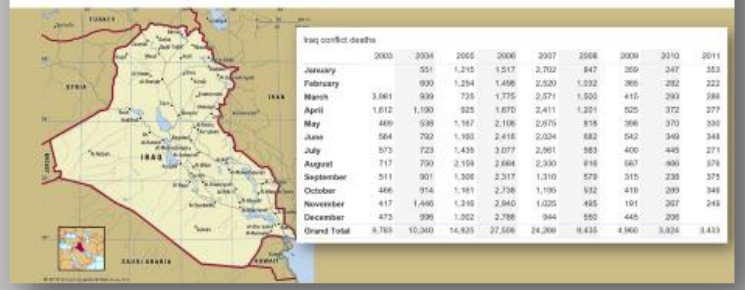
Speaking the language of data

Why do charts work?

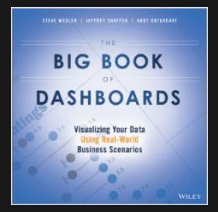
Choosing the chart

Telling a story

Bring it together

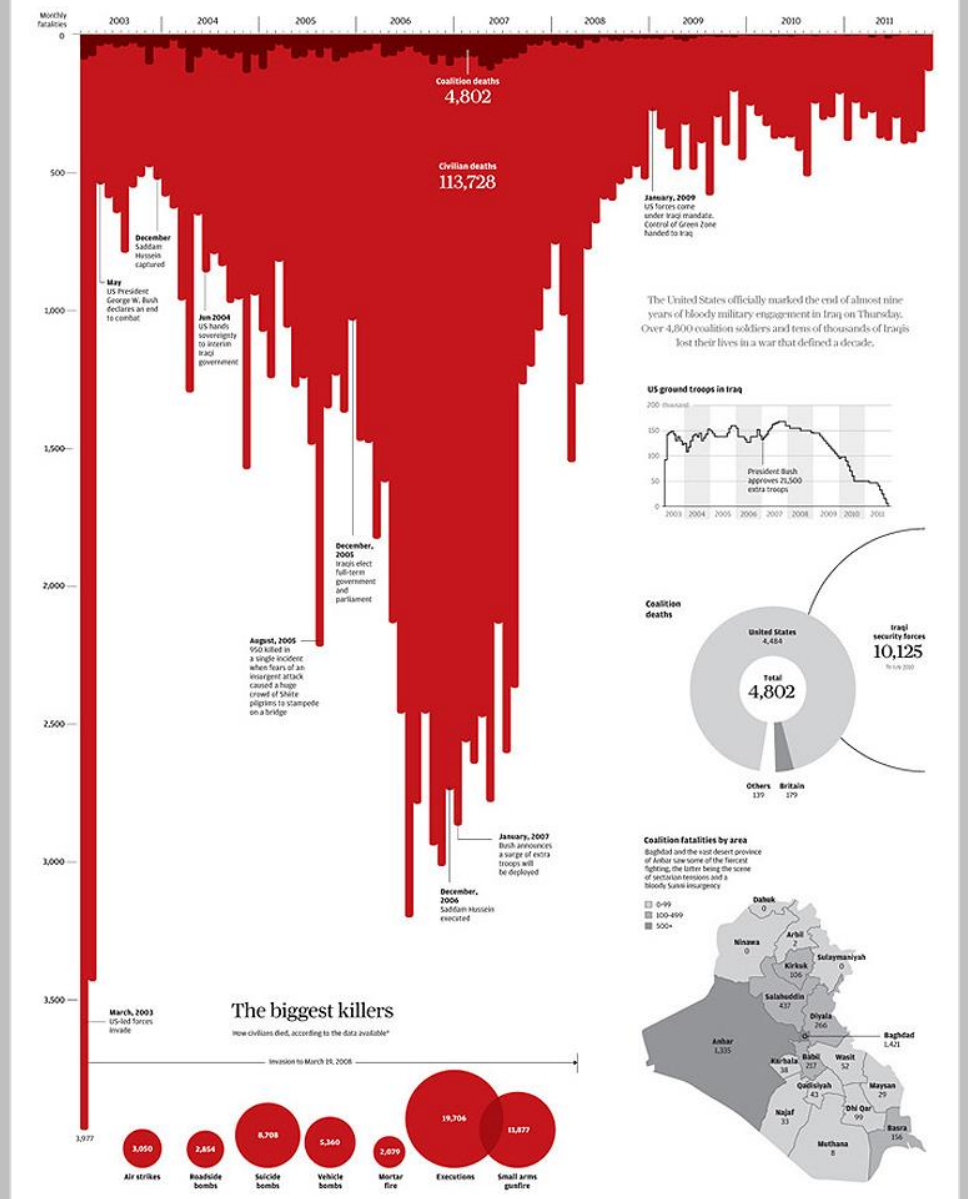


Sign up to my newsletter:



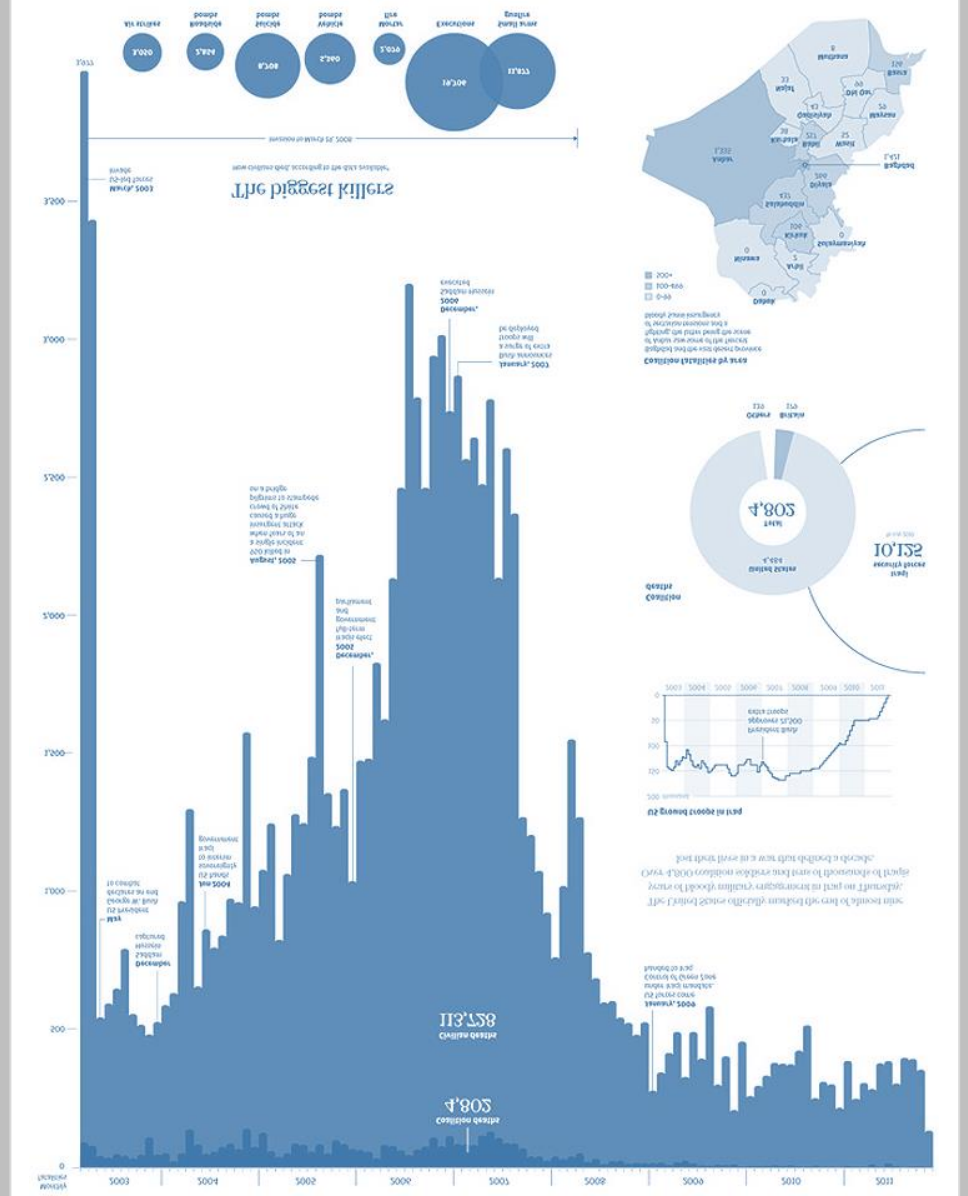
Andy Cotgreave

Iraq's bloody toll



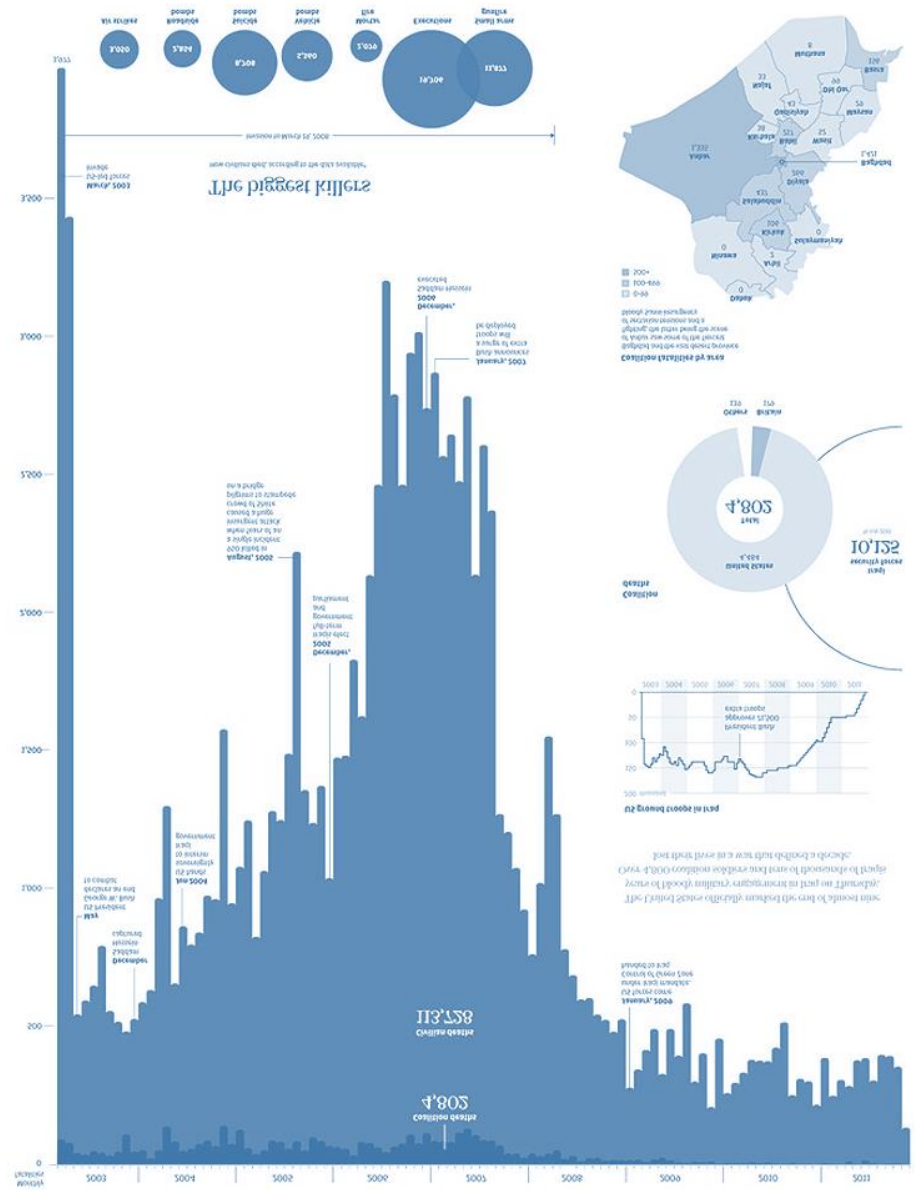
Original: Simon Scarr, South China Morning Post

Iraq: deaths on the decline

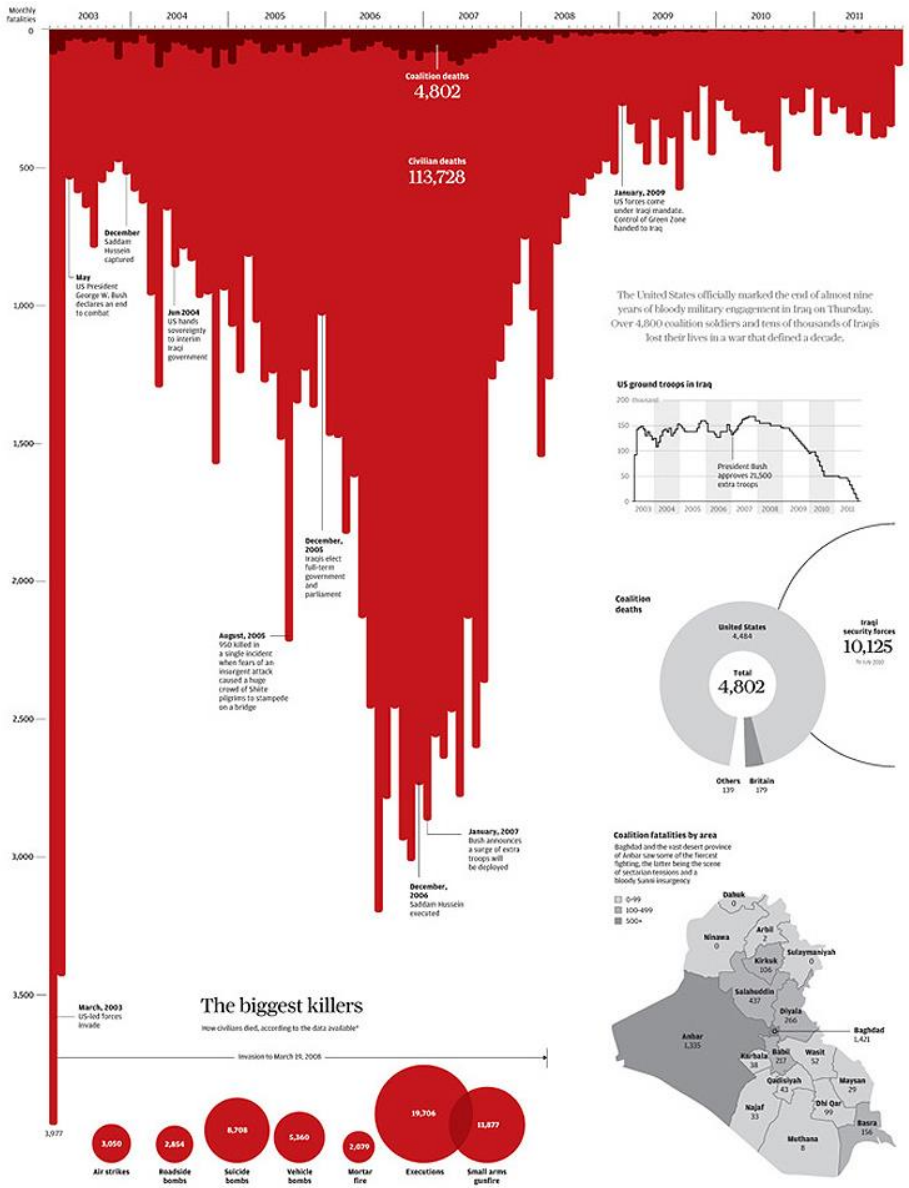


Andy Cotgreave

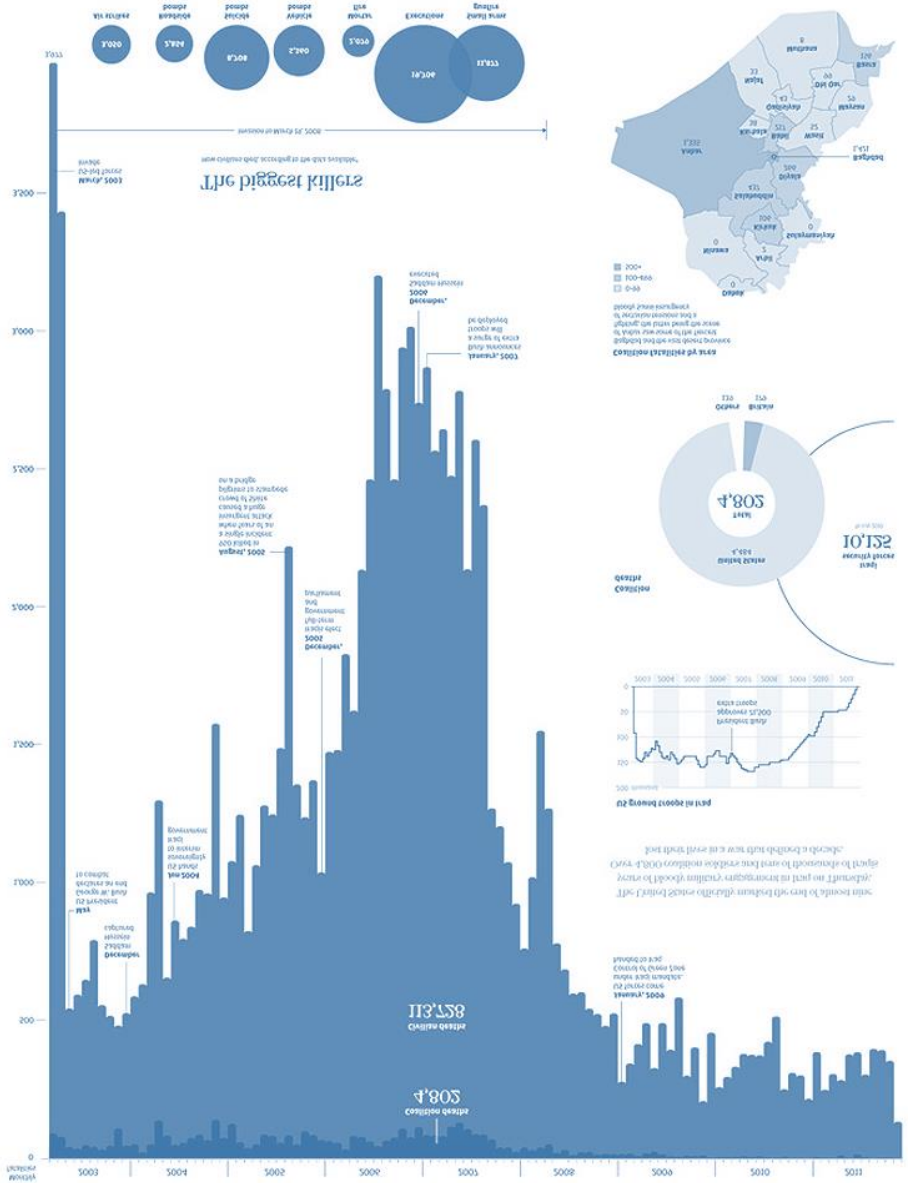
Iraq: deaths on the decline

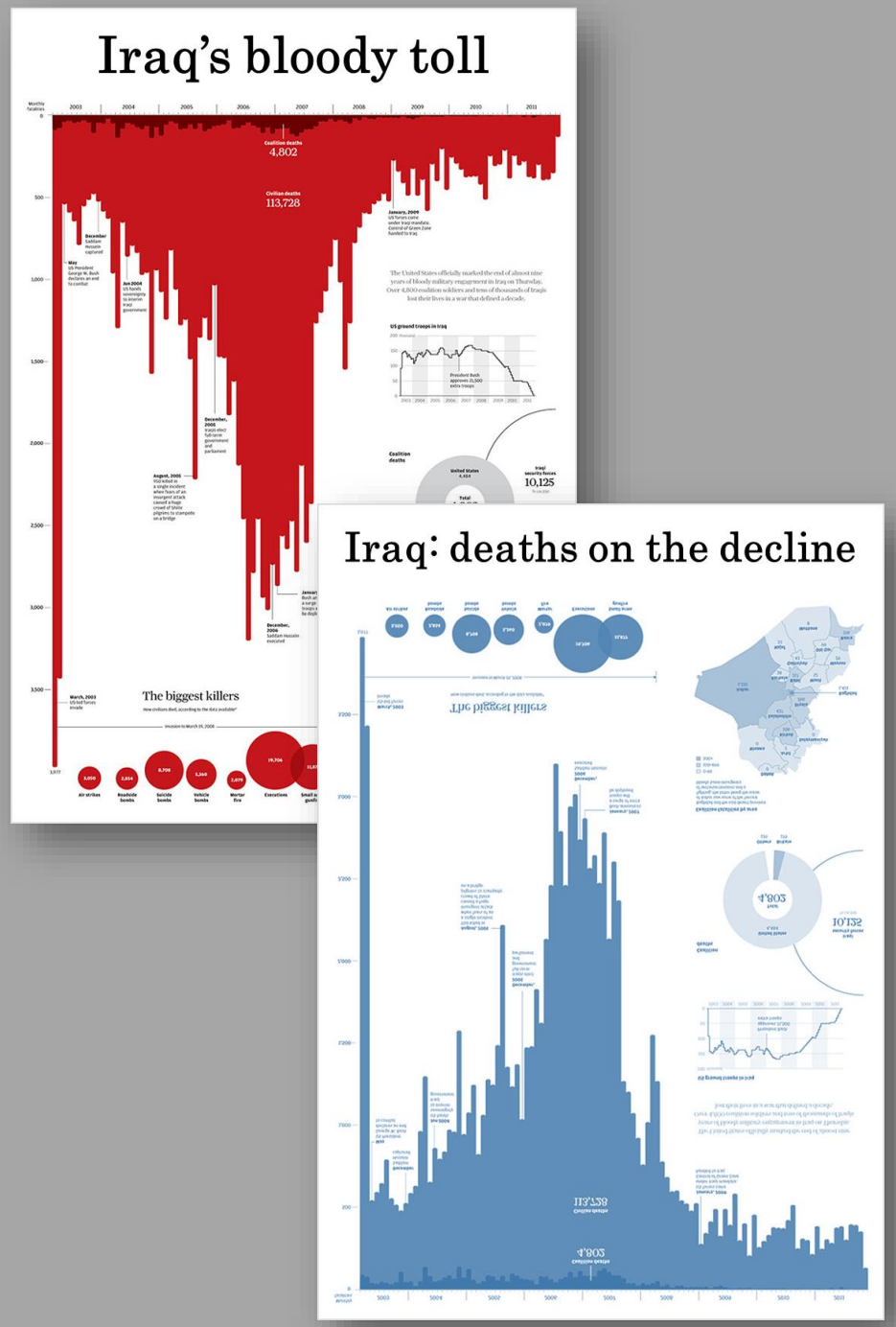


Iraq's bloody toll

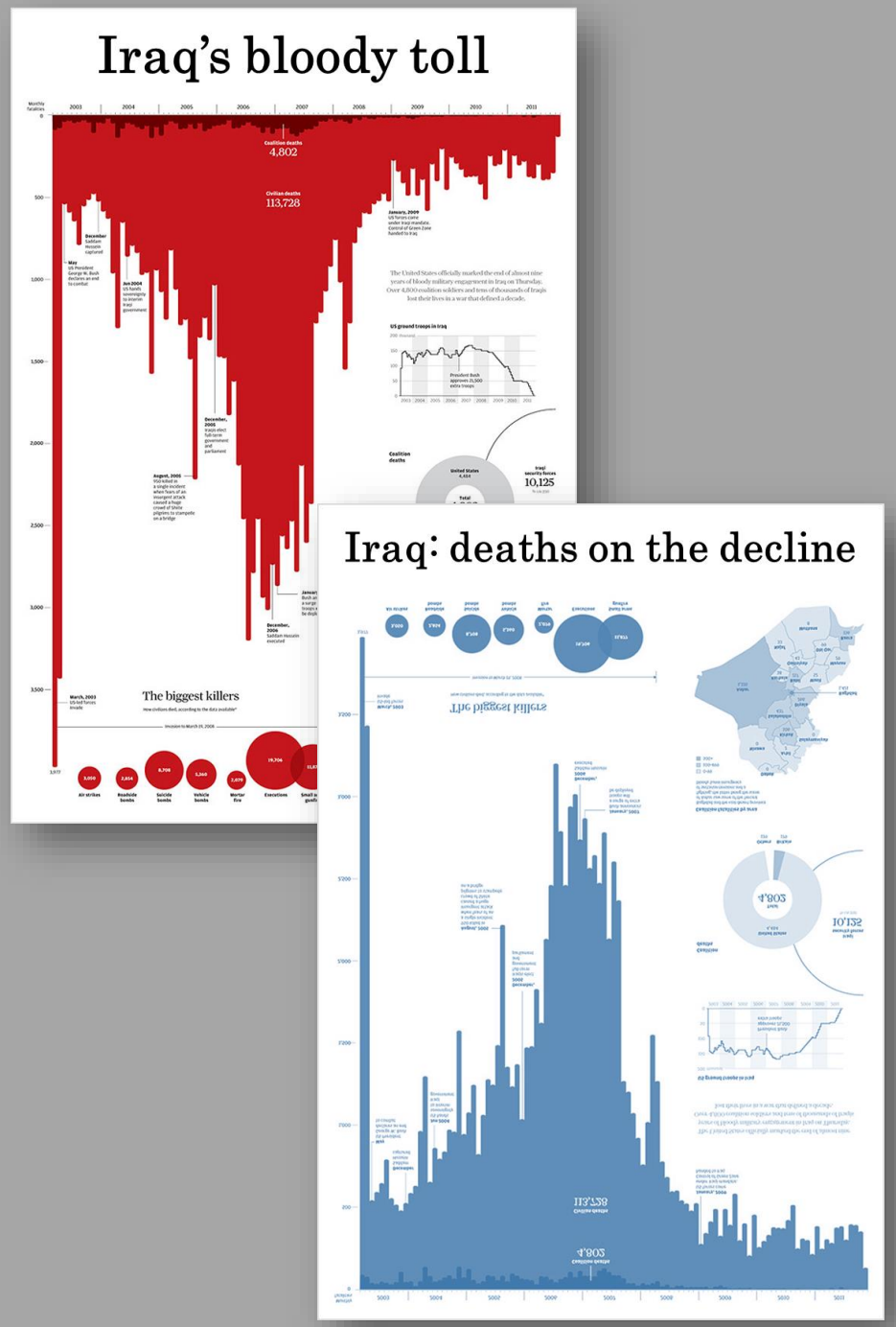


Iraq: deaths on the decline





Data visualization is not neutral; every element is a choice, every choice an opinion.



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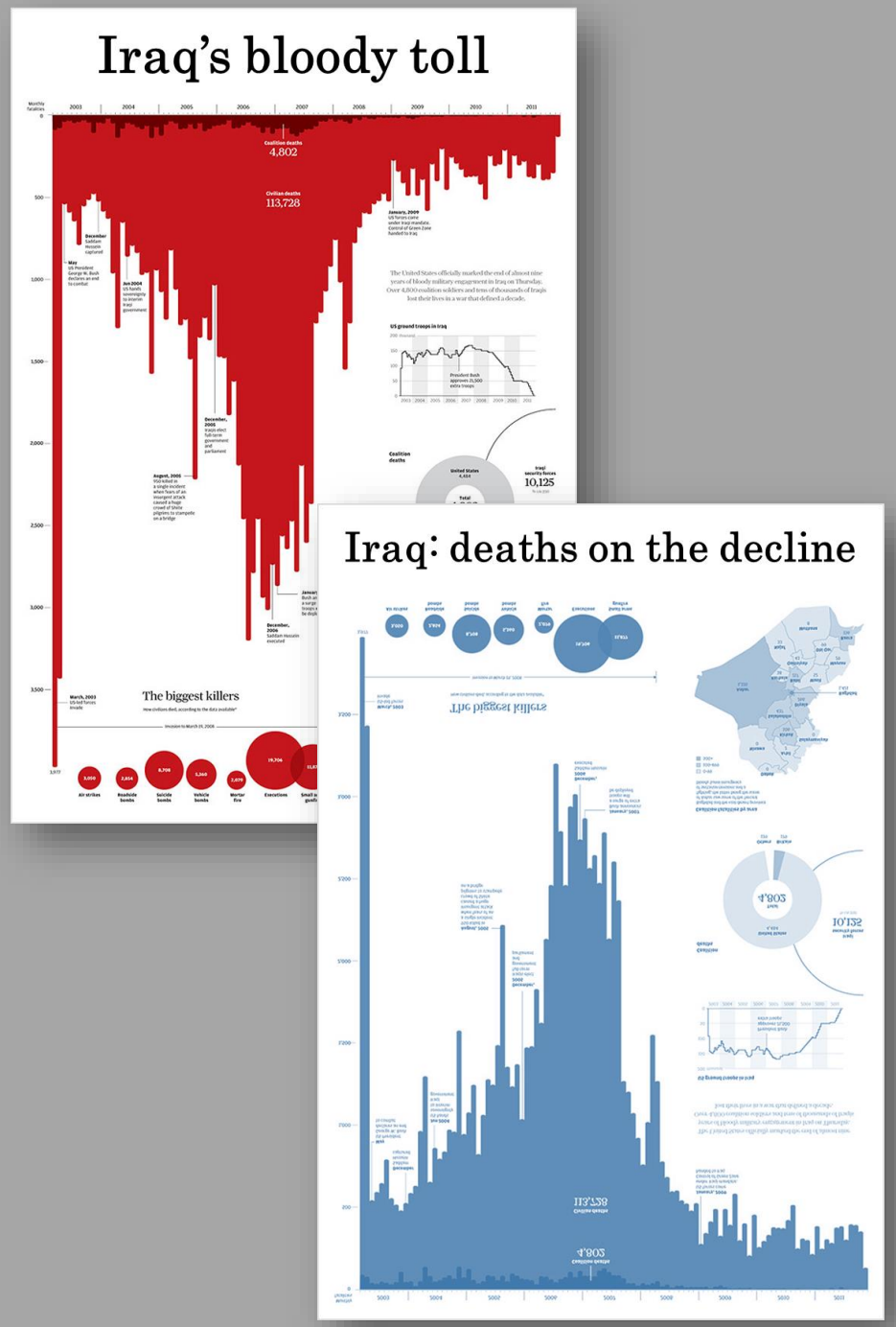
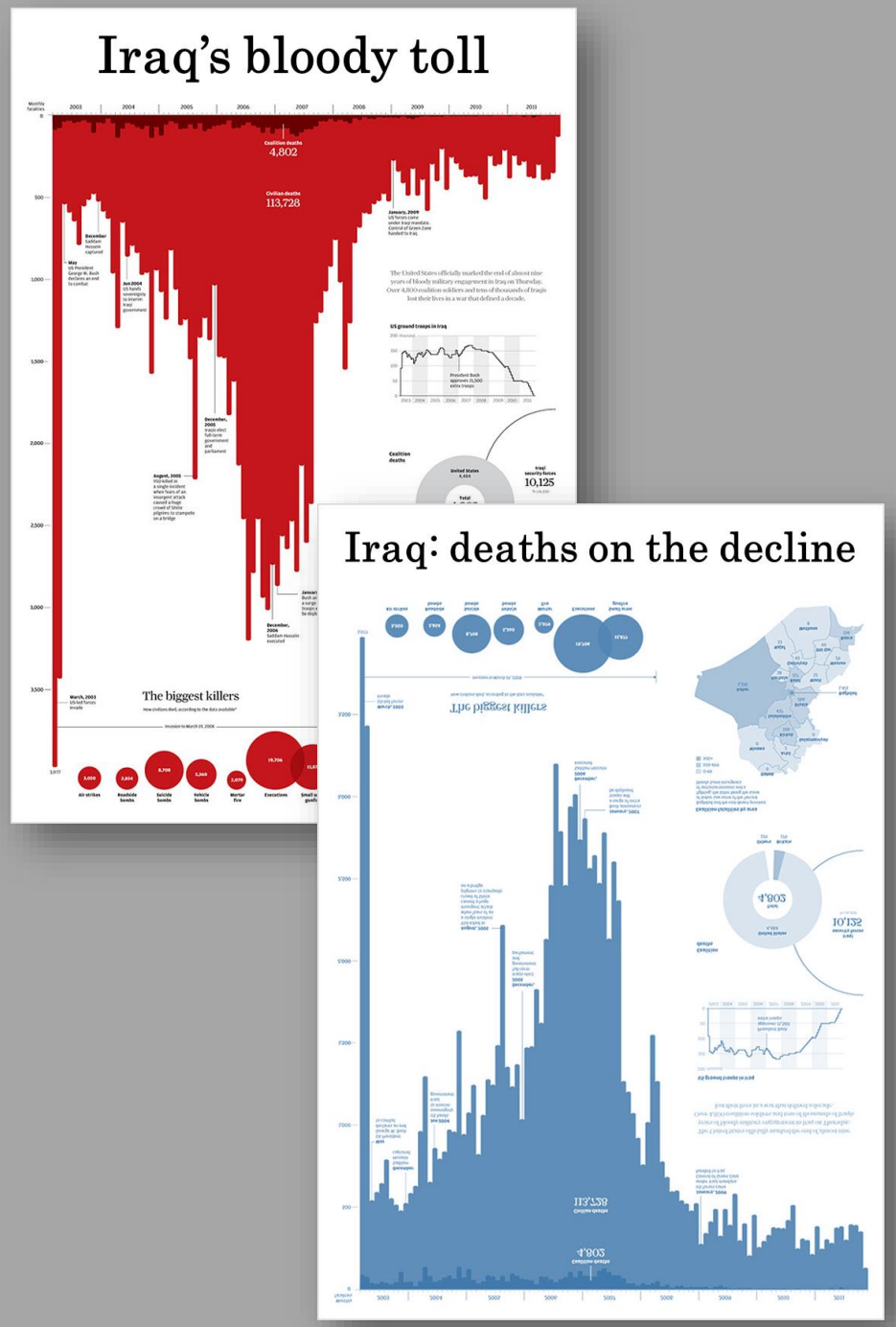


Data visualization **is not neutral**; every element is a **choice**, every choice an opinion.



Data visualization **is not neutral**; every element is a **choice**, every choice an **opinion**.

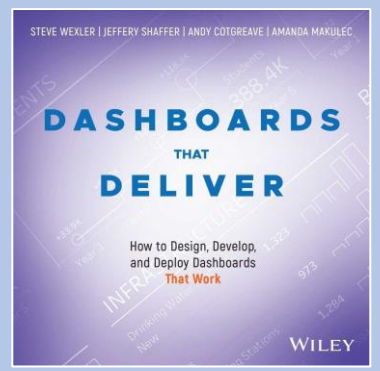
Andy Cotgreave

Technical Evangelist, Tableau

tableau

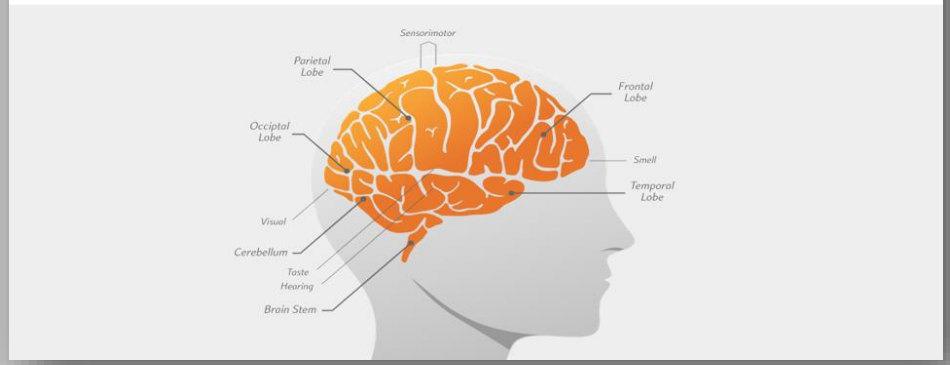
CHART CHAT

How To Speak Data



Speaking the language of data

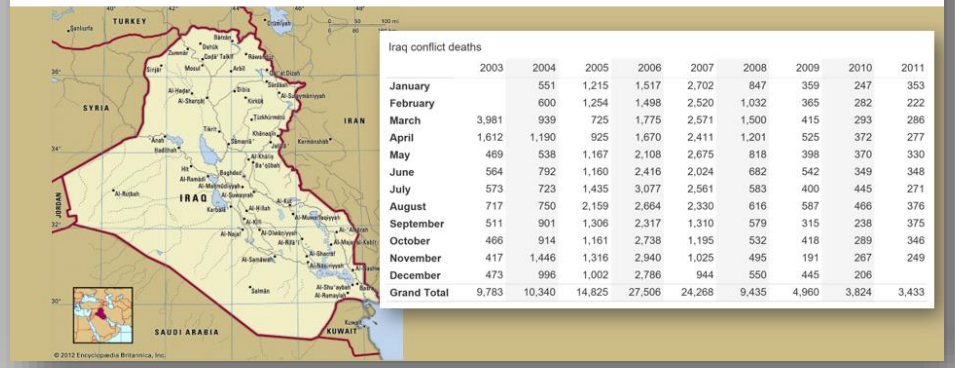
Why do charts work?



Choosing the chart

Telling a story

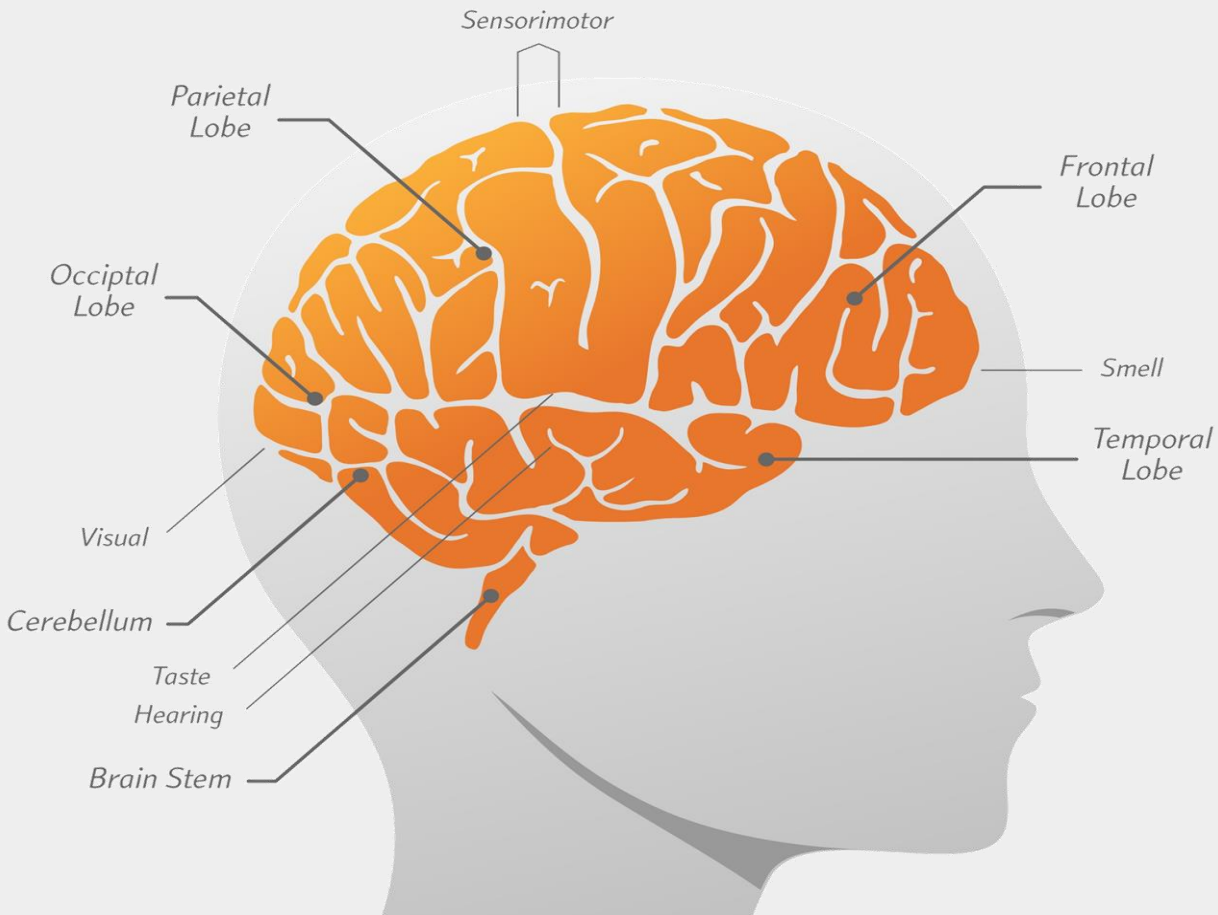
Bring it together



Iraq conflict deaths

	2003	2004	2005	2006	2007	2008	2009	2010	2011
January		551	1,215	1,517	2,702	847	359	247	353
February		600	1,254	1,498	2,520	1,032	365	282	222
March	3,981	939	725	1,775	2,571	1,500	415	293	286
April	1,612	1,190	925	1,670	2,411	1,201	525	372	277
May	469	538	1,167	2,108	2,675	818	398	370	330
June	564	792	1,160	2,416	2,024	682	542	349	348
July	573	723	1,435	3,077	2,561	583	400	445	271
August	717	750	2,159	2,664	2,330	616	587	466	376
September	511	901	1,306	2,317	1,310	579	315	238	375
October	466	914	1,161	2,738	1,195	532	418	289	346
November	417	1,446	1,316	2,940	1,025	495	191	267	249
December	473	996	1,002	2,786	944	550	445	206	
Grand Total	9,783	10,340	14,825	27,506	24,268	9,435	4,960	3,824	3,433

Why do charts work?



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4 5 2 9 6 9 7 6 4 6
8 1 5 7 8 5 6 6 6 7
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3 8 6 8 4 5 6 9 4 5
4 9 9 2 3 7 1 9 1 2
3 7 8 1 6 1 5 6 1 6
5 6 6 8 6 6 9 1 2 6
3 2 4 2 6 9 4 2 7 1

2 2 5 6 7 1 1 6 9 1
9 1 7 5 5 5 6 2 5 9
4 5 2 9 6 9 7 6 4 6
8 1 5 7 8 5 6 6 6 7
7 2 3 6 8 9 1 7 9 1
3 8 6 8 4 5 6 9 4 5
4 9 9 2 3 7 1 9 1 2
3 7 8 1 6 1 5 6 1 6
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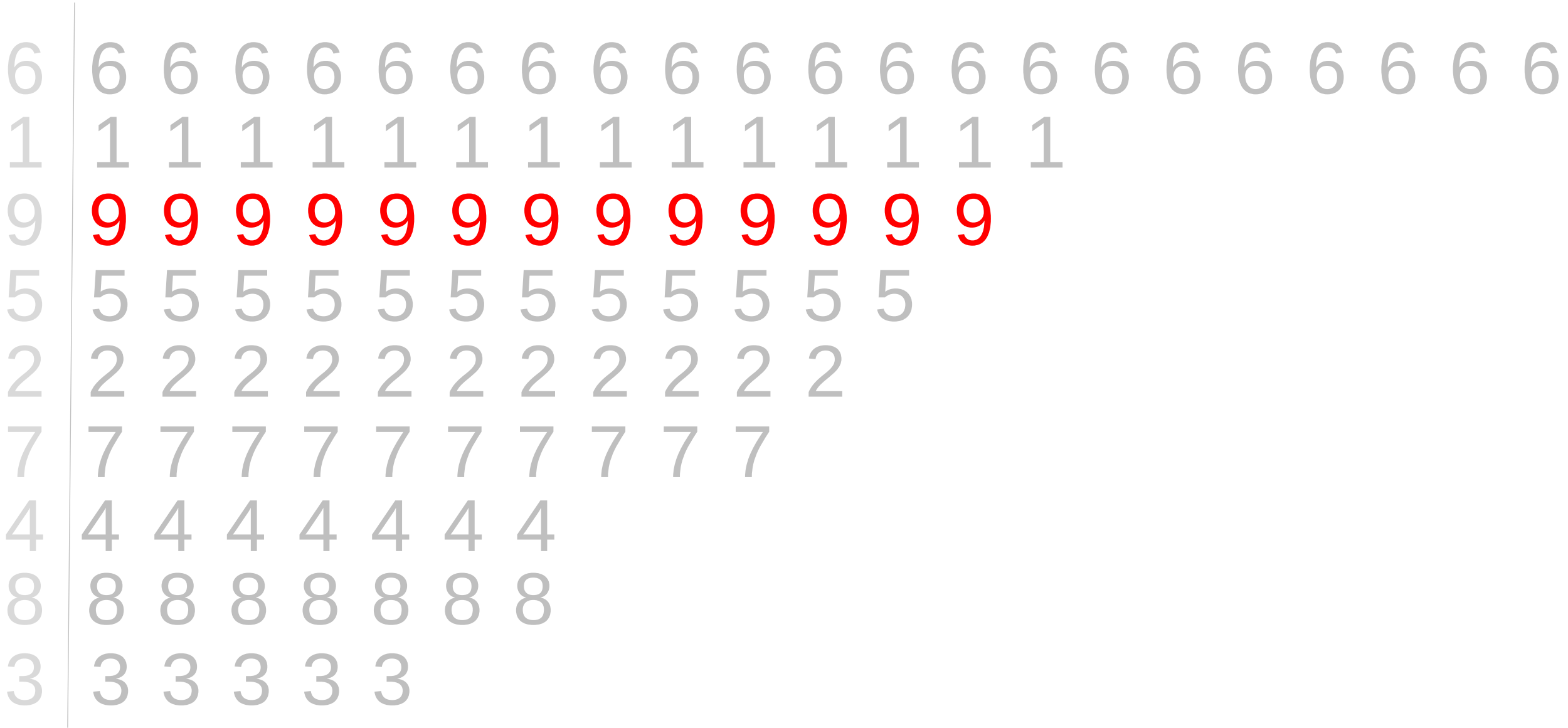
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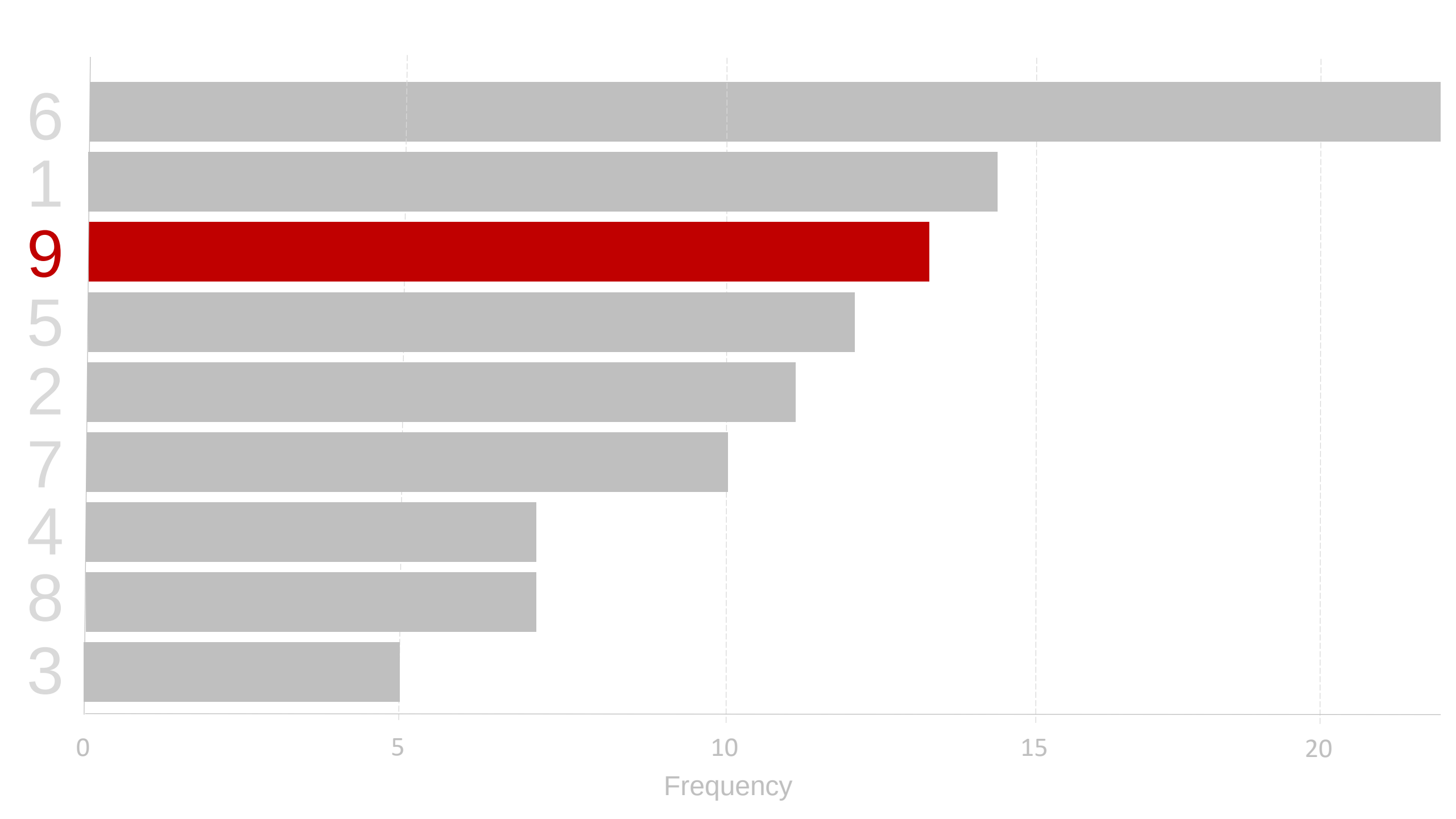
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20
Frequency

Position

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4 5 2 9 6 9 7 6 4 6
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3 2 4 2 6 9 4 2 7 1

Colour

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4 5 2 9 6 9 7 6 4 6
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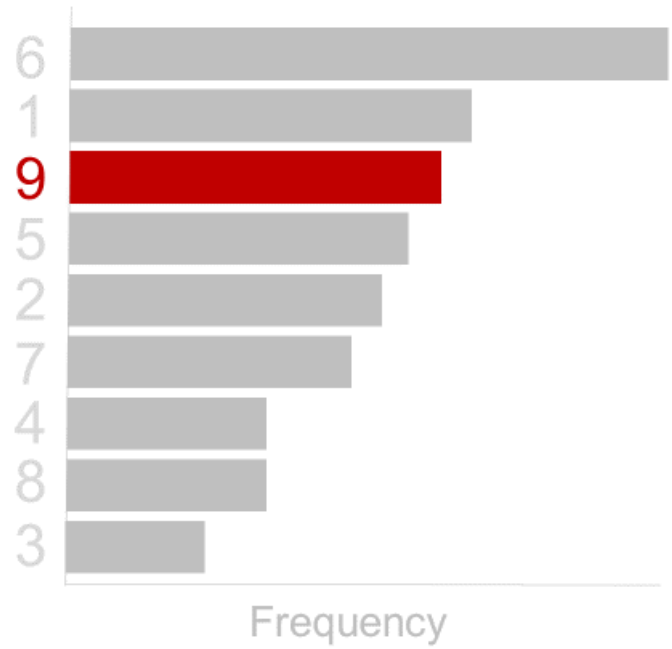
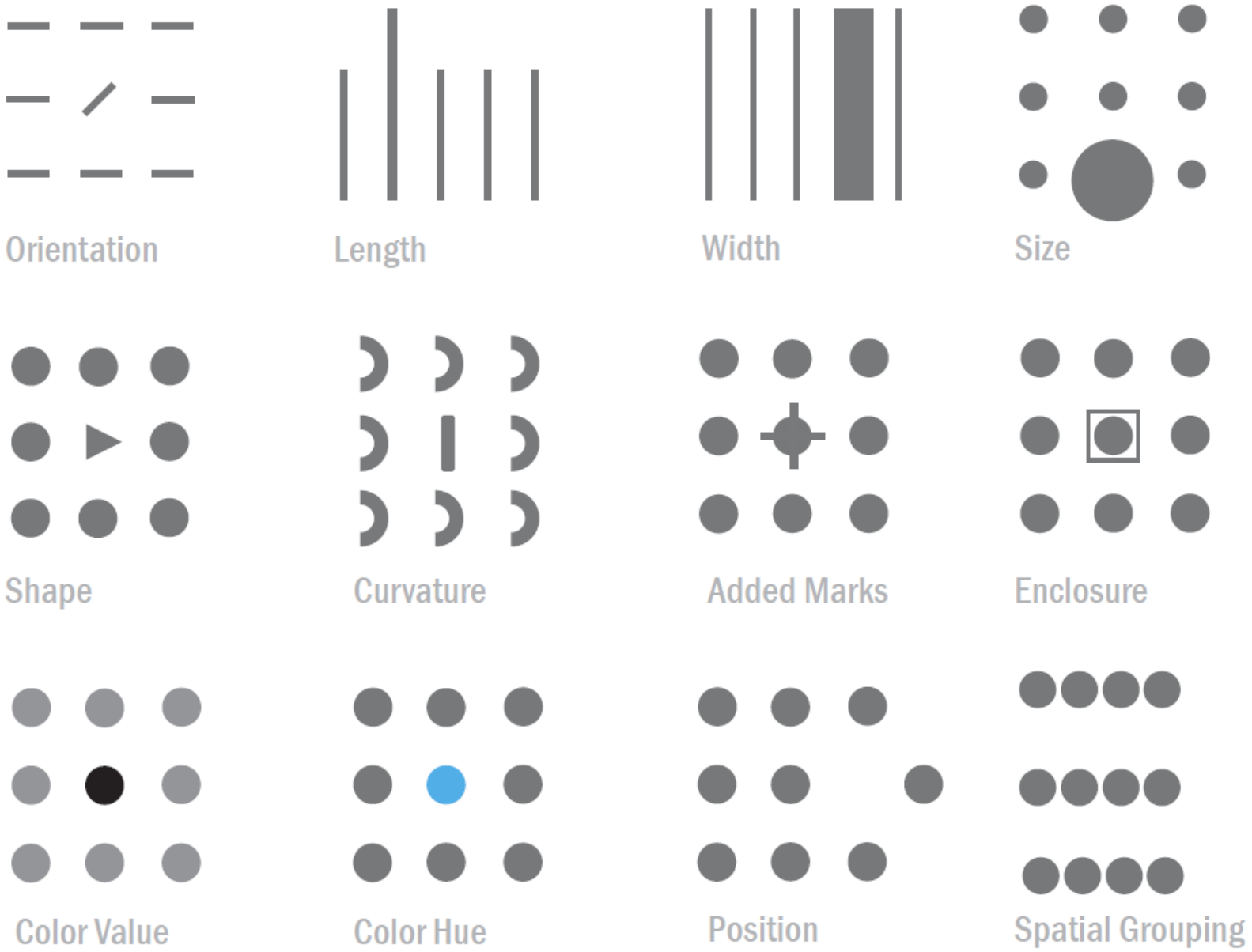
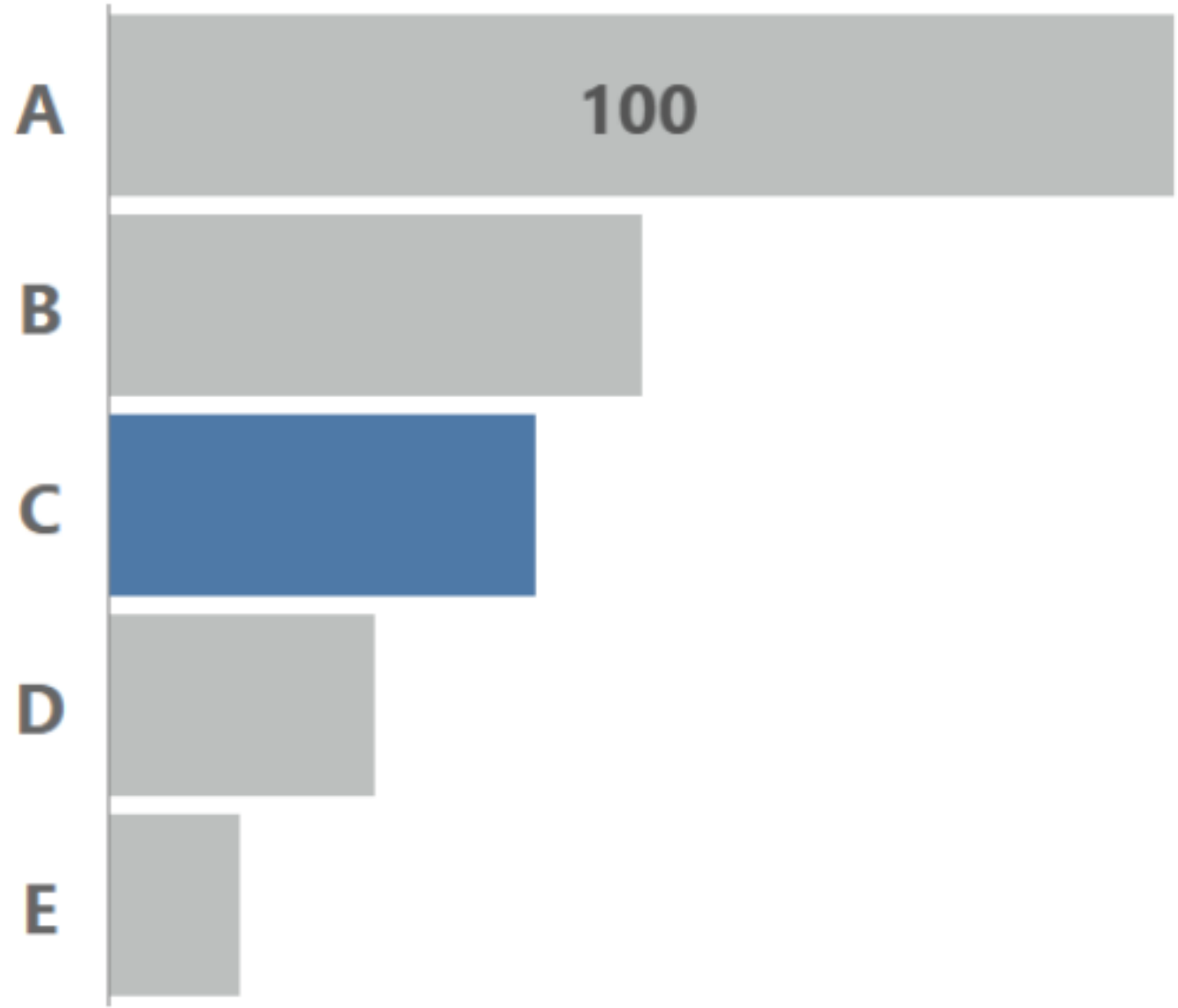
Length



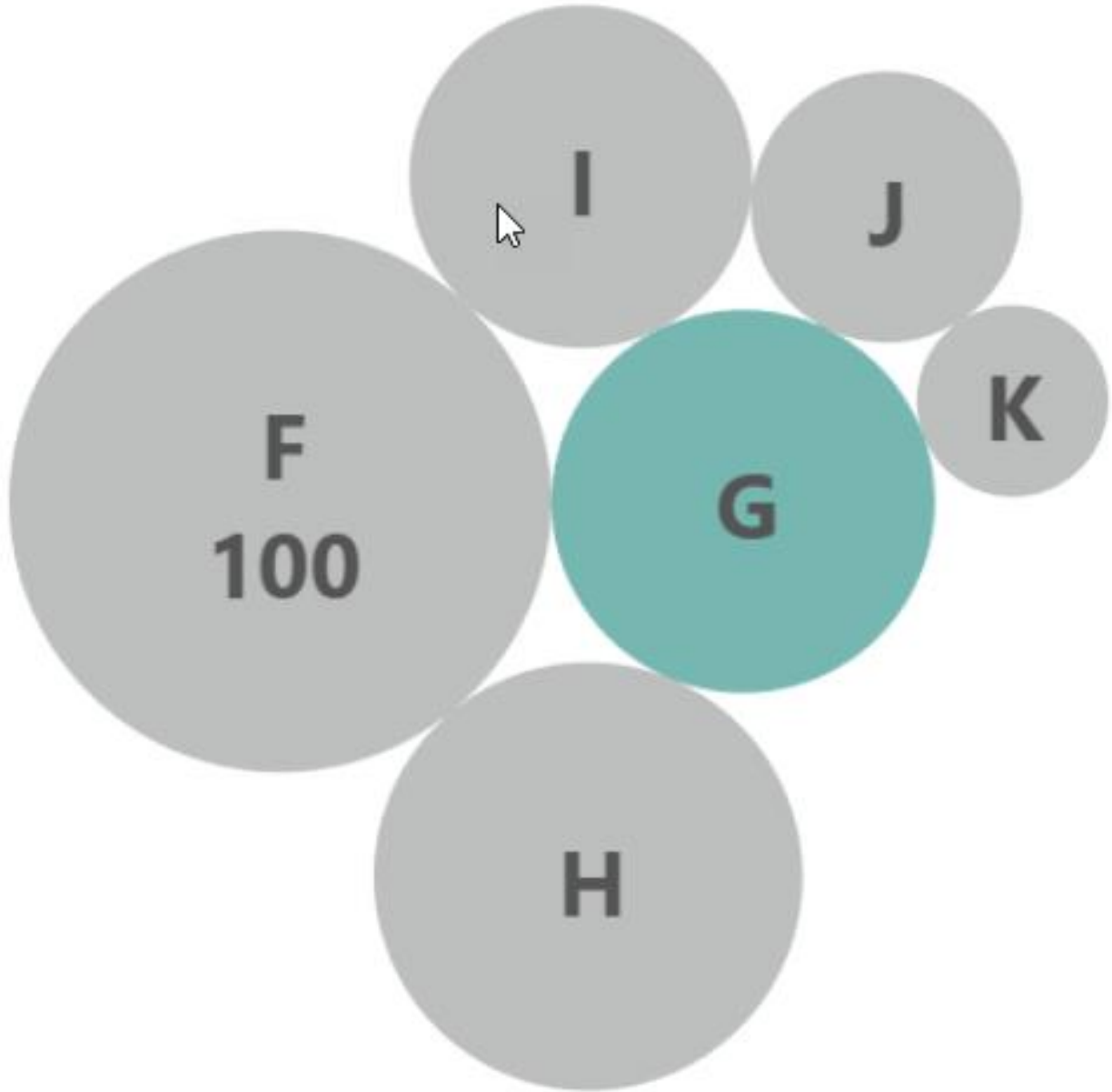
Preattentive Attributes



If the length of A is 100, what is C?



If the area of F is 100, what is G?



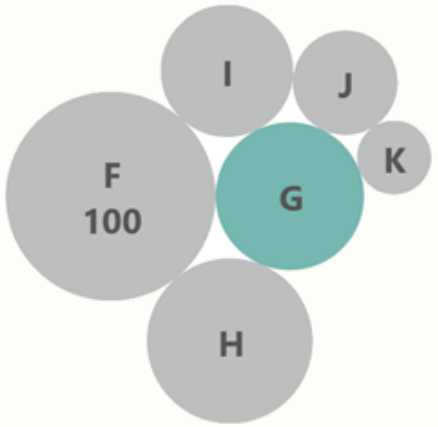
The results…

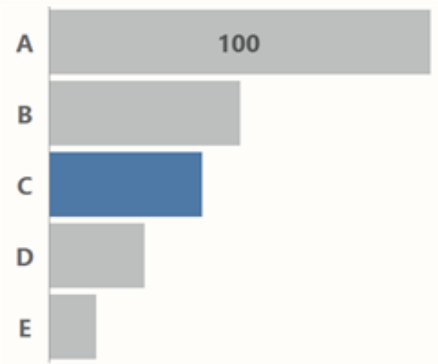
Circles and Bars: The Results

Last 3 years

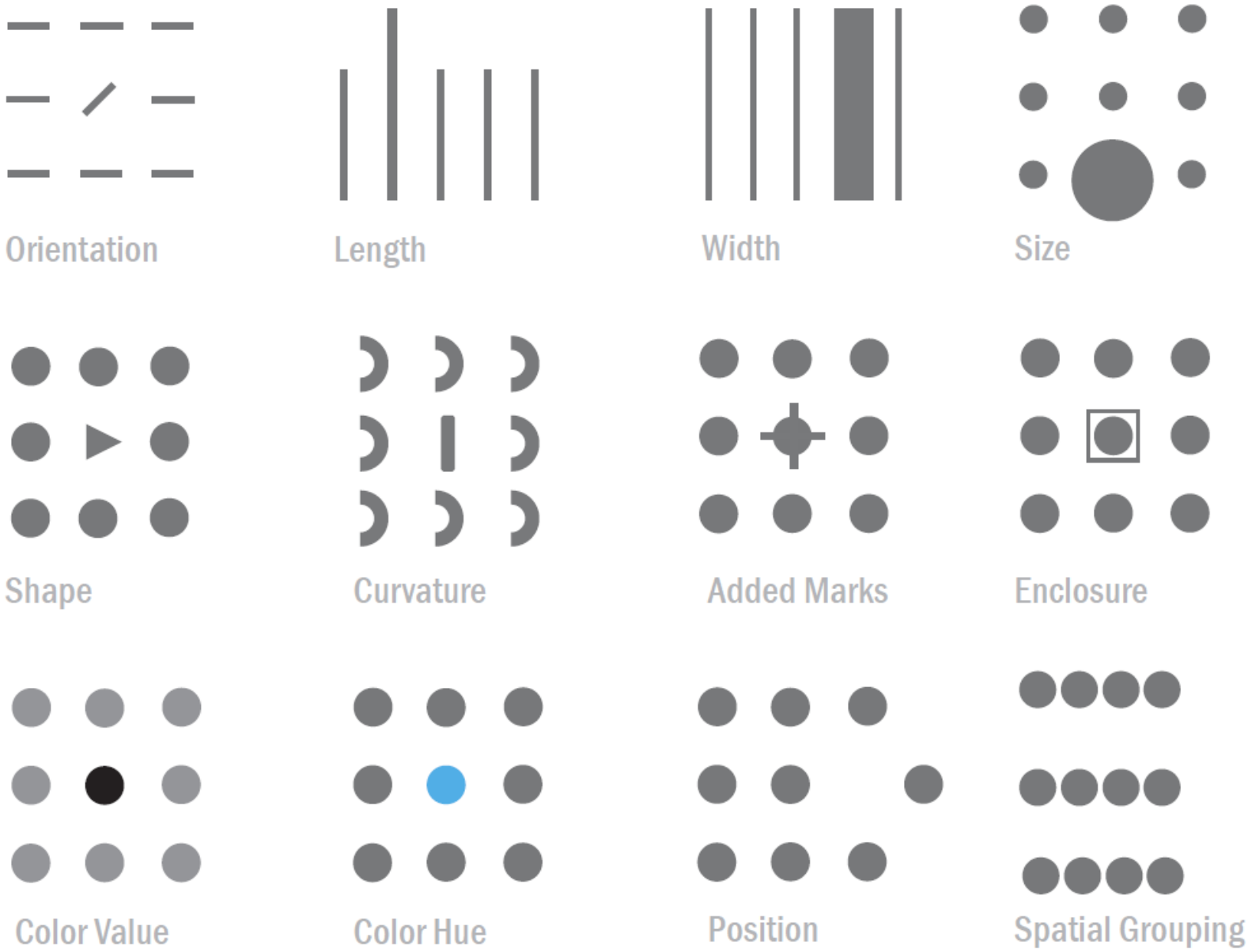
Responses: 3,427

Updated: 26/01/2021 16:33:43

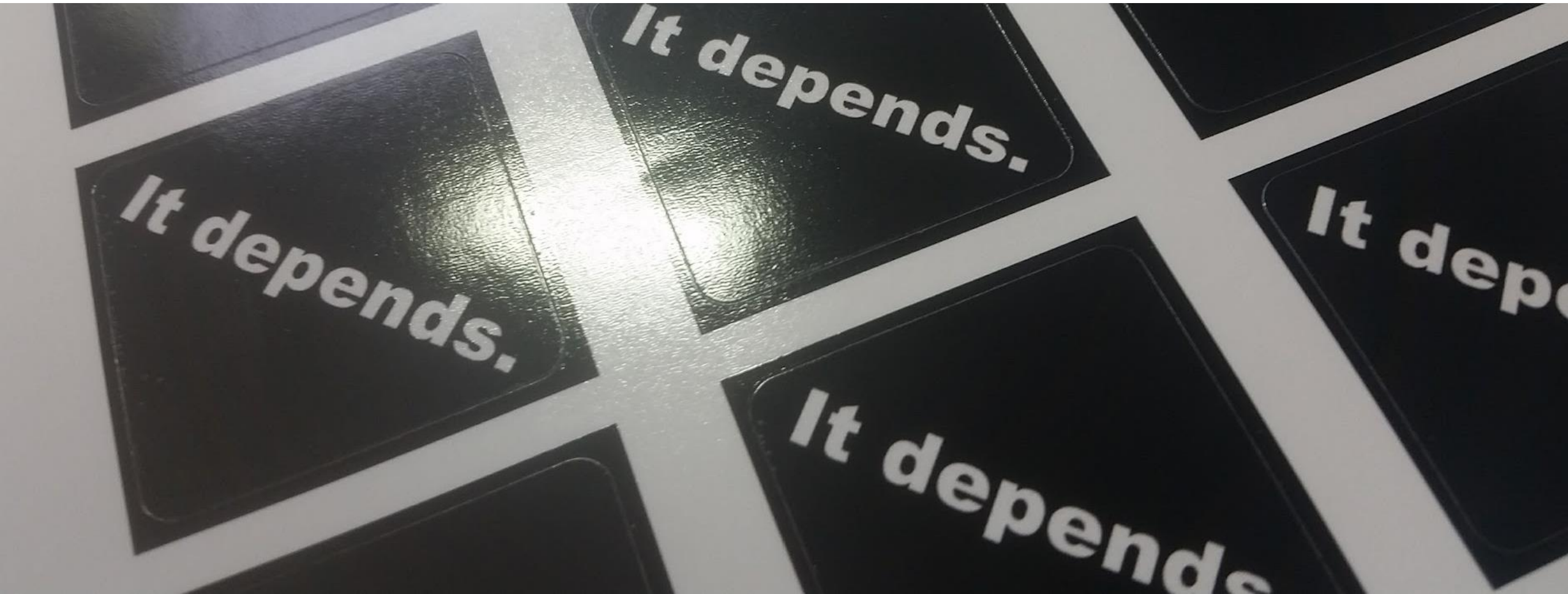




Preattentive Attributes



Choosing the chart



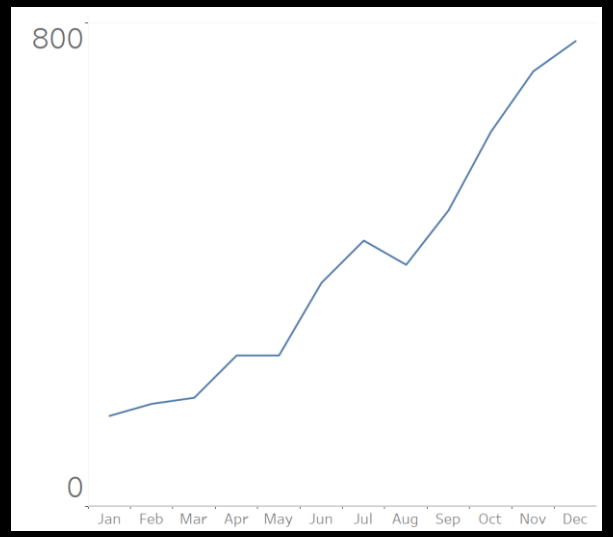
What chart would you use to show this data?

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A	90	100	130	150	100	190	220	240	220	240	330	340	2,350
B	60	70	50	100	150	180	220	160	270	380	390	430	2,460

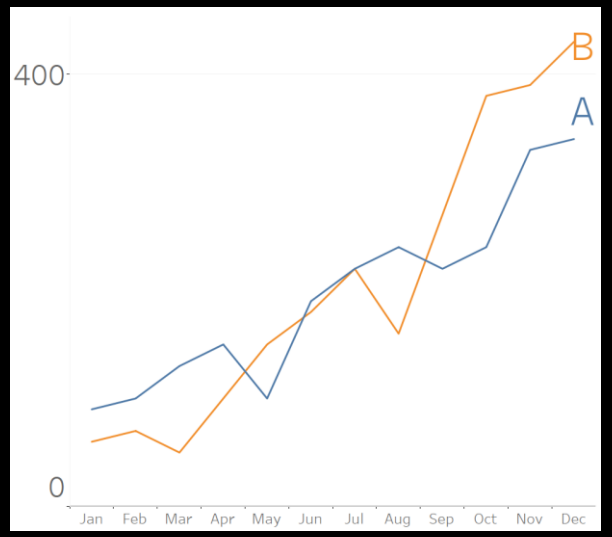
What chart would you use to show this data?

It Depends

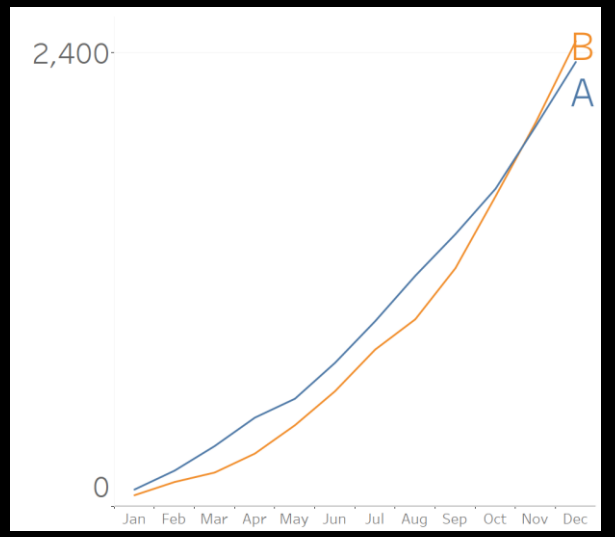
Total sales thru this year?



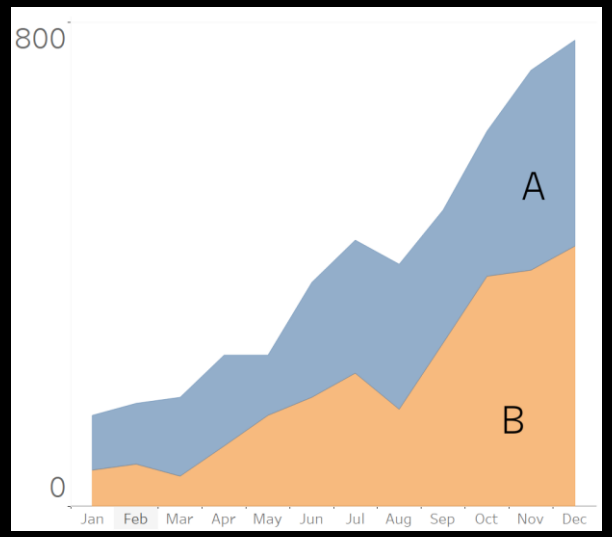
Sales of **A and B** thru this year?



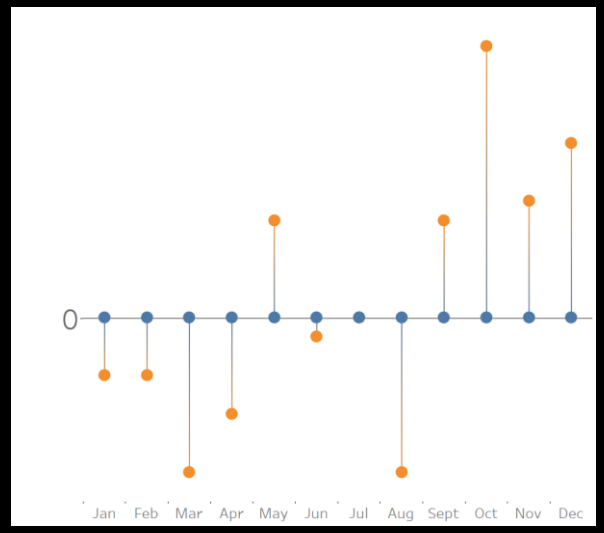
Cumulative sales of A and B this year?



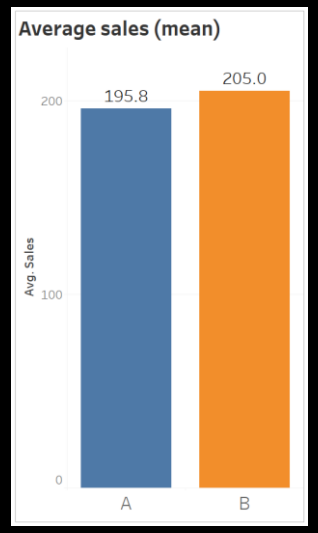
Total sales, **broken down** by A and B?



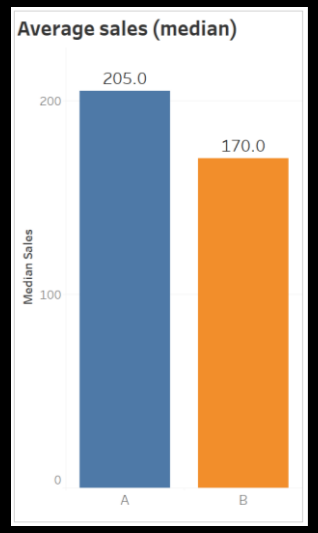
Difference between A and B this year?



B did better than A! (Average sales)



A did better than B! (Average sales)



Which story do you want to tell?

Telling a story

LEVERS
START
PFL

L

E

V

E

R

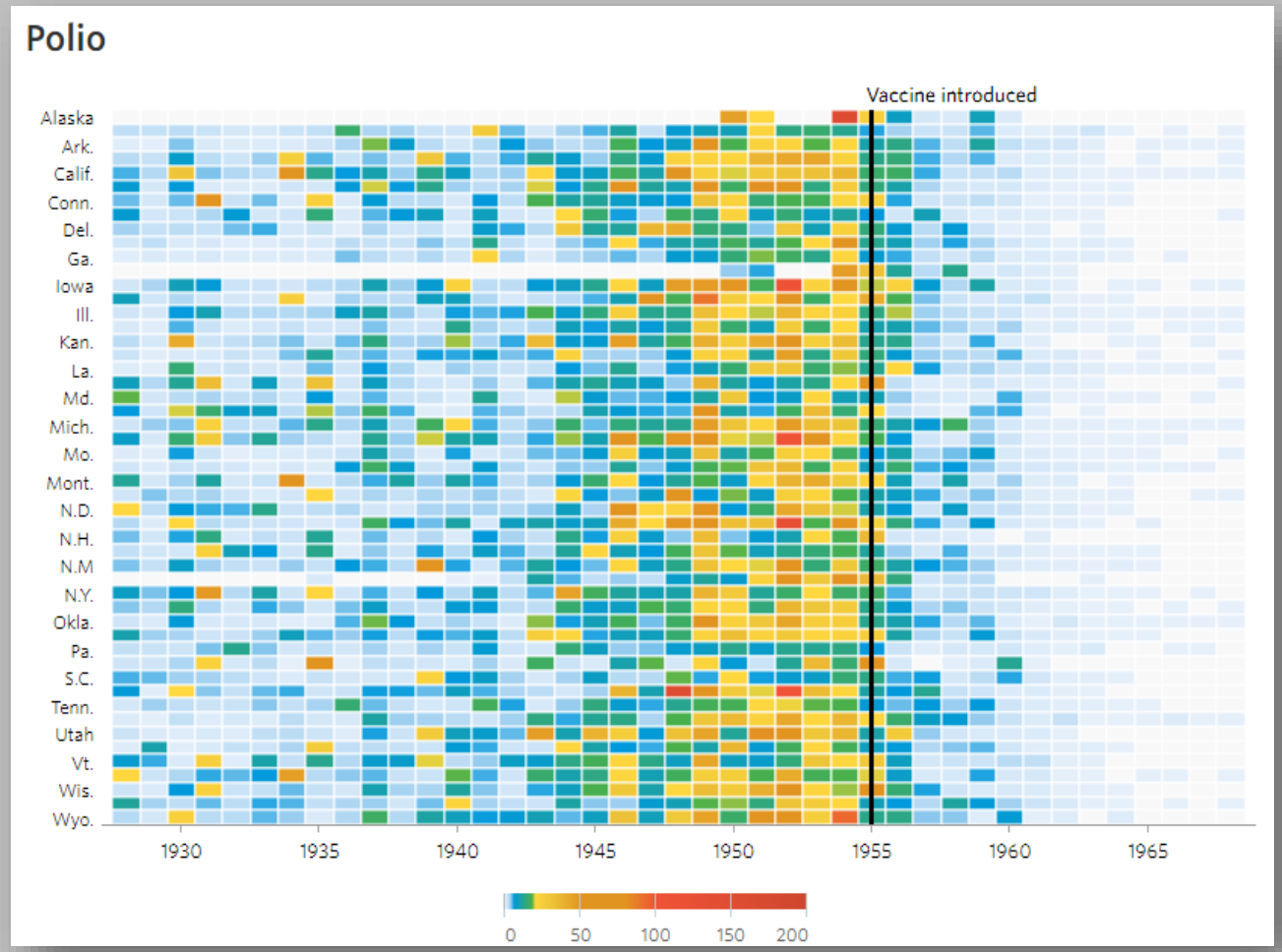
S

L E V E R S

Level of detail?

Granular

Sparse



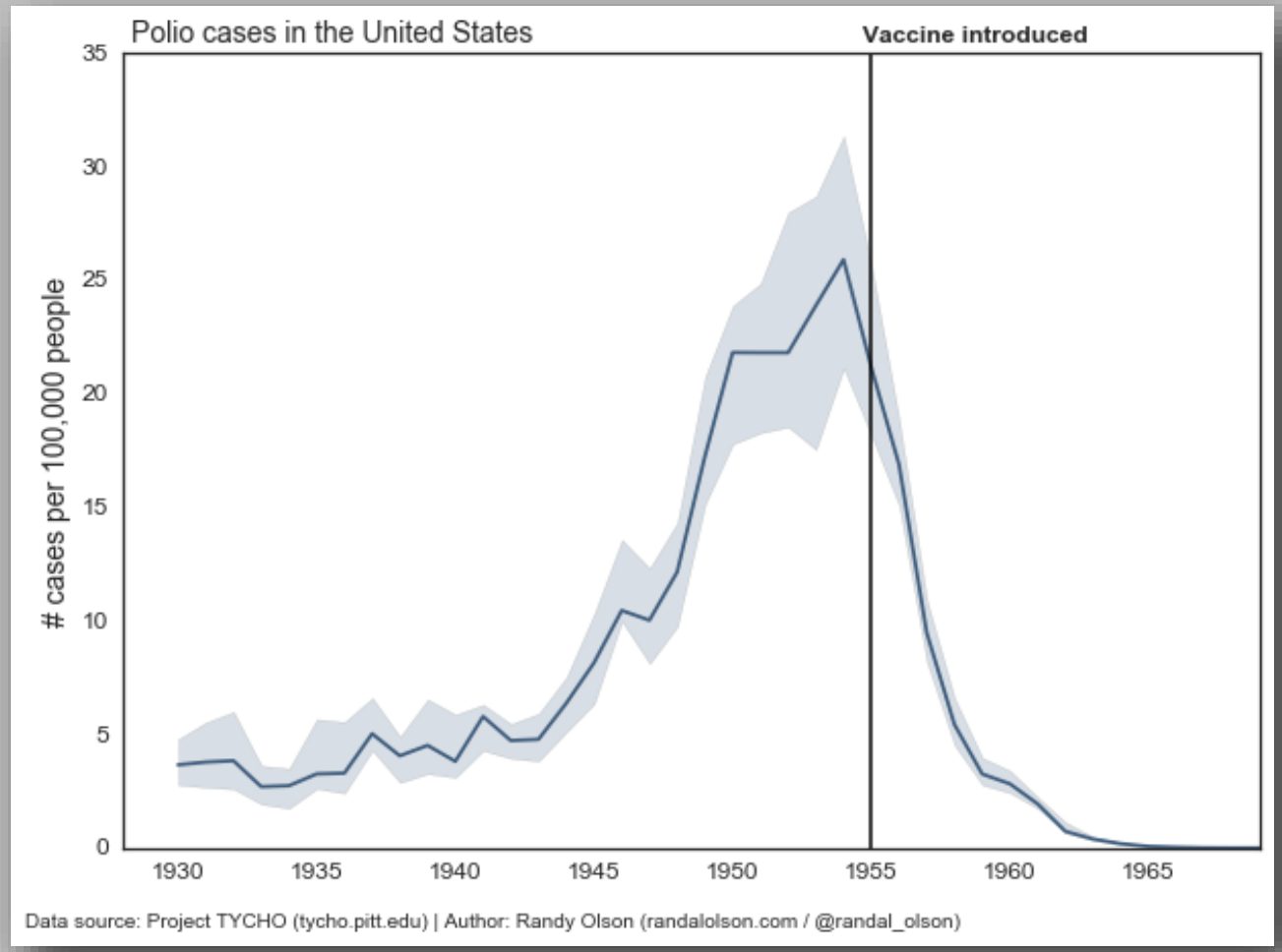
Tynan DeBold http://graphics.wsj.com/infectious-diseases-and-vaccines/

L E V E R S

Level of detail?

Granular

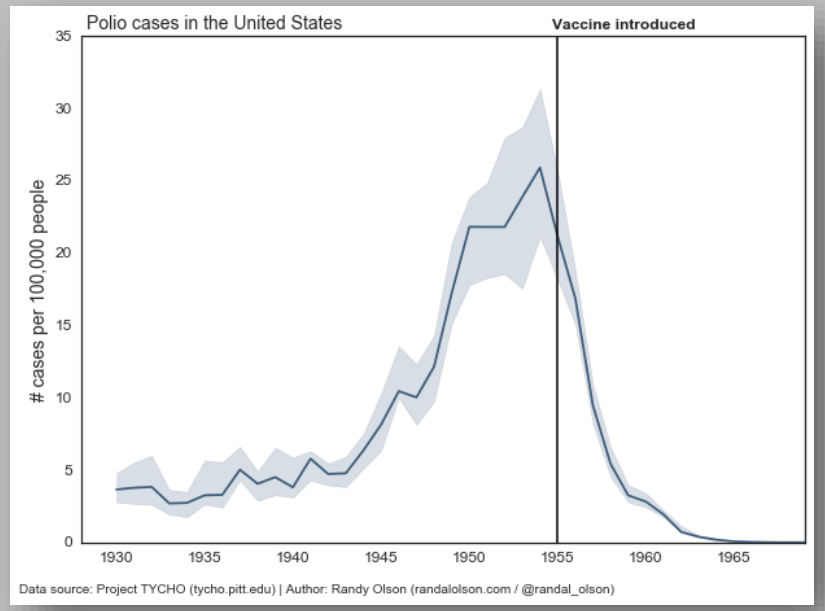
Sparse

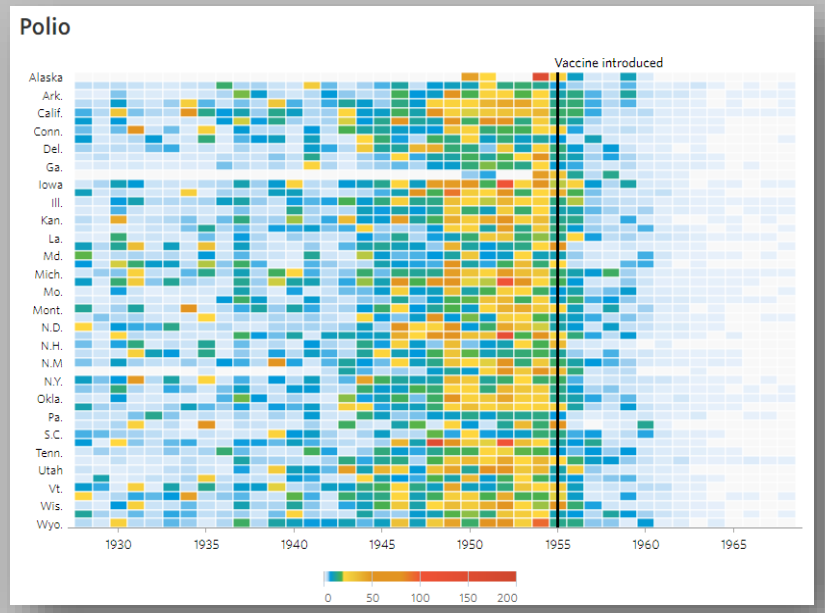


Randy Olson https://randalolson.com/2016/03/04/revisiting-the-vaccine-visualizations/

L E V E R S

Level of detail?





L

Level of detail?

E

Emotional?

V

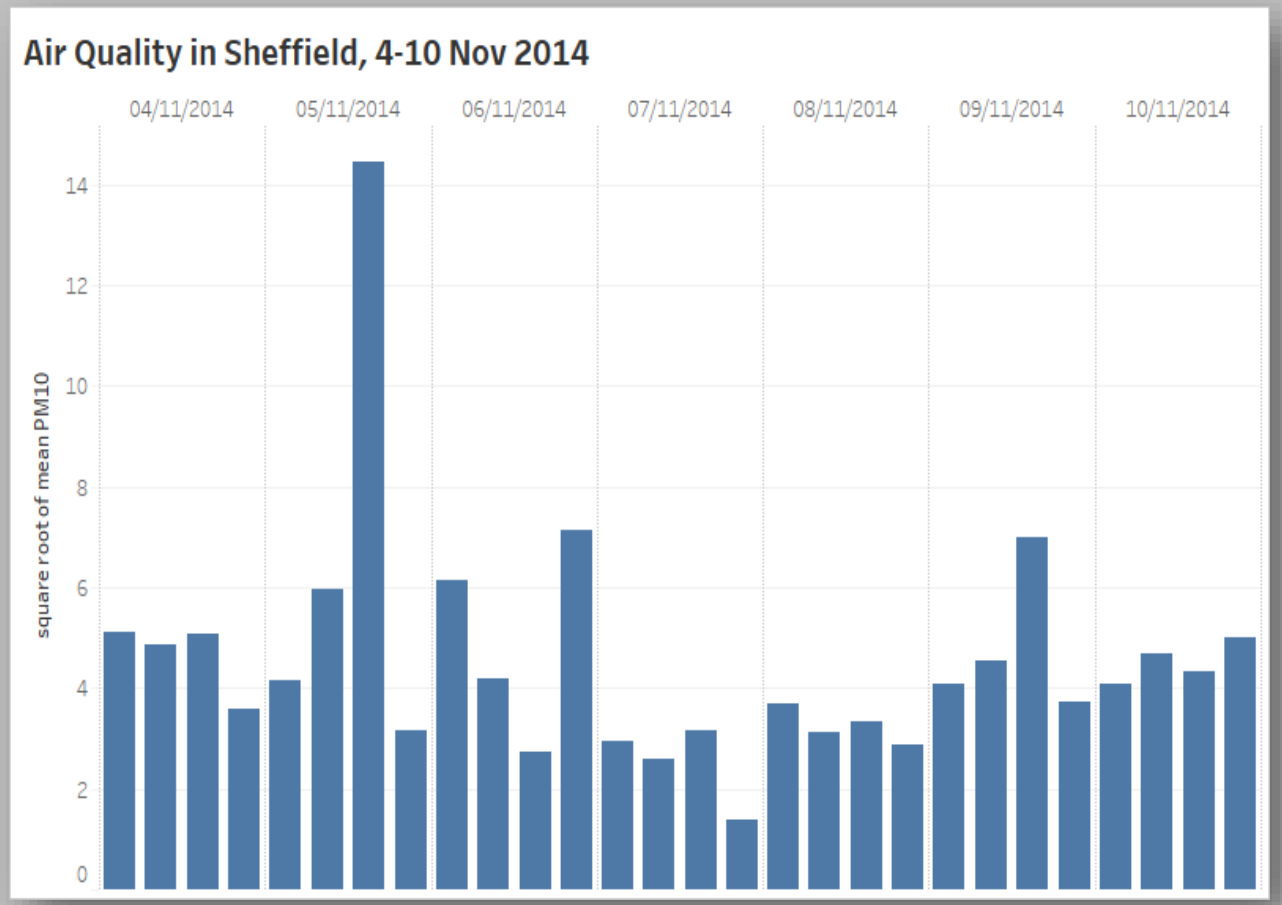
E

R

S

Dry

Emotive



L

Level of detail?

E

Emotional?

V

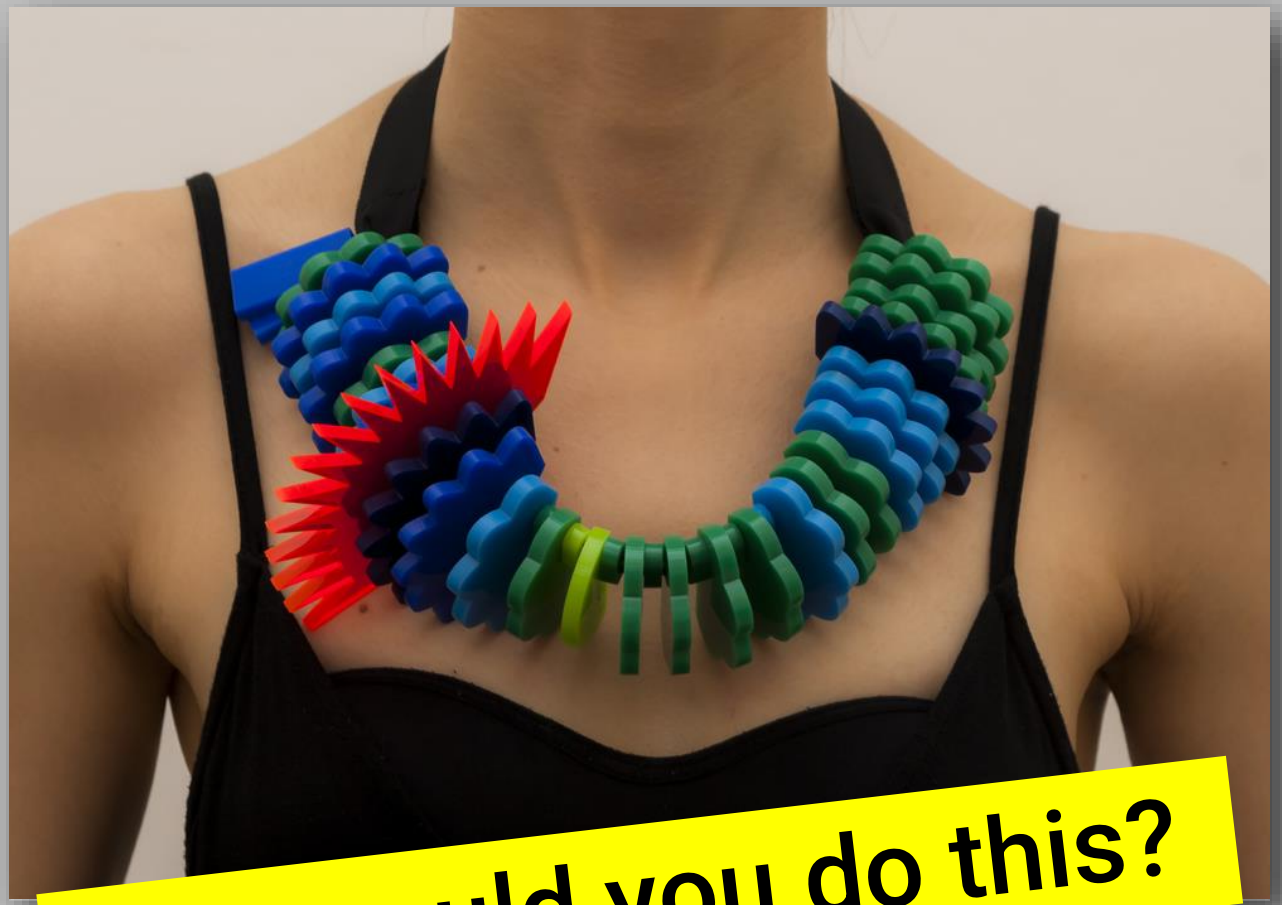
E

R

S

Dry

Emotive



Why would you do this?

Miriam Quick, Stefanie Posavec https://miriamquick.com/air-transformed

L

Level of detail?

E

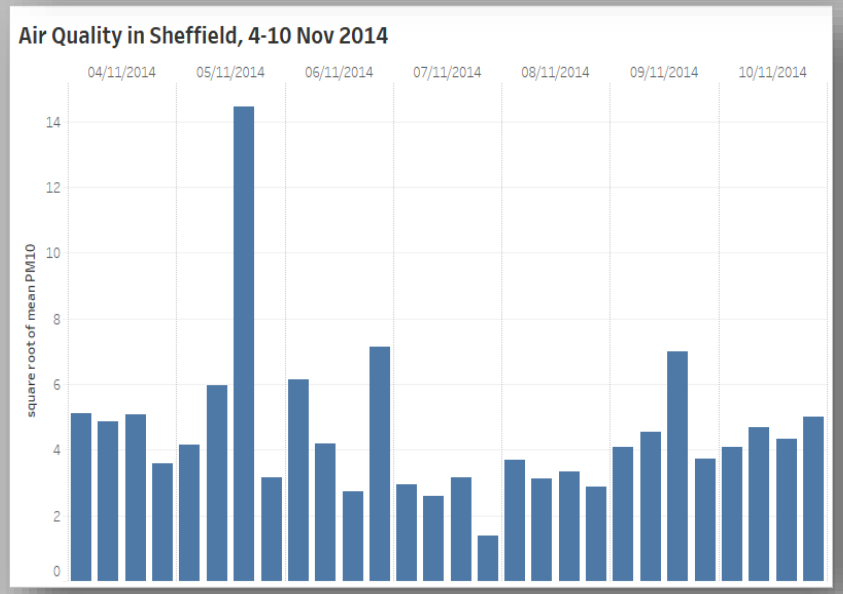
Emotional?

V

E

R

S



L Level of detail?

E Emotional?

V Vagueness?

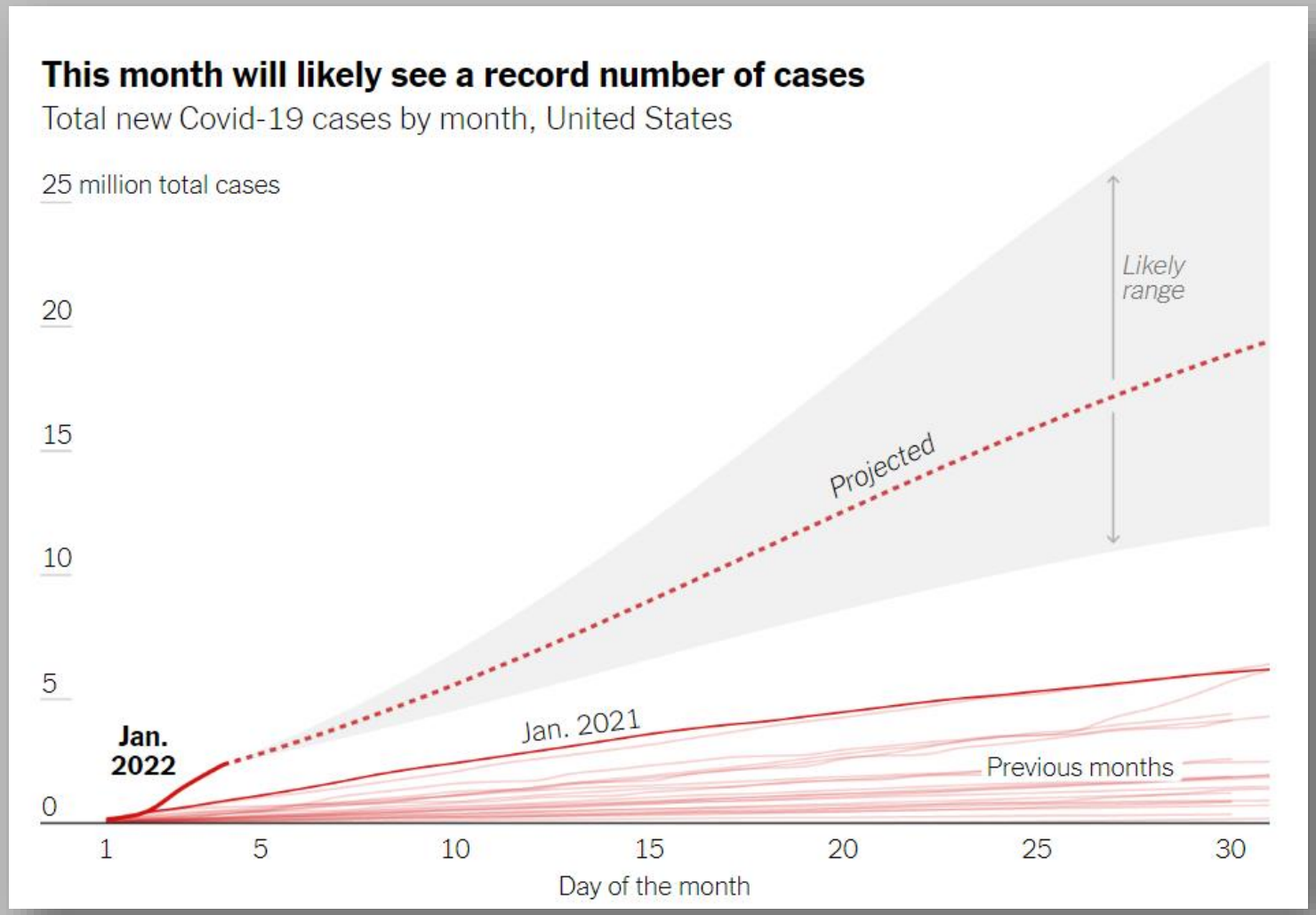
E

R

S

Precise

Ambiguous



New York Times https://www.nytimes.com/2022/01/06/opinion/omicron-covid-us.html

L Level of detail?

E Emotional?

V Vagueness?

E

R

S

Precise

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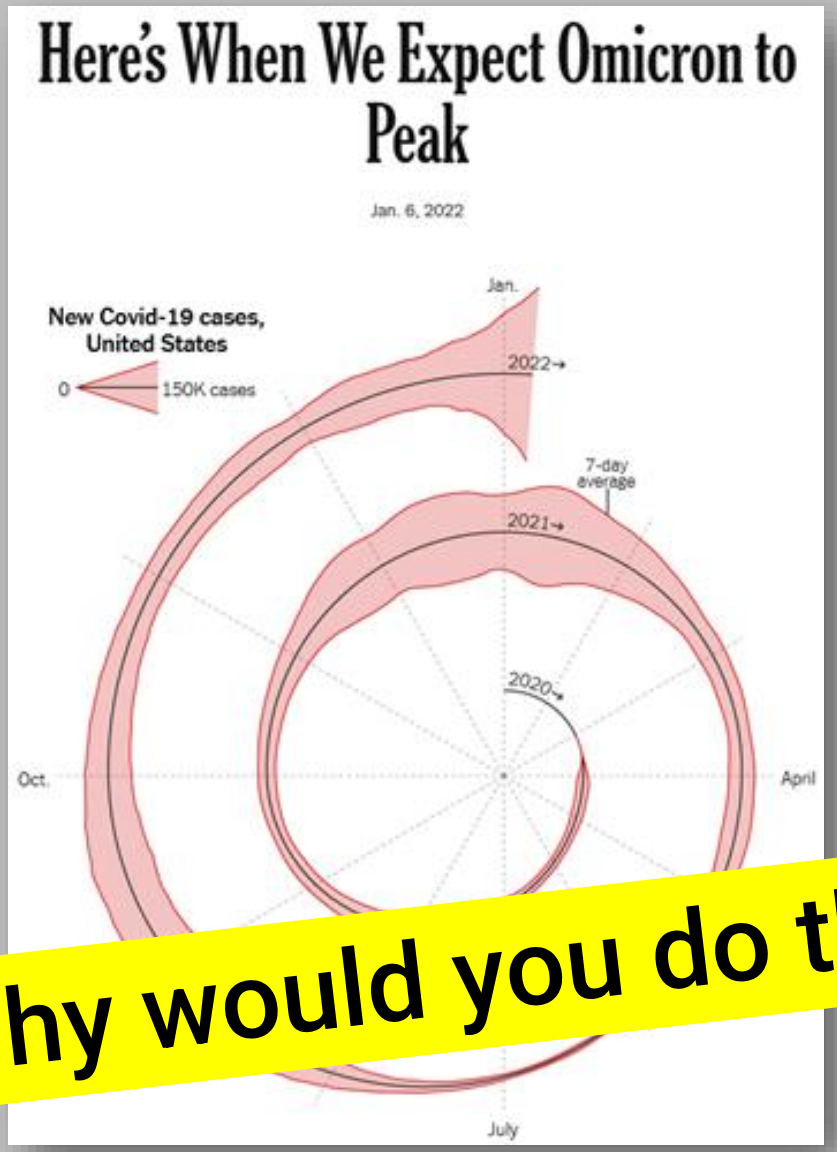


Why would you do this?

New York Times: https://twitter.com/nytopinion/status/1479174216603910144

L

Level of detail?

E

Emotional?

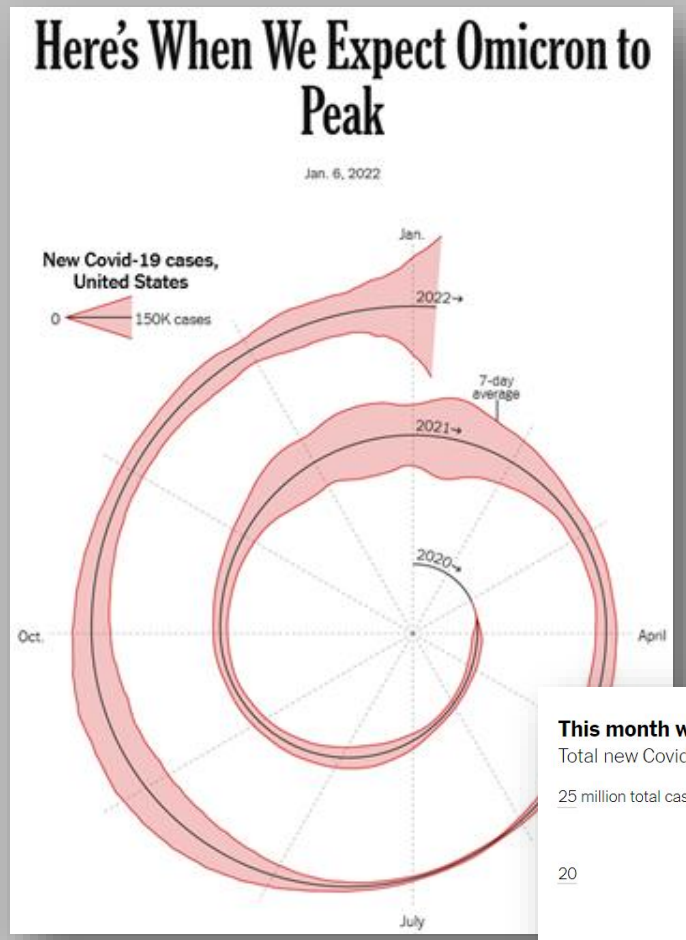
V

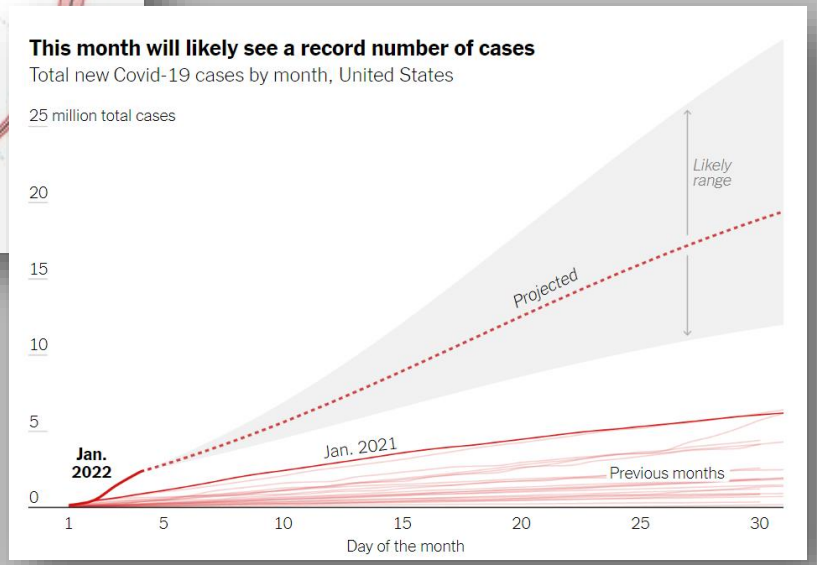
Vagueness?

E

R

S





L Level of detail?

E Emotional?

V Vagueness?

E Exploratory?

R

S

Explore

Explain

Source: Tableau

L Level of detail?

E Emotional?

V Vagueness?

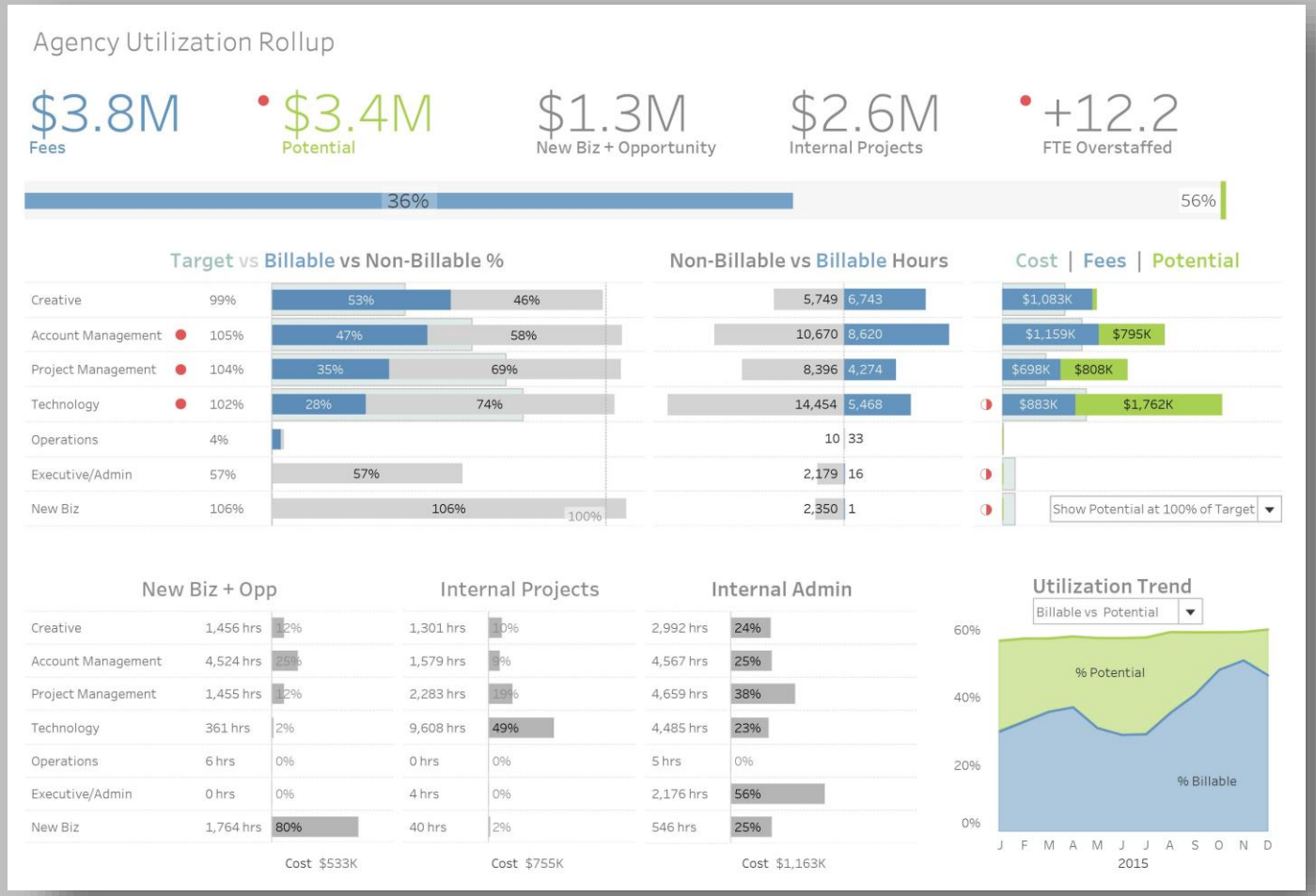
E Exploratory?

R

S

Explore

Explain



Source: Big Book of Dashboards

L

Level of detail?

E

Emotional?

V

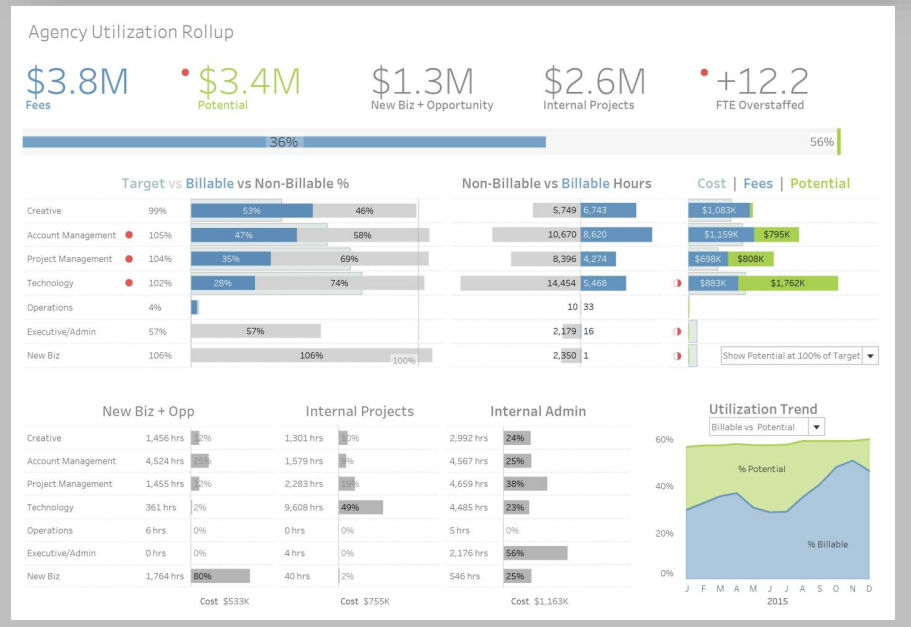
Vagueness?

E

Exploratory?

R

S



L Level of detail?

E Emotional?

V Vagueness?

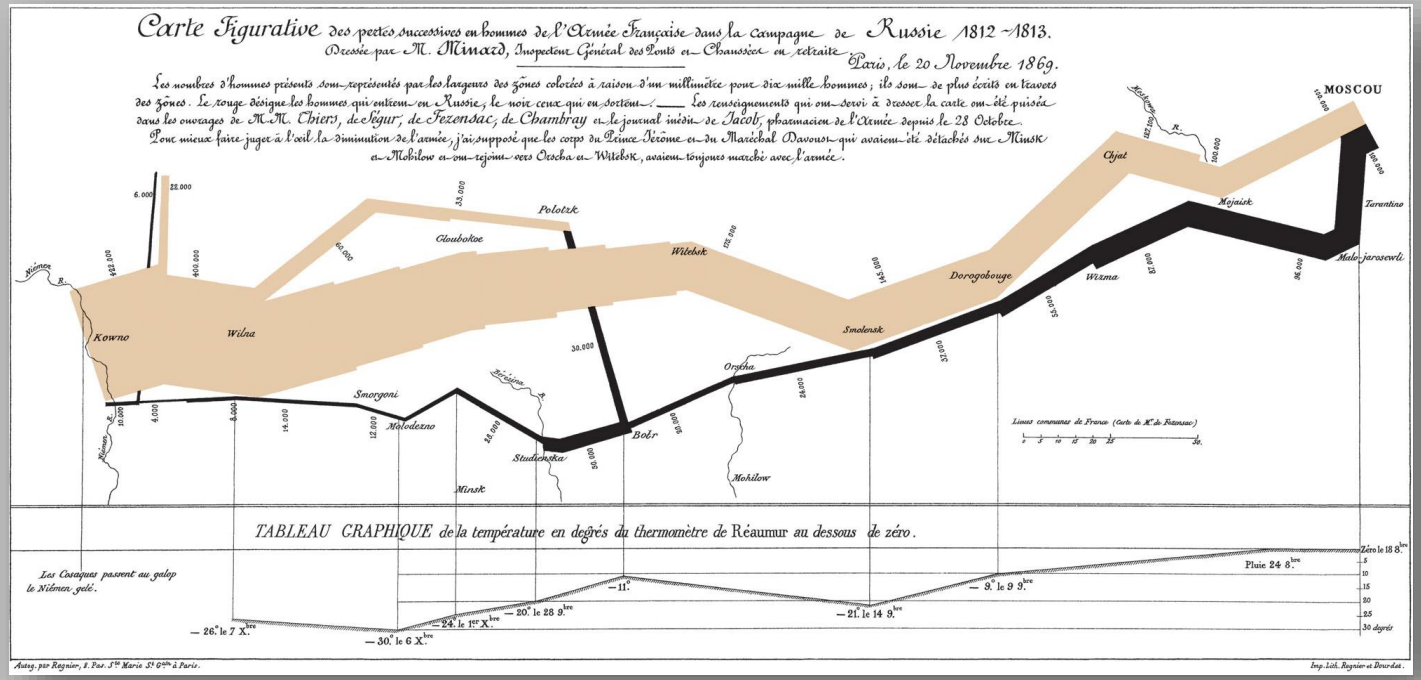
E Exploratory?

R Rapidity?

S

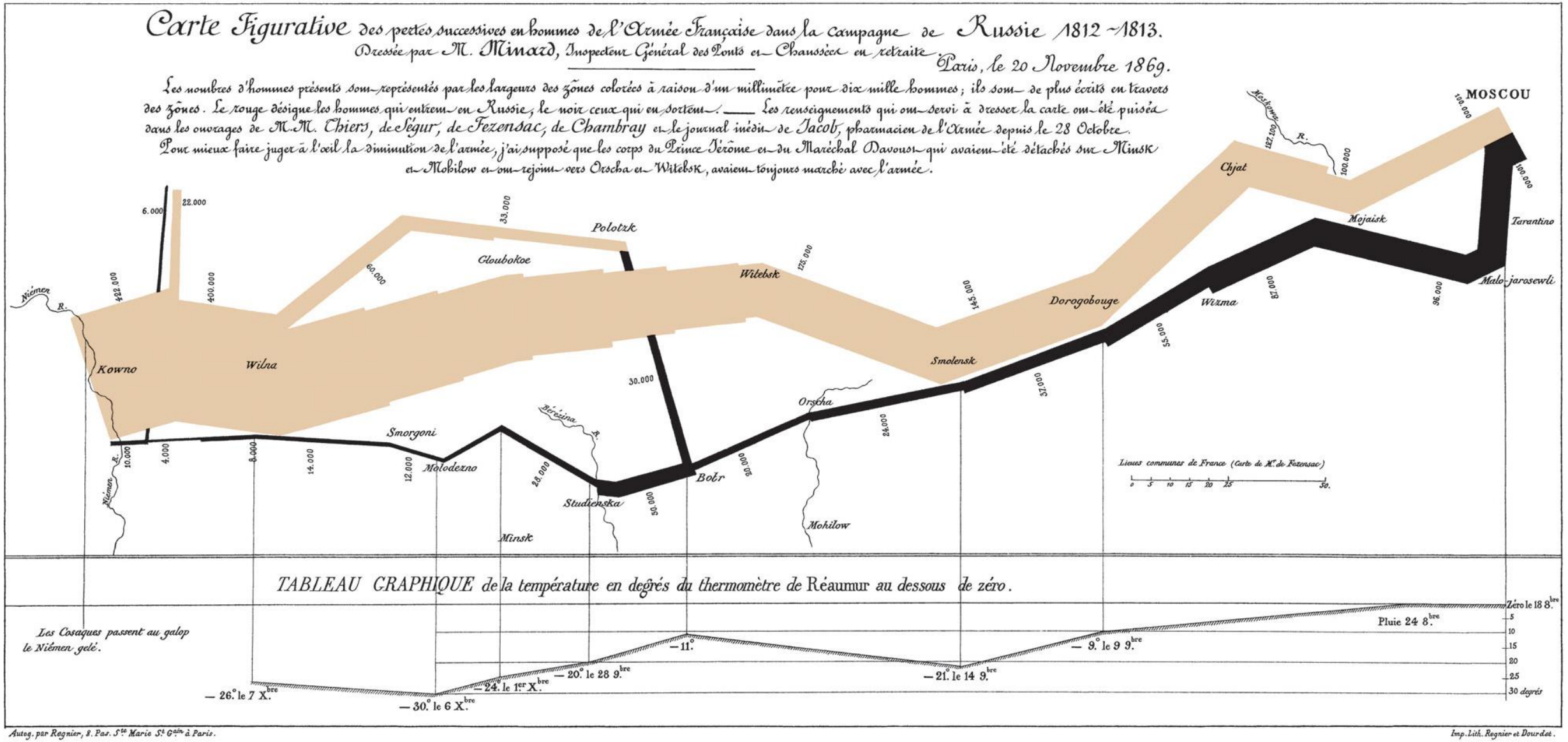
Slow

Fast



Have you seen this chart before?

Source: Wikipedia



Video: tabsoft.co/Minard

Field Marshal
Mikhail Kutuzov

Emperor
Alexander I

Field Marshal
Mikhail Kutuzov

3G 18:12

Alex_1
+7 495 697-03-49

Write message

Emperor
Alexander I

Field Marshal
Mikhail Kutuzov

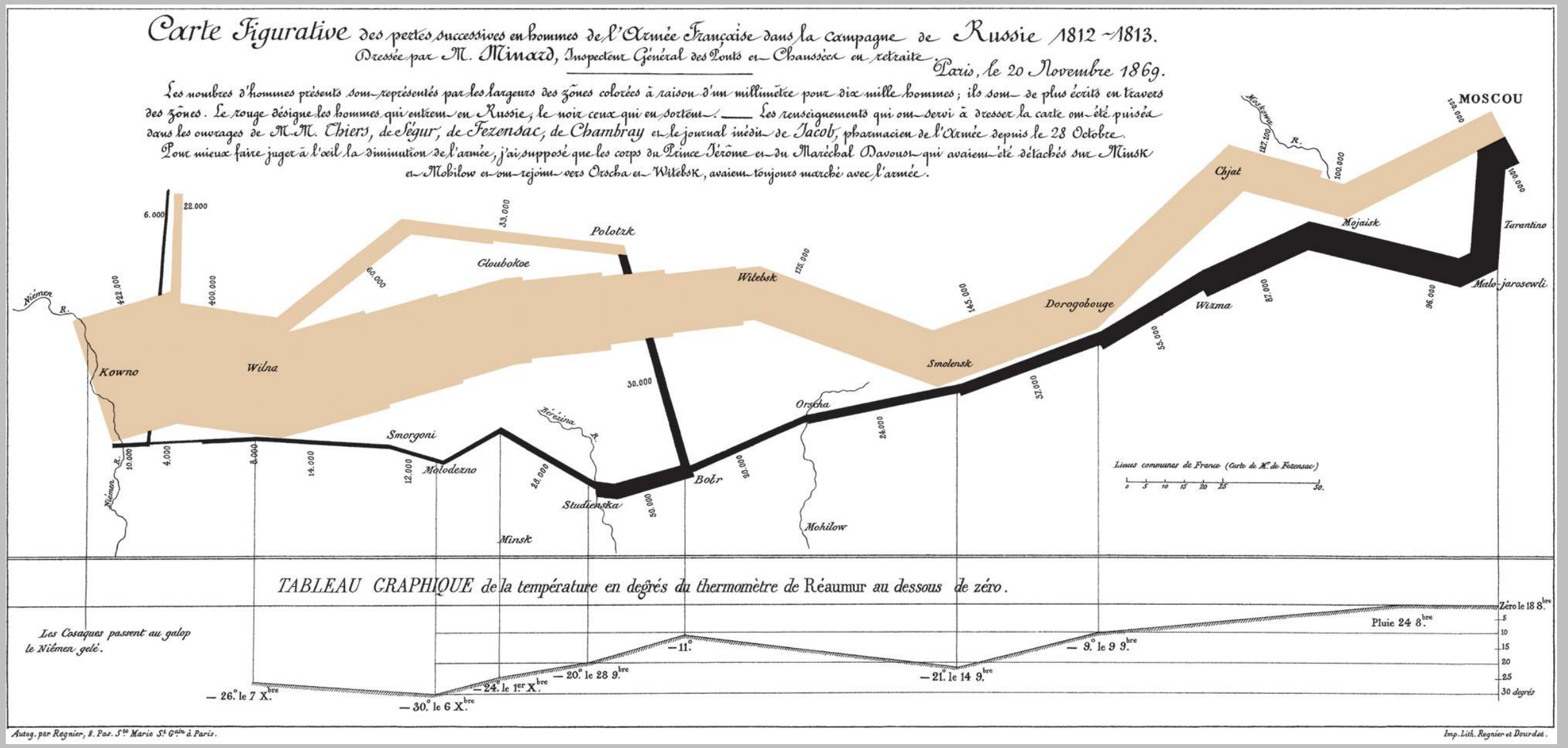
3G 18:12

Alex_1
+7 495 697-03-49

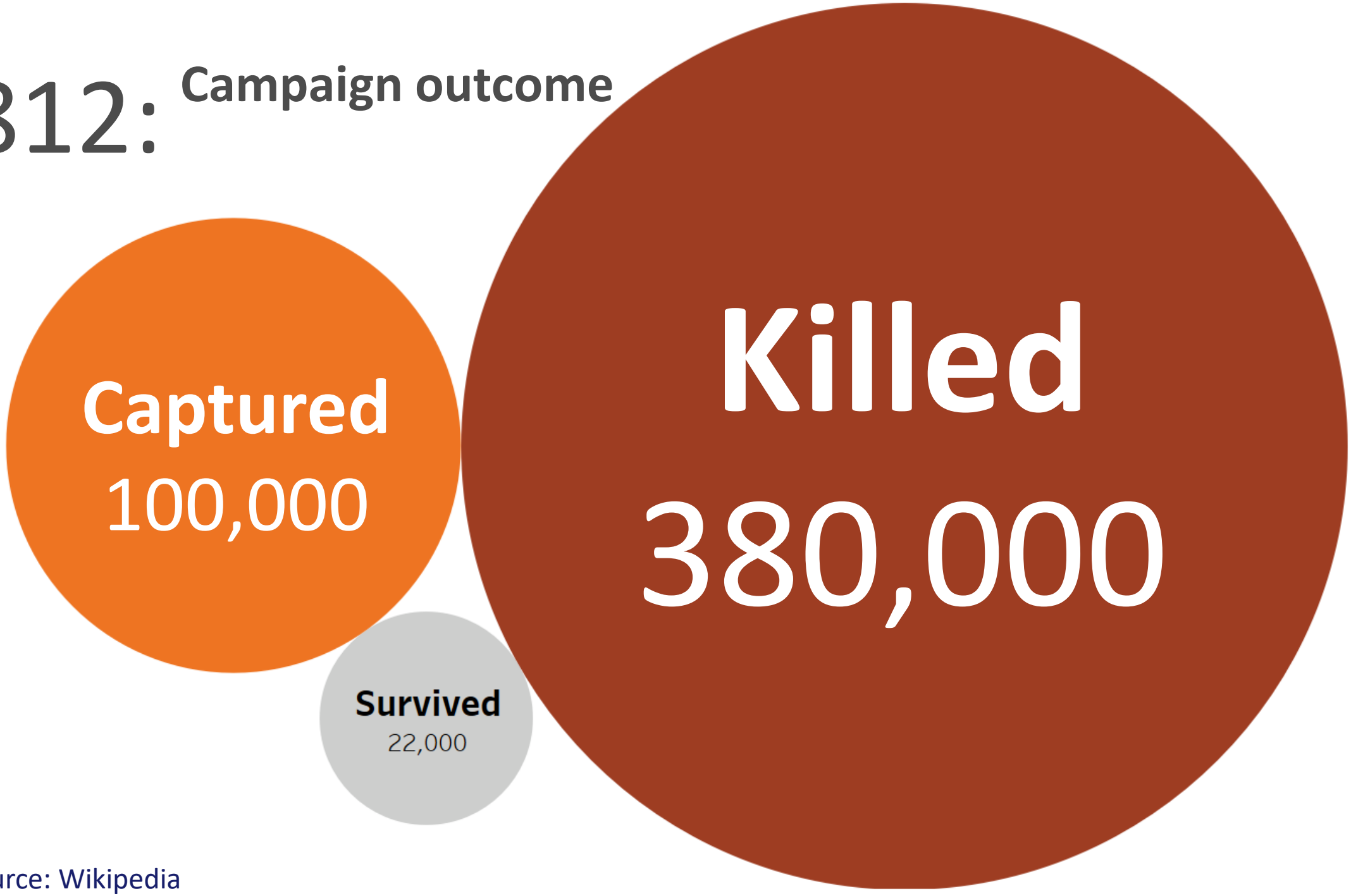
Write message

Emperor
Alexander I

What is the *key* point I need to make?



1812: Campaign outcome



Data Source: Wikipedia

L

Level of detail?

E

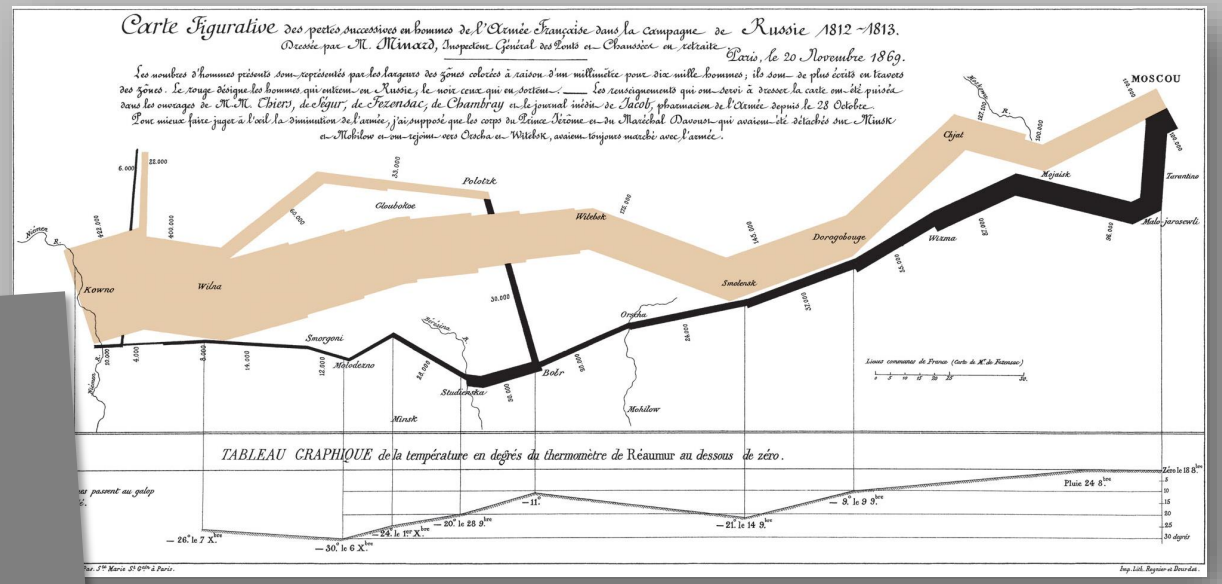
Emotional?

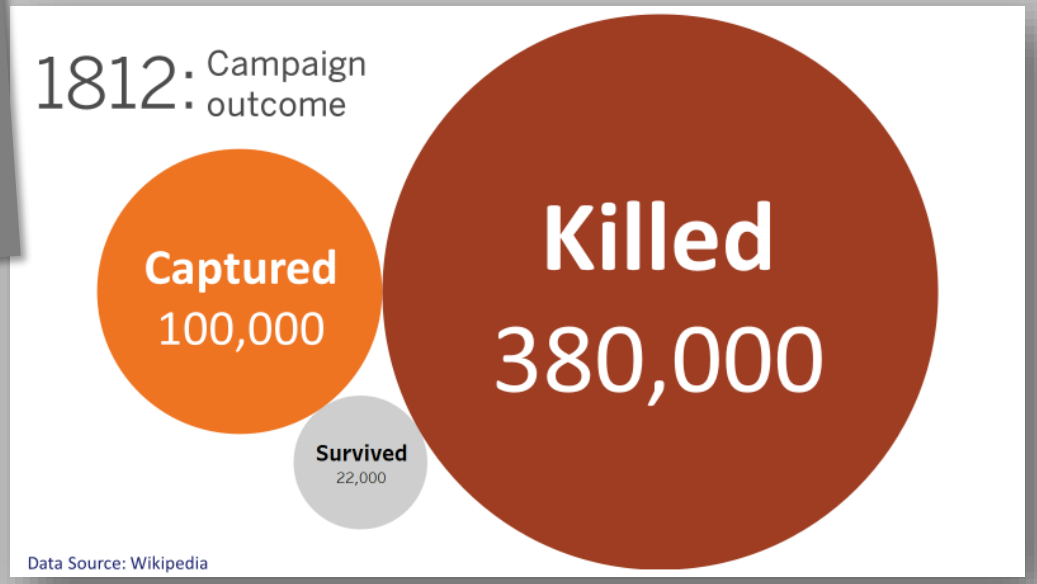
A chart should be understandable in less than half the time it is to be viewed.

R

Rapidity?

S





L Level of detail?

E Emotional?

V Vagueness?

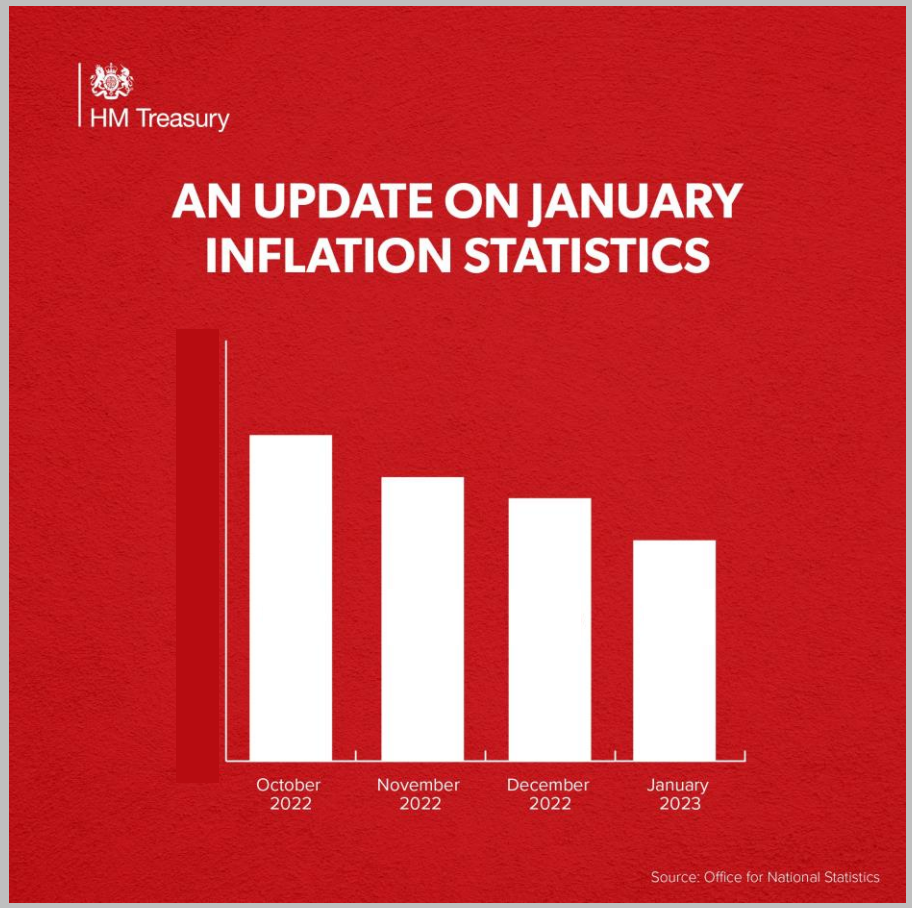
E Exploratory?

R Rapidity?

S Sneakiness?

Honest

Dishonest

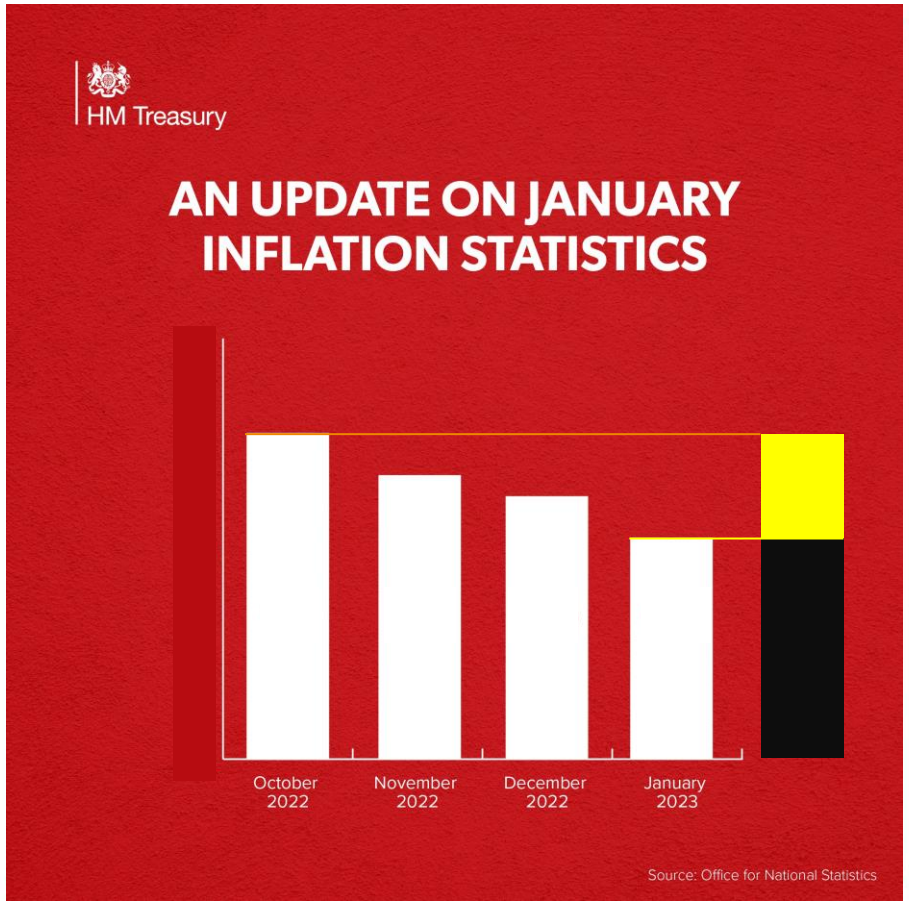


The Sun: https://www.thesun.co.uk/news/22304001/migration-high-brits-paid-benefits/

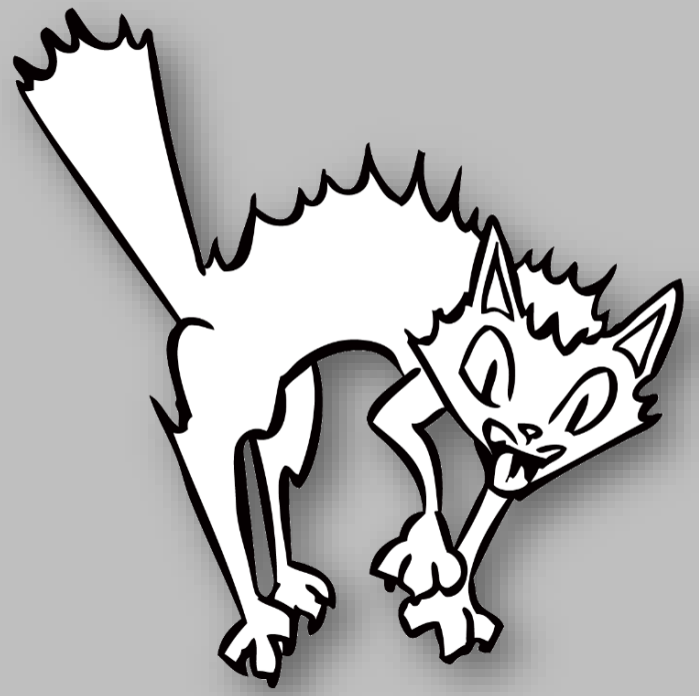
HM Treasury
@hmtreasury

"High inflation strangles growth & causes pain for families & businesses - that's why we must stick to the plan to halve inflation this year, reduce debt & grow the economy."

Chancellor @Jeremy_Hunt responds to statistics from the @ONS which show a fall in inflation.

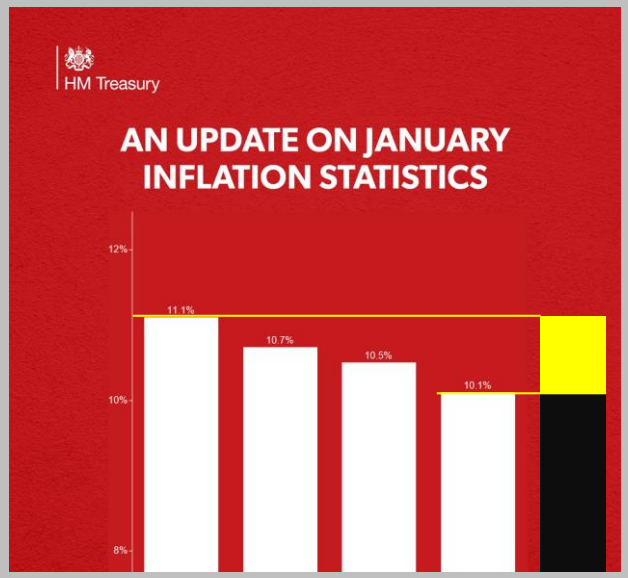


11:58 AM · Feb 15, 2023 · **142.1K** Views

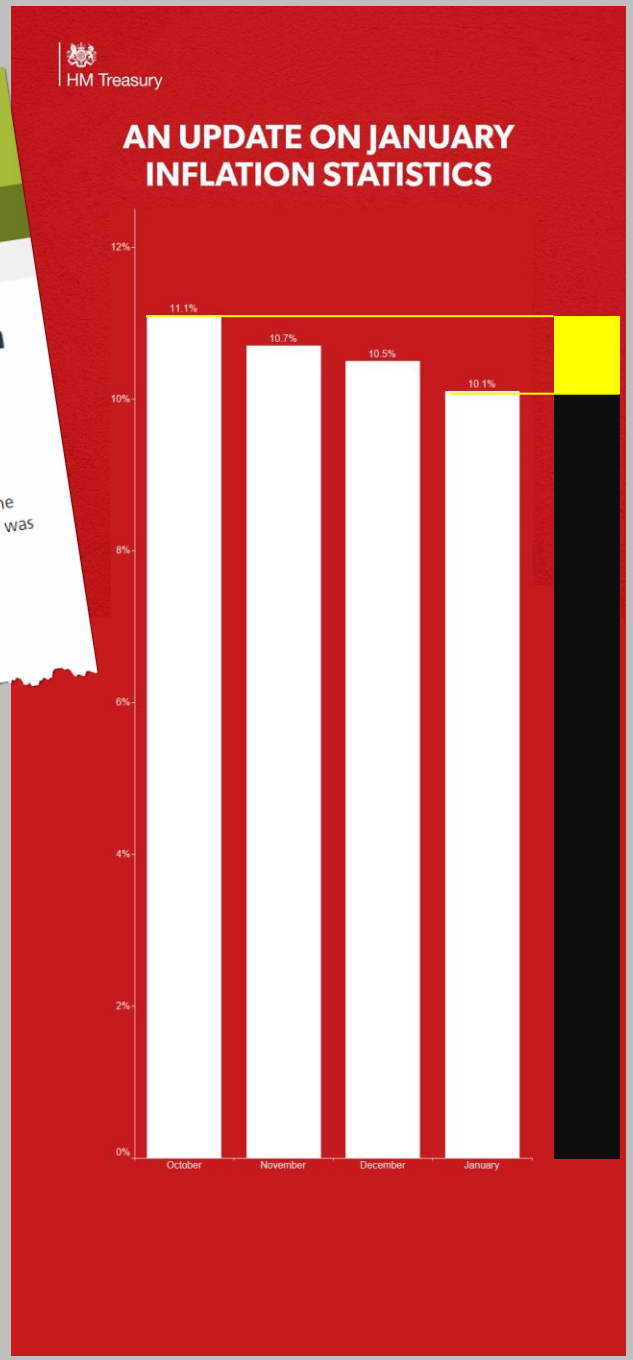


How much has inflation reduced?

https://twitter.com/hmtreasury/status/1625826967688806400



https://twitter.com/hmtreasury/status/1625826967688806400



How much has inflation reduced?

L Level of detail?

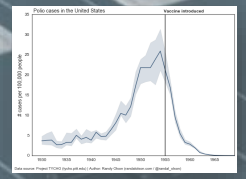
E Emotional?

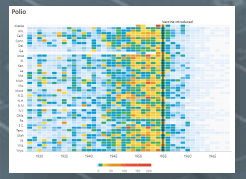
V Vagueness?

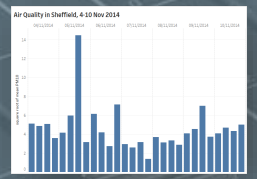
E Exploratory?

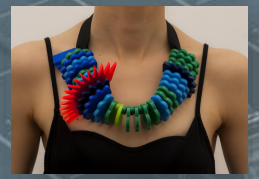
R Rapidity?

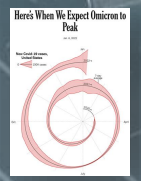
S Sneakiness?

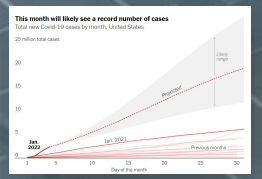


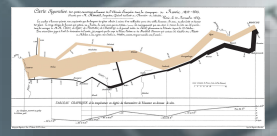


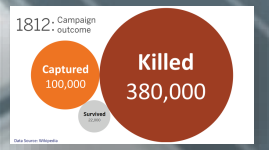


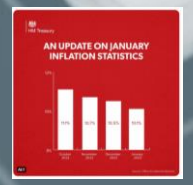












It is ok to push and pull each lever in any direction (except Sneakiness: don't be sneaky!).

You need to be intentional about how you are using them.

Bring it together

Iraq conflict deaths

	2003	2004	2005	2006	2007	2008	2009	2010	2011
January		551	1,215	1,517	2,702	847	359	247	353
February		600	1,254	1,498	2,520	1,032	365	282	222
March	3,981	939	725	1,775	2,571	1,500	415	293	286
April	1,612	1,190	925	1,670	2,411	1,201	525	372	277
May	469	538	1,167	2,108	2,675	818	398	370	330
June	564	792	1,160	2,416	2,024	682	542	349	348
July	573	723	1,435	3,077	2,561	583	400	445	271
August	717	750	2,159	2,664	2,330	616	587	466	376
September	511	901	1,306	2,317	1,310	579	315	238	375
October	466	914	1,161	2,738	1,195	532	418	289	346
November	417	1,446	1,316	2,940	1,025	495	191	267	249
December	473	996	1,002	2,786	944	550	445	206	
Grand Total	9,783	10,340	14,825	27,506	24,268	9,435	4,960	3,824	3,433

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Iraq conflict deaths

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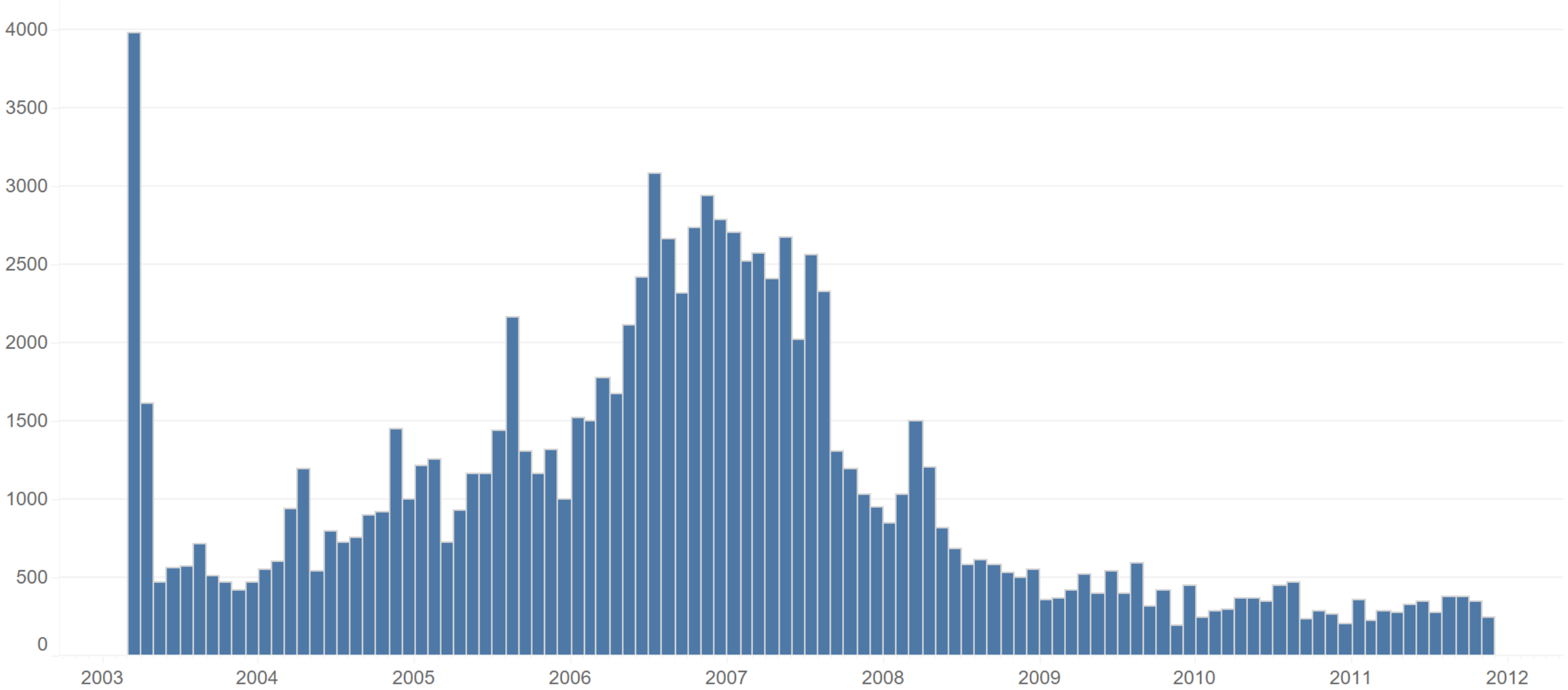
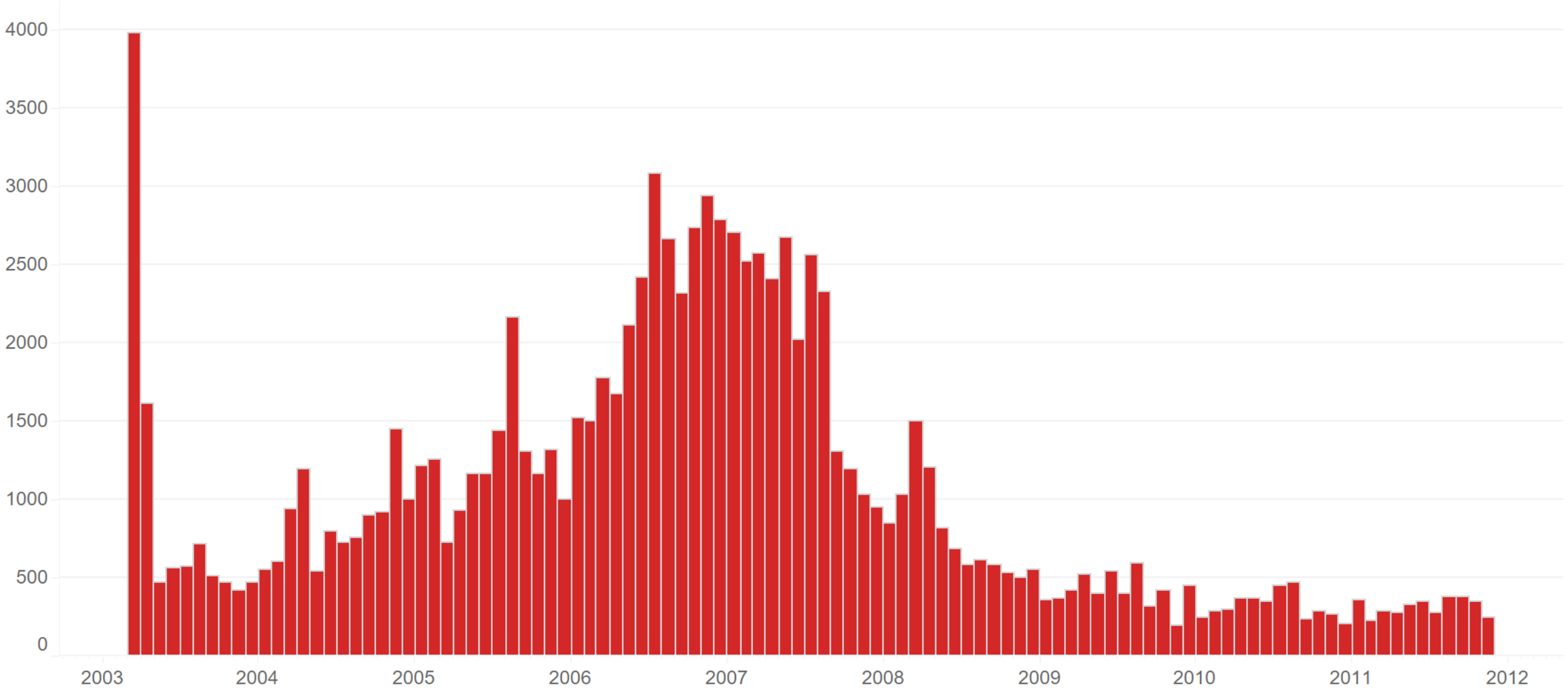
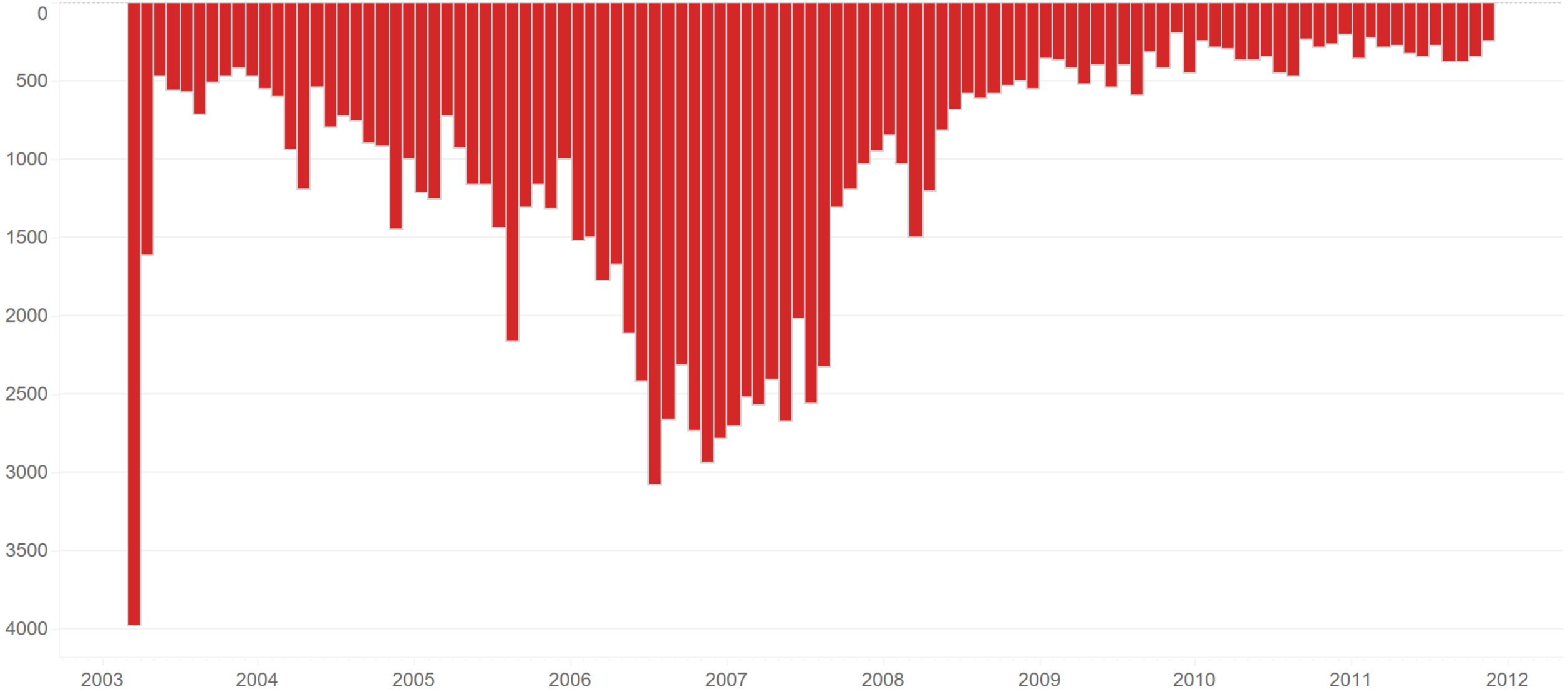
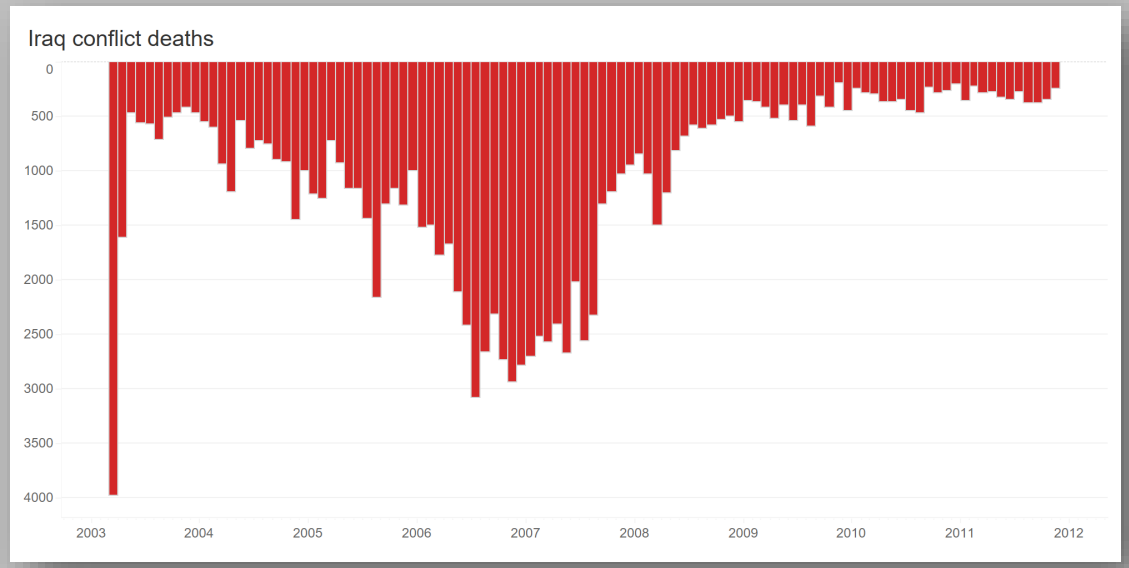


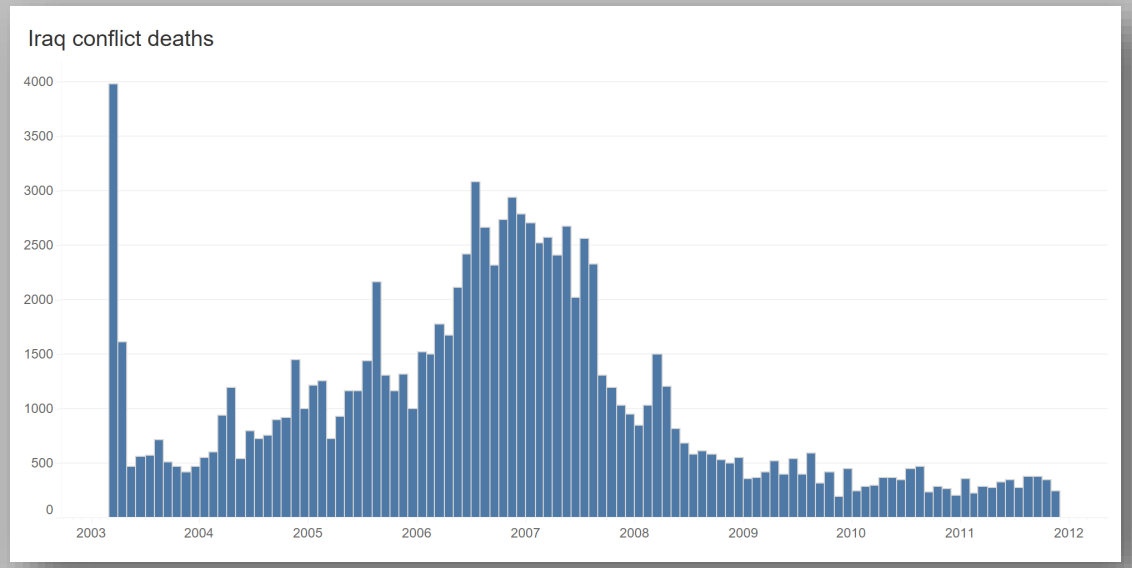
Iraq conflict deaths



Iraq conflict deaths




Iraq conflict deaths
0
500
1000
1500
2000
2500
3000
3500
4000
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012


Iraq conflict deaths
4000
3500
3000
2500
2000
1500
1000
500
0
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

Iraq's Bloody Toll

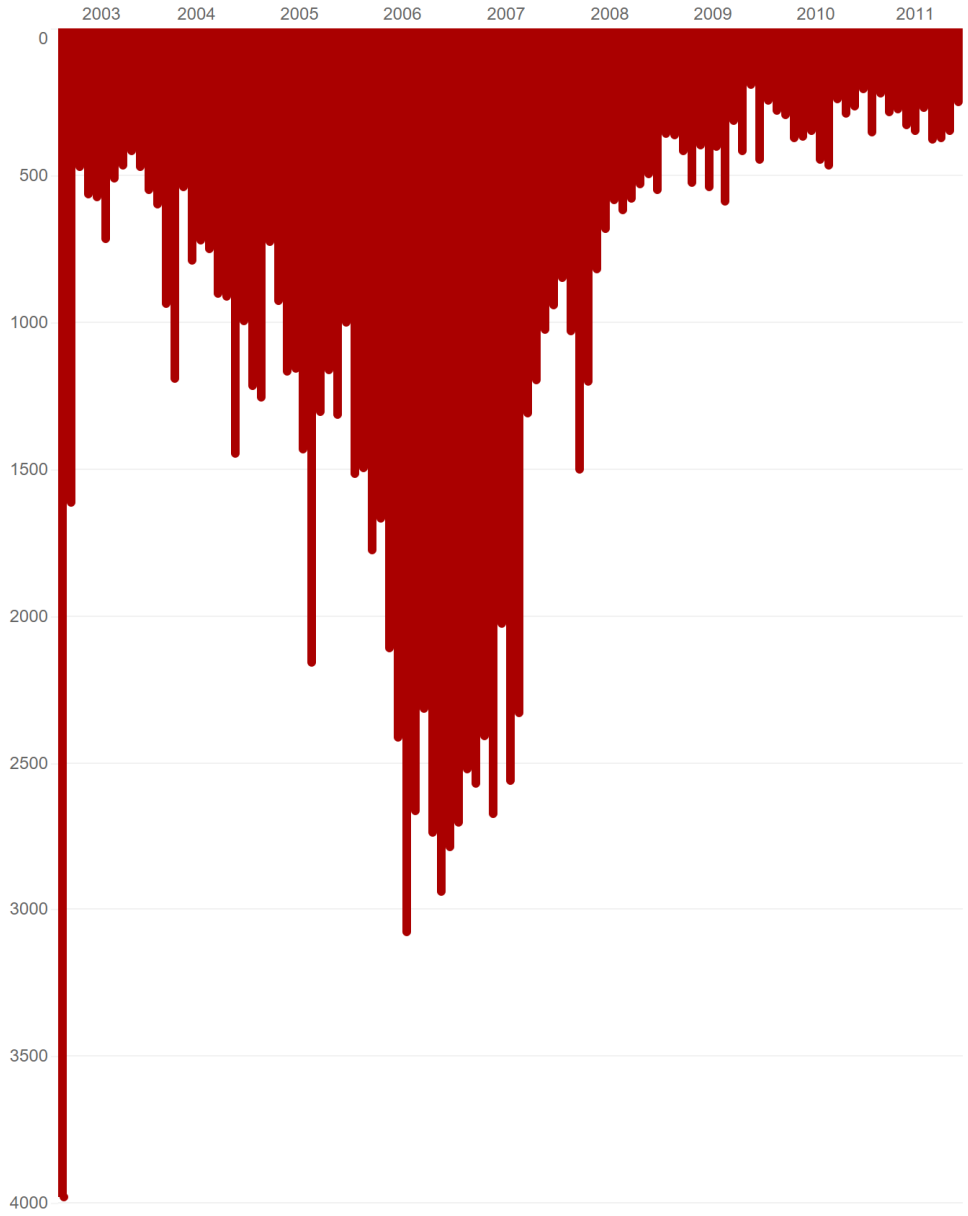
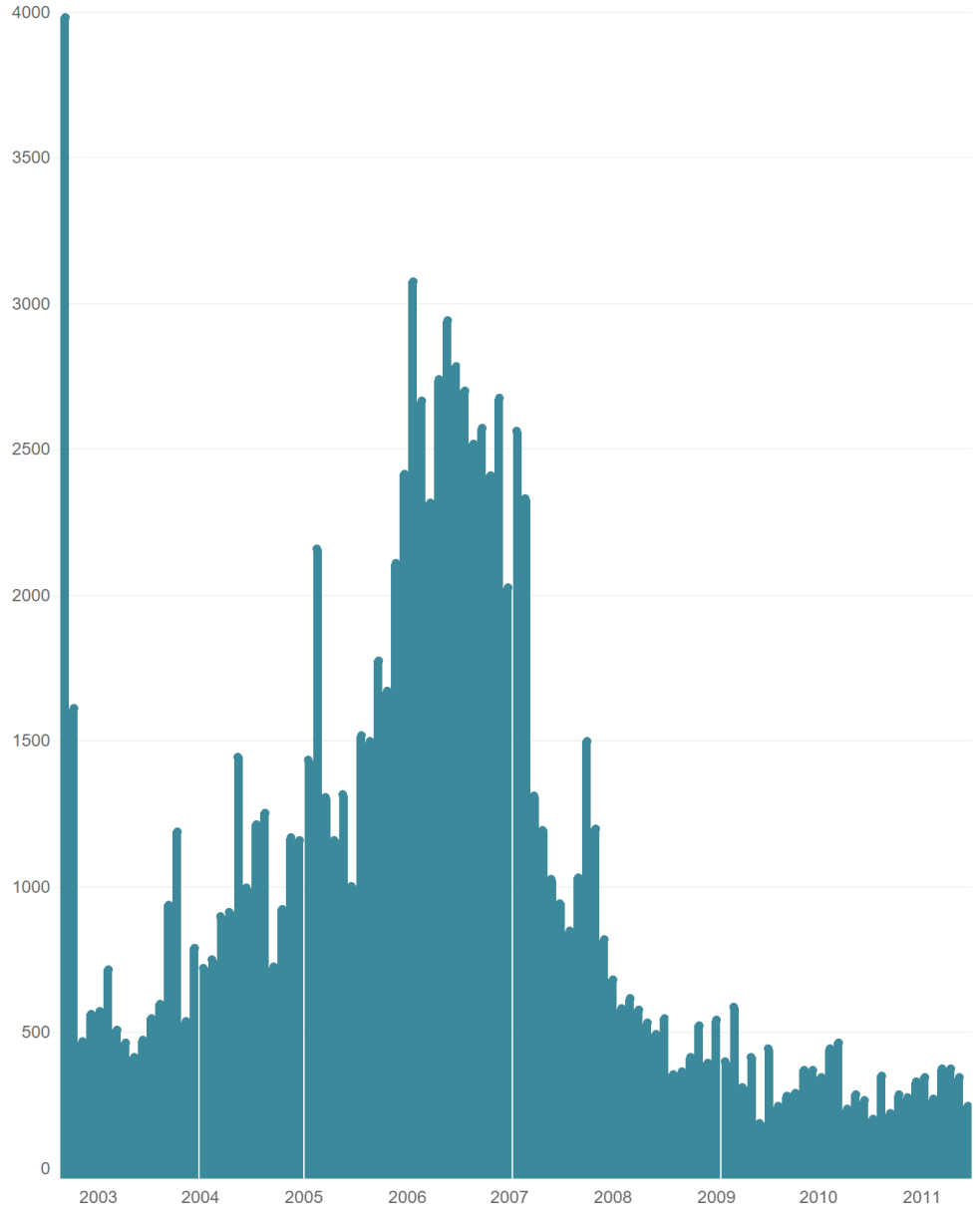


Chart shows monthly documented deaths caused by violence in Iraq, 2003-2011.
Design by Andy Cotgreave. Inspired by Simon Scarr, South China Morning Post. Data Source: Iraq Body Count.

Iraq: Deaths on the Decline



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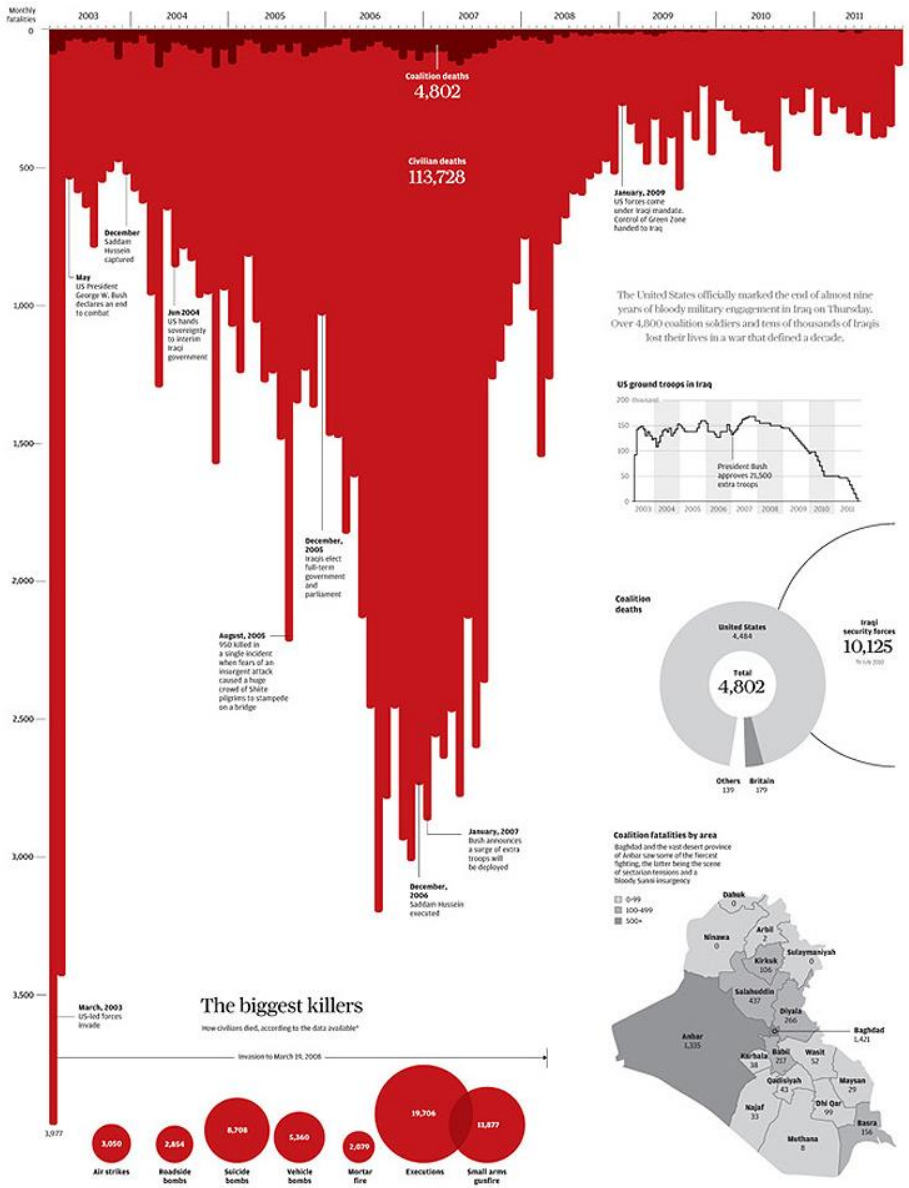
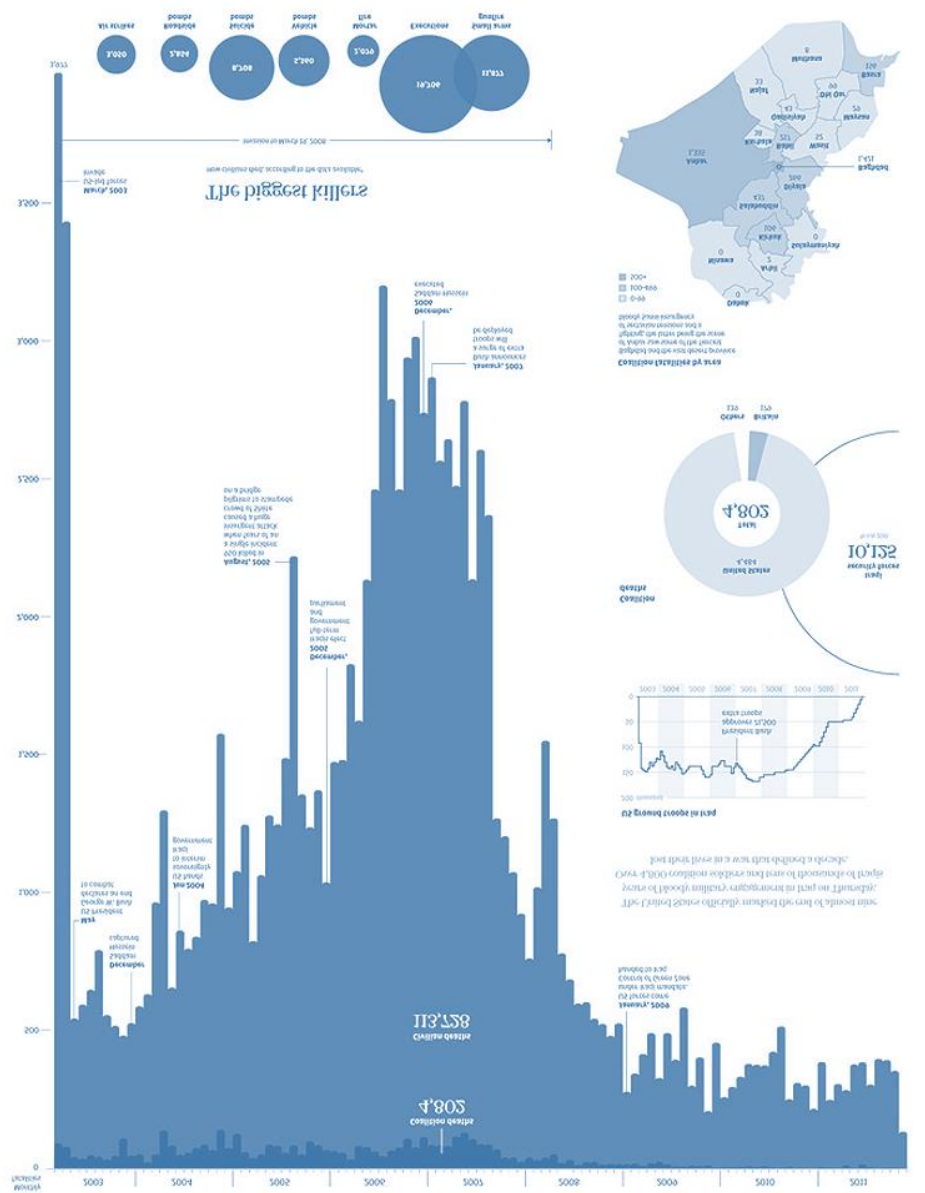
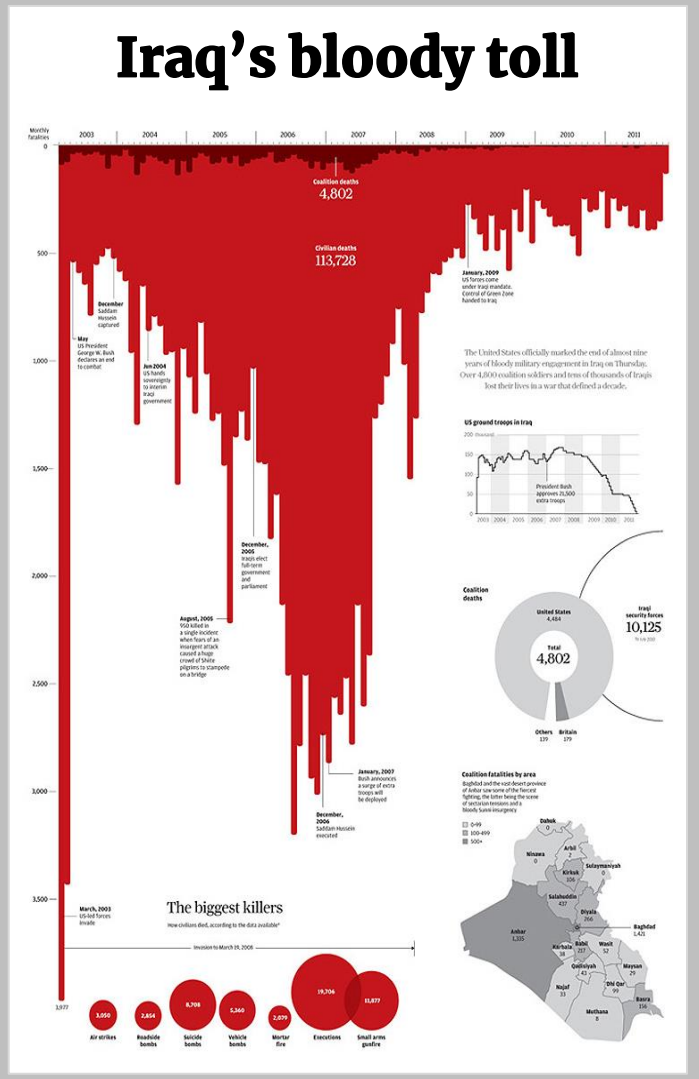
Iraq’s bloody toll

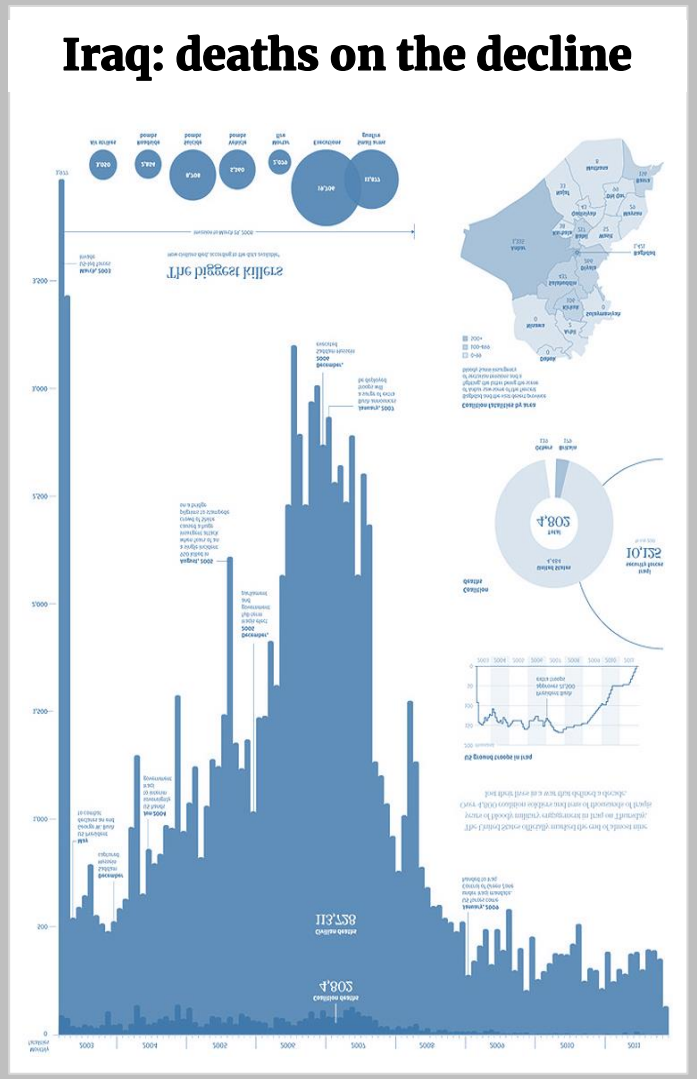


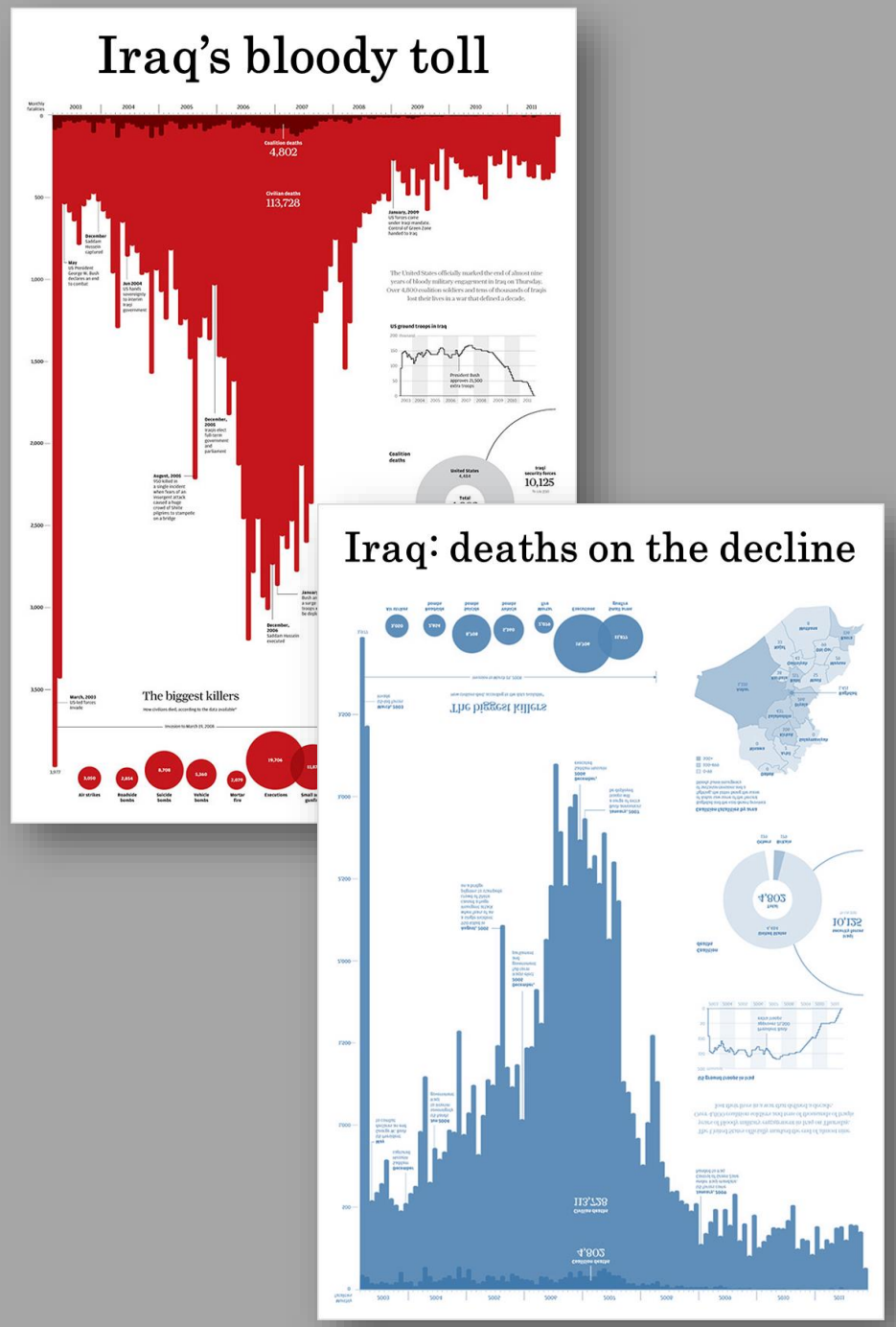
Iraq: deaths on the decline



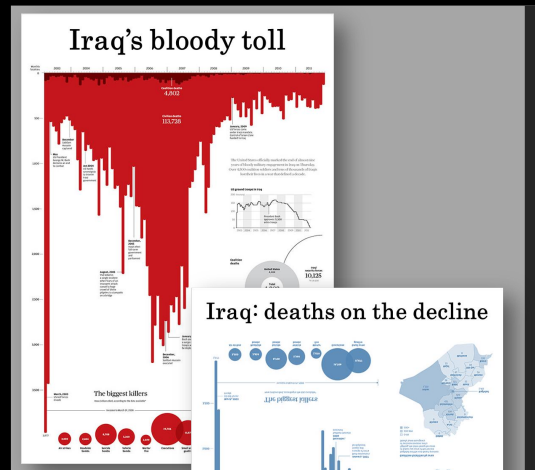
How were the levers applied?







Data visualization **is not neutral**; every element is a **choice**, every choice an **opinion**.



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Thank you

Sign up to my newsletter:

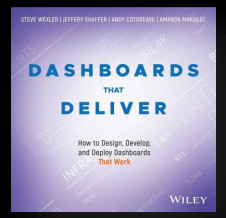

CHART CHAT

Andy Cotgreave