Supplementary Materials

Modeling the Novel Coronavirus (SARS-CoV-2) outbreak in Sicily, Italy

Andrea Maugeri 1, Martina Barchitta 1, Sebastiano Battiato 2 and Antonella Agodi 1,3,*

- ¹ Department of Medical and Surgical Sciences and Advanced Technologies "GF Ingrassia", University of Catania, 95123, Catania, Italy
- ² Department of Mathematics and Computer Science, University of Catania, 95123, Catania, Italy
- ³ Azienda Ospedaliero-Universitaria "Policlinico-Vittorio Emanuele", 95123 Catania, Italy
- * Correspondence: <u>agodia@unict.it</u>

Index

- Figure S1. Summary of data collection, model formulation and fitting
- **Table S1.** Extract of data of SARS-CoV-2 cases in Sicily (Italy), reported by the Italy's Civil Protection from 24 February to 13 April, 2020

Figure S1. Summary of data collection, model formulation and fitting

• Data were obtained from the Italy's Civil Protection of the Italian Ministry of Health from 24 February to 13 April, 2020. Although we described all the data, we employed only those referred to the daily number of patients in intensive care unit (ICU) and to cumulative **Data collection** deaths • A susceptible-exposed-infective-remove-dead (SEIRD) model was formulated. We separated the infectious state into I_{com} (patients with very mild or no symptoms in the community), I_{hos} (patients with mild clinical presentation admitted to non-intensive care wards), and I_{icu} **Model formulation** (patients with severe disease who required ICU hospitalization) • The model was first fitted to the daily number of ICU patients and cumulative deaths reported by the Italy's Civil Protection from 24 February to 17 March and from 24 February to 24 March, respectively. Using the best-fitting parameters, the number of Fitting in absence individuals in each state could be estimated of restrictions • The model was next fitted to the reported daily number of ICU patients from 18 to 27 March and cumulative deaths from 25 March Fitting after to 2 April restrictions of 10 March

Fitting after restrictions of 23 March

 The model was finally fitted to the reported daily number of ICU patients from 28 March to 13 April and cumulative deaths from 3 to 13 April

Table S1. Extract of data on SARS-CoV-2 cases in Sicily (Italy), reported by the Italy's Civil Protection from 24 February to 13 April, 2020

Date	Hospitalized in non-intensive care wards ^a	Hospitalized in Intensive Care Unit ^{a,b}	Total hospitalized patients ^a	Non-hospitalized patients ^a	Recovereda	Deaths ^{a,b}	Total cases ^a
24-Feb-20	0	0	0	0	0	0	0
25-Feb-20	1	0	1	2	0	0	3
26-Feb-20	1	0	1	2	0	0	3
27-Feb-20	1	0	1	1	2	0	4
28-Feb-20	1	0	1	1	2	0	4
29-Feb-20	1	0	1	1	2	0	4
1-Mar-20	1	0	1	6	2	0	9
2-Mar-20	2	0	2	3	2	0	7
3-Mar-20	2	0	2	3	2	0	7
4-Mar-20	5	0	5	11	2	0	18
5-Mar-20	5	0	5	11	2	0	18
6-Mar-20	7	0	7	15	2	0	24
7-Mar-20	8	0	8	25	2	0	35
8-Mar-20	18	0	18	33	2	0	53
9-Mar-20	19	0	19	33	2	0	54
10-Mar-20	17	2	19	41	2	0	62
11-Mar-20	23	1	24	57	2	0	83
12-Mar-20	28	5	33	78	2	2	115
13-Mar-20	37	7	44	82	2	2	130
14-Mar-20	42	11	53	97	4	2	156
15-Mar-20	56	15	71	108	7	2	188
16-Mar-20	75	20	95	108	8	2	213
17-Mar-20	86	28	114	112	8	3	237
18-Mar-20	100	29	129	138	12	3	282
19-Mar-20	143	36	179	142	15	4	340
20-Mar-20	168	42	210	169	25	4	408
21-Mar-20	206	48	254	204	26	6	490
22-Mar-20	220	55	275	321	26	8	630
23-Mar-20	250	60	310	371	27	13	721
24-Mar-20	250	60	310	489	27	20	846
25-Mar-20	259	80	339	597	33	25	994
26-Mar-20	346	68	414	681	36	33	1164
27-Mar-20	425	75	500	658	53	39	1250
28-Mar-20	441	71	512	730	60	57	1359
29-Mar-20	451	71	522	808	65	65	1460
30-Mar-20	484	75	559	849	71	76	1555
31-Mar-20	503	72	575	917	74	81	1647

1-Apr-20	496	72	568	976	86	88	1718
2-Apr-20	503	73	576	1030	92	93	1791
3-Apr-20	535	73	608	1056	94	101	1859
4-Apr-20	553	74	627	1099	95	111	1932
5-Apr-20	556	76	632	1142	104	116	1994
6-Apr-20	563	74	637	1178	108	123	2046
7-Apr-20	562	73	635	1224	113	125	2097
8-Apr-20	563	65	628	1265	133	133	2159
9-Apr-20	566	63	629	1313	152	138	2232
10-Apr-20	568	62	630	1337	187	148	2302
11-Apr-20	562	58	620	1381	209	154	2364
12-Apr-20	552	53	605	1425	223	163	2416
13-Apr-20	554	51	605	1445	237	171	2458

^a These data are described in Figure 2 reported in the main text ^b These data are used to fit the Susceptible-Exposed-Infectious-Recovered-Dead (SEIRD) model

Table S2. Best-fitting parameters in the sensitivity analysis.

Modeling period	SEIRD Parameters	Estimated values (95%CI)
	eta_{com}	0.99 (0.96 – 1.04)
	etahos	0.37 (0.32 - 0.43)
	βicu	0.28 (0.24 - 0.33)
	\mathcal{U}_{com}	0.76 (0.70–0.82)
In absence of control measures	Uhos	0.19 (0.15 – 0.23)
	vicu	0.05 (0.03 - 0.07)
	μсот	0.01 (0.00 - 0.02)
	μhos	0.07 (0.04 - 0.10)
	Џіси	0.26 (0.20 - 0.30)
After most of the control on 10	eta_{com}	0.67 (0.57 - 0.76)
After restrictions adopted on 10	βhos	0.34 (0.33 – 0.35)
March, 2020	βicu	0.25 (0.23 - 0.27)
A from machinisticans a domas d can 22	Всот	0.20 (0.11-0.30)
After restrictions adopted on 23 March, 2020	βhos	0.28 (0.25 - 0.31)
	Віси	0.22 (0.20 – 0.25)