

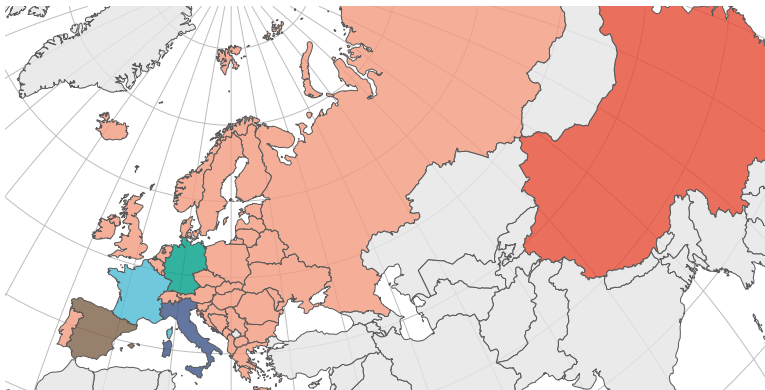
Trajectory Mapping Results

analysis x

Cecilia Valenzuela

17 December, 2020

Deme configuration



deme	division	country	region	exclude_country	min_date	max_date
China		China	Asia		2019-12-24	2020-01-23
France		France	Europe		2020-01-23	2020-03-08
Germany		Germany	Europe		2020-01-28	2020-03-08
Italy		Italy	Europe		2020-01-29	2020-03-08
OtherEuropean			Europe	France,Germany,Italy,Spain	2020-01-29	2020-03-08
Spain		Spain	Europe		2020-02-24	2020-03-08

Table 2: Total number of cases reported to ECDC
18th March

deme	cumcases	pop	cas100
China	81063	1439323.8	5.6
France	6633	65273.5	10.2
Germany	6012	83783.9	7.2
Italy	27980	60461.8	46.3
OtherEuropean	16685	491362.0	3.4
Spain	13994	46754.8	29.9

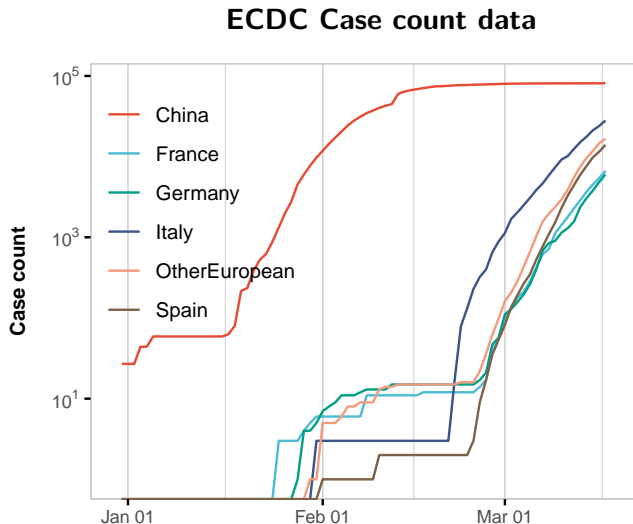


Figure 1: ECDC case counts for each deme from the beginning of the pandemic to March 18

Epidemic trajectory data

From the Stochastic Trajectory Mapping analysis, we obtain one epidemic trajectory per set of parameters + typed node tree.

The processing of the trajectory data includes the generation of two different datasets:

- **states:** We have the total number of inferred cases by trajectory, deme and time.
- **events:** We have each event that happened in a epidemic trajectory, with its type (origin, birth, death or migration), the source/destination deme and time.

Table 3: States dataset

traj	type	time	N	age	date_model	date
1	China	0.0000000	0	0.3081309	2019-11-15	2019-11-25
1	China	0.0061626	0	0.3019683	2019-11-17	2019-11-27
1	China	0.0095228	0	0.2986080	2019-11-18	2019-11-28
1	China	0.0187668	0	0.2893641	2019-11-22	2019-12-02
1	China	0.0241403	0	0.2839906	2019-11-24	2019-12-04

Epidemic trajectory data

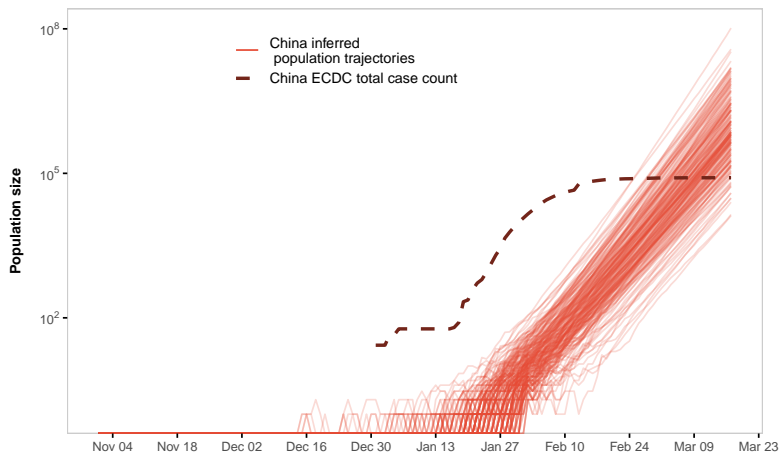
Table 4: Events dataset

traj	time	event	src	dest	mult	age	date_model	date
1	0.0000000	O				0.3081309	2019-11-15	2019-11-25
1	0.0061626	B	Germany	Germany	1	0.3019683	2019-11-17	2019-11-27
1	0.0095228	B	Germany	Germany	1	0.2986080	2019-11-18	2019-11-28
1	0.0187668	B	Germany	Germany	1	0.2893641	2019-11-22	2019-12-02
1	0.0241403	B	Germany	Germany	1	0.2839906	2019-11-24	2019-12-04

To have a feasible time of analysis of the epidemic trajectories we take a random subsample of 500 trajectories.

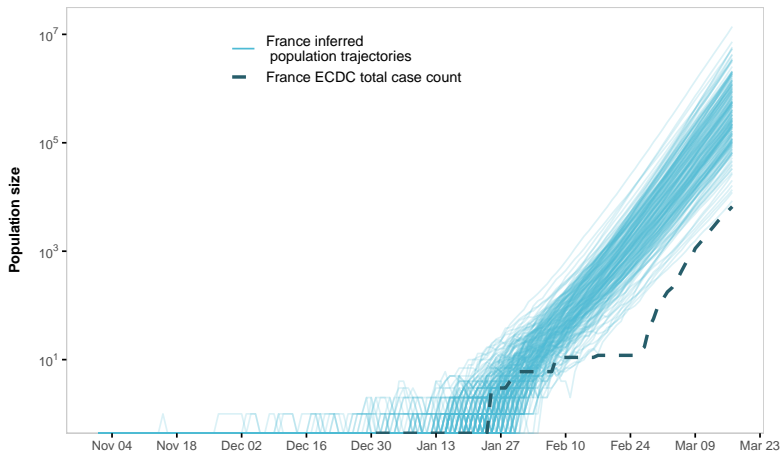
To facilitate visualization and summarise the results, we take a grid time of 1 day and summarise the number of events that day as the sum of the events in the corresponding time interval; and the number of inferred cases as the maximum of the interval.

Inferred case counts - China



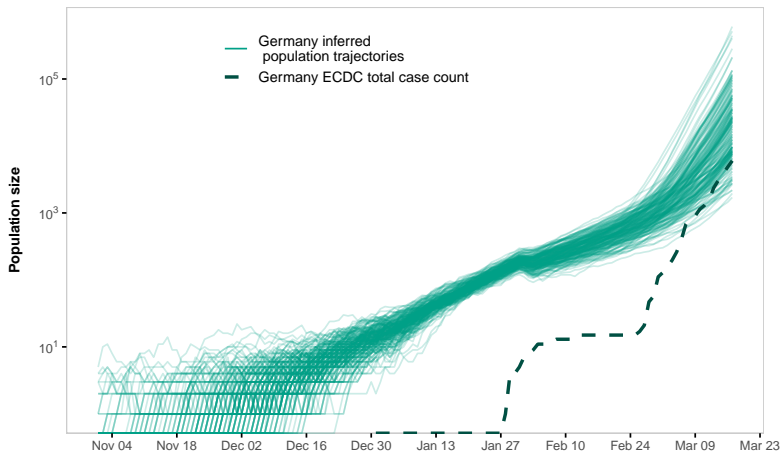
<i>lmedian</i>	711268.5
<i>llow</i>	38683.68
<i>lhigh</i>	15451119
<i>cumcases</i>	81063
<i>cumdeaths</i>	3225
<i>cases</i>	43
<i>pop</i>	1439324
<i>cas100</i>	5.63
<i>fc</i>	0.11
<i>lfc</i>	0.01
<i>hfc</i>	2.1
<i>rc</i>	8.77
<i>lrc</i>	0.48
<i>hrc</i>	190.61

Inferred case counts - France



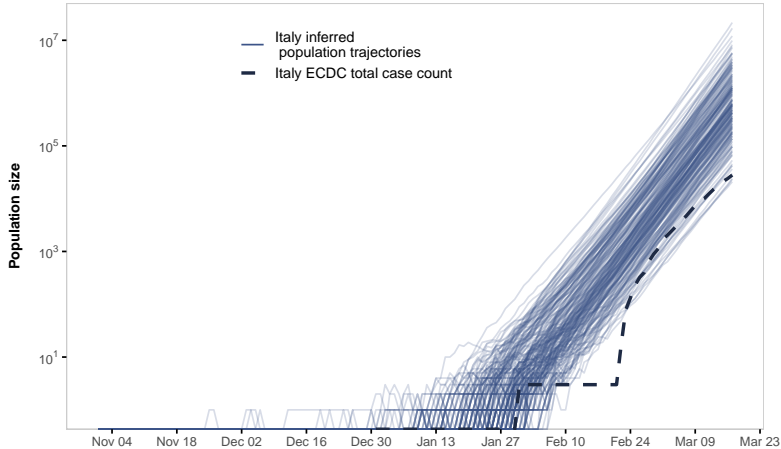
<i>Imedian</i>	332552
<i>llow</i>	26513.03
<i>lhigh</i>	4319834
<i>cumcases</i>	6633
<i>cumdeaths</i>	148
<i>cases</i>	1210
<i>pop</i>	65273.51
<i>cas100</i>	10.16
<i>fc</i>	0.02
<i>lfc</i>	0
<i>hfc</i>	0.25
<i>rc</i>	50.14
<i>lrc</i>	4
<i>hrc</i>	651.26

Inferred case counts - Germany



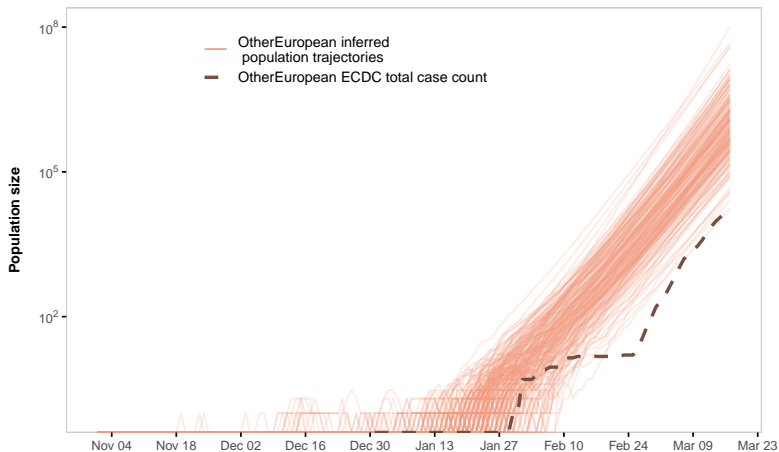
<i>Imedian</i>	17133
<i>llow</i>	2724.67
<i>Ihigh</i>	212835
<i>cumcases</i>	6012
<i>cumdeaths</i>	13
<i>cases</i>	1174
<i>pop</i>	83783.95
<i>cas100</i>	7.18
<i>fc</i>	0.35
<i>lfc</i>	0.03
<i>hfc</i>	2.21
<i>rc</i>	2.85
<i>lrc</i>	0.45
<i>hrc</i>	35.4

Inferred case counts - Italy



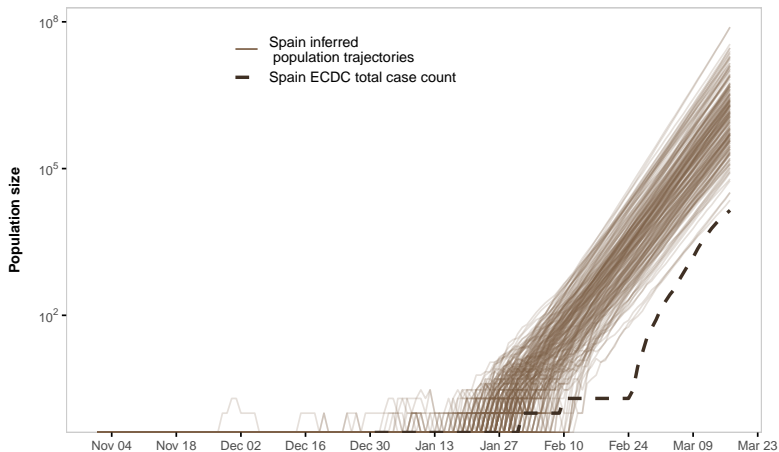
<i>Imedian</i>	575387
<i>llow</i>	41882.85
<i>lhigh</i>	7658113
<i>cumcases</i>	27980
<i>cumdeaths</i>	2158
<i>cases</i>	4000
<i>pop</i>	60461.83
<i>cas100</i>	46.28
<i>fc</i>	0.05
<i>lfc</i>	0
<i>hfc</i>	0.67
<i>rc</i>	20.56
<i>lrc</i>	1.5
<i>hrc</i>	273.7

Inferred case counts - OtherEuropean



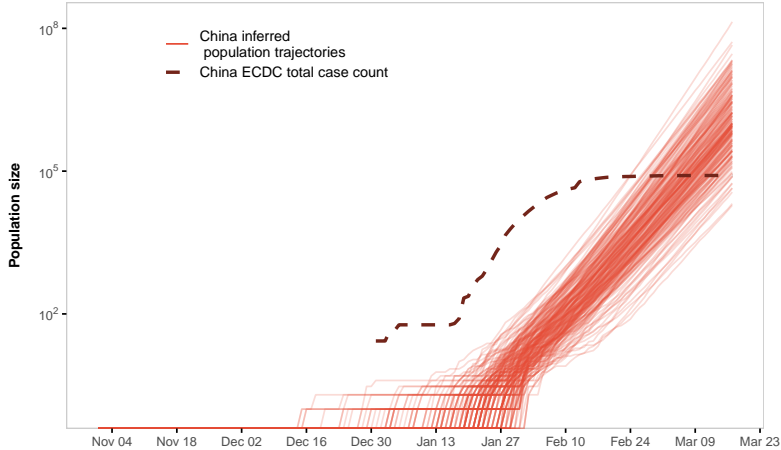
<i>Imedian</i>	866232
<i>llow</i>	47570.15
<i>lhigh</i>	14111162
<i>cumcases</i>	16685
<i>cumdeaths</i>	191
<i>cases</i>	9
<i>pop</i>	491362
<i>cas100</i>	3.4
<i>fc</i>	0.02
<i>lfc</i>	0
<i>hfc</i>	0.35
<i>rc</i>	51.92
<i>lrc</i>	2.85
<i>hrc</i>	845.74

Inferred case counts - Spain



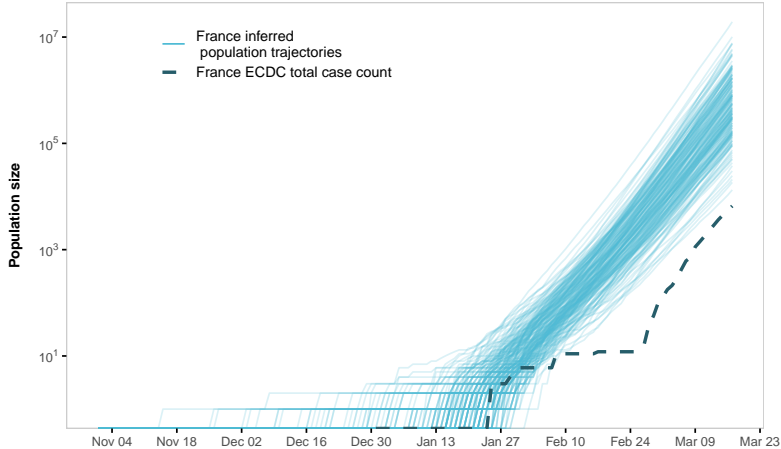
<i>Imedian</i>	1328895
<i>llow</i>	81586.65
<i>lhigh</i>	25698555
<i>cumcases</i>	13994
<i>cumdeaths</i>	309
<i>cases</i>	2503
<i>pop</i>	46754.78
<i>cas100</i>	29.93
<i>fc</i>	0.01
<i>lfc</i>	0
<i>hfc</i>	0.17
<i>rc</i>	94.96
<i>lrc</i>	5.83
<i>hrc</i>	1836.4

Inferred case counts v2- China



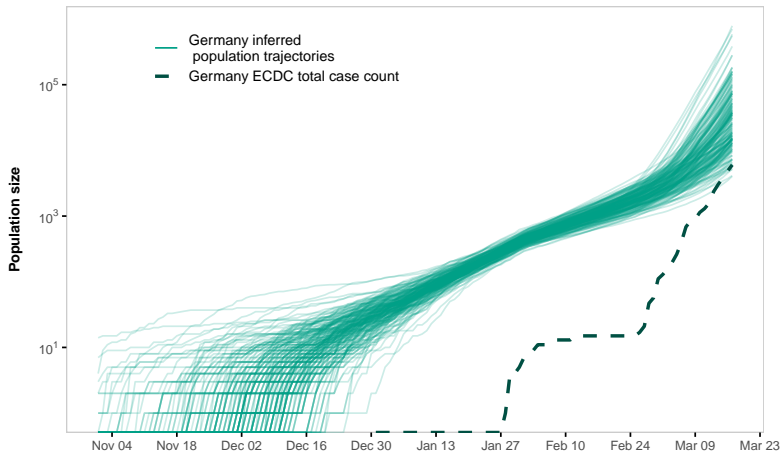
<i>l</i> low	54560.8
<i>l</i> high	21430641
<i>D</i> median	246809
<i>D</i> low	13074.88
<i>D</i> high	5882031
<i>cumcases</i>	81063
<i>cumdeaths</i>	3225
<i>cases</i>	43
<i>pop</i>	1439324
<i>cas100</i>	5.63
<i>fc</i>	0.08
<i>lfc</i>	0
<i>hfc</i>	1.49
<i>rc</i>	12.33
<i>lrc</i>	0.67

Inferred case counts v2- France



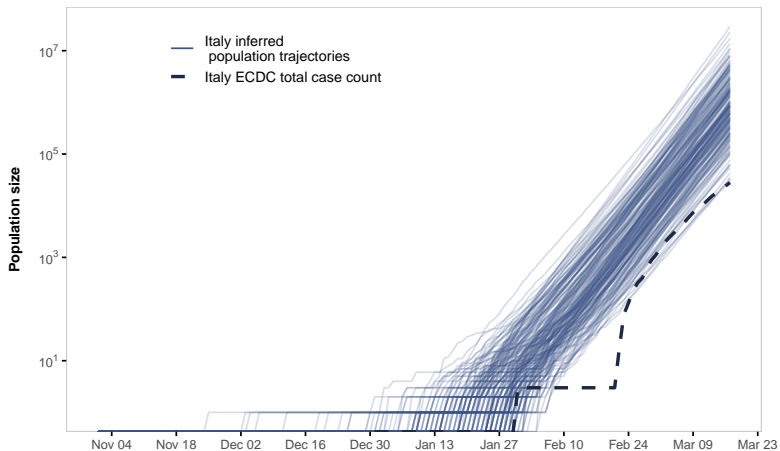
<i>l</i> low	37642.63
<i>l</i> high	5980463
<i>D</i> median	113272.5
<i>D</i> low	8918.77
<i>D</i> high	1567914
<i>cumcases</i>	6633
<i>cumdeaths</i>	148
<i>cases</i>	1210
<i>pop</i>	65273.51
<i>cas100</i>	10.16
<i>fc</i>	0.01
<i>lfc</i>	0
<i>hfc</i>	0.18
<i>rc</i>	71.82
<i>lrc</i>	5.68

Inferred case counts v2- Germany



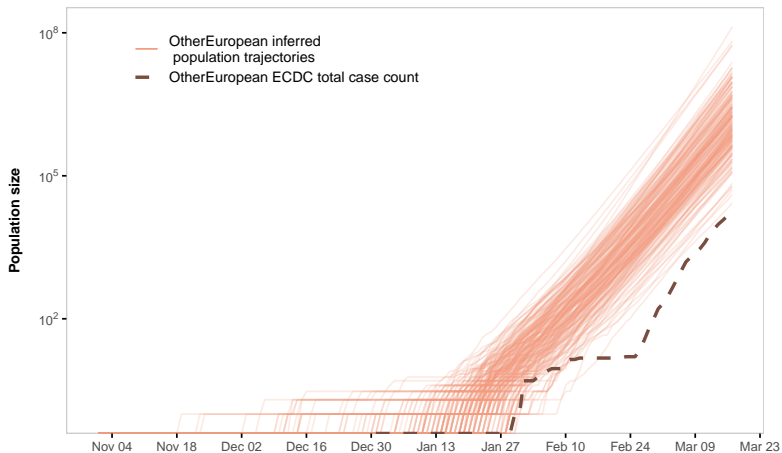
<i>l</i> low	5985.63
<i>l</i> high	283596
<i>D</i> median	5104.5
<i>D</i> low	639.85
<i>D</i> high	78295
<i>cum</i> cases	6012
<i>cum</i> deaths	13
<i>cases</i>	1174
<i>pop</i>	83783.95
<i>cas</i> 100	7.18
<i>fc</i>	0.23
<i>l</i> fc	0.02
<i>h</i> fc	1
<i>rc</i>	4.41
<i>l</i> rc	1

Inferred case counts v2- Italy



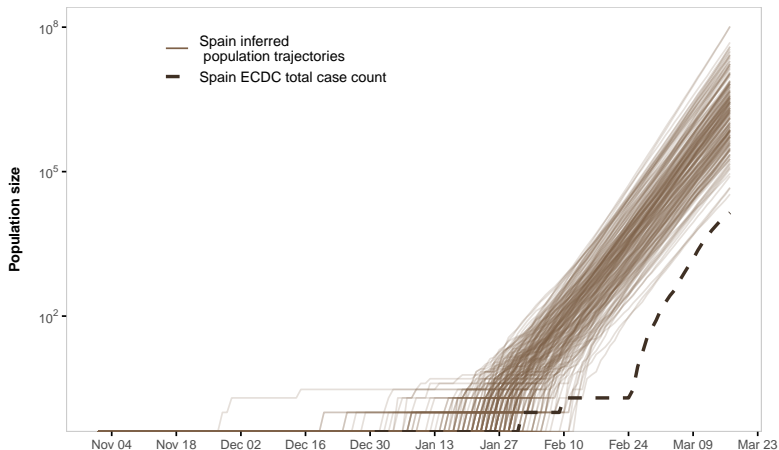
<i>l</i> low	60232.15
<i>l</i> high	10822157
<i>D</i> median	196192.5
<i>D</i> low	13431.83
<i>D</i> high	2651328
<i>cumcases</i>	27980
<i>cumdeaths</i>	2158
<i>cases</i>	4000
<i>pop</i>	60461.83
<i>cas100</i>	46.28
<i>fc</i>	0.03
<i>lfc</i>	0
<i>hfc</i>	0.46
<i>rc</i>	29.4
<i>lrc</i>	2.15

Inferred case counts v2- OtherEuropean



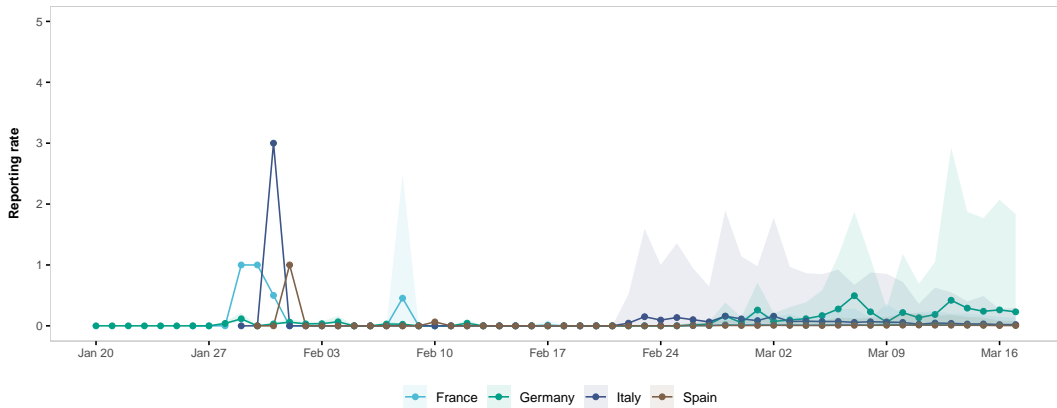
<i>l</i> low	69036.75
<i>l</i> high	19338381
<i>D</i> median	306737
<i>D</i> low	17328.68
<i>D</i> high	5687452
<i>cumcases</i>	16685
<i>cumdeaths</i>	191
<i>cases</i>	9
<i>pop</i>	491362
<i>cas100</i>	3.4
<i>fc</i>	0.01
<i>lfc</i>	0
<i>hfc</i>	0.24
<i>rc</i>	76.59
<i>lrc</i>	4.14

Inferred case counts v2- Spain



<i>l</i> low	113738.9
<i>l</i> high	35371519
<i>D</i> median	471681
<i>D</i> low	30480.03
<i>D</i> high	9800623
<i>cumcases</i>	13994
<i>cumdeaths</i>	309
<i>cases</i>	2503
<i>pop</i>	46754.78
<i>cas100</i>	29.93
<i>fc</i>	0.01
<i>lfc</i>	0
<i>hfc</i>	0.12
<i>rc</i>	132.99
<i>lrc</i>	8.13

Reporting rate



Inferred case counts - Additional figures

