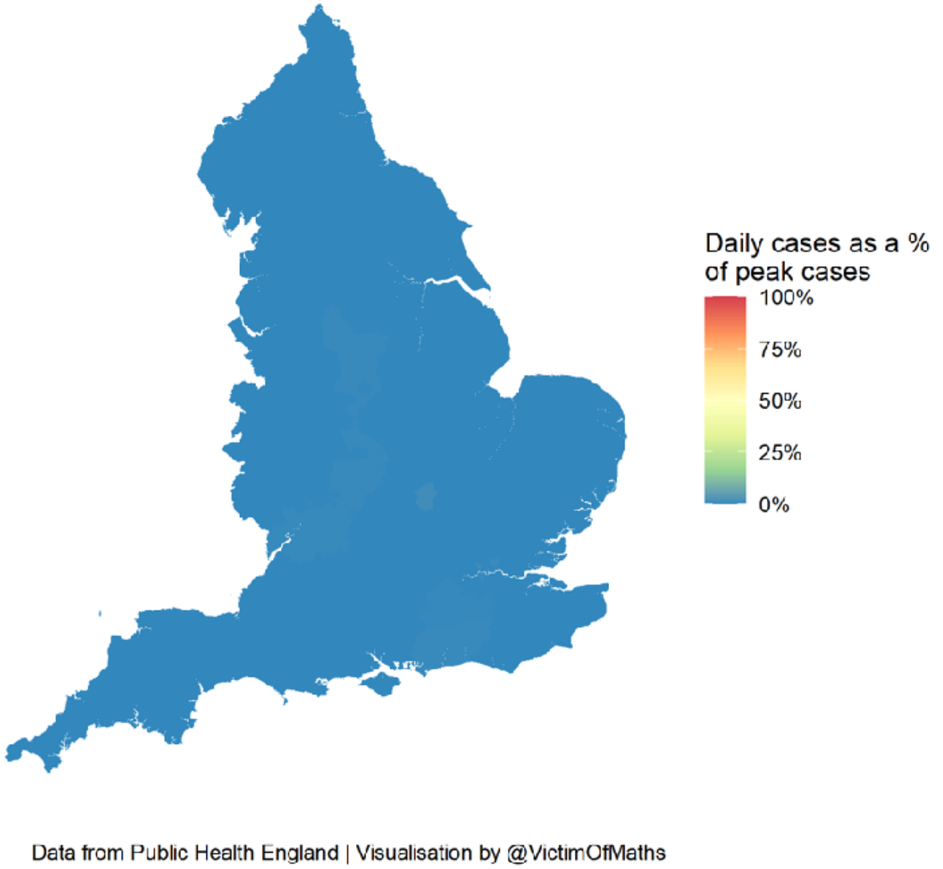
Glyphmaps for analysing the scale and temporal spread of Covid-19 case data

— http://www.roger-beecham.com/covid-19-datavis/

Roger Beecham, Layak Hama, Nik Lomax, Jason Dykes

Visualising the spread of the pandemic across England

Rolling 5-day average number of new confirmed cases coloured relative to the peak in each Local Authority (i.e. dark red represents the peak of new cases).
Date: 2020-02-26

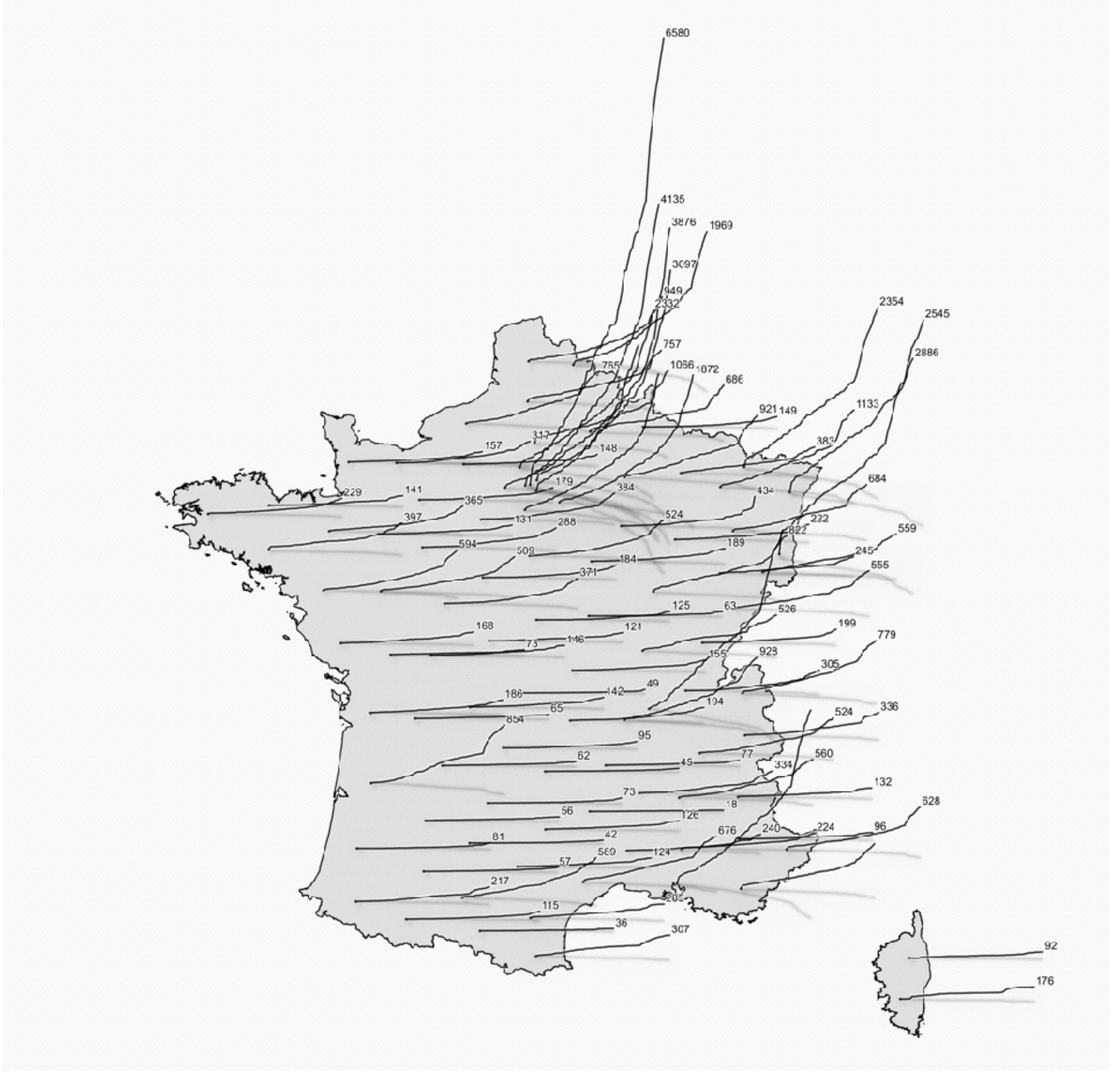


There are obvious cognitive and perceptual limits that must be understood …[in]… map design….[E]xceeding these limits — which is easty to do with today's massive and complex dataset coupled with powerful computer graphics card — is likely to leave the user frustrated or unsure what they have seen.

There is a fine amount of information the user can distil from the animation and store in their short-term visual memory.

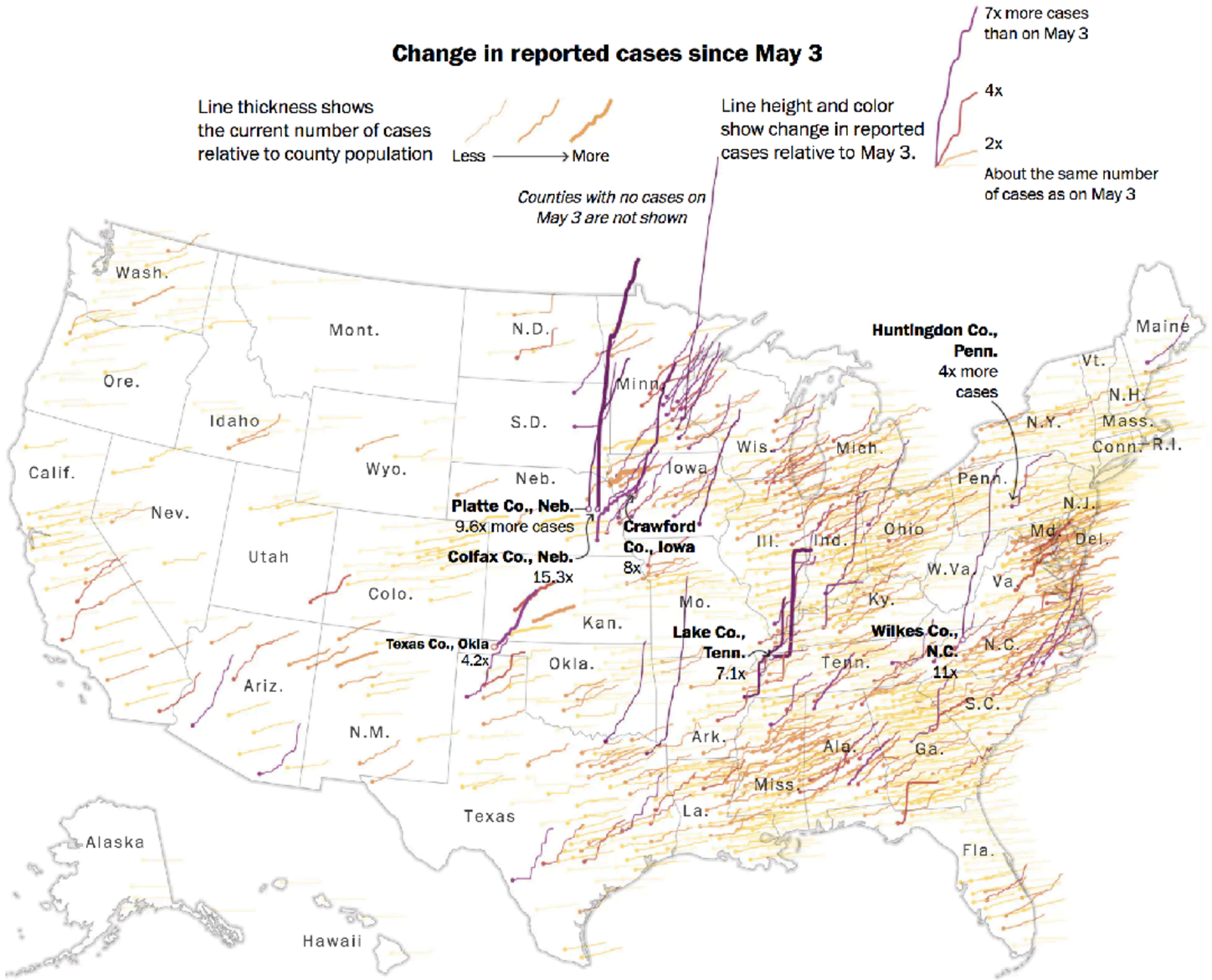
Harrower & Fabrikant 2008
The role of map animation in geovisualization

Mathieu Rajerison



Mathieu Rajerison

Glyphmaps —
Wickham H. et al. (2012) Glyph-maps for visually exploring temporal patterns in climate data and models. *Environmetrics*, 23(5):382–393, 2012



Reis Thebault and Abigail Hauslohner

The Washington Post

GOV.UK
Coronavirus (COVID-19) in the UK

Last updated on Sunday 6 September 2020 at 3:56pm

- UK Summary
- Testing
- Cases
- Healthcare
- Deaths

- About the data
- Developer's guide

UK Summary

Testing

More on testing

Testing capacity (all pillars)
369,937

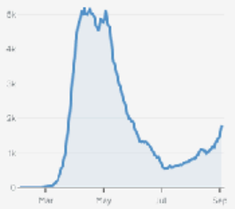
Testing capacity (pillars 1, 2 & 4)
249,937

Tests processed

Daily	Total
175,687	17,619,897

Cases

More on cases



People tested positive

Daily	Total
2,988	347,152

Data Item 1

Geography – case numbers by area displayed with a geo-spatial arrangement.

Data Item 2

Absolute number – of cases by area.

Data Item 3

Relative number – of cases by area, for example expressing case numbers as a share of population size.

Data Item 4

Rate of change – the extent to which growth in cases by area is speeding-up or slowing-down.

Data Item 5

Time elapsed – against an absolute or relative start point in time.

Data Item 6

Case history – cases numbers by areas either continuously (daily case releases) or at specific milestones in the disease trajectory.

Data Item 7

Cases relative to local 'peak' – whether the daily growth in case numbers at a time point by area has reached its fastest recorded growth rate.

Data requirements

Data Item 1
Geography

Data Item 2
Absolute number

Data Item 3
Relative number

Data Item 4
Rate of change

Data Item 5
Time elapsed

Data Item 6
Case history

Data Item 7
Cases relative to local ‘peak’

Data requirements

Design requirements

Design Requirement 1

Concurrent : all data items must be shown simultaneously

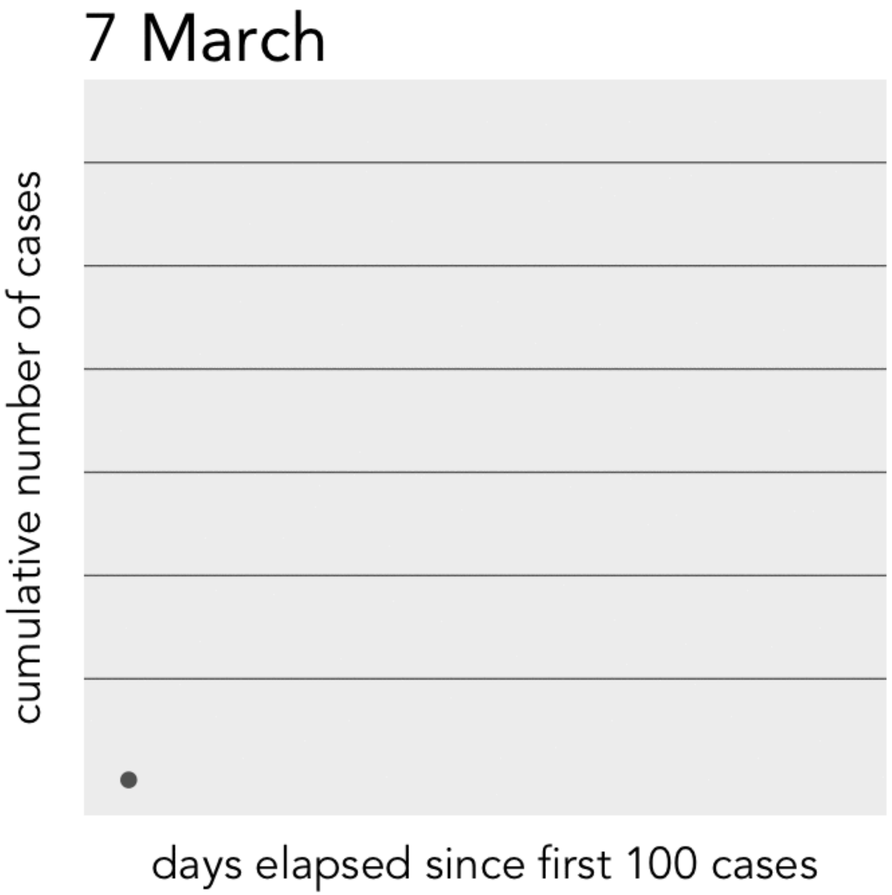
Design Requirement 2

Discernible : all marks must be discernible (no occlusion)

Design Requirement 3

Prioritised : things that are more important must be more salient

ridge contours



lines

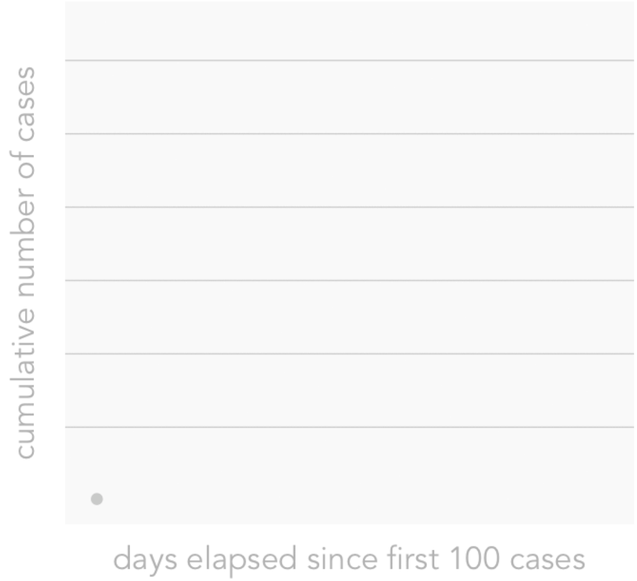
7 March

7 March

height	height	Data Item 2 **Absolute number**
milestone density	slope gradient	Data Item 4 **Rate of change**
width	width	Data Item 5 **Time elapsed**
milestones contours	slope shape	Data Item 6 **Case history**

7 March

7 March



Data Item 1
Geography

Data Item 3
Relative number

Data Item 7
Cases relative to local ‘peak’

Data Requirement 1
concurrent

height

milestone density

width

milestones contours

height

slope gradient

width

slope shape

Data Item 2
Absolute number

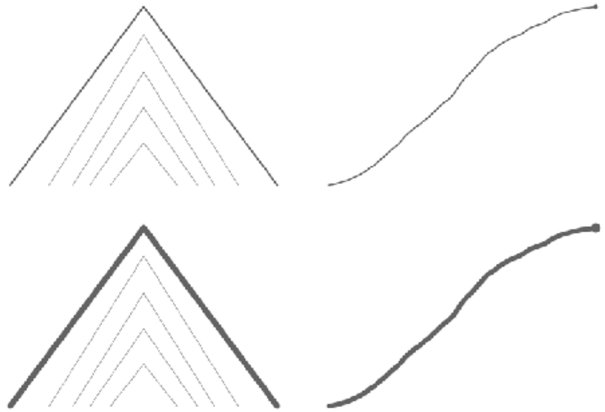
Data Item 4
Rate of change

Data Item 5
Time elapsed

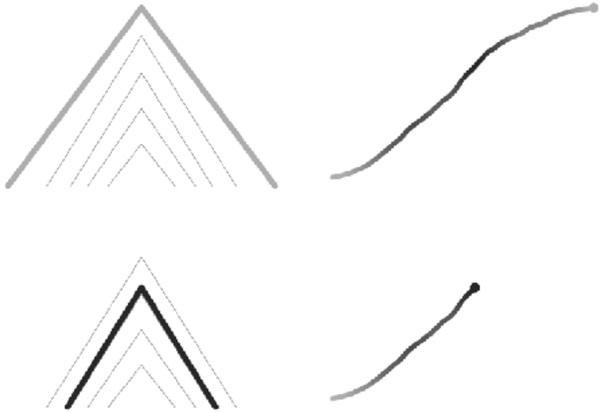
Data Item 6
Case history

increasing density

thickness : relative cases
--cases per 100k residents



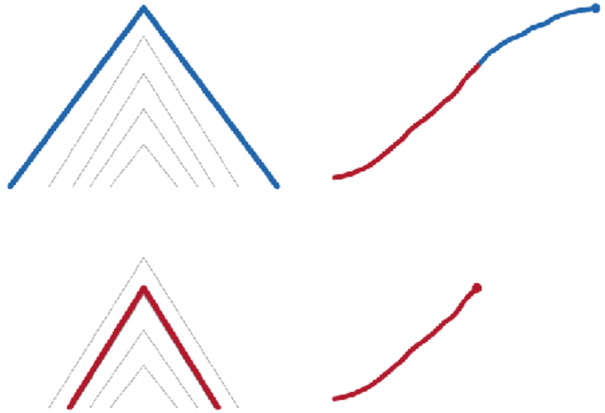
colour value : distance from local peak
--7 day rolling new cases



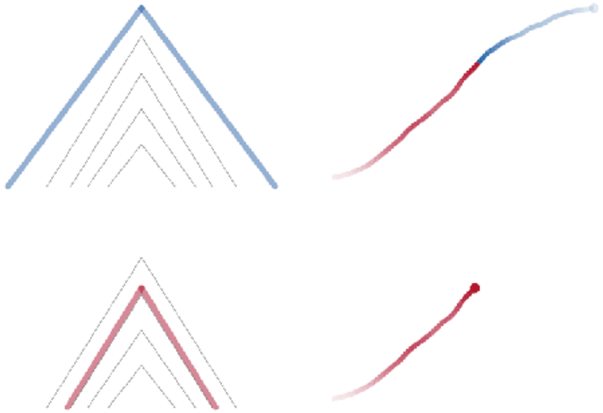
Data Item 3
Relative number

Data Item 7
Cases relative to local ‘peak’

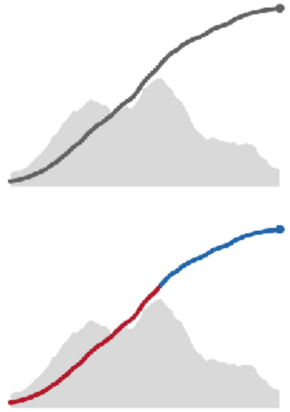
colour value : distance from local peak
--7 day rolling new cases



colour value + hue : distance from and whether local peak i
--7 day rolling new cases



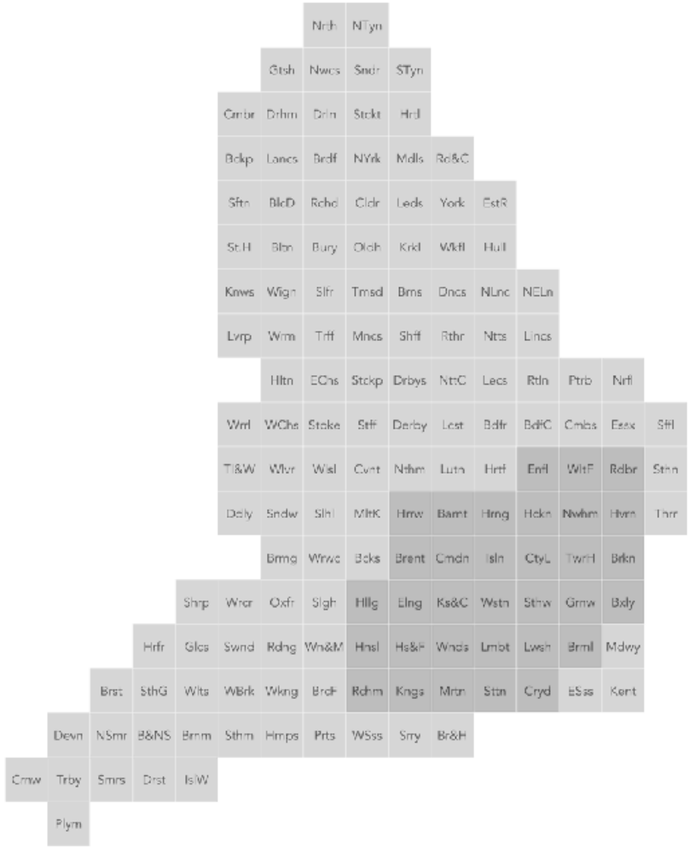
superimposing views :
--cumulative cases (line) I 7-day rolline cases (area)



Data Item 1
Geography

real

cartogram



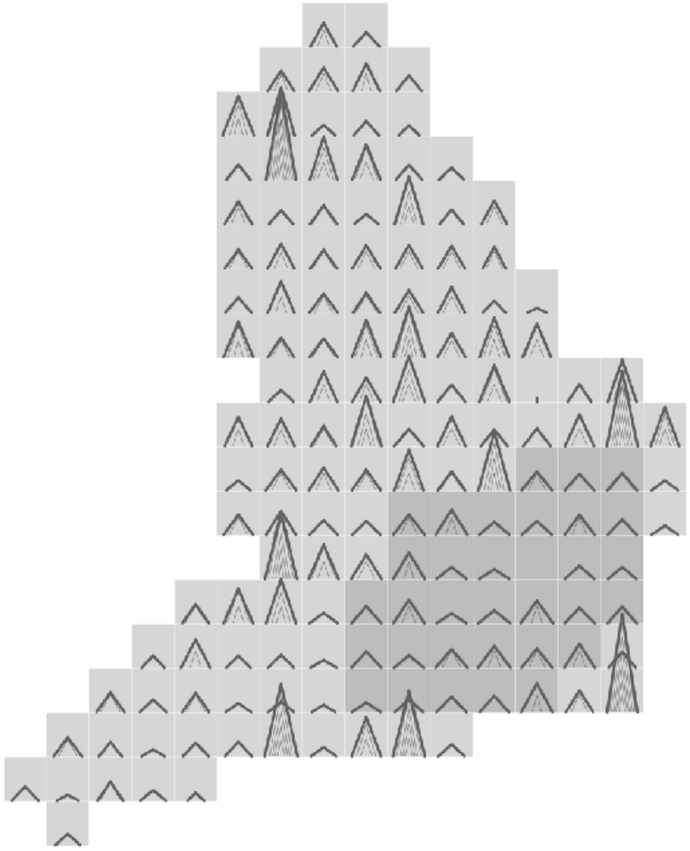
smwg

Design Requirement 2

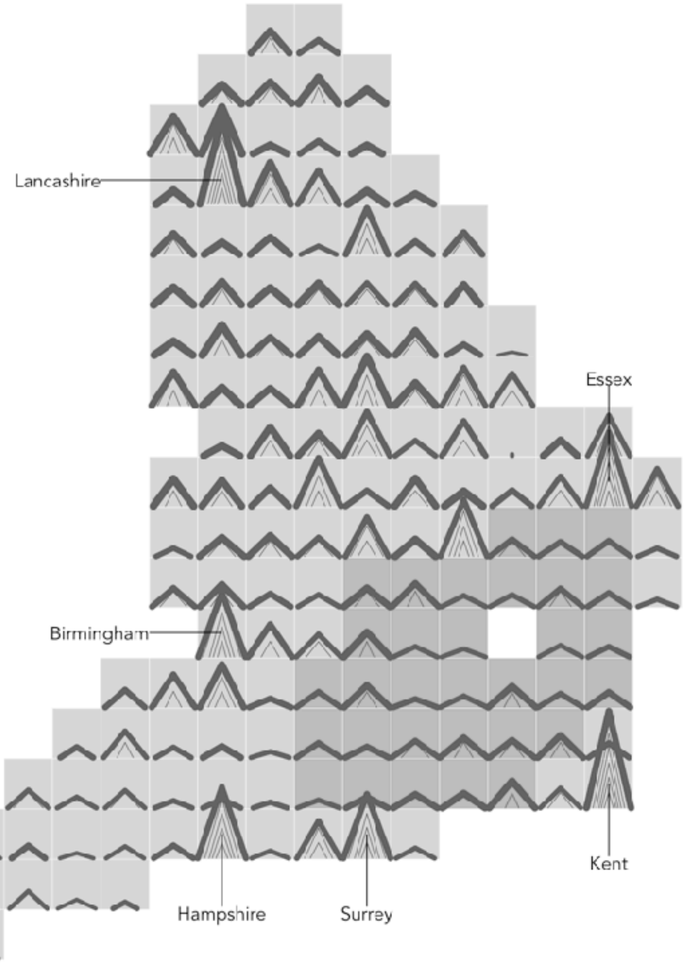
Discernable (no occlusion)

real

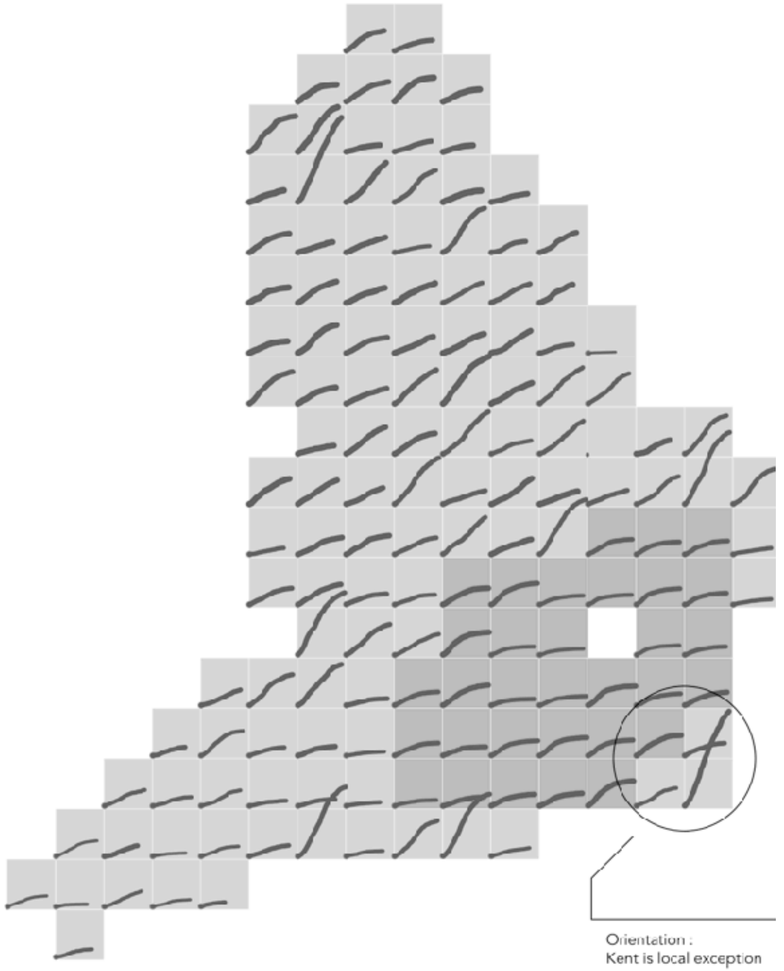
cartogram



smwg

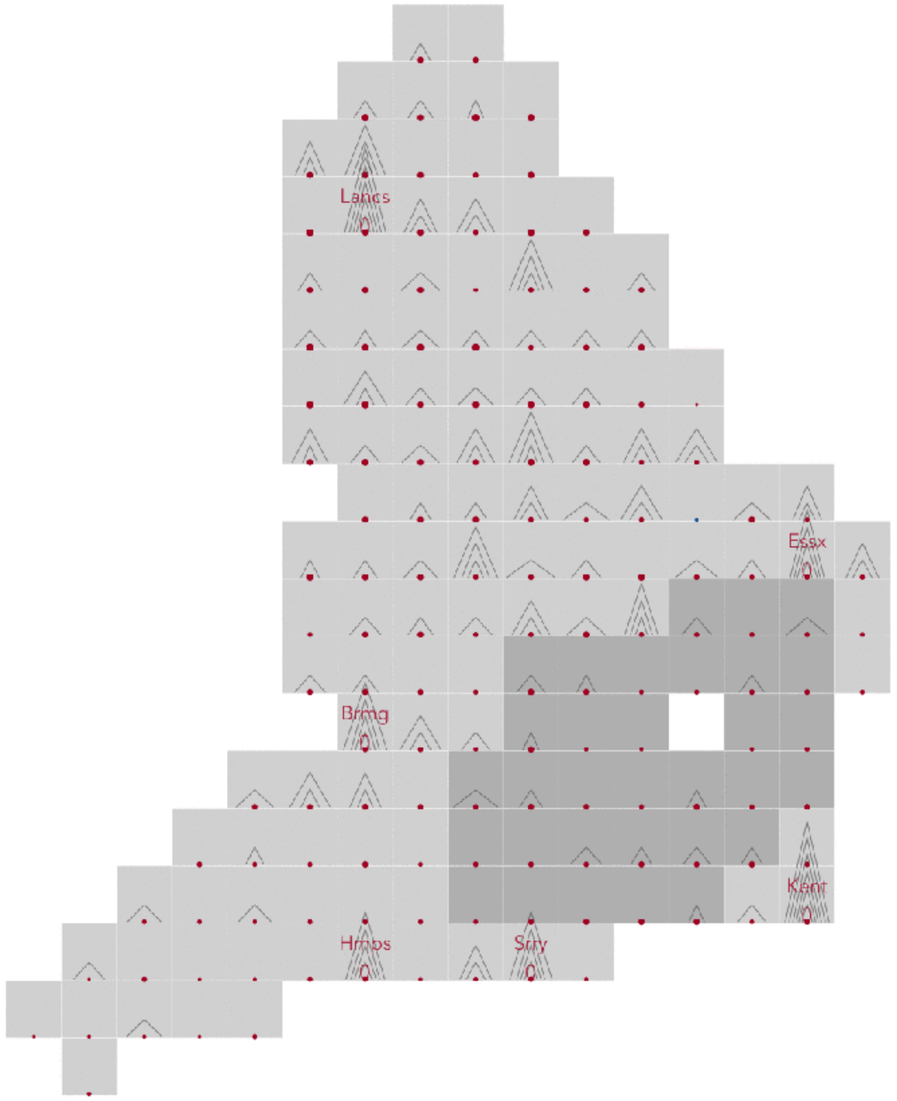

Lancashire
Essex
Birmingham
Kent
Hampshire
Surrey


HEIGHT
cum
cases
1300
3300
5250
WIDTH
days
since
100
cases
16
39
62
THICKNESS
cases
100k
population
170
430
690

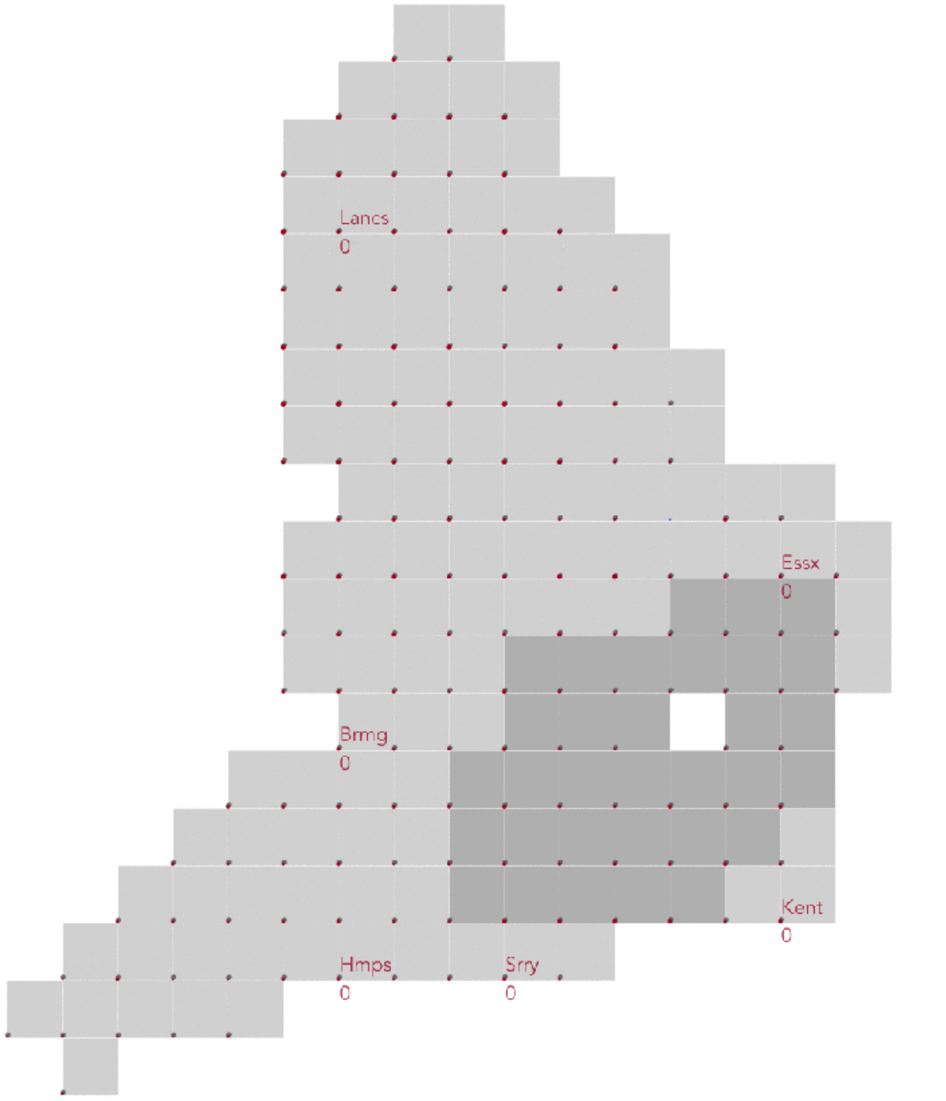

Orientation :
Kent is local exception

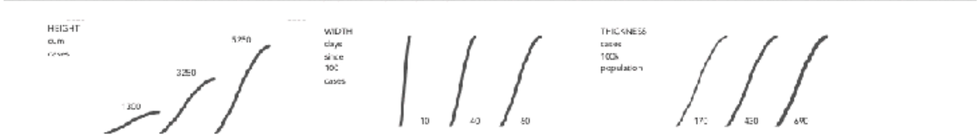

HEIGHT
cum
cases
1300
3250
5250
WIDTH
days
since
100
cases
10
40
60
THICKNESS
cases
100k
population
170
430
690

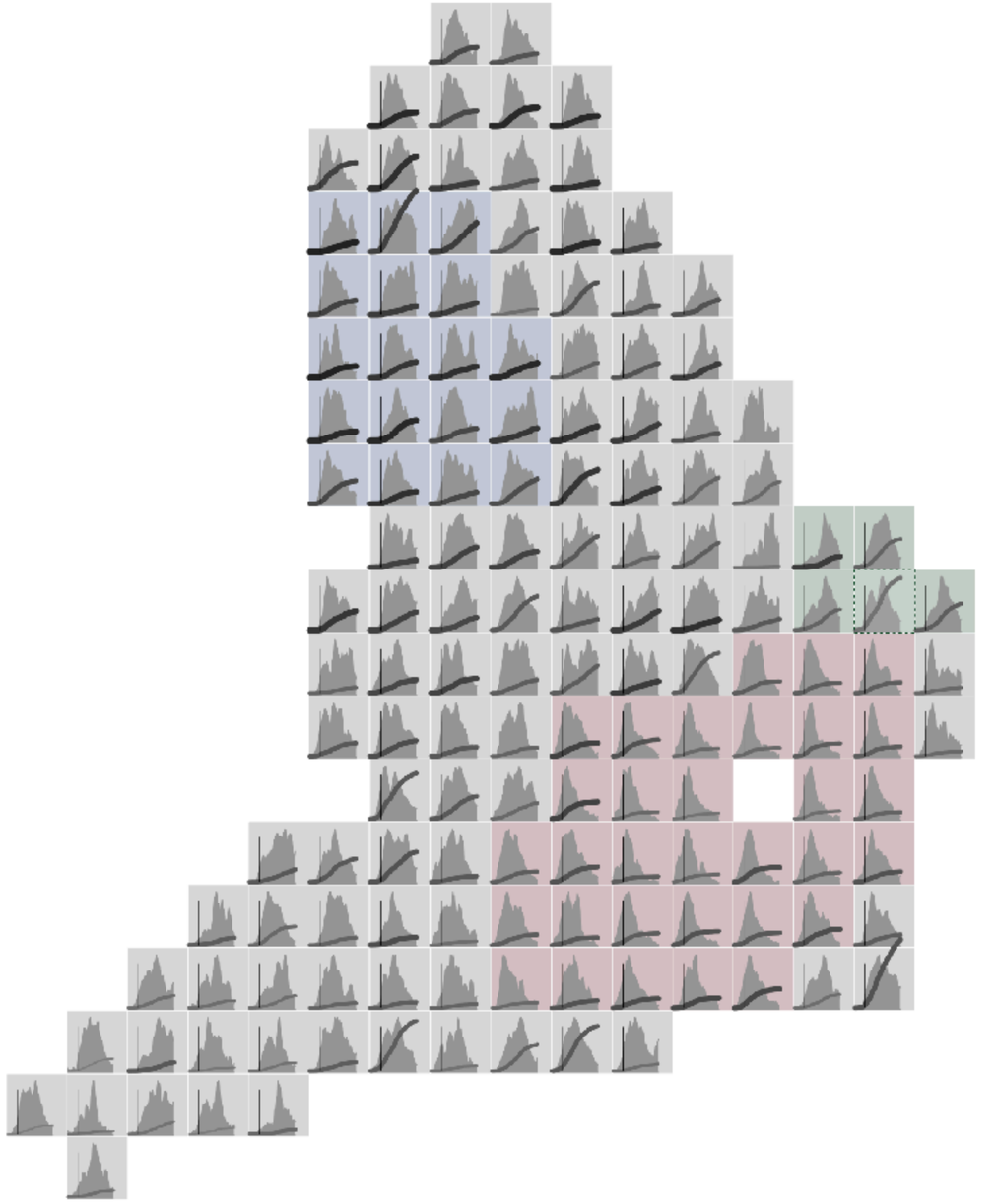
7 March



7 March



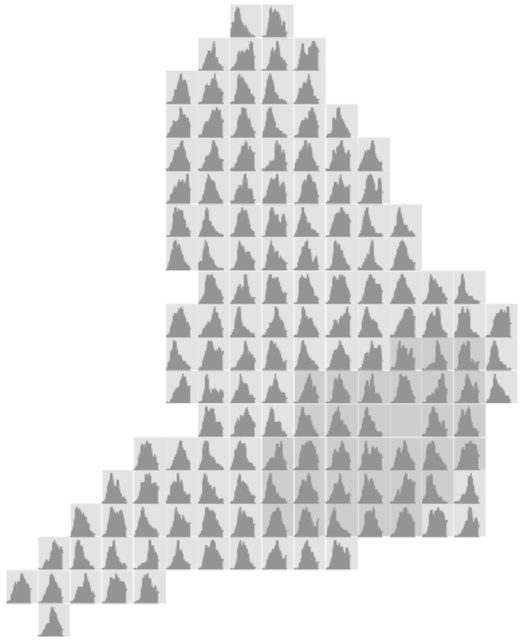


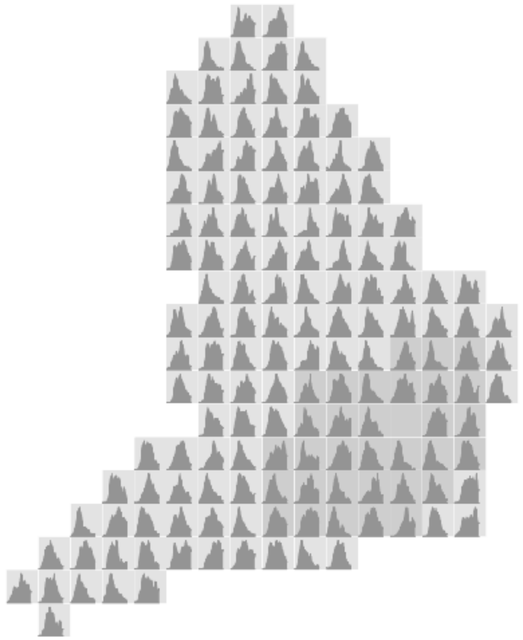


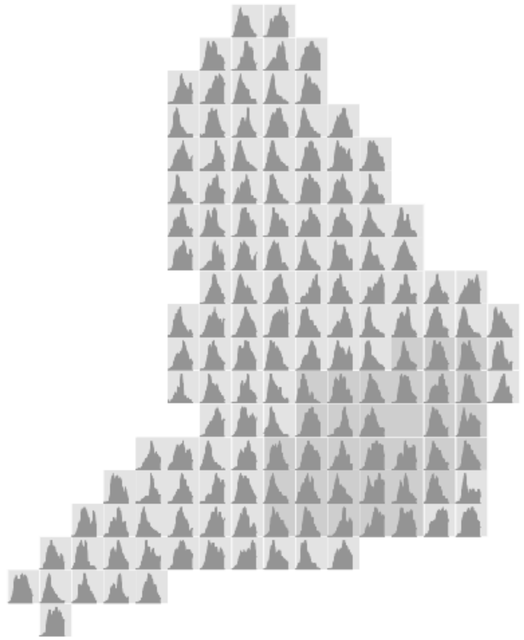
NW : peaks are more prolonged with high case counts relative to population size.

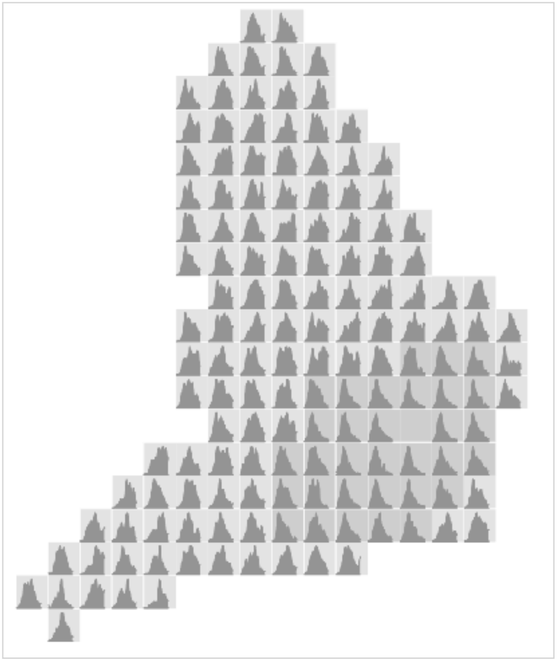
Essex : almost has a bimodal peak, a pattern which is shared by its neighbours.

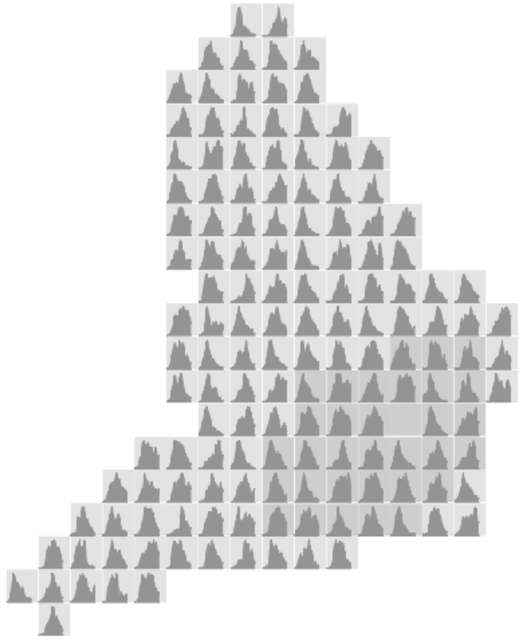
London : consistent shape with single peaks and long tails to area charts.

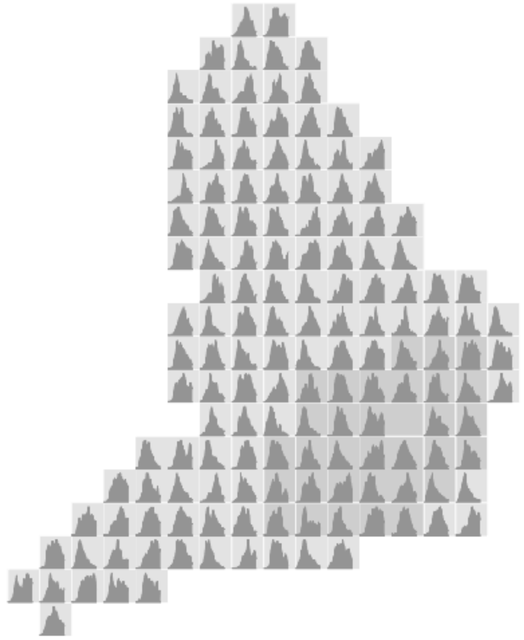












Thanks

https://github.com/rogerbeecham/covid-19-datavis