Trajectory Mapping Results

analysis x

Cecilia Valenzuela

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

ECDC Case count data

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
OtherEuropean	19994	491362.0	4.1
OtherEuropean	19994	491362.0	4.1
OtherEuropean	19994	491362.0	4.1
OtherEuropean	19994	491362.0	4.1
OtherEuropean	19994	491362.0	4.1
OtherEuropean	19994	491362.0	4.1
OtherEuropean	19994	491362.0	4.1
OtherEuropean	19994	491362.0	4.1
OtherEuropean	19994	491362.0	4.1
OtherEuropean	19994	491362.0	4.1
OtherEuropean	19994	491362.0	4.1
OtherEuropean	19994	491362.0	4.1
OtherEuropean	19994	491362.0	4.1
OtherEuropean	19994	491362.0	4.1
OtherEuropean	19994	491362.0	4.1
OtherEuropean	19994	491362.0	4.1
OtherFurencen	10004	401362.0	4.1

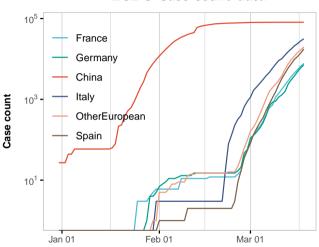


Figure 1: ECDC case counts for each deme from the beginning of the pandemic to March $18\,$

Epidemic trajectory data

From the Stochastic Trajectory Mapping analysis, we obtain one epidemic trajectory per set of parameters \pm 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	Ν	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

Epidemic trajectory data

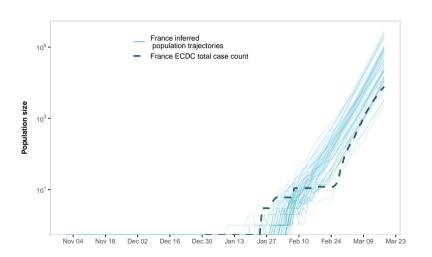
Table 4: Events dataset

traj	time	event	src	dest	mult	age	date_model	date
1	0.0000000	0				0.2724047	2019-11-29	2019-12-09
1	0.0196264	В	Germany	Germany	1	0.2527784	2019-12-06	2019-12-16
1	0.0250744	В	Germany	Germany	1	0.2473303	2019-12-08	2019-12-18
1	0.0332466	В	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.

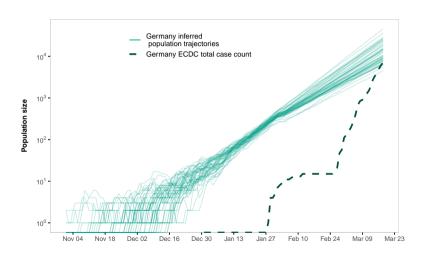
To facilitate visualization and summarise the results, we take a grid time of 1 day and summarise the number of events that day as the sum of the events in the corresponding time interval; and the number of inferred cases as the maximum of the interval.

Inferred case counts - France



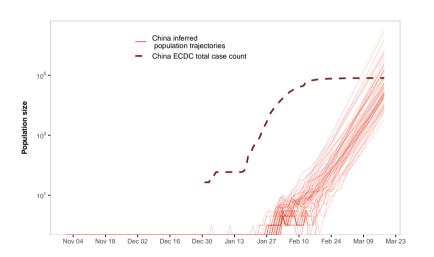
Imedian	34774.5
llow	3300.52
Ihigh	255441
cumcases	7730
cumdeaths	175
cases	1097
рор	65273.51
cas100	11.84
fc	0.22
Ifc	0.03
hfc	2.34
rc	4.5
Irc	0.43
hrc	33.05

Inferred case counts - Germany



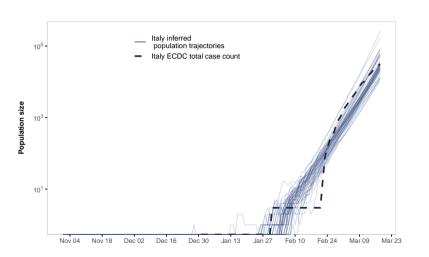
Imedian	10755.5
llow	5619.43
lhigh	34831.57
cumcases	7156
cumdeaths	13
cases	1144
рор	83783.95
cas100	8.54
fc	0.67
Ifc	0.21
hfc	1.27
rc	1.5
Irc	0.79
hrc	4 87

Inferred case counts - China



Imedian	33540.5
llow	5904.12
lhigh	1347854
cumcases	81086
cumdeaths	3241
cases	23
рор	1439324
cas100	5.63
fc	2.42
Ifc	0.06
hfc	13.73
rc	0.41
Irc	0.07
hrc	16.62

Inferred case counts - Italy

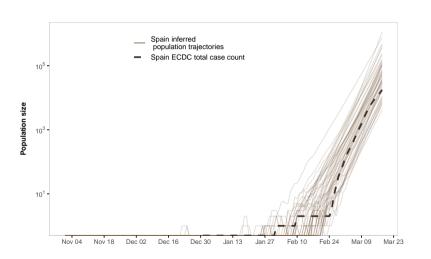


Imedian	28243
llow	12246.98
lhigh	152018.9
cumcases	31506
cumdeaths	2505
cases	3526
рор	60461.83
cas100	52.11
fc	1.12
Ifc	0.21
hfc	2.57
rc	0.9
Irc	0.39
hrc	4.83

Inferred case counts - OtherEuropean

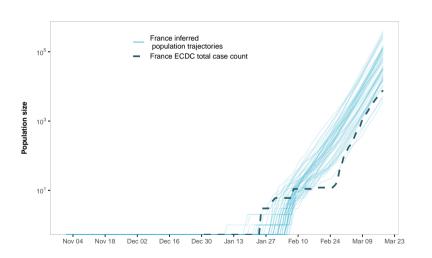
		34850	34850	34850	34850	34850	34850	34850	34
5		7177.35		ectories /1/7.35	7177.35	7177.35	7177.35	7177.35	71
)	10 ⁵ -	542259	 OtherEuropean 542259 	ECDC total case coun	t 542259	542259	542259	542259	54
		19994	19994	19994	19994	19994	19994	19994	1!
		252	252	252	252	252	252	252	1
size		7	47	1	35	48	69	3	
Population	10 ³	491362	491362	491362	491362	491362	491362	491362	49
indo		4.07	4.07	4.07	4.07	4.07	4.07	4.07	4
ď		0.57	0.57	0.57	0.57	0.57	0.57	0.57	(
		0.04	0.04	0.04	0.04	0.04	0.04	0.04	(
	10 ¹	2.79	2.79	2.79	2.79	2.79	2.79	2.79	2
		1.74	1.74	1.74	1.74	1.74	1.74	1.74	1
		0.36	0.36	0.36	0.36	0.36	0.36	0.36	(
	L	27 ₀ 12 Nov 18	Dec 27.12ec 16	Dec 30 27Ja123	lan 27 Per 10 2 Feb 24	Mar 297.12 ar 23	27.12	27.12	2

Inferred case counts - Spain



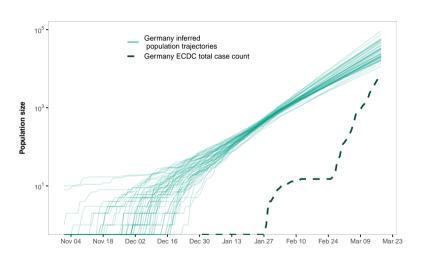
Imedian	47696.5
llow	5930.38
Ihigh	699828.3
cumcases	17688
cumdeaths	491
cases	3694
рор	46754.78
cas100	37.83
fc	0.37
Ifc	0.03
hfc	2.98
rc	2.7
Irc	0.34
hrc	39.57

Inferred case counts v2- France



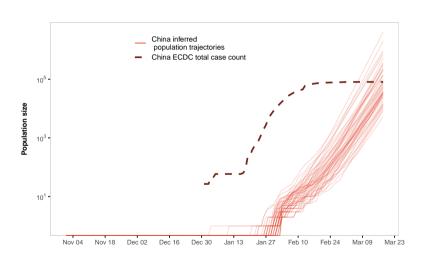
llow	4868.05
lhigh	348413.1
Dmedian	10855.5
Dlow	1016.92
Dhigh	89716.35
cumcases	7730
cumdeaths	175
cases	1097
рор	65273.51
cas100	11.84
fc	0.15
Ifc	0.02
hfc	1.59
rc	6.68
Irc	0.63

Inferred case counts v2- Germany



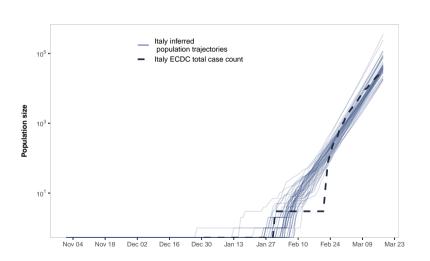
llow	14201.23
lhigh	72573.3
Dmedian	1818
Dlow	855.73
Dhigh	6375.65
cumcases	7156
cumdeaths	13
cases	1144
рор	83783.95
cas100	8.54
fc	0.28
Ifc	0.1
hfc	0.5
rc	3.53
Irc	1.98

Inferred case counts v2- China



llow	8621.65
Ihigh	1778206
Dmedian	11350
Dlow	2119.57
Dhigh	514795.2
cumcases	81086
cumdeaths	3241
cases	23
рор	1439324
cas100	5.63
fc	1.65
Ifc	0.05
hfc	9.4
rc	0.61
Irc	0.11

Inferred case counts v2- Italy

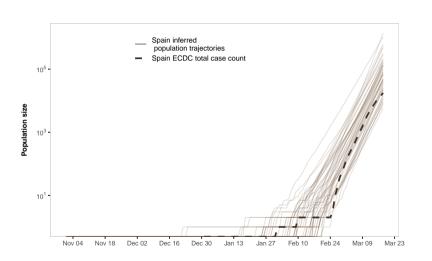


llow	18331.95
lhigh	212813.6
Dmedian	9346
Dlow	3533.15
Dhigh	50948.52
cumcases	31506
cumdeaths	2505
cases	3526
рор	60461.83
cas100	52.11
fc	0.78
Ifc	0.15
hfc	1.72
rc	1.29
Irc	0.58

Inferred case counts v2- OtherEuropean

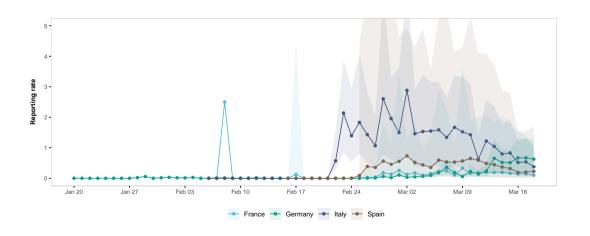
5		10832.45	10832.45	10832.45	10832.45	10832.45	10832.45	10832.45	108
1		748102.1		inferre 7 48102.1	748102.1	748102.1	748102.1	748102.1	748
5		11602.5	population traje	ctories ECDC total Case Count	11602.5	11602.5	11602.5	11602.5	11
	10 ⁵	2125.6	2125.6	2125.6	2125.6	2125.6	2125.6	2125.6	21
6		183320.6	183320.6	183320.6	183320.6	183320.6	183320.6	183320.6	183
ze		19994	19994	19994	19994	19994	19994	19994	19
Population size		252	252	252	252	252	252	252	:
	10 ³	7	47	1	35	48	69	3	
; &		491362	491362	491362	491362	491362	491362	491362	49
		4.07	4.07	4.07	4.07	4.07	4.07	4.07	4
		0.4	0.4	0.4	0.4	0.4	0.4	0.4	
	10 ¹	0.03	0.03	0.03	0.03	0.03	0.03	0.03	(
		1.85	1.85	1.85	1.85	1.85	1.85	1.85	1
		2.47	2.47	2.47	2.47	2.47	2.47	2.47	2
		Nov 18	Dec 00.54 Pec 16	Dec 30 0.54 ¹³ Jan	27 Feb 10 Feb 24	Mar 00.54 Mar 23	0.54	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
рор	46754.78
cas100	37.83
fc	0.27
lfc	0.02
hfc	2.26
rc	3.66
Irc	0.44

Reporting rate



Inferred case counts - Additional figures

