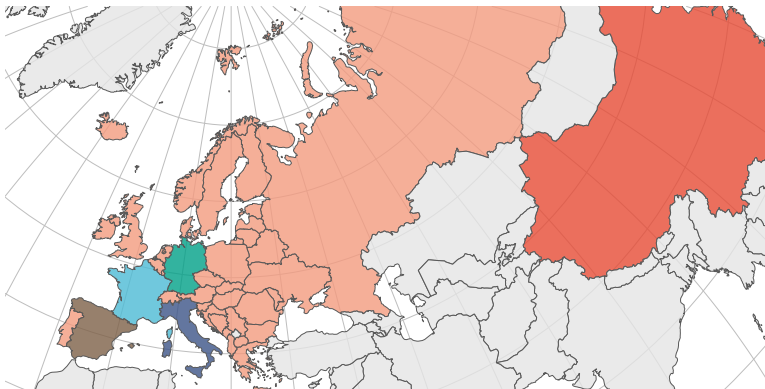# Trajectory Mapping Results
analysis x

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16 December, 2020

Deme configuration

deme	division	country	region	exclude_country	min_date	max_date
France		France	Europe		2020-01-23	2020-03-08
Germany		Germany	Europe		2020-01-28	2020-03-08
China	Hubei	China	Asia		2019-12-24	2020-01-23
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
France	7730	65273.5	11.8
Germany	7156	83783.9	8.5
China	81086	1439323.8	5.6
Italy	31506	60461.8	52.1
OtherEuropean	19994	491362.0	4.1
Spain	17688	46754.8	37.8
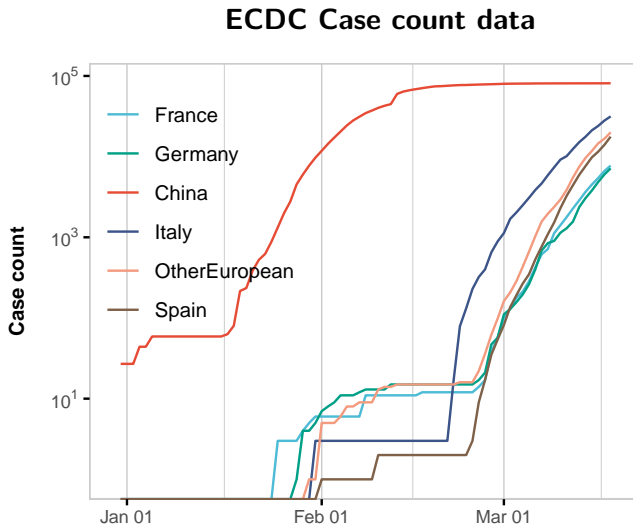
Figure 1: ECDC case counts for each deme from the beginning of the pandemic to March 18

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	0.2724047	2019-11-29	2019-12-09
1	China	0.0196264	0	0.2527784	2019-12-06	2019-12-16
1	China	0.0250744	0	0.2473303	2019-12-08	2019-12-18
1	China	0.0332466	0	0.2391581	2019-12-11	2019-12-21
1	China	0.0332466	0	0.2391581	2019-12-11	2019-12-21

Table 4: Events dataset

traj	time	event	src	dest	mult	age	date_model	date
1	0.0000000	O				0.2724047	2019-11-29	2019-12-09
1	0.0196264	B	Germany	Germany	1	0.2527784	2019-12-06	2019-12-16
1	0.0250744	B	Germany	Germany	1	0.2473303	2019-12-08	2019-12-18
1	0.0332466	B	Germany	Germany	2	0.2391581	2019-12-11	2019-12-21
1	0.0332466	D	Germany	Germany	1	0.2391581	2019-12-11	2019-12-21

To have a feasible time of analysis of the epidemic trajectories we take a random subsample of 500 trajectories.
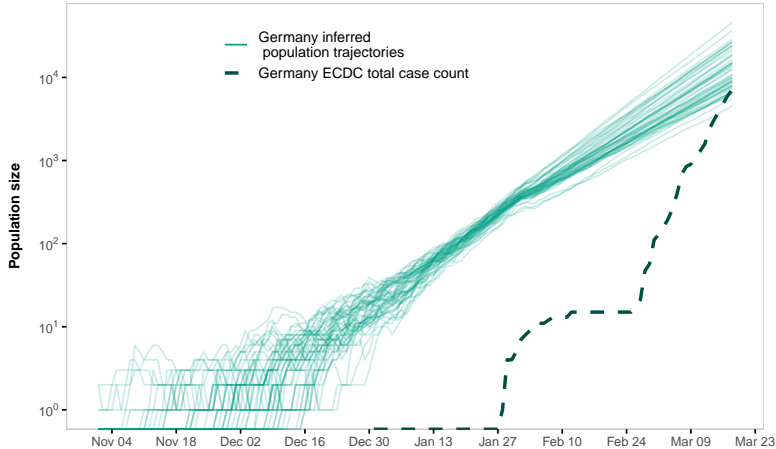
To facilitate visualization and summarise the results, we take a grid time of 1 day and summarise the number of events that day as the sum of the events in the corresponding time interval; and the number of inferred cases as the maximum of the interval.
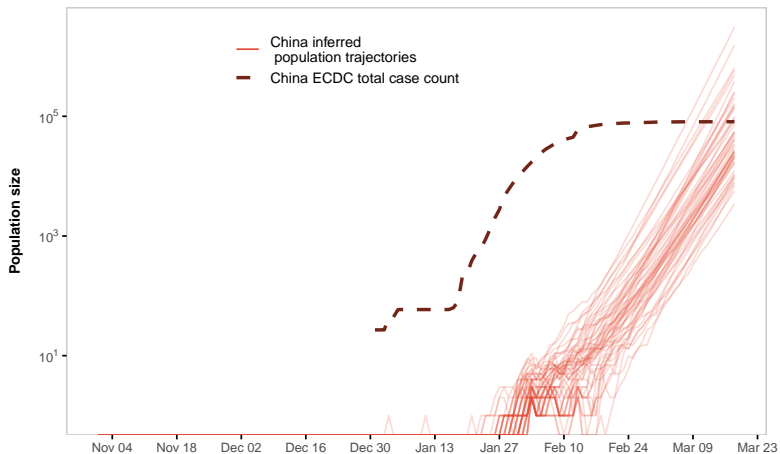
Inferred case counts - France
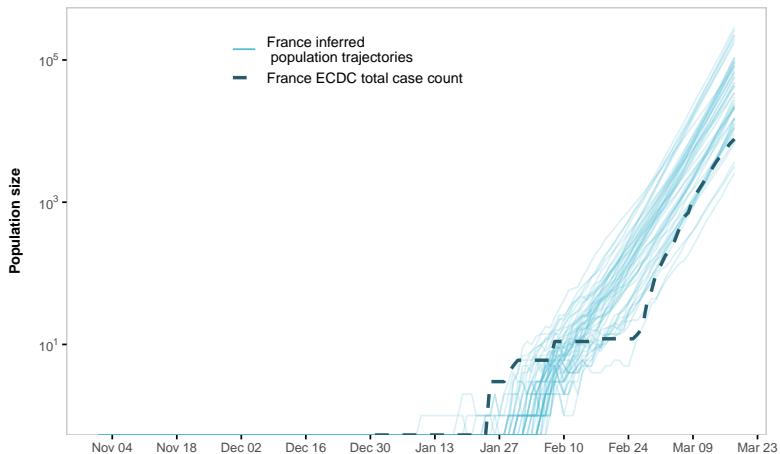
lmedian	34774.5
llow	3300.52
lhigh	255441
cumcases	7730
cumdeaths	175
cases	1097
pop	65273.51
cas100	11.84
fc	0.22
lfc	0.03
hfc	2.34
rc	4.5
lrc	0.43
hrc	33.05

Legend (within plot):
France inferred population trajectories
France ECDC total case count

Y-axis: Population size

Inferred case counts - Germany

lmedian	10755.5
llow	5619.43
lhigh	34831.57
cumcases	7156
cumdeaths	13
cases	1144
pop	83783.95
cas100	8.54
fc	0.67
lfc	0.21
hfc	1.27
rc	1.5
lrc	0.79
hrc	4.87

Legend:
Germany inferred population trajectories
Germany ECDC total case count

Population size

Inferred case counts - China

lmedian	33540.5
llow	5904.12
lhigh	1347854
cumcases	81086
cumdeaths	3241
cases	23
pop	1439324
cas100	5.63
fc	2.42
lfc	0.06
hfc	13.73
rc	0.41
lrc	0.07
hrc	16.62

Inferred case counts - Italy
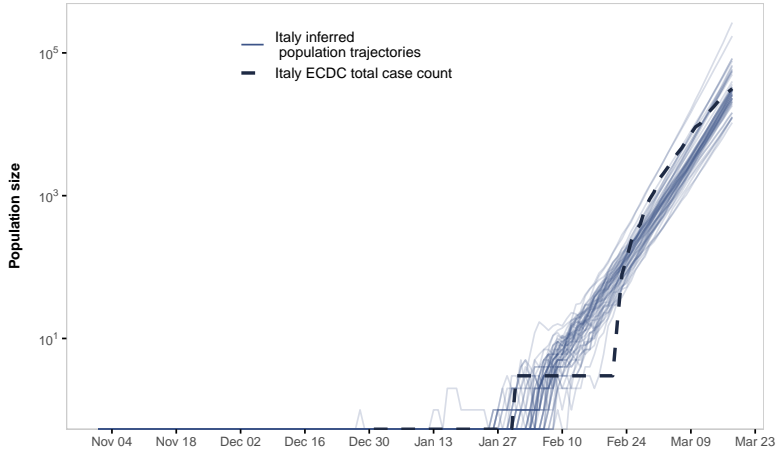
lmedian	28243
llow	12246.98
lhigh	152018.9
cumcases	31506
cumdeaths	2505
cases	3526
pop	60461.83
cas100	52.11
fc	1.12
lfc	0.21
hfc	2.57
rc	0.9
lrc	0.39
hrc	4.83

Inferred case counts - OtherEuropean
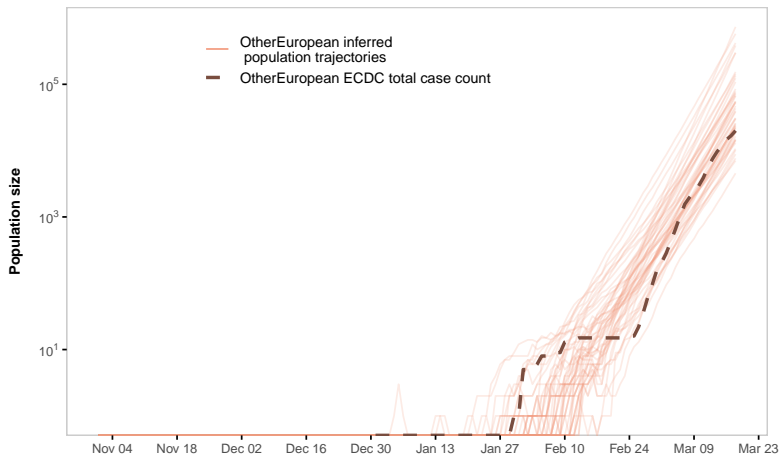
lmedian	34850
llow	7177.35
lhigh	542259
cumcases	19994
cumdeaths	252
cases	4
pop	491362
cas100	4.07
fc	0.57
lfc	0.04
hfc	2.79
rc	1.74
lrc	0.36
hrc	27.12

Inferred case counts - Spain
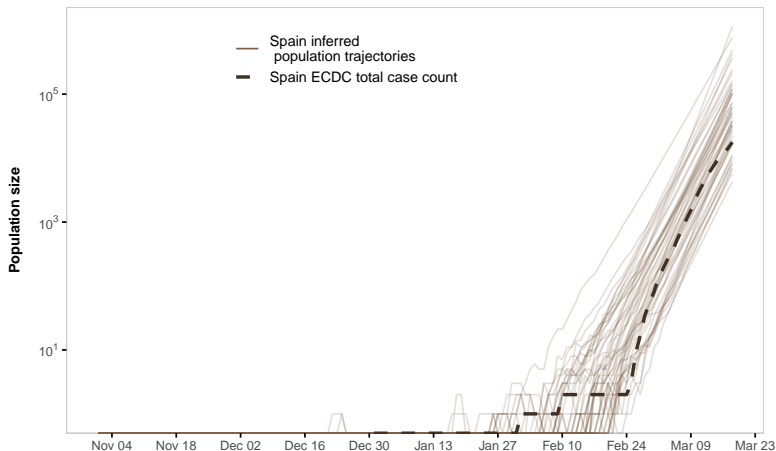
lmedian	47696.5
llow	5930.38
lhigh	699828.3
cumcases	17688
cumdeaths	491
cases	3694
pop	46754.78
cas100	37.83
fc	0.37
lfc	0.03
hfc	2.98
rc	2.7
lrc	0.34
hrc	39.57

Inferred case counts v2- France
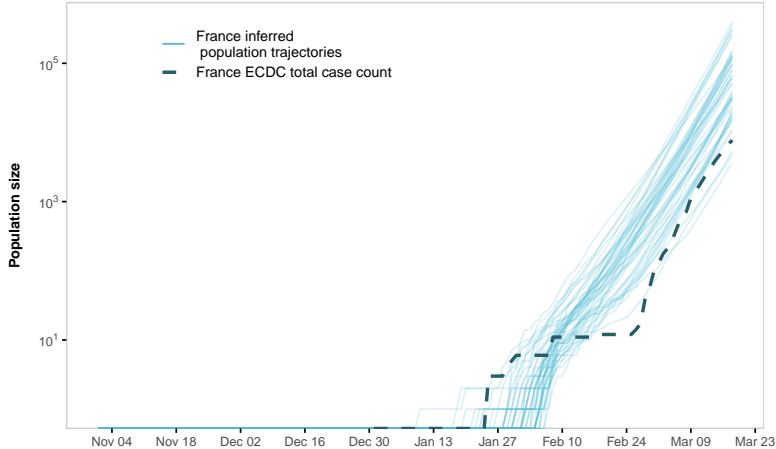
llow	4868.05
lhigh	348413.1
Dmedian	10855.5
Dlow	1016.92
Dhigh	89716.35
cumcases	7730
cumdeaths	175
cases	1097
pop	65273.51
cas100	11.84
fc	0.15
lfc	0.02
hfc	1.59
rc	6.68
lrc	0.63

Inferred case counts v2- Germany
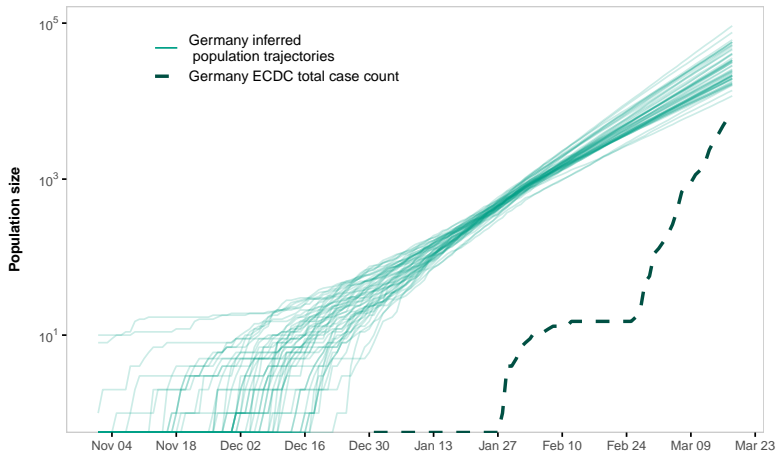
llow	14201.23
lhigh	72573.3
Dmedian	1818
Dlow	855.73
Dhigh	6375.65
cumcases	7156
cumdeaths	13
cases	1144
pop	83783.95
cas100	8.54
fc	0.28
lfc	0.1
hfc	0.5
rc	3.53
lrc	1.98

Inferred case counts v2- China
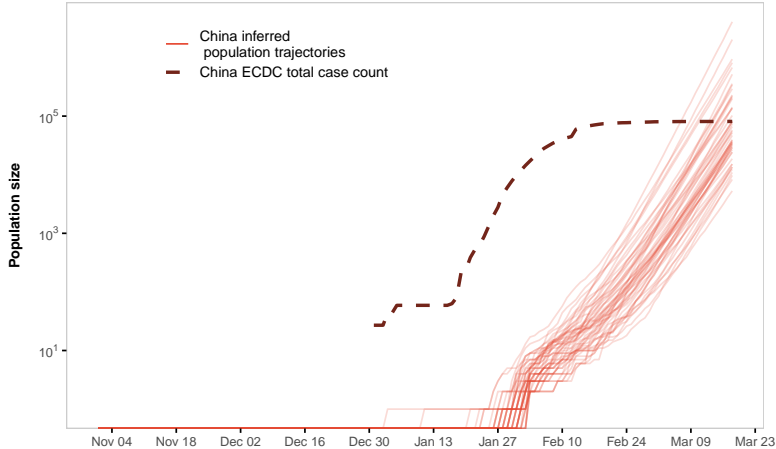
llow	8621.65
lhigh	1778206
Dmedian	11350
Dlow	2119.57
Dhigh	514795.2
cumcases	81086
cumdeaths	3241
cases	23
pop	1439324
cas100	5.63
fc	1.65
lfc	0.05
hfc	9.4
rc	0.61
lrc	0.11

Inferred case counts v2- Italy
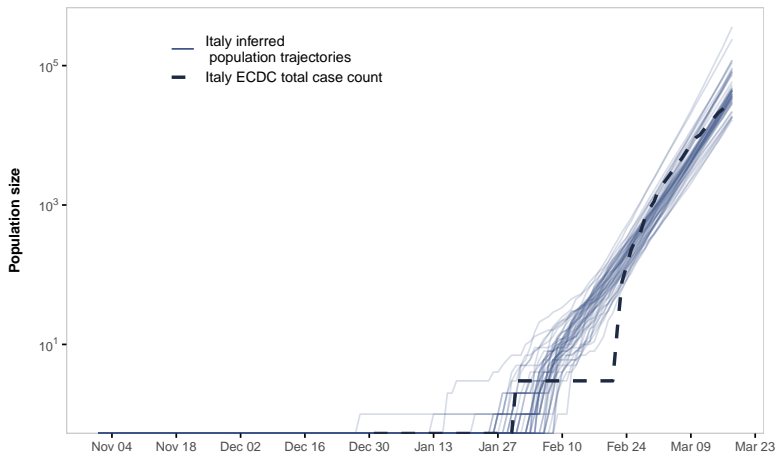
llow	18331.95
lhigh	212813.6
Dmedian	9346
Dlow	3533.15
Dhigh	50948.52
cumcases	31506
cumdeaths	2505
cases	3526
pop	60461.83
cas100	52.11
fc	0.78
lfc	0.15
hfc	1.72
rc	1.29
lrc	0.58

Inferred case counts v2- OtherEuropean
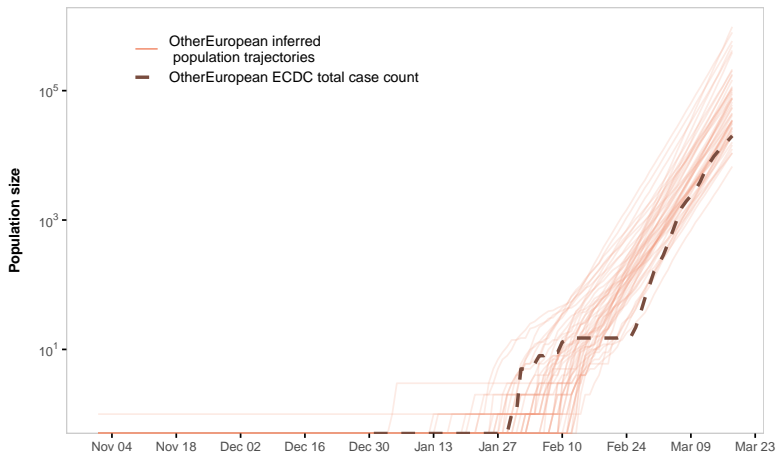
llow	10832.45
lhigh	748102.1
Dmedian	11602.5
Dlow	2125.6
Dhigh	183320.6
cumcases	19994
cumdeaths	252
cases	4
pop	491362
cas100	4.07
fc	0.4
lfc	0.03
hfc	1.85
rc	2.47
lrc	0.54

Inferred case counts v2- Spain
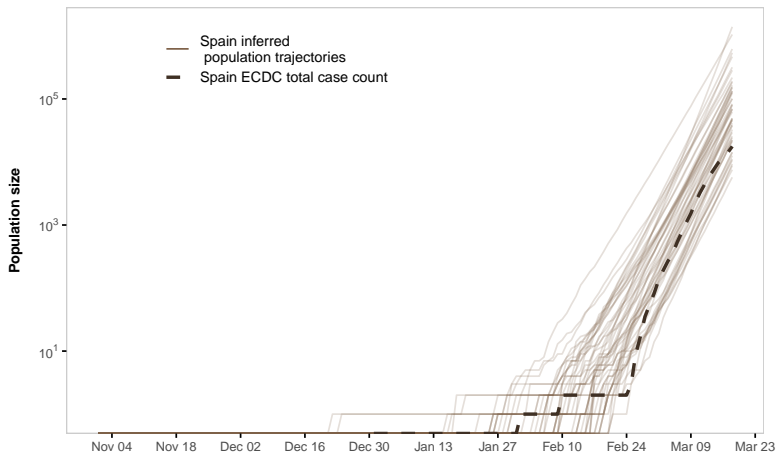
llow	7811.38
lhigh	956752.3
Dmedian	16344.5
Dlow	2174.75
Dhigh	245838.7
cumcases	17688
cumdeaths	491
cases	3694
pop	46754.78
cas100	37.83
fc	0.27
lfc	0.02
hfc	2.26
rc	3.66
lrc	0.44

Reporting rate
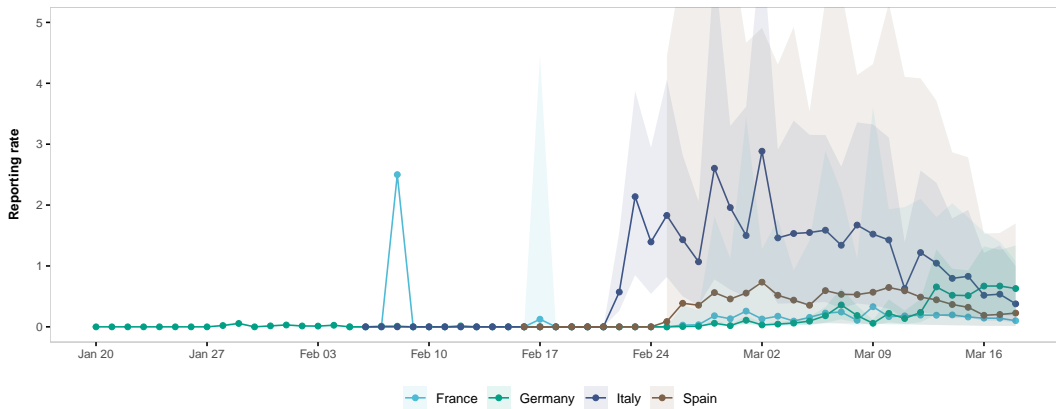
Inferred case counts - Additional figures