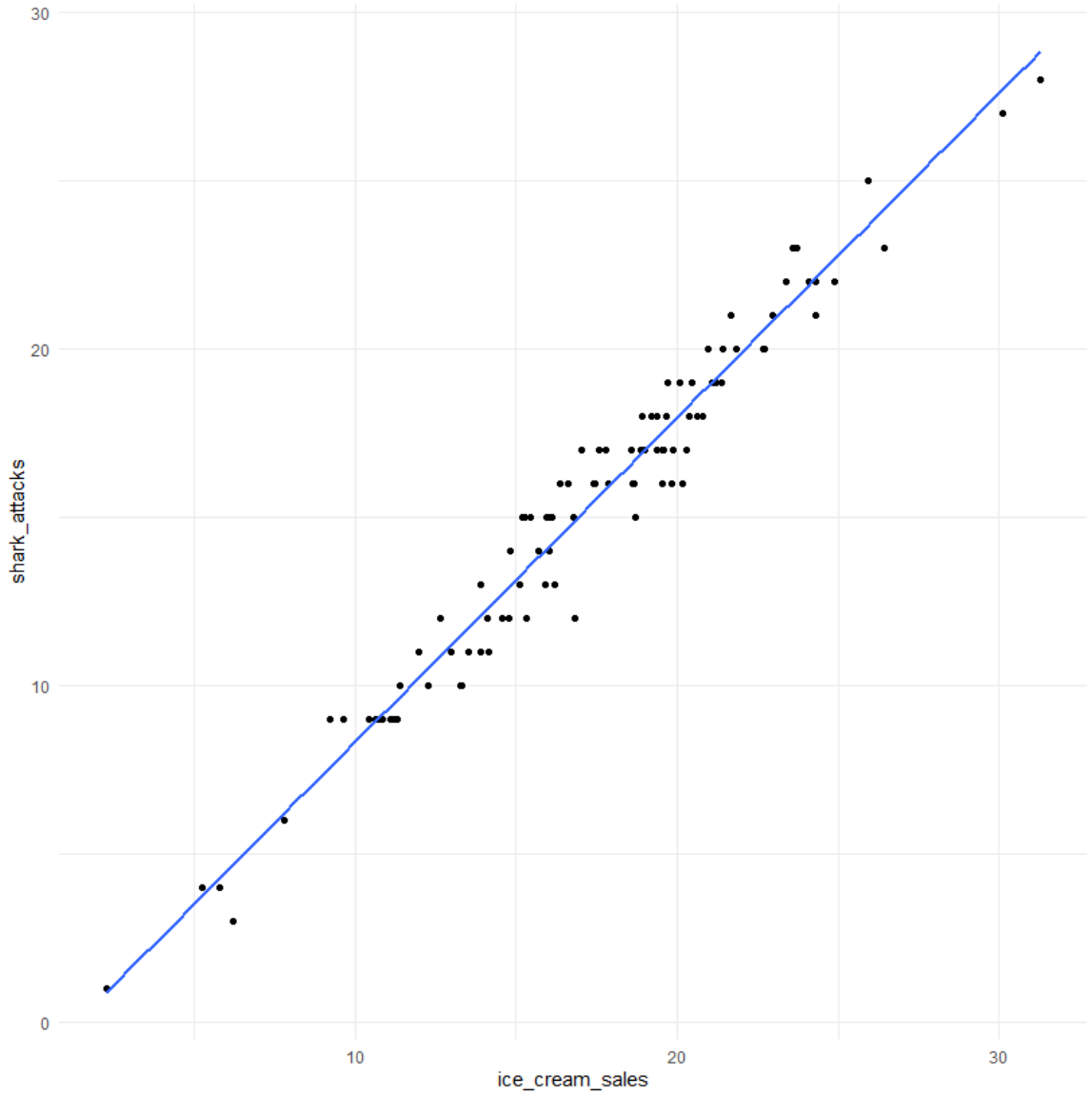

A quick tangent on correlation and causation

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If you eat ice cream are you more likely to be attacked by a shark?

A quick tangent on correlation and causation

If you eat ice cream are you more likely to be attacked by a shark?

Yes!

A quick tangent on correlation and causation

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If you eat ice cream are you more likely to be attacked by a shark?

Yes, but is there another covariant variable we have not accounted for?

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What does better look like

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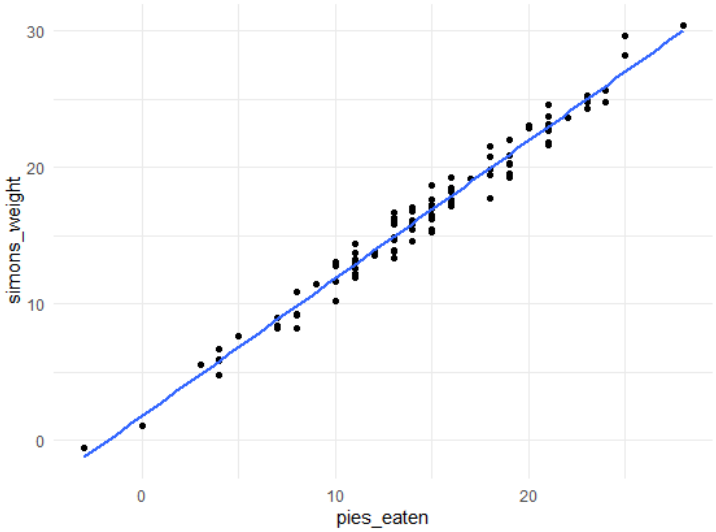
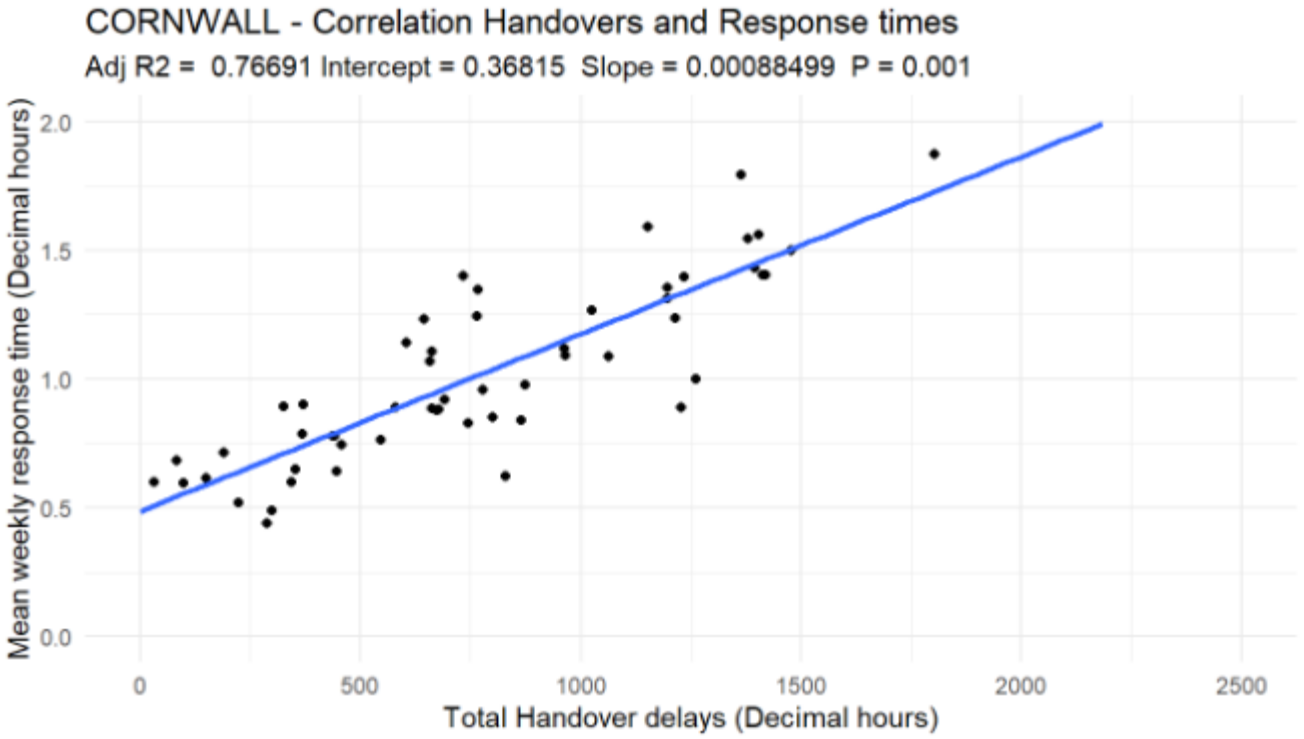
Ah, but correlation is not causation!
(Something about shark ice cream.)

That is true.
However, that does not imply that any correlation is necessarily not causation

If we pick the correct variables
we can absolutely link
correlation to causation



Presented visually



Characteristic	Beta	95% CI[1]	p-value
(Intercept)	368	243, 493	<0.001
Handover delay time	0.88	0.76, 1.0	<0.001

[1] CI = Confidence Interval

"The greatest value of a picture is when it forces us to notice what we never expected to see" John Tukey

Data explained with a story...

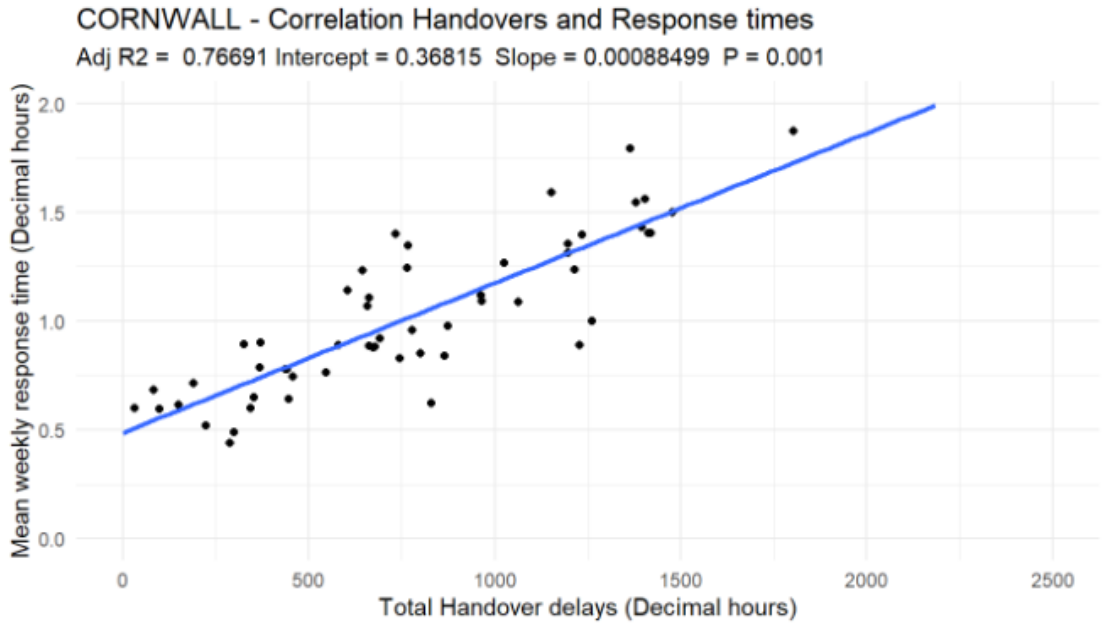
The mean average of handover delays per week in Cornwall is 845 hours and it ranges from 303 to 1,546 hours.

We can model that if there were no handover delays, the average base response time for a category 2 ambulance would be 21 minutes.

For each additional 100 hours of handover delay adds approx. 5 minutes 19 seconds to this base category 2 ambulance response time.

Current levels of handover delays add an average of around 40 minutes to response times.

"There are two goals when presenting data: convey your story and establish credibility" Edward Tufte



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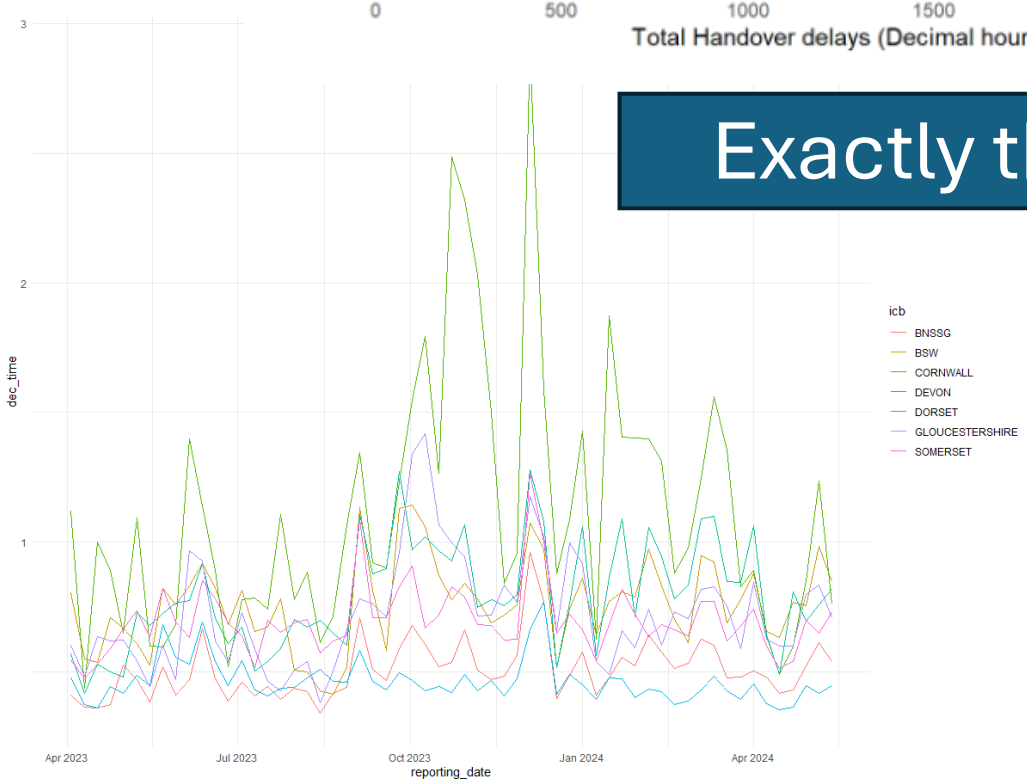
Exactly the same dataset



"The purpose of visualisation is insight, not pictures" Ben Shneiderman

Actionable

Benchmarked against other ICBs within the region.

Understanding where we have variation and where delays have the most impact.

Discussion with our SWAST colleagues around other covariance variables.

Understanding where in the system the issue lies.

“Not everything that can be counted counts, and not everything that counts can be counted” Albert Einstein

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“The goal is to turn data into information, and information into insight”
Carly Fiorini

A quick tangent about insight

In 1942 bombers were being shot down on bombing sorties.

Bombers had to carry a lot of fuel and crew and bombs.

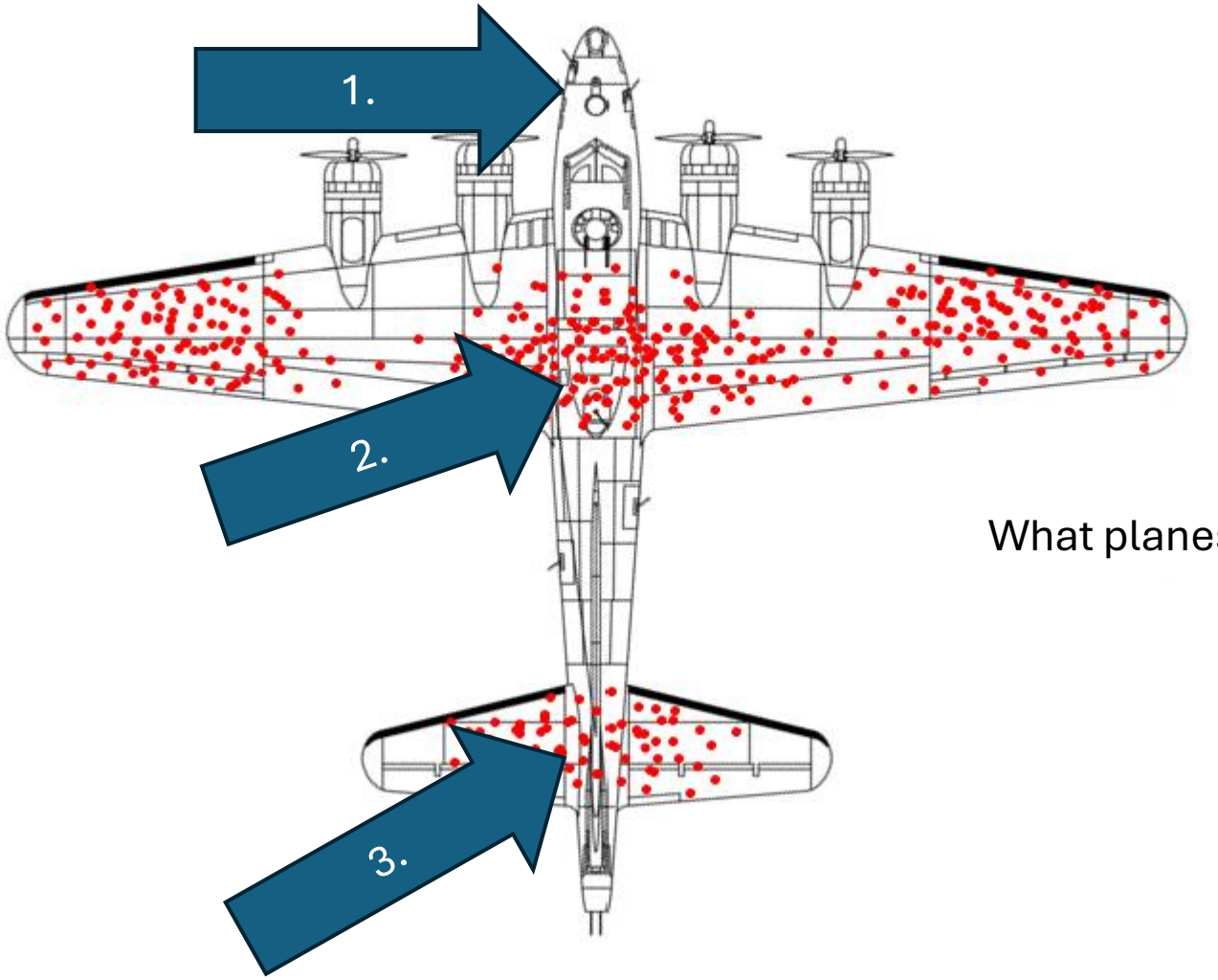
There is a limited weight trade off between all of these variables.

They also didn’t want to be shot down and so had armour.

Armor is heavy and so they really want to put it in the appropriate places.

A study was carried out mapping where planes were being shot.

A quick tangent about insight



Where do we put the armour?

What planes do we have data for?

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Data strategy

Data strategy

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- Predictive data – identifying opportunities
- Data engineering – secure dataset and yet open
- Prescriptive data – using simulation to support scenario planning and modelling intervention impact
- Decision science – supporting leaders to formulate better analytical questions to drive performance to better outcomes

Data strategy

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- Understand bigger datasets with whole system thinking and full patient pathways
- System dynamic modelling
- Understanding operational requirements for data products verses more strategic, planning and operational research
- Open code and practices – Reproducible analytical pipelines (RAP)

Data strategy

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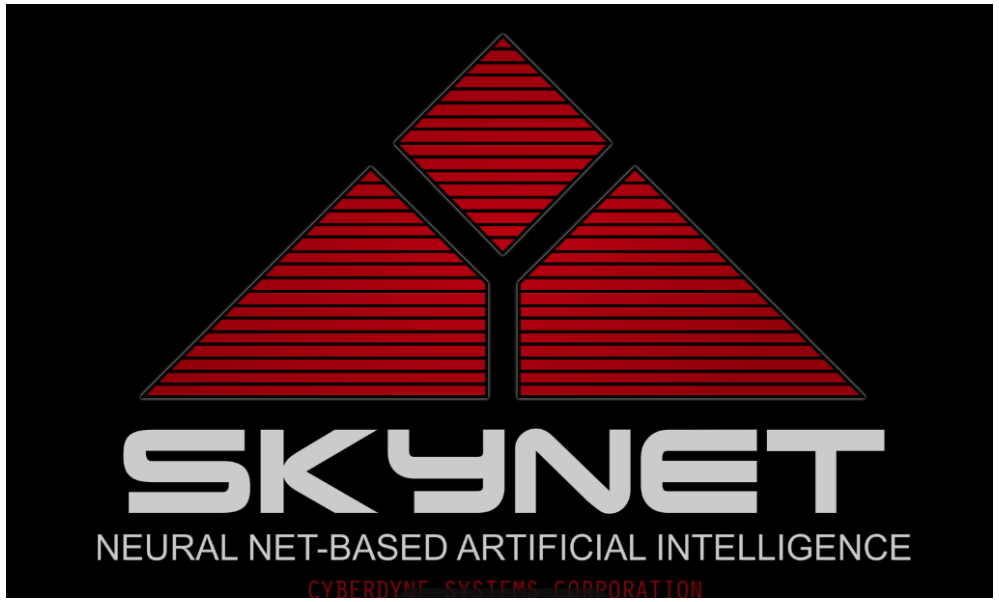
AI



S write me a short rap about healthcare data strategy for the south west digital connect conference

Show draft

(Verse 1)
Yo, South West Digital Connect, listen up tight,
Healthcare's got data, shinin' so bright.
From Exeter streets to the Cornish coast,
Data strategy's the remedy we boast!

(Chorus)
Healthcare data, untapped potential,
Unlockin' insights, that's quite essential.
Predictive models, personalized care,
Better outcomes, for all to share.

(Verse 2)
GP records singin', wearables trackin',
Data's the rhythm, the future we're crackin'.
Breakin' down silos, connectin' the dots,
Better treatments, hittin' the right spots.

(Chorus)
Healthcare data, untapped potential,
Unlockin' insights, that's quite essential.
Predictive models, personalized care,
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Data strategy

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- System wide planning with linked datasets
- Early warning systems
- Clinical variation and assurance techniques
- Risk stratification
- Population health – understanding of wider health issues and impact
- Evaluation

Data strategy

KPIs

KPIs

KPIs

Data strategy

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- Data literacy – give leaders more knowledge to make data driven decisions
- Consider best practice visualisations, but also get to the story and the insight
- Innovation – improving analytical capability
- Professionalisation of analytical workforce

Pictures of kittens

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Closing remarks

Be very careful about where you shoot sharks if they are after your ice cream.

Part of the digital agenda needs to be how can we can ALL utilise analytics to support patient care

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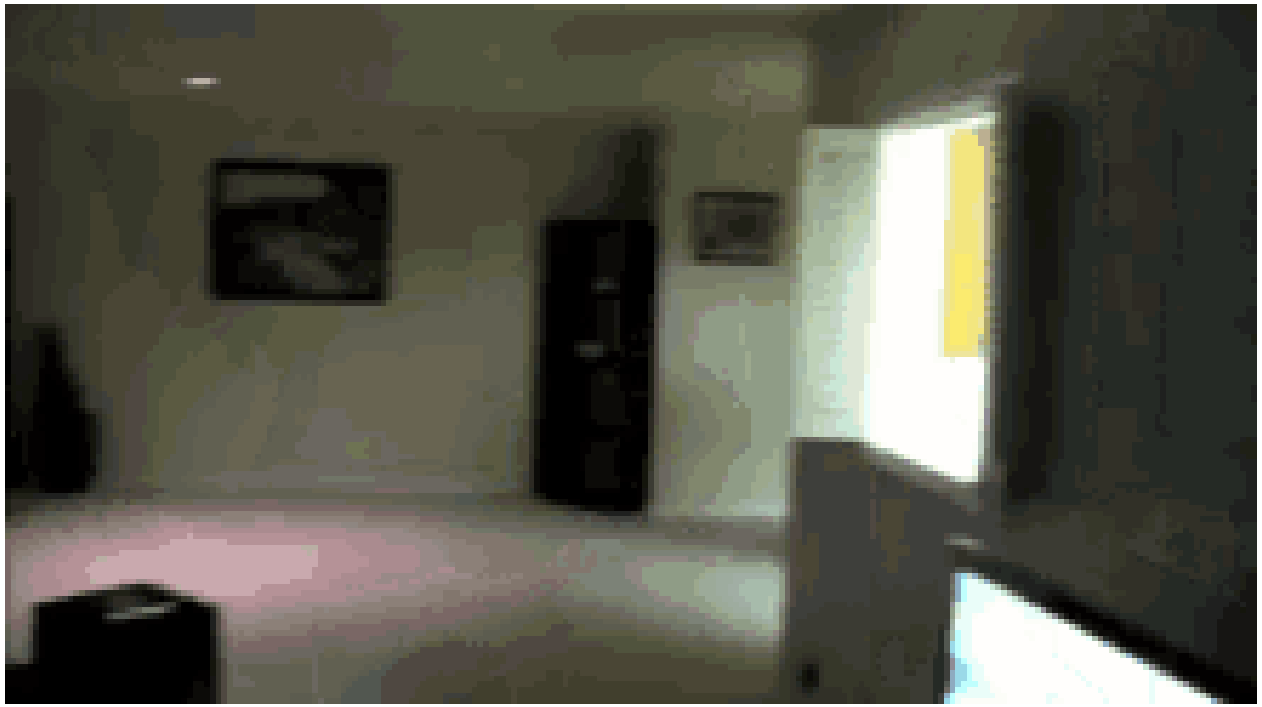
A wonderful segway to our next speaker, who is going to tell us more around the competency framework for healthcare analysts



Discussion about data and analytics

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- What does it mean to you?
- How do you do feel digital fits with data?
- What are your perceptions of analytics?
- What is your feedback to me as an analyst?
- What conversations do we need to have?