COVID-19 Confirmed Cases Prediction as of March 24, 2020

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[1] Chair of Entrepreneurial Risks, D-MTEC, ETH Zurich
[2] Institute of Risk Analysis, Prediction and Management (Risks-X), Academy of Interdisciplinary and Advanced Studies, Southern University of Science and Technology (SUSTech)
[3] Gavekal Intelligence Software

Contacts:
Dr. Ke WU (kwu@ethz.ch) and Prof. Dr. Didier SORNETTE (dsornette@ethz.ch)

This report updates predictions for the number of COVID-19 confirmed cases at four time horizons (1-day, 5-day, 10-day and end of the outbreak) and for various countries/regions, based on a phenomenological approach detailed in [1], i.e., employing 3 versions of the generalized logistic growth equation to model the total number of confirmed cases. The prediction results are shown in Table 1. Note that, for countries/regions at early growth stages, the predictions for long-term horizon (10-day and end of the outbreak) are highly uncertain and will vary a lot as the situation changes.

A summary of the situation:

- Europe is at present the new epicenter of the COVID-19 outbreak, with approximately 1 million population estimated to be the final confirmed cases in a medium scenario.
- Readers may observe some large changes in the Final Total numbers reported today compared with yesterday's report. This is because the outbreaks in Europe and US are still at an early stage, thus the predictions in distant time are likely to vary significantly. For example, yesterday for Europe we predicted 3.8 million (95% CI: 1.88 – 7.51) as the final total confirmed number in medium scenario, while today we predict 971 thousand (95% CI: 486 – 1940). The predicted ranges overlap and as time passes, we anticipate our methodology to zero in on more confident and reliable numbers.
- Italy and Spain are the most infected countries in Europe, while the inflection point is still not clear from the current trajectory, indicating the numbers will continue to grow with a fast rate.
- United States, Germany, Switzerland, United Kingdom, Netherlands, Austria, and Belgium are all in early exponential growth stages.
- We have added Austria and Belgium to our watch list in Table 2.
- We have added a new column "3" called "Today's validation". This shows the range predicted yesterday in brackets with the actual value recorded today. The prediction error in percentage is plotted in Figure 2.

- France has a large increase (24%) today, which makes it the only country that falls out of the confidence intervals of our yesterday's predictions in all three scenarios. This increase changes completely the previous trend of approaching the inflection point, leading to a large surge of predicted numbers in all future scenarios of France.
- The first wave of outbreak in South Korea has closed to an end, while there seems to be a second round of transmission, which is beyond our model based scenarios. This can be seen from the huge errors in the prediction for South Korea (Figure 2).
- It is of course relatively straightforward to forecast one day ahead. The data we are working with are subject to a number of variables in addition to pandemic spread (see Limitations note at the end of this report) making the task more challenging. When the time comes, we will provide validations for the 3 and 5 day forecasts and the ultimate prediction.

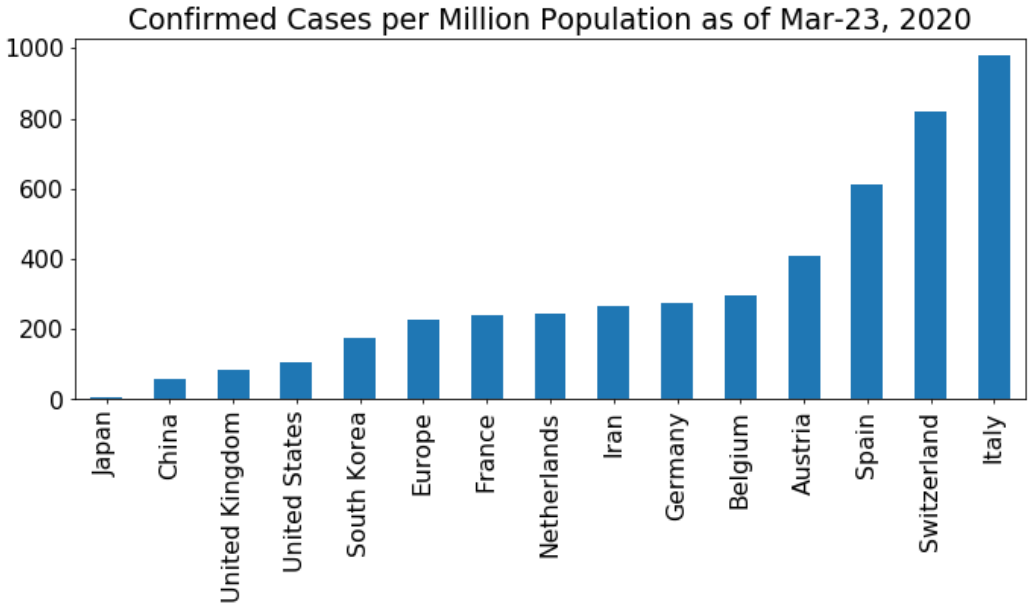


Figure 1. Confirmed cases per million population as of March 23, 2020

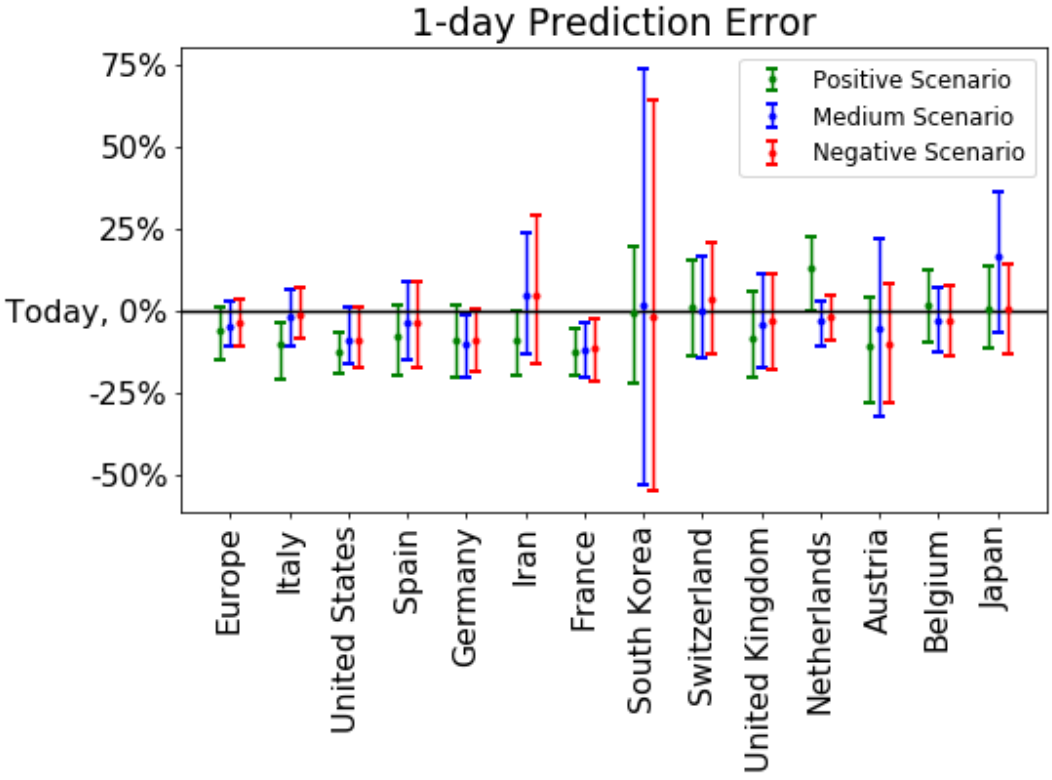


Figure 2. One-day prediction error of the 14 countries/regions. The horizontal line corresponds to today's empirical data.

Table 1. Predictions for the number of confirmed cases at four time horizons (1-day, 5-day, 10-day and end of the outbreak) and for various countries/regions. All numbers are in thousands. The values in parentheses are 95% prediction intervals based on 500 simulations from the negative binomial error structure. In Today's validation column, today's empirical data is presented below yesterday's 1-day predictive interval.

Country	Scenario	Today's validation	25-Mar	29-Mar	3-Apr	Final Total Confirmed
Europe	Positive	(165, 196) 194	209 (195, 224)	309 (272, 357)	405 (318, 538)	486 (340, 786)
	Medium	(173, 199) 194	210 (195, 223)	332 (291, 367)	509 (383, 628)	971 (486, 1940)
	Negative	(173, 201) 194	212 (197, 230)	355 (326, 393)	635 (550, 750)	Not Reliable
Italy	Positive	(50.4, 61.6) 63.9	64.8 (60.2, 68.9)	82.4 (73.8, 88.4)	94.9 (81.2, 105)	103 (84.4, 117)
	Medium	(57.1, 67.9) 63.9	68.2 (61.7, 74.4)	98.4 (89.4, 108)	146 (128, 171)	831 (416, 1660)
	Negative	(58.4, 68.2) 63.9	68.4 (63, 74.5)	99.8 (91.1, 110)	152 (136, 176)	Not Reliable

United States	**Positive**	(37.6, 43.3) 46.4	53.1 (49.7, 56.6)	115 (82.9, 148)	168 (95.3, 289)	186 (96.8, 372)
	Medium	(38.8, 46.8) 46.4	55 (50.8, 60.1)	144 (116, 170)	333 (205, 487)	557 (279, 1110)
	Negative	(38.4, 46.8) 46.4	55.1 (51.2, 60.2)	161 (134, 190)	596 (395, 805)	Not Reliable
Spain	**Positive**	(26.5, 33.6) 33.1	35.1 (31.8, 37.9)	50.9 (42.3, 58.2)	61.4 (46.3, 76.8)	66.2 (47.1, 87.3)
	Medium	(28.2, 35.9) 33.1	35.8 (32.9, 39.4)	55.5 (44.9, 65.3)	76.4 (51.2, 107)	99.3 (53.4, 199)
	Negative	(27.3, 36.1) 33.1	36.8 (32.4, 42)	64.3 (55.3, 77.2)	120 (95.9, 168)	Not Reliable
Germany	**Positive**	(21.8, 27.9) 27.4	29.5 (26.4, 32.2)	59 (43.9, 70.7)	117 (57, 173)	253 (63.4, 507)
	Medium	(21.8, 27) 27.4	29.7 (26.7, 32.7)	56.1 (47.6, 66.3)	107 (78.5, 148)	329 (165, 658)
	Negative	(22.3, 27.6) 27.4	29.9 (26.4, 32.7)	58.4 (49.9, 68.2)	125 (97.2, 179)	Not Reliable
Iran	**Positive**	(18.5, 23) 23	20.9 (18.4, 23.5)	22.2 (19.4, 24.9)	22.8 (19.9, 25.7)	23 (20, 26)
	Medium	(19.9, 28.6) 23	25.6 (20.7, 30.7)	31.4 (25.2, 37.8)	39.1 (30.8, 48)	161 (80.7, 323)
	Negative	(19.4, 29.8) 23	25.6 (20.1, 32.2)	31.8 (25.2, 40.3)	40.4 (31.5, 52.5)	Not Reliable
France	**Positive**	(15.9, 18.8) 19.9	21 (18.3, 22.9)	40.4 (31.9, 48.3)	84.1 (50.4, 119)	320 (80, 640)
	Medium	(15.8, 19.2) 19.9	21.1 (18.8, 23)	37.7 (33.4, 43.2)	72.1 (58.4, 93.5)	1910 (953, 3810)
	Negative	(15.6, 19.4) 19.9	21.1 (19, 23.4)	37.9 (33.3, 43.3)	73.2 (59.3, 96.9)	Not Reliable
South Korea	**Positive**	(7.05, 10.8) 9.04	9.02 (6.89, 11)	9.03 (6.9, 11.1)	9.04 (6.9, 11.1)	9.04 (6.9, 11.1)
	Medium	(4.21, 15.7) 9.04	9.37 (4.52, 16.6)	10.4 (5.09, 19)	11.7 (5.82, 24.8)	54.2 (27.1, 108)
	Negative	(4.08, 14.9) 9.04	8.91 (4.24, 15.5)	10 (5.01, 18.7)	11.4 (5.71, 27.6)	Not Reliable
Switzerland	**Positive**	(6.9, 9.24) 8.02	9.09 (7.66, 10.2)	12.8 (9.96, 16.1)	15.2 (10.8, 24.1)	16.4 (11.1, 32.8)
	Medium	(6.87, 9.35) 8.02	9.03 (7.9, 10.2)	12.9 (10.4, 16.1)	15.9 (11.5, 24.4)	17.7 (11.8, 35.5)
	Negative	(6.97, 9.66) 8.02	9.42 (7.83, 11.1)	16 (12.9, 19.8)	28.8 (21.3, 42.3)	Not Reliable
United Kingdo	**Positive**	(5.29, 7.03) 6.65	7.31 (6.25, 8.22)	11.3 (8.28, 14.6)	14.6 (9.12, 23.7)	16.6 (9.37, 33.2)

m	**Medium**	(5.49, 7.4) 6.65	7.34 (6.46, 8.36)	11.7 (9.31, 15)	16.1 (11, 25.6)	20 (11.7, 39.9)
	Negative	(5.46, 7.4) 6.65	7.48 (6.33, 8.6)	13.6 (11.2, 17.2)	26.9 (19.5, 46.5)	Not Reliable
Netherlands	**Positive**	(4.73, 5.82) 4.75	5.53 (5.09, 5.88)	7.36 (6.34, 8.44)	8.45 (6.85, 10.4)	8.93 (6.99, 11.5)
	Medium	(4.24, 4.88) 4.75	5.28 (4.9, 5.59)	8.69 (7.84, 9.41)	14.3 (11.8, 16.8)	47.5 (23.7, 95)
	Negative	(4.31, 4.98) 4.75	5.37 (4.99, 5.75)	9.07 (8.35, 9.82)	16.1 (14.3, 18.7)	Not Reliable
Austria	**Positive**	(3.23, 4.68) 4.49	5.14 (3.92, 6.53)	10.6 (7.97, 15.7)	25.8 (15.4, 60.2)	431 (108, 861)
	Medium	(3.03, 5.47) 4.49	4.92 (4.13, 5.72)	9.72 (7.68, 13.3)	20.6 (13.2, 42.3)	431 (215, 861)
	Negative	(3.21, 4.86) 4.49	4.92 (4.12, 5.73)	9.76 (7.58, 13.2)	21 (13.5, 41.8)	Not Reliable
Belgium	**Positive**	(3.38, 4.2) 3.74	3.91 (3.43, 4.44)	5.69 (4.59, 7.42)	6.9 (5.03, 11.1)	7.49 (5.16, 15)
	Medium	(3.26, 4.02) 3.74	4.2 (3.55, 4.88)	7.57 (5.73, 9.64)	14.4 (7.99, 22.8)	43 (10.8, 86.1)
	Negative	(3.23, 4.03) 3.74	4.07 (3.5, 4.69)	7.05 (5.92, 8.7)	12.8 (9.89, 18.5)	Not Reliable
Japan	**Positive**	(1, 1.28) 1.13	1.26 (1.07, 1.46)	1.44 (1.2, 1.69)	1.64 (1.32, 2.02)	2.26 (1.47, 4.51)
	Medium	(1.05, 1.54) 1.13	1.18 (1.03, 1.33)	1.38 (1.19, 1.56)	1.63 (1.41, 1.9)	4.51 (2.26, 9.02)
	Negative	(0.98, 1.29) 1.13	1.17 (1.03, 1.33)	1.39 (1.22, 1.59)	1.69 (1.46, 1.98)	Not Reliable

Note:

- Data source: European Centre for Disease Prevention and Control (ECDC), https://www.ecdc.europa.eu/en/geographical-distribution-2019-ncov-cases.
- The scenarios are based on the final total confirmed numbers. The positive and medium scenarios are derived from the Generalized Logistic Model and the Logistic Model. The model with the lowest mean predicted final total confirmed number K is classified as the positive scenario, and the other one is classified as the medium scenario. The negative scenario is based on Generalized Growth model, which should only describe the early stage of the epidemic outbreak.

Limitations of using the statistics of reported confirmed number

It is important to understand what our prediction models show. The predictions are based on cases identified on the basis of testing and they therefore predict the numbers of future positive tests. Relating positive test results to real levels of infection is subject to a large

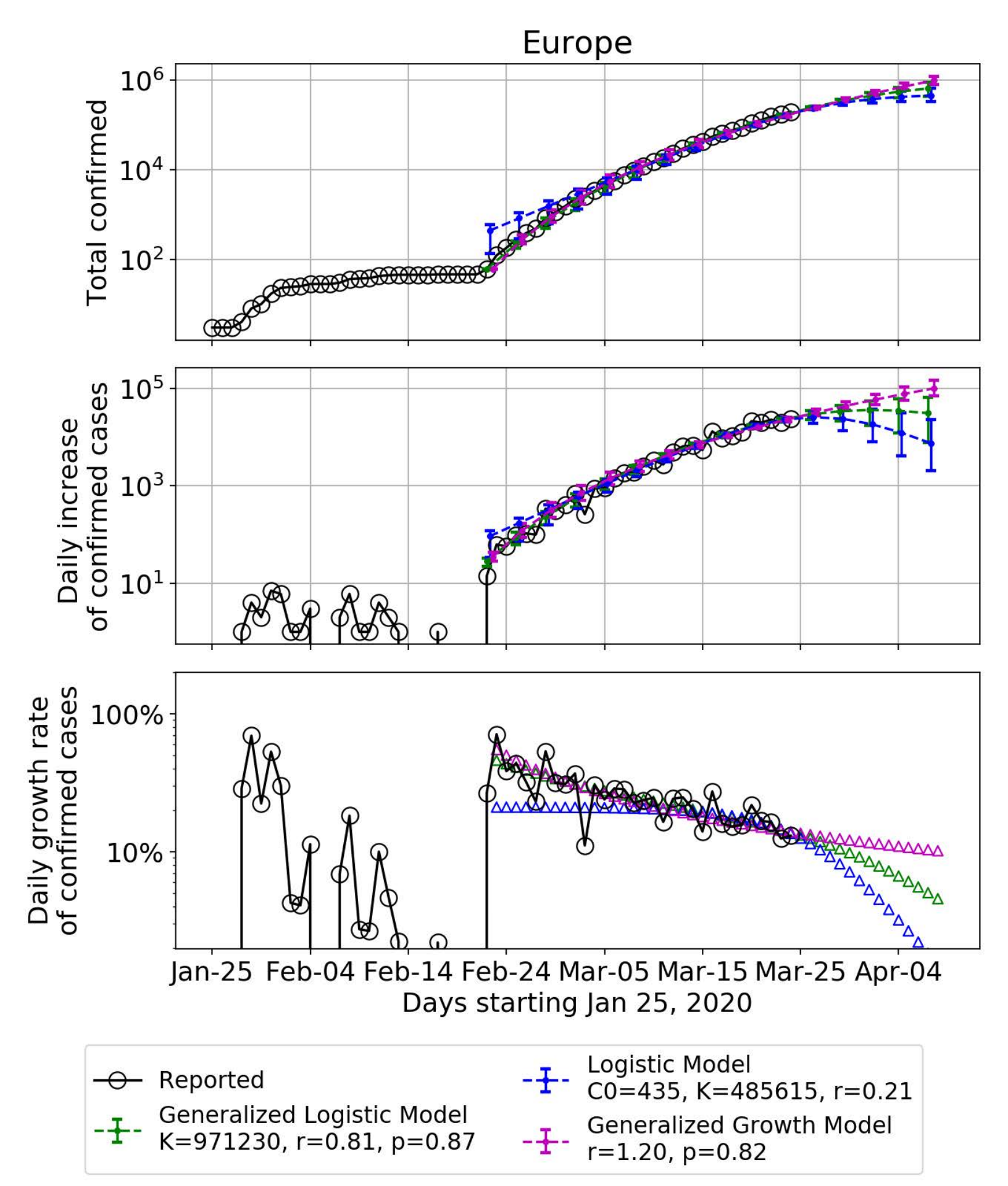
number of biases. It is a fact that the real number of infections is far higher than those recorded in positive tests since only a tiny fraction of any population has been tested. It is also the case that, in most countries, testing is biased towards those who think they are infected. The first bias, therefore, will underestimate the real number of infections while the second bias will tend to overestimate since it is biased towards those who think they are ill.

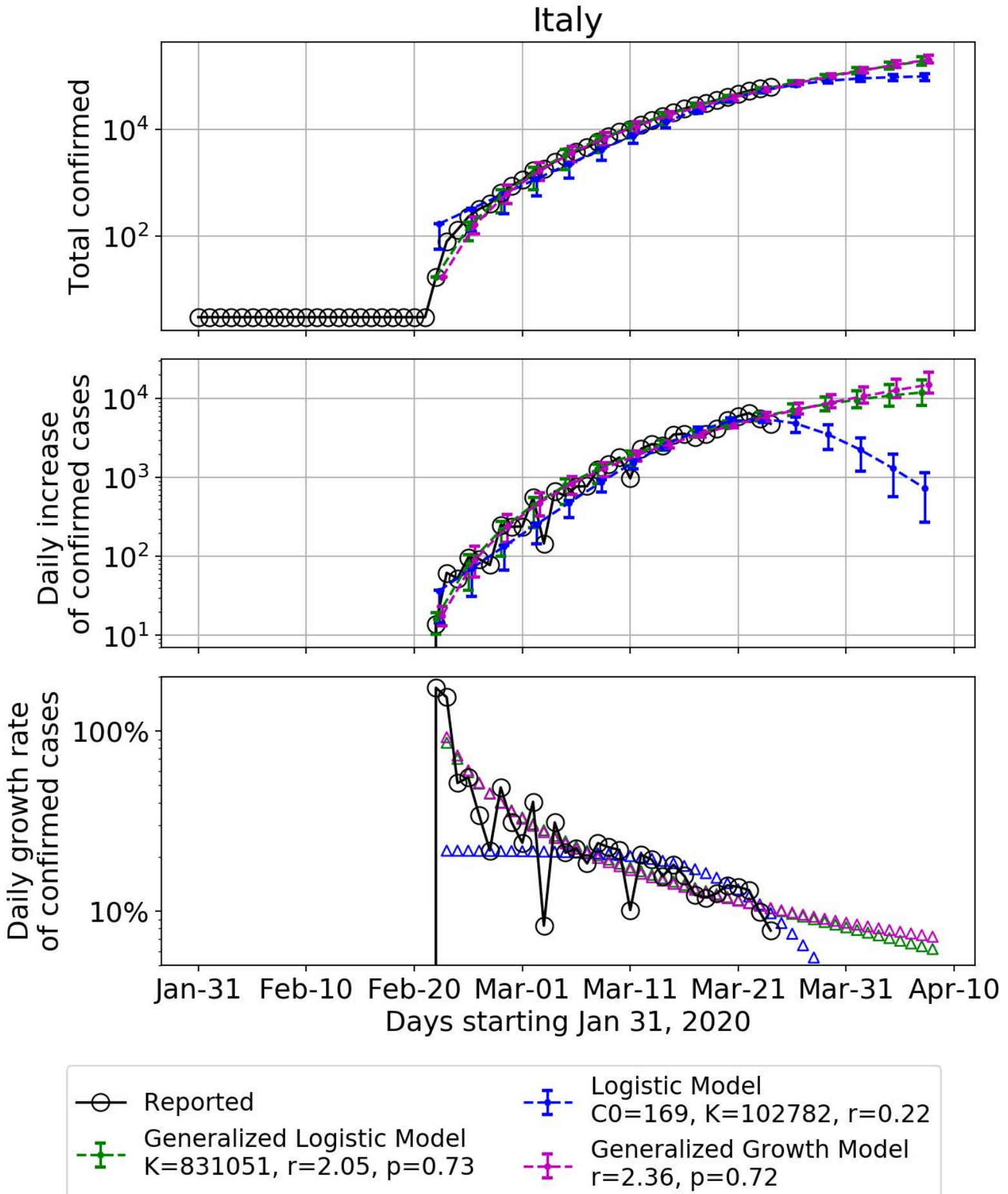
There are further complications. Depending on the testing protocols used, in some instances false positive results have been obtained. In other words, someone without the disease tested positive, probably because they were infected with some other coronavirus. And in other cases, false negative results were obtained, as was the case with the early testing deployed in the USA.

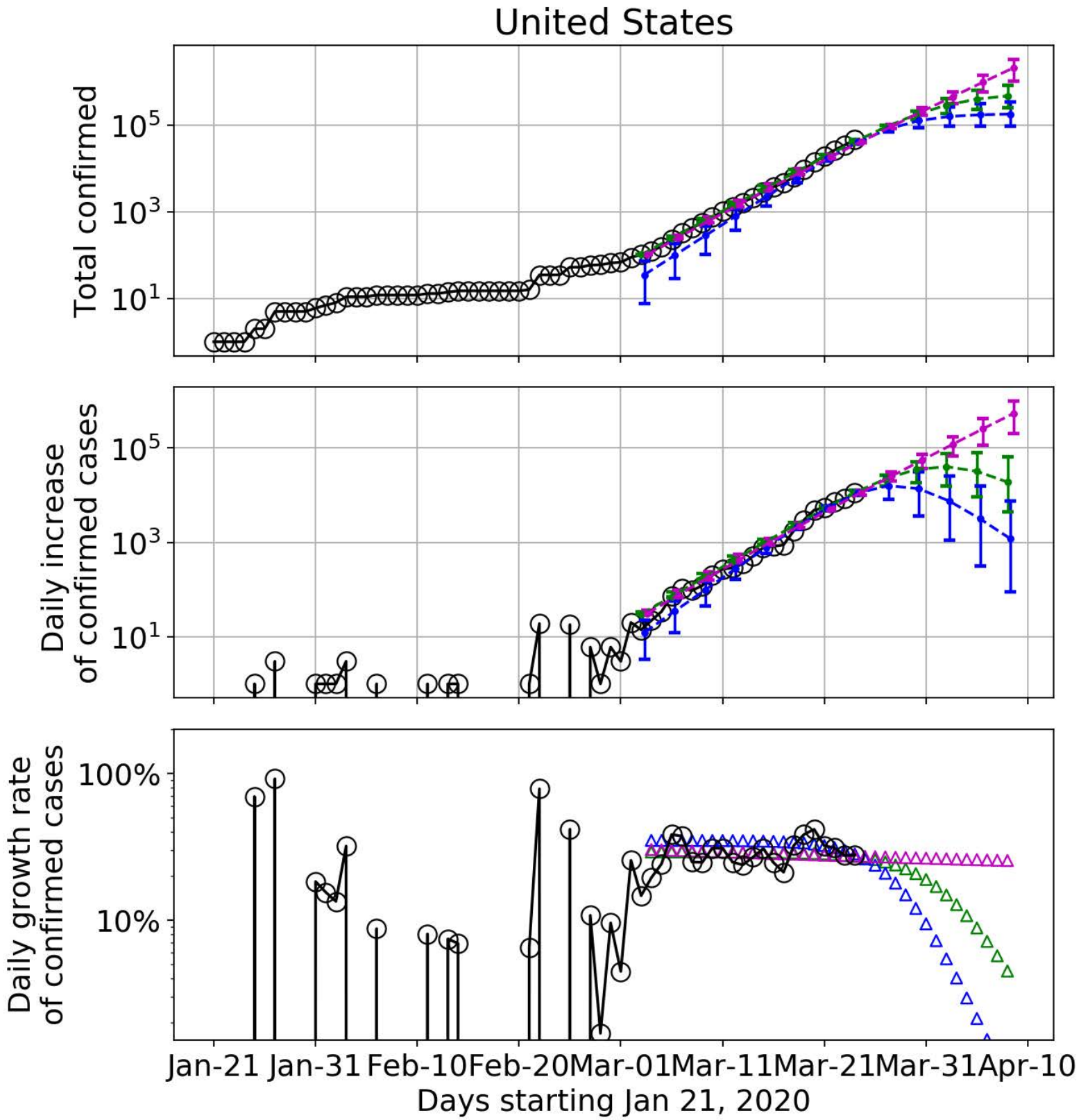
One final complication is the fact that tests are conducted sequentially over time. They do not represent a snapshot of a day in time. Many of those tested early, given a negative result, may today get a positive result. And many who tested positive early on, may today be cured.

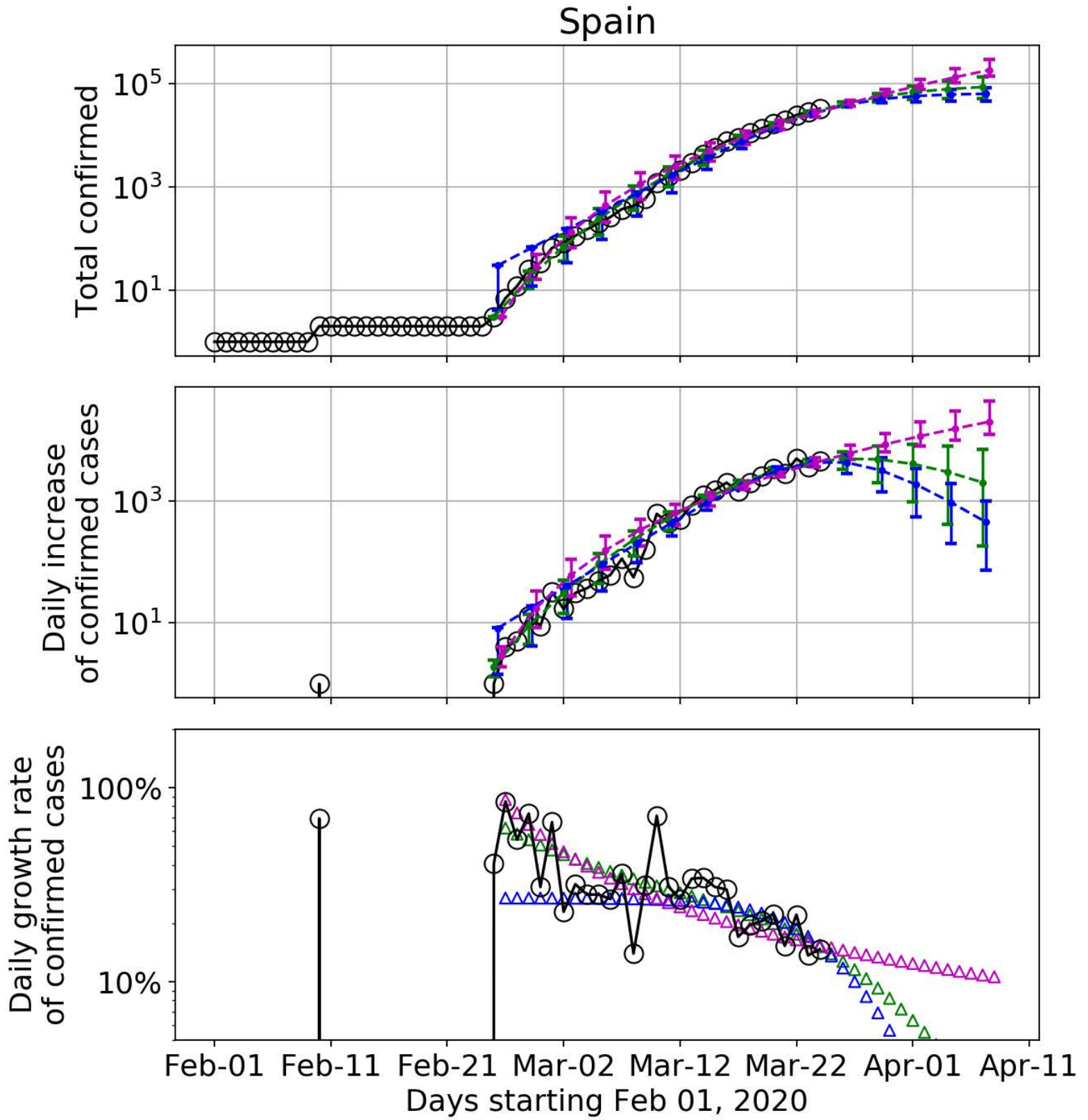
We anticipate that, over time, our methodology will improve and will provide a more accurate picture of the true levels of infection and where they are headed.

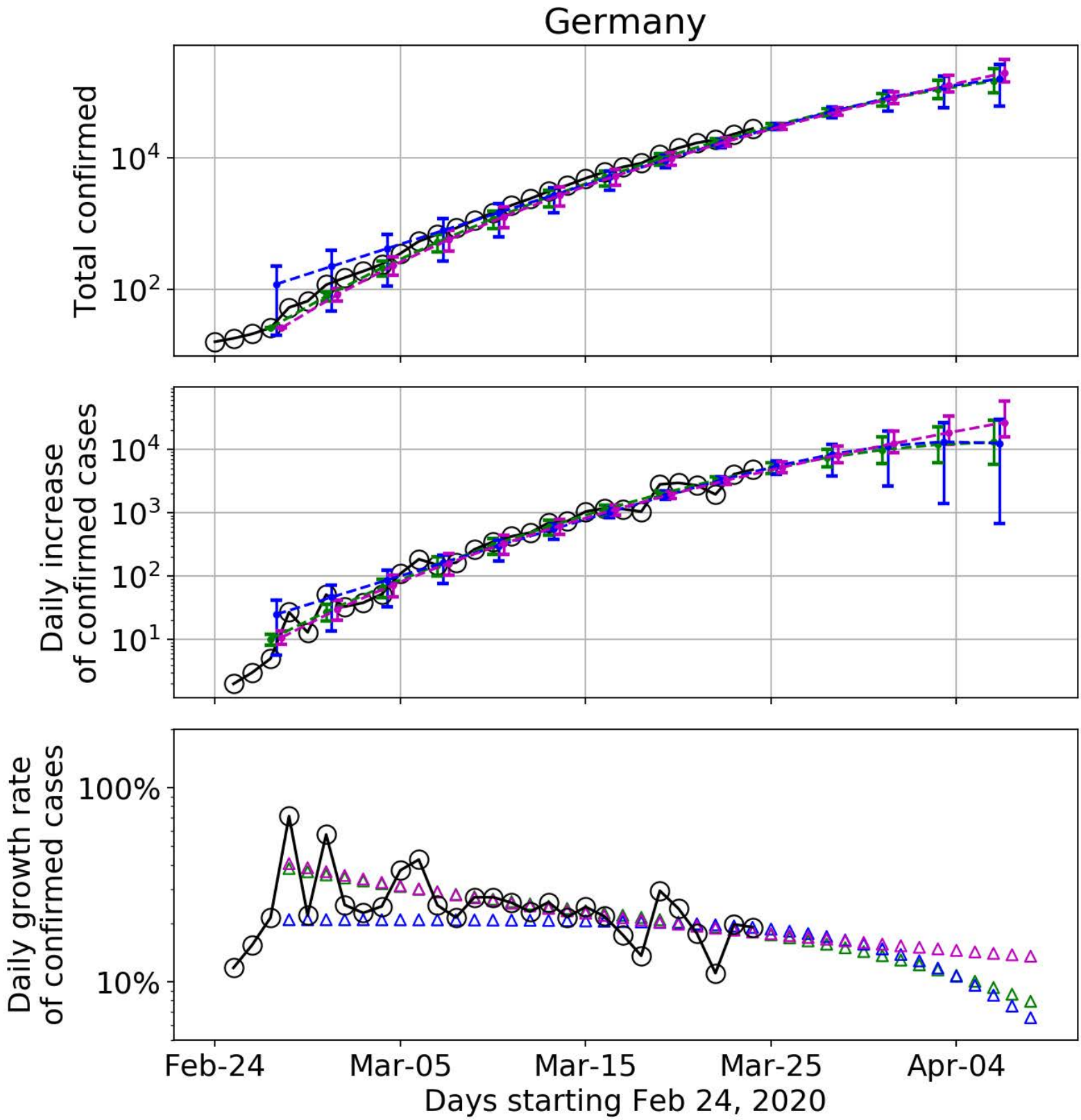
[1] Ke Wu, Didier Darcet, Qian Wang and Didier Sornette, Generalized logistic growth modeling of the COVID-19 outbreak in 29 provinces in China and in the rest of the world, preprint at http://arxiv.org/abs/2003.05681 and
medRxiv: https://medrxiv.org/cgi/content/short/2020.03.11.20034363v1

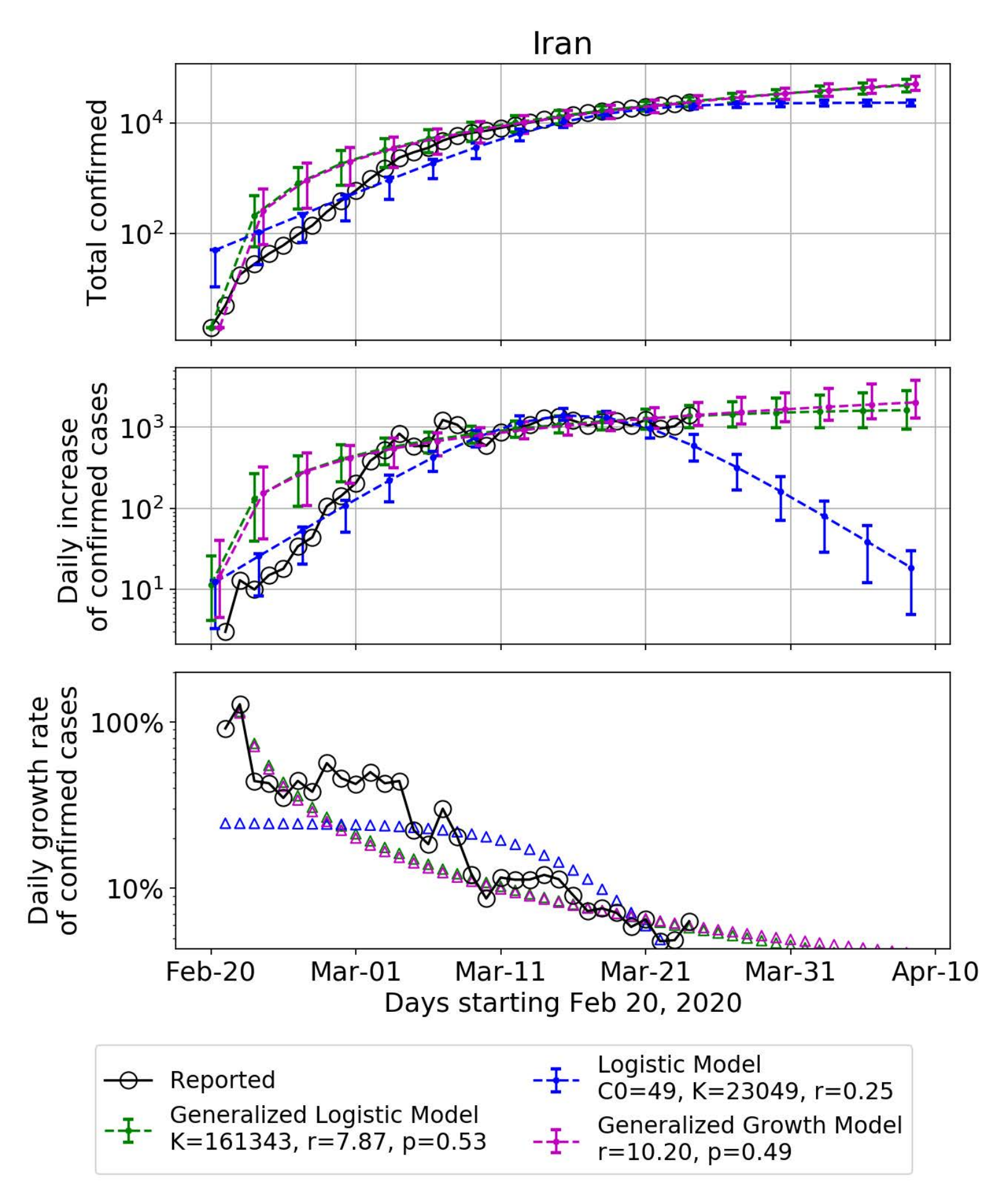

Europe
Total confirmed
10^6
10^4
10^2
Daily increase of confirmed cases
10^5
10^3
10^1
Daily growth rate of confirmed cases
100%
10%
Jan-25
Feb-04
Feb-14
Feb-24
Mar-05
Mar-15
Mar-25
Apr-04
Days starting Jan 25, 2020
Reported
Generalized Logistic Model
K=971230, r=0.81, p=0.87
Logistic Model
C0=435, K=485615, r=0.21
Generalized Growth Model
r=1.20, p=0.82

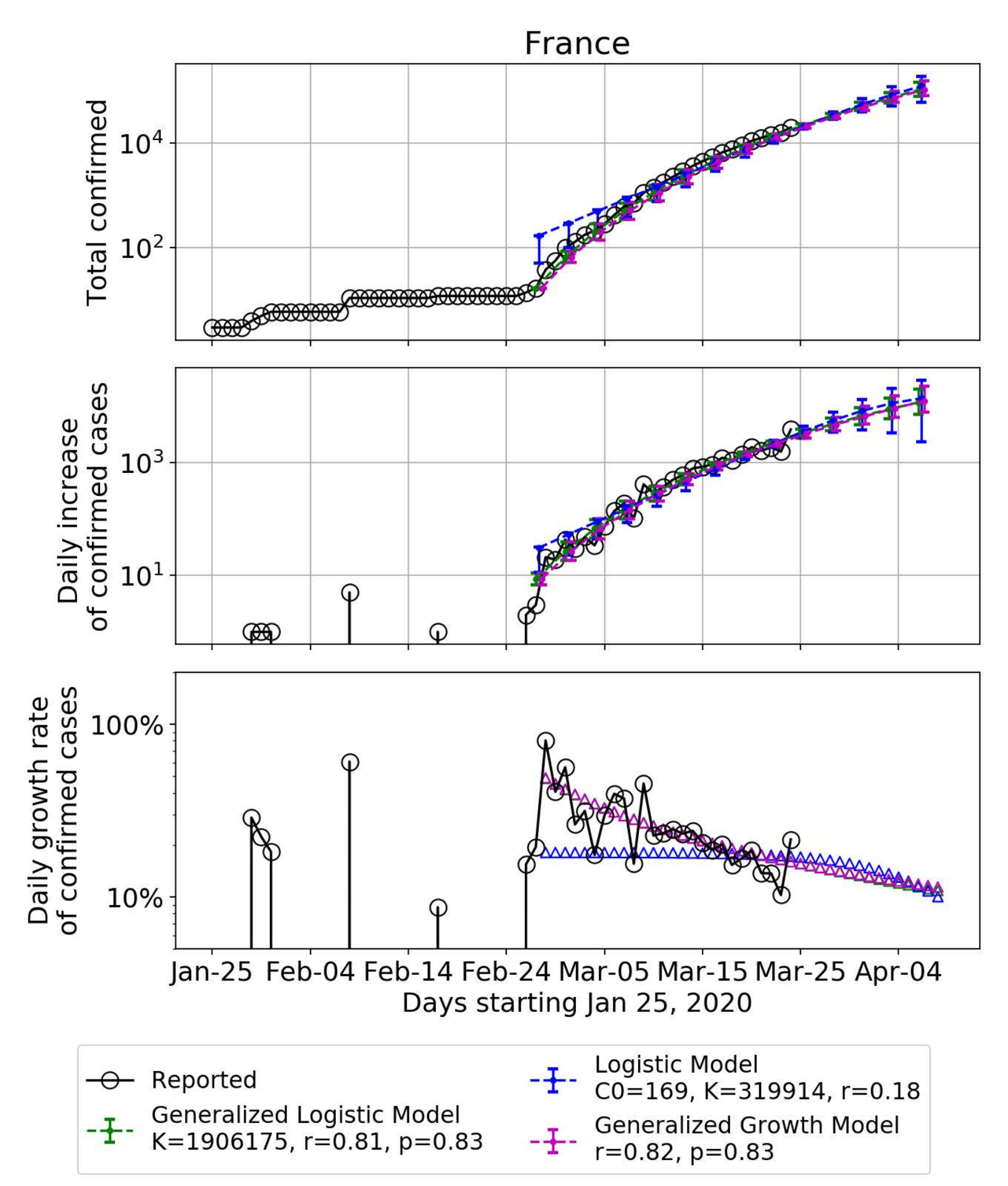

Italy
Total confirmed
10^4
10^2
Daily increase of confirmed cases
10^4
10^3
10^2
10^1
Daily growth rate of confirmed cases
100%
10%
Jan-31
Feb-10
Feb-20
Mar-01
Mar-11
Mar-21
Mar-31
Apr-10
Days starting Jan 31, 2020
Reported
Generalized Logistic Model
K=831051, r=2.05, p=0.73
Logistic Model
C0=169, K=102782, r=0.22
Generalized Growth Model
r=2.36, p=0.72

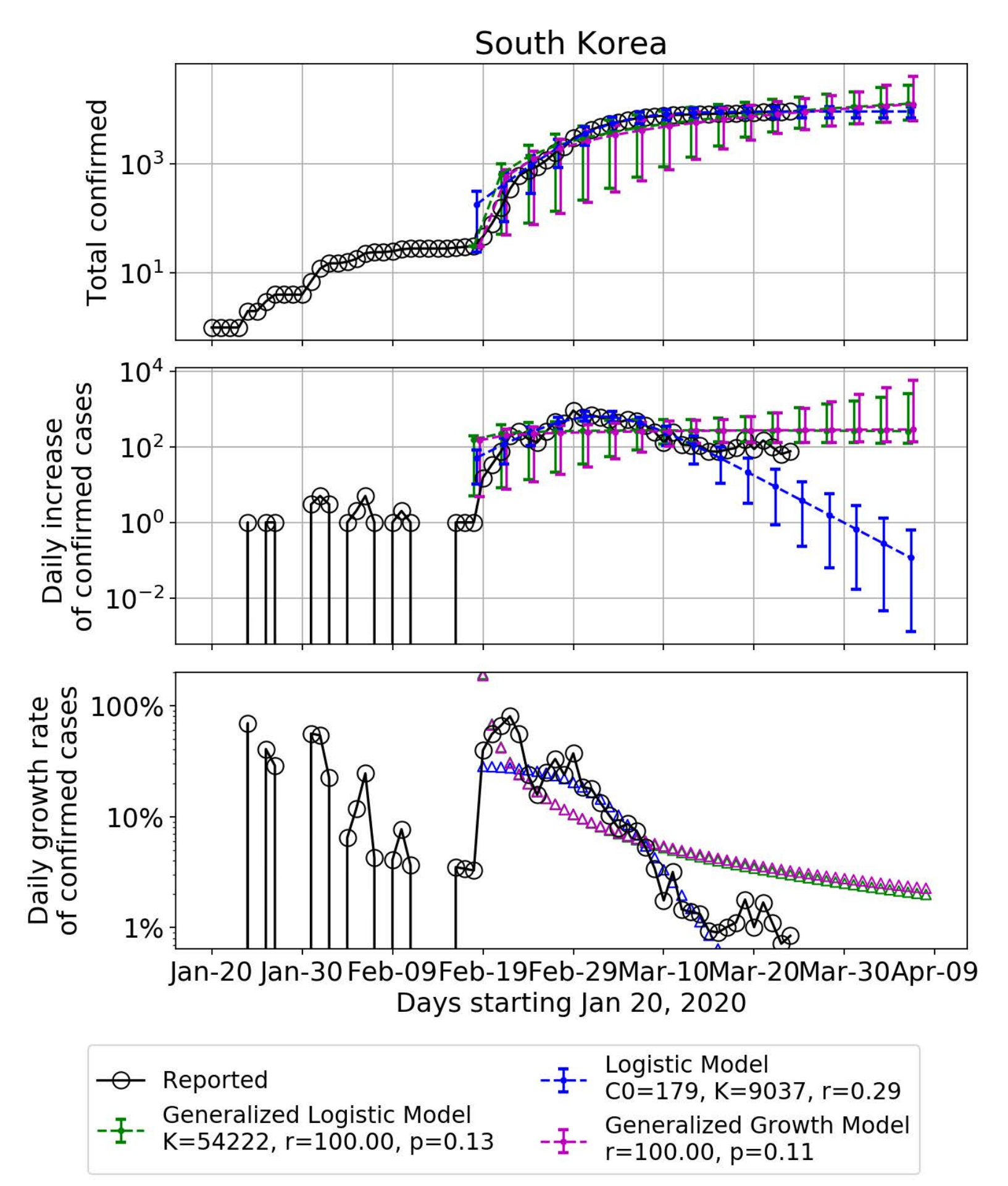

United States
Total confirmed
10^5
10^3
10^1
Daily increase of confirmed cases
10^5
10^3
10^1
Daily growth rate of confirmed cases
100%
10%
Jan-21
Jan-31
Feb-10
Feb-20
Mar-01
Mar-11
Mar-21
Mar-31
Apr-10
Days starting Jan 21, 2020
Reported
Generalized Logistic Model
K=557304, r=0.29, p=1.00
Logistic Model
C0=35, K=185768, r=0.35
Generalized Growth Model
r=0.33, p=0.98

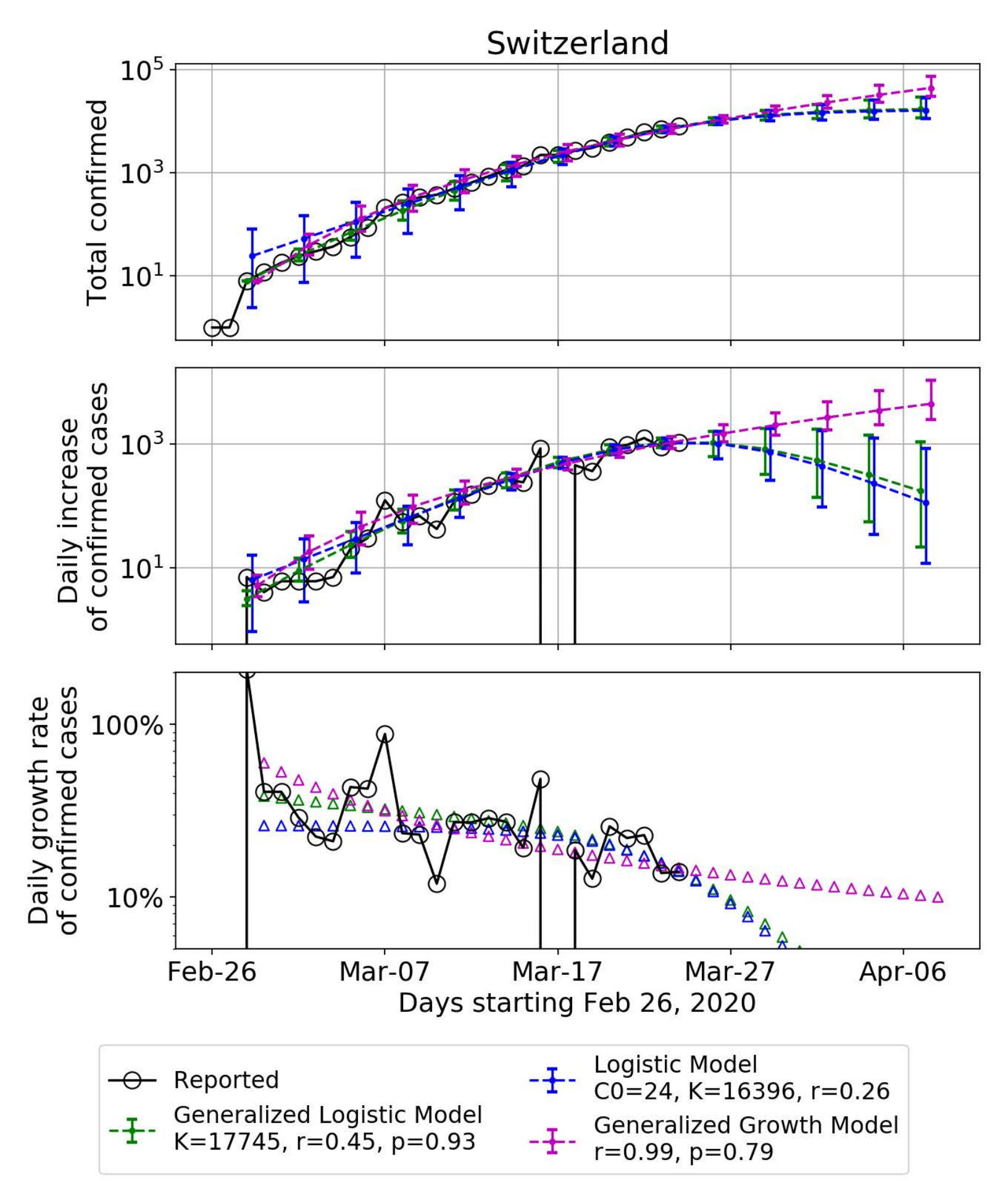

Spain
Total confirmed
10^5
10^3
10^1
Daily increase
of confirmed cases
10^3
10^1
Daily growth rate
of confirmed cases
100%
10%
Feb-01
Feb-11
Feb-21
Mar-02
Mar-12
Mar-22
Apr-01
Apr-11
Days starting Feb 01, 2020
Reported
Generalized Logistic Model
K=99278, r=0.73, p=0.88
Logistic Model
C0=29, K=66178, r=0.27
Generalized Growth Model
r=1.17, p=0.80

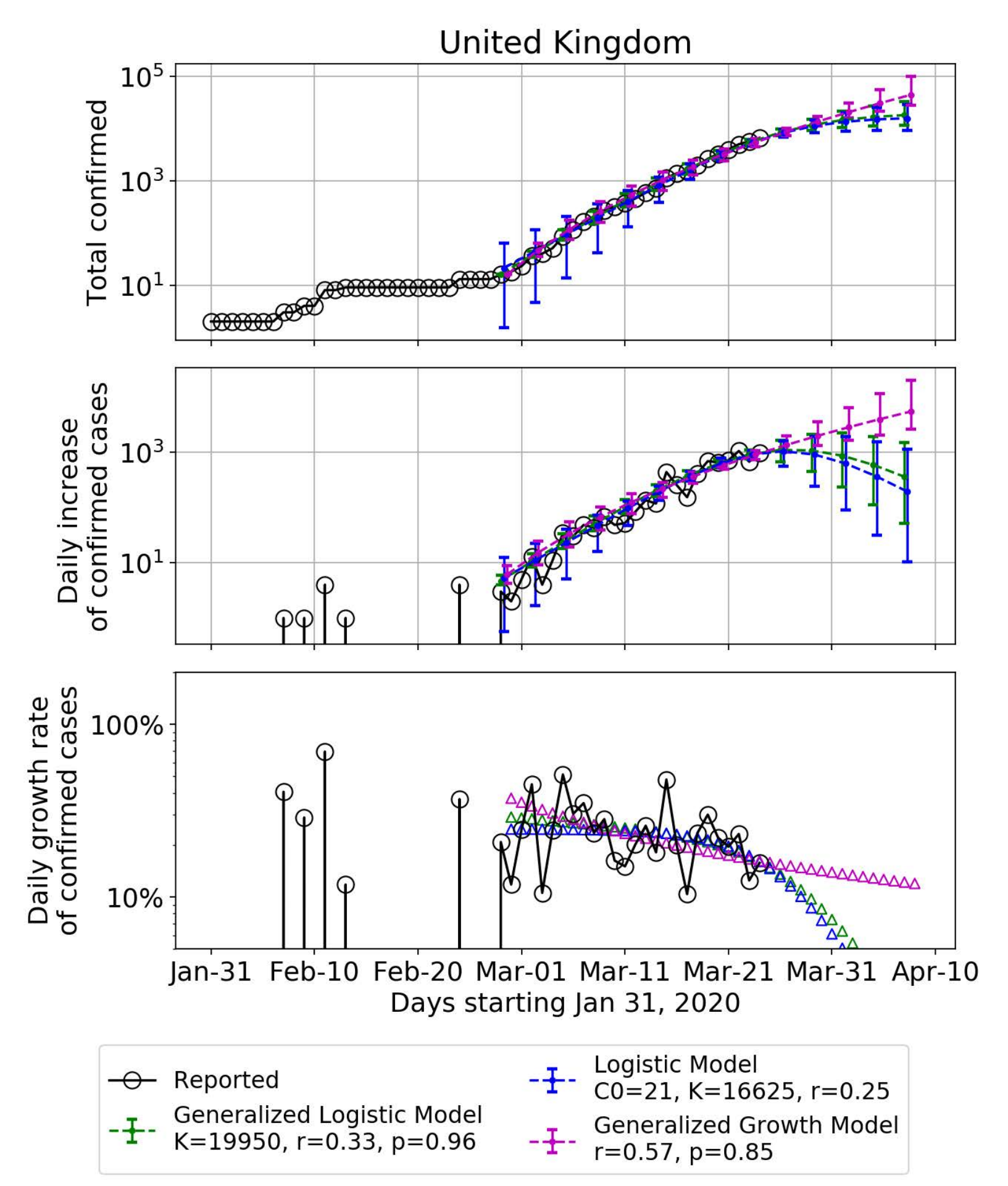

Germany
Total confirmed
10^4
10^2
Daily increase of confirmed cases
10^4
10^3
10^2
10^1
Daily growth rate of confirmed cases
100%
10%
Feb-24
Mar-05
Mar-15
Mar-25
Apr-04
Days starting Feb 24, 2020
Reported
Generalized Logistic Model
K=329231, r=0.55, p=0.90
Logistic Model
C0=119, K=253465, r=0.21
Generalized Growth Model
r=0.62, p=0.88

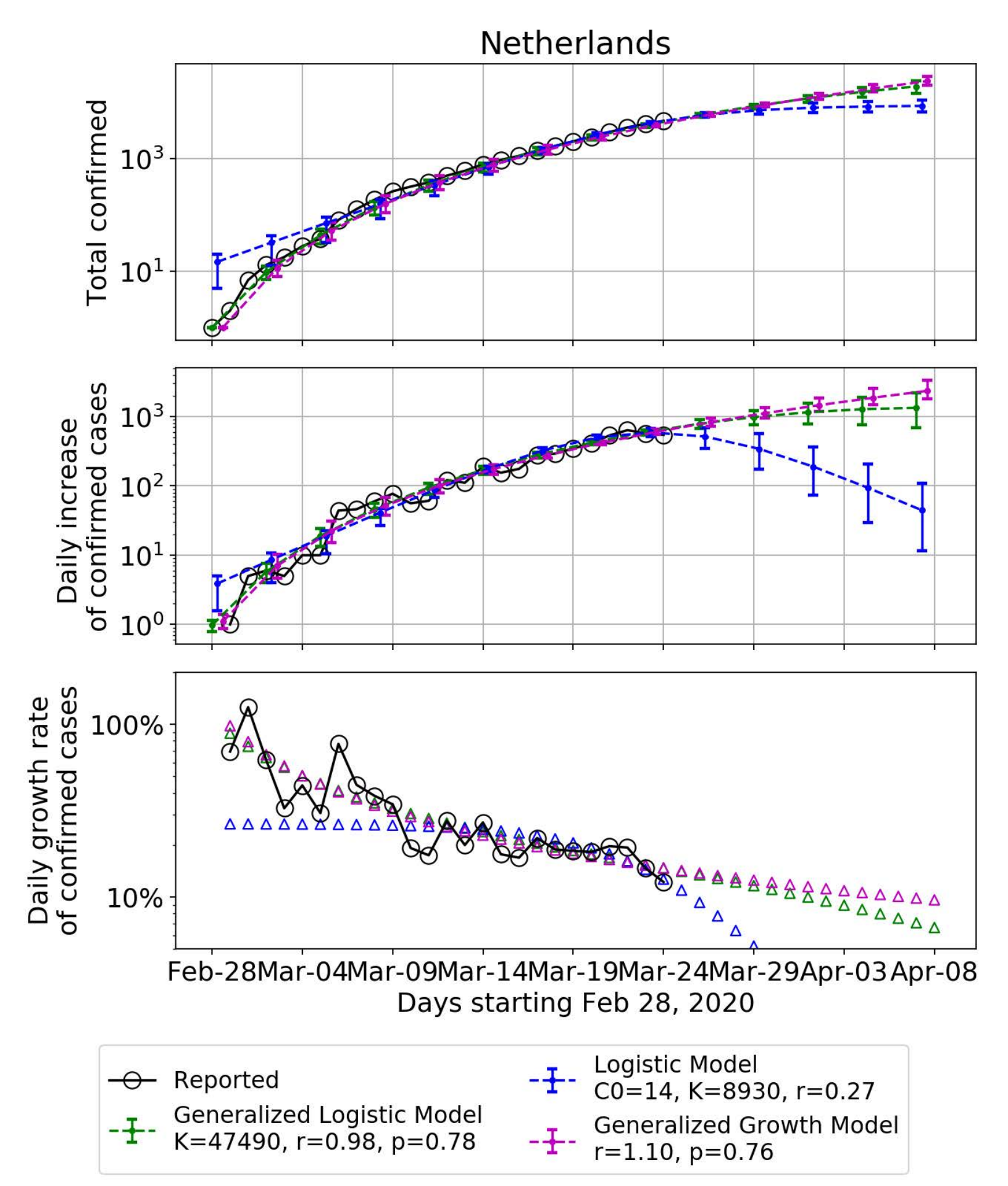

Iran
Total confirmed
10^4
10^2
Daily increase of confirmed cases
10^3
10^2
10^1
Daily growth rate of confirmed cases
100%
10%
Feb-20
Mar-01
Mar-11
Mar-21
Mar-31
Apr-10
Days starting Feb 20, 2020
Reported
Generalized Logistic Model
K=161343, r=7.87, p=0.53
Logistic Model
C0=49, K=23049, r=0.25
Generalized Growth Model
r=10.20, p=0.49

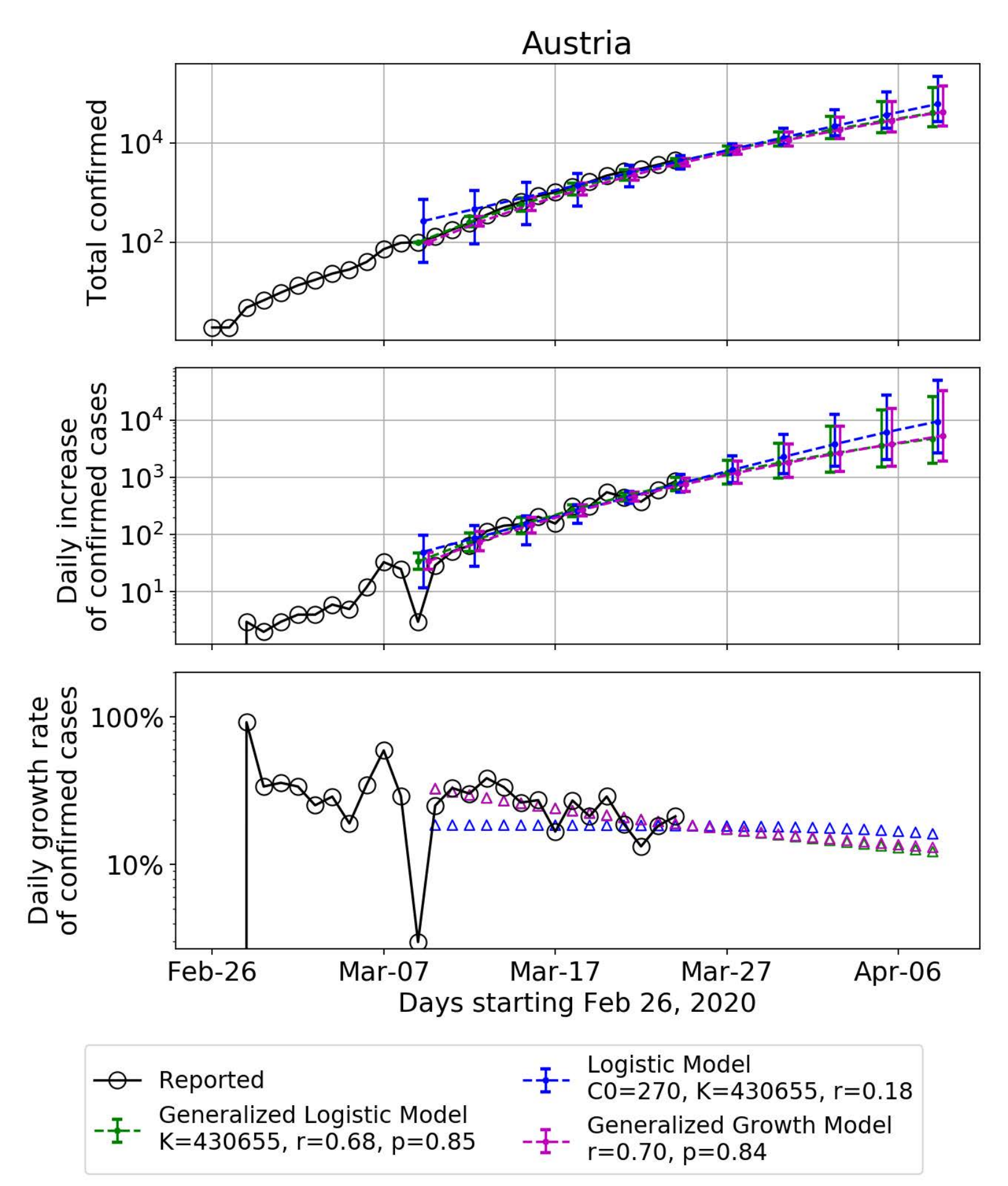

France
Total confirmed
10^4
10^2
Daily increase
of confirmed cases
10^3
10^1
Daily growth rate
of confirmed cases
100%
10%
Jan-25
Feb-04
Feb-14
Feb-24
Mar-05
Mar-15
Mar-25
Apr-04
Days starting Jan 25, 2020
Reported
Generalized Logistic Model
K=1906175, r=0.81, p=0.83
Logistic Model
C0=169, K=319914, r=0.18
Generalized Growth Model
r=0.82, p=0.83

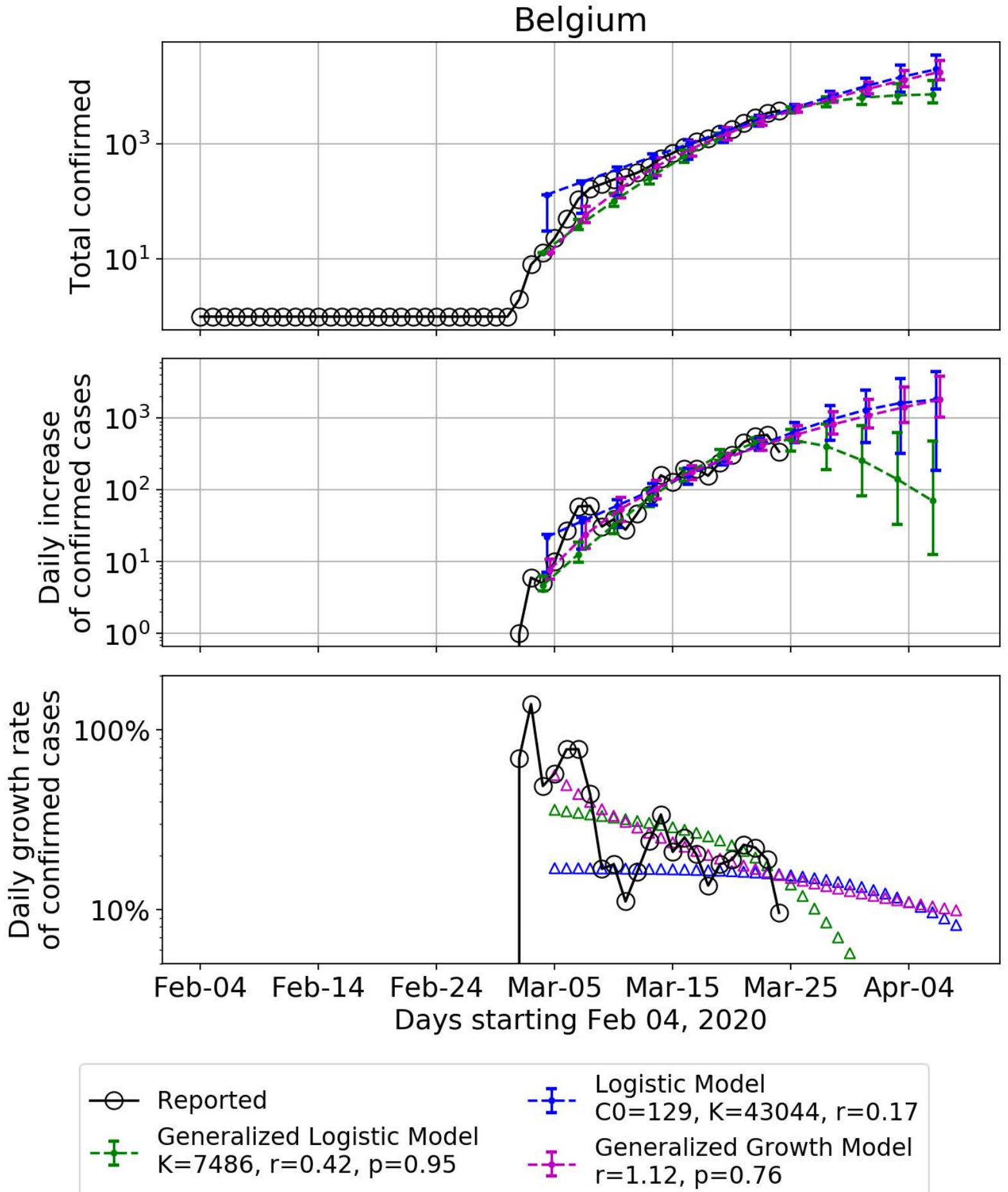

South Korea
Total confirmed
10^3
10^1
Daily increase of confirmed cases
10^4
10^2
10^0
10^{-2}
Daily growth rate of confirmed cases
100%
10%
1%
Jan-20
Jan-30
Feb-09
Feb-19
Feb-29
Mar-10
Mar-20
Mar-30
Apr-09
Days starting Jan 20, 2020
Reported
Generalized Logistic Model
K=54222, r=100.00, p=0.13
Logistic Model
C0=179, K=9037, r=0.29
Generalized Growth Model
r=100.00, p=0.11

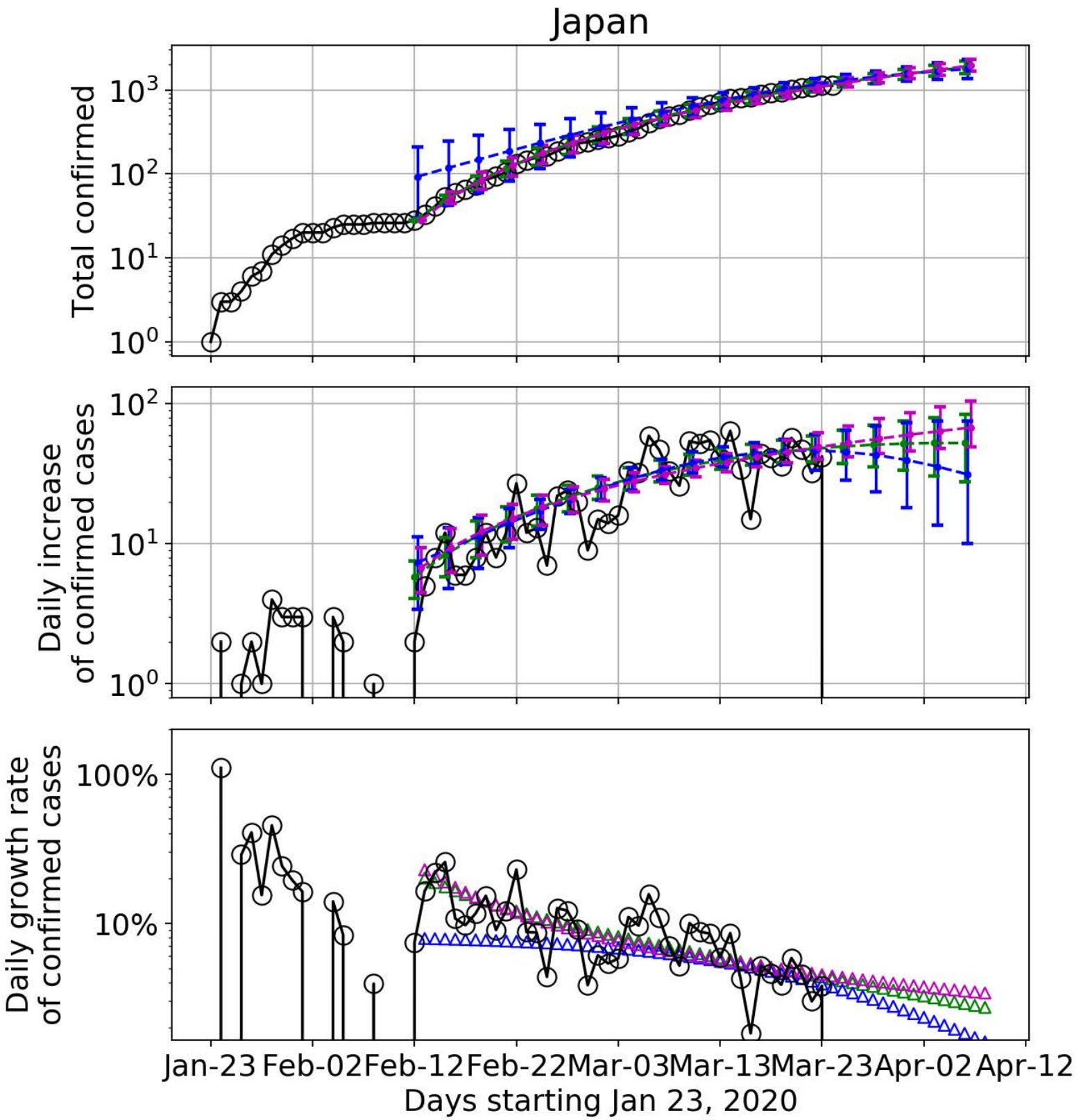

Switzerland
Total confirmed
10^5
10^3
10^1
Daily increase of confirmed cases
10^3
10^1
Daily growth rate of confirmed cases
100%
10%
Feb-26
Mar-07
Mar-17
Mar-27
Apr-06
Days starting Feb 26, 2020
Reported
Generalized Logistic Model
K=17745, r=0.45, p=0.93
Logistic Model
C0=24, K=16396, r=0.26
Generalized Growth Model
r=0.99, p=0.79

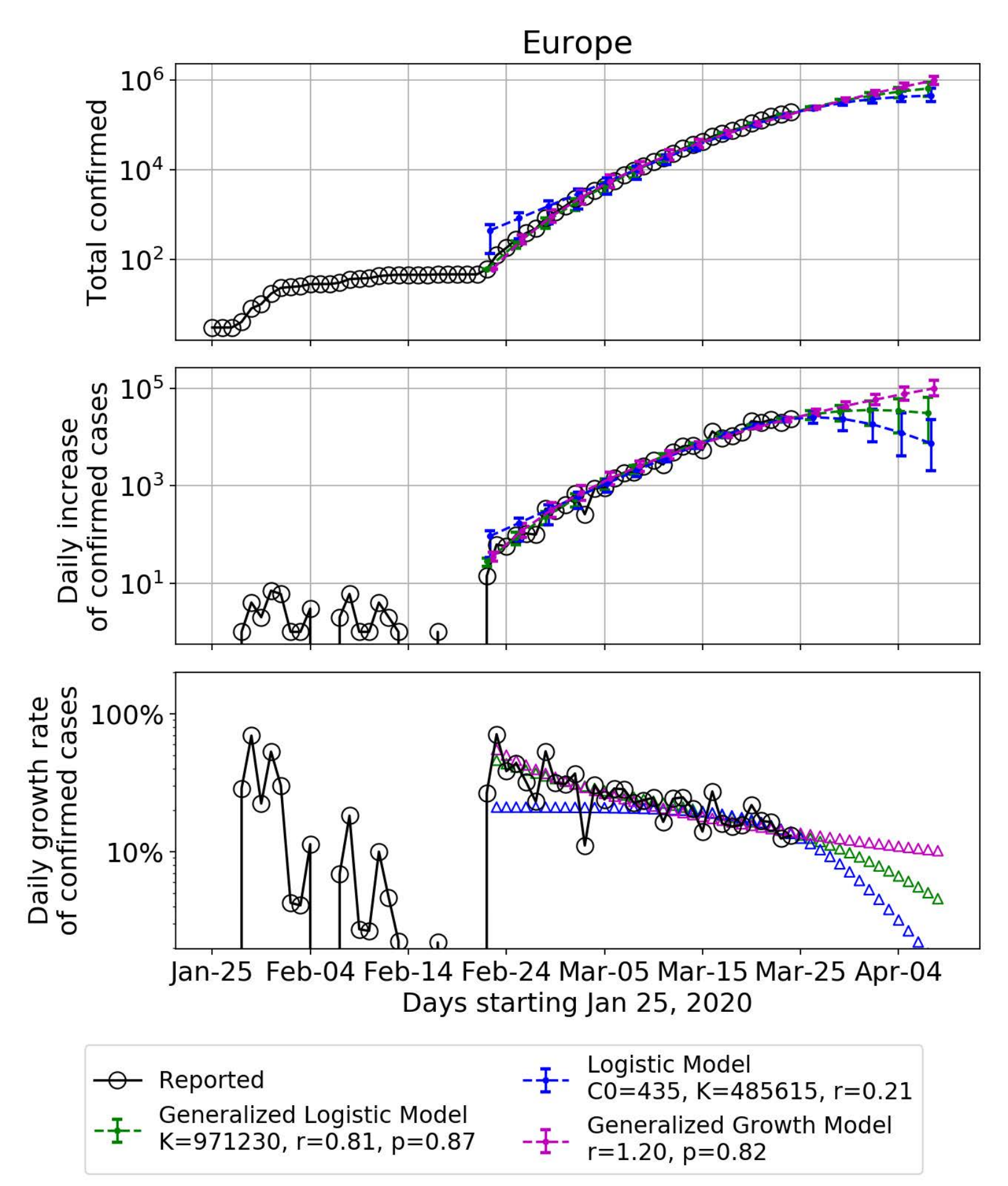

United Kingdom
Total confirmed
10^5
10^3
10^1
Daily increase of confirmed cases
10^3
10^1
Daily growth rate of confirmed cases
100%
10%
Jan-31
Feb-10
Feb-20
Mar-01
Mar-11
Mar-21
Mar-31
Apr-10
Days starting Jan 31, 2020
Reported
Generalized Logistic Model
K=19950, r=0.33, p=0.96
Logistic Model
C0=21, K=16625, r=0.25
Generalized Growth Model
r=0.57, p=0.85

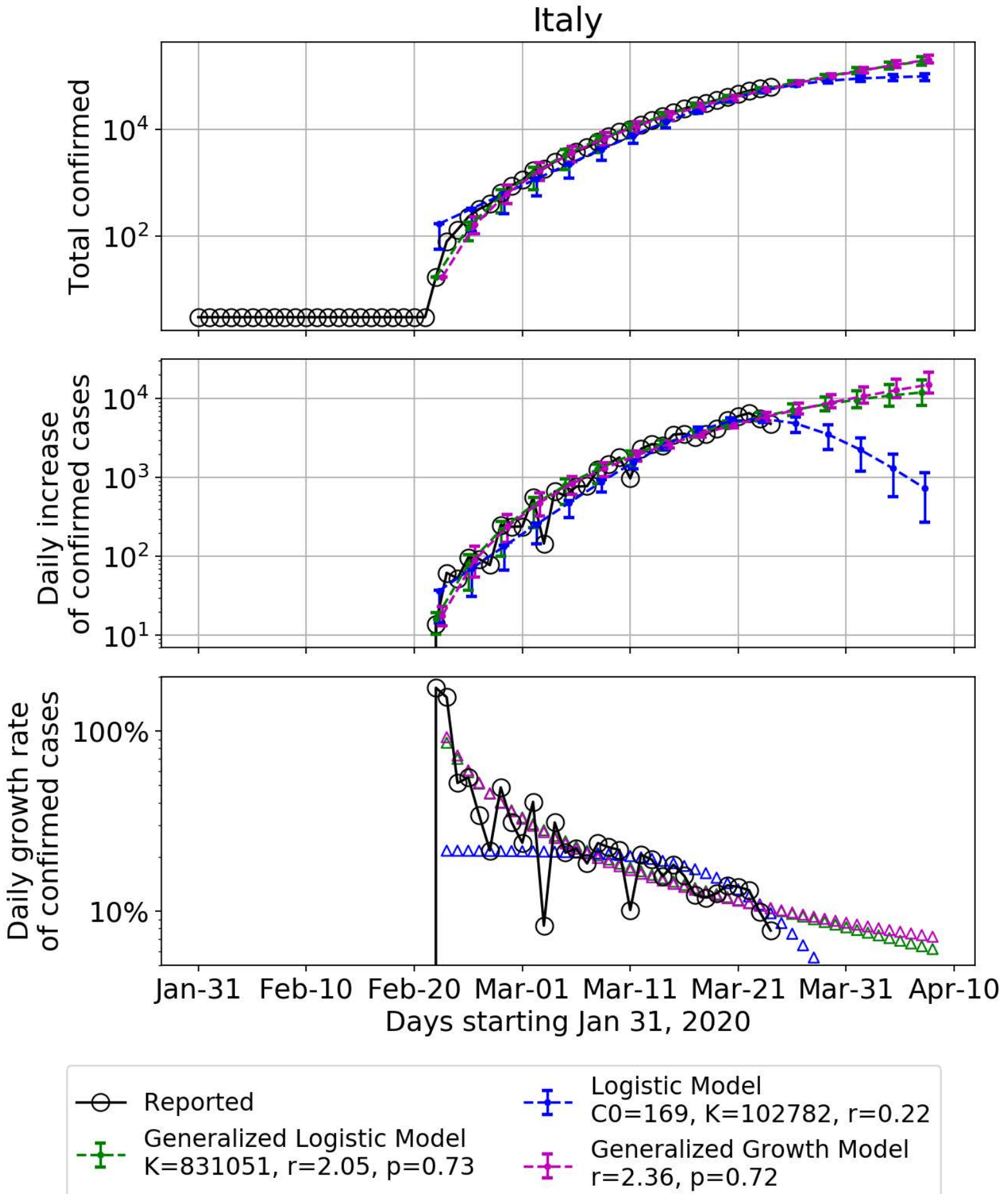

Netherlands
Total confirmed
10^3
10^1
Daily increase of confirmed cases
10^3
10^2
10^1
10^0
Daily growth rate of confirmed cases
100%
10%
Feb-28
Mar-04
Mar-09
Mar-14
Mar-19
Mar-24
Mar-29
Apr-03
Apr-08
Days starting Feb 28, 2020
Reported
Generalized Logistic Model
K=47490, r=0.98, p=0.78
Logistic Model
C0=14, K=8930, r=0.27
Generalized Growth Model
r=1.10, p=0.76

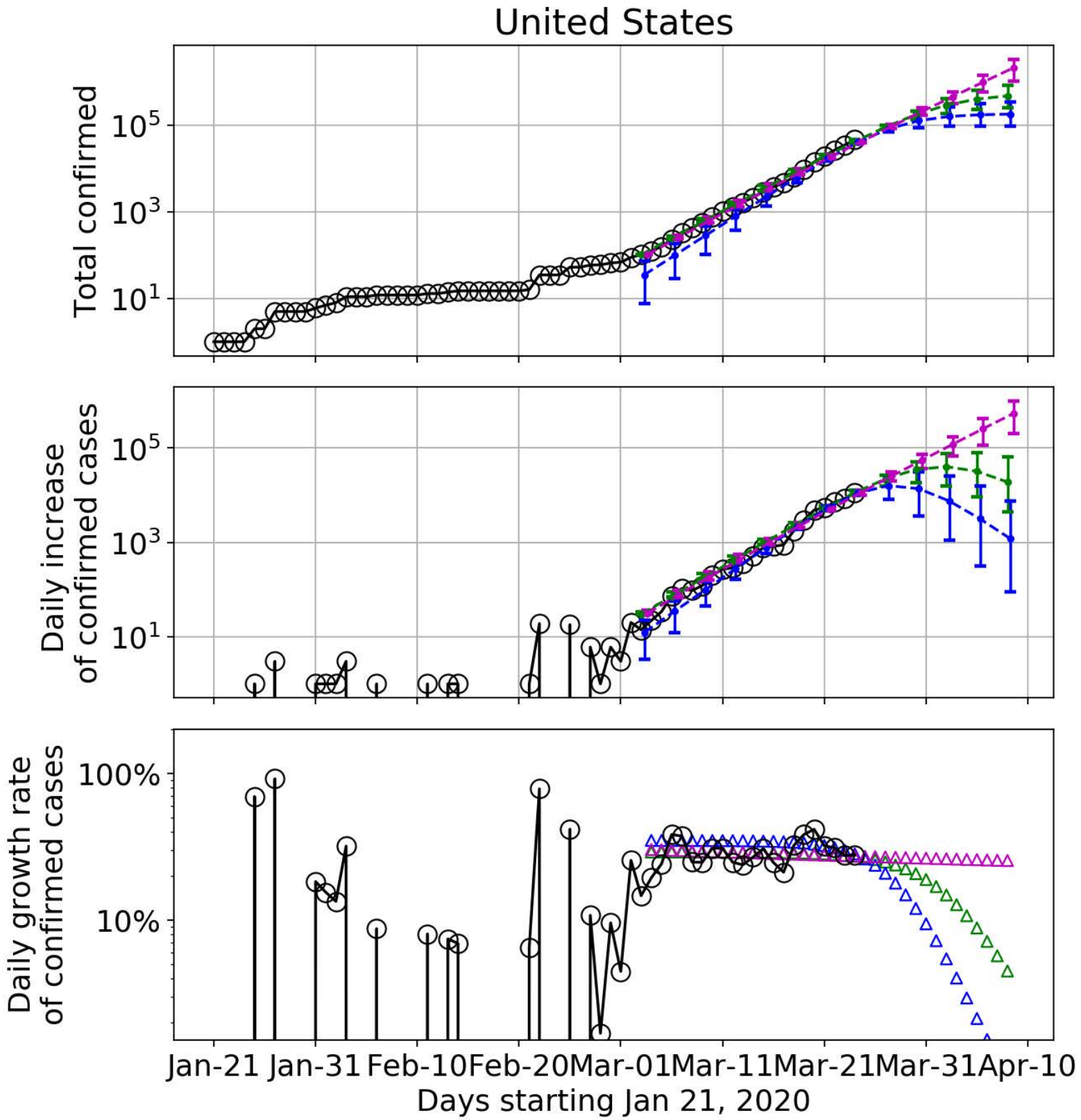

Austria
Total confirmed
10^4
10^2
Daily increase of confirmed cases
10^4
10^3
10^2
10^1
Daily growth rate of confirmed cases
100%
10%
Feb-26
Mar-07
Mar-17
Mar-27
Apr-06
Days starting Feb 26, 2020
Reported
Generalized Logistic Model
K=430655, r=0.68, p=0.85
Logistic Model
C0=270, K=430655, r=0.18
Generalized Growth Model
r=0.70, p=0.84

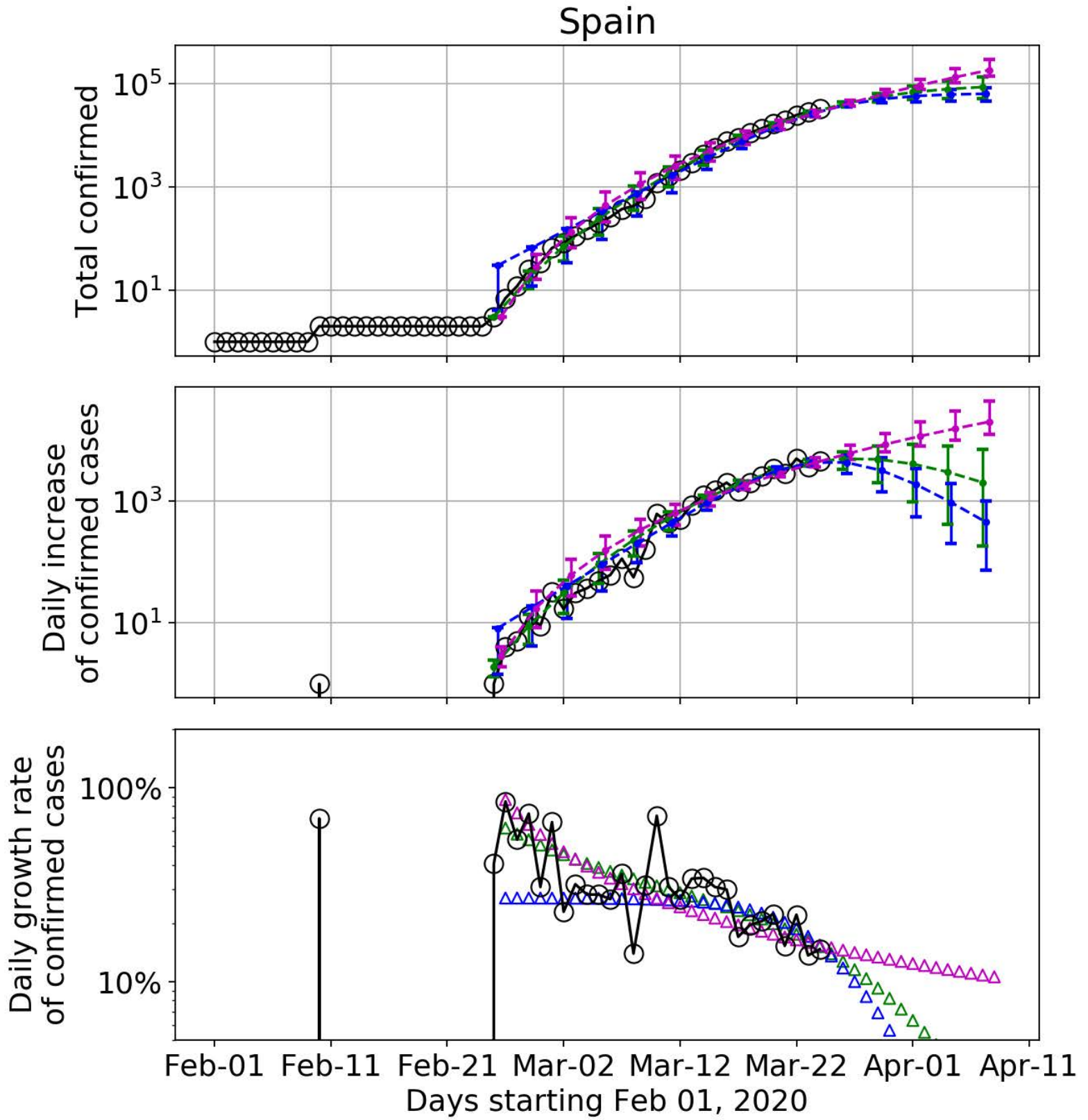

Belgium
Total confirmed
10^3
10^1
Daily increase of confirmed cases
10^3
10^2
10^1
10^0
Daily growth rate of confirmed cases
100%
10%
Feb-04
Feb-14
Feb-24
Mar-05
Mar-15
Mar-25
Apr-04
Days starting Feb 04, 2020
Reported
Generalized Logistic Model
K=7486, r=0.42, p=0.95
Logistic Model
C0=129, K=43044, r=0.17
Generalized Growth Model
r=1.12, p=0.76

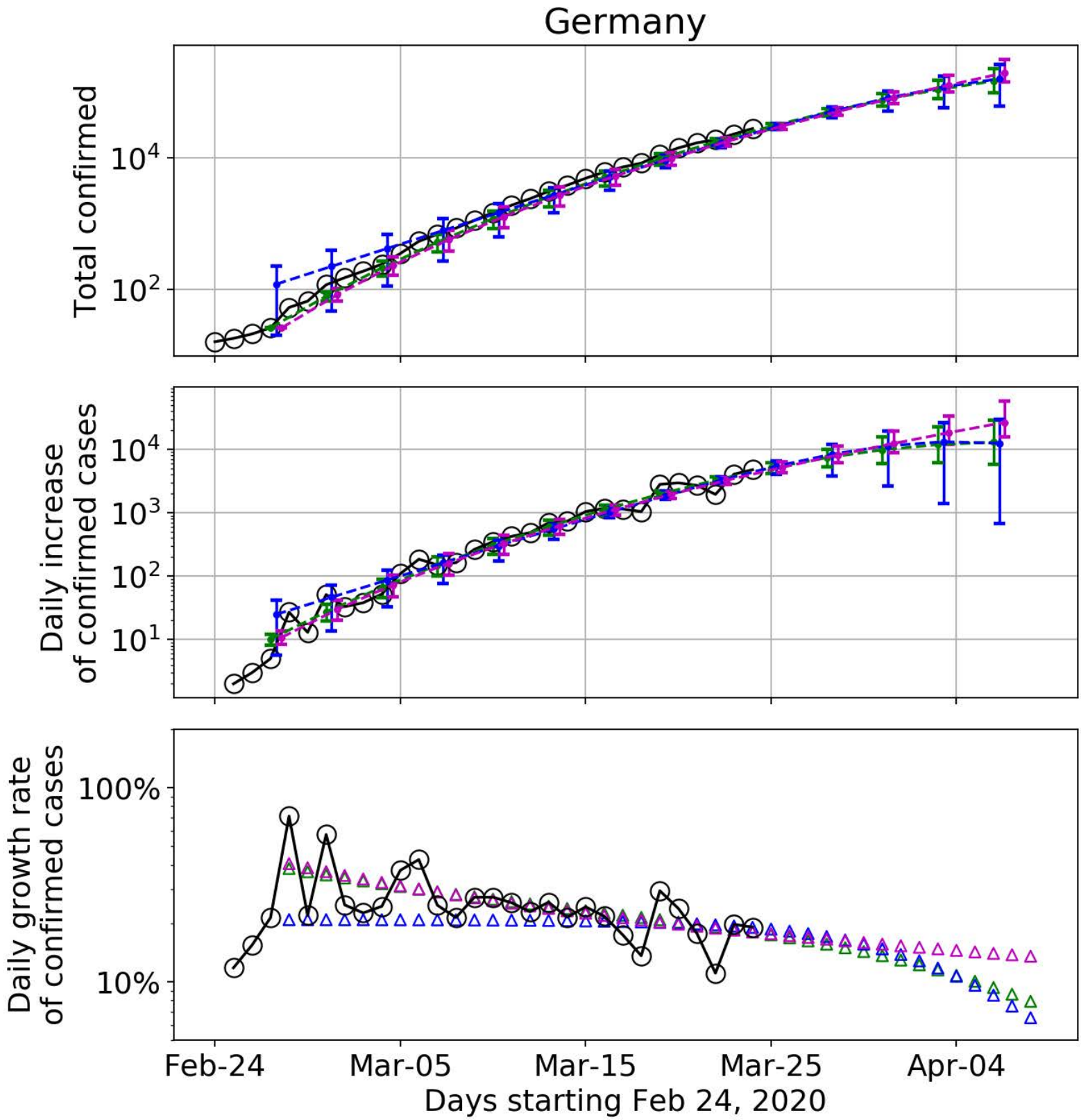

Japan
Total confirmed
Daily increase of confirmed cases
Daily growth rate of confirmed cases
100%
10%
Jan-23
Feb-02
Feb-12
Feb-22
Mar-03
Mar-13
Mar-23
Apr-02
Apr-12
Days starting Jan 23, 2020
Reported
Generalized Logistic Model
K=4512, r=0.67, p=0.65
Logistic Model
C0=92, K=2256, r=0.08
Generalized Growth Model
r=1.09, p=0.54

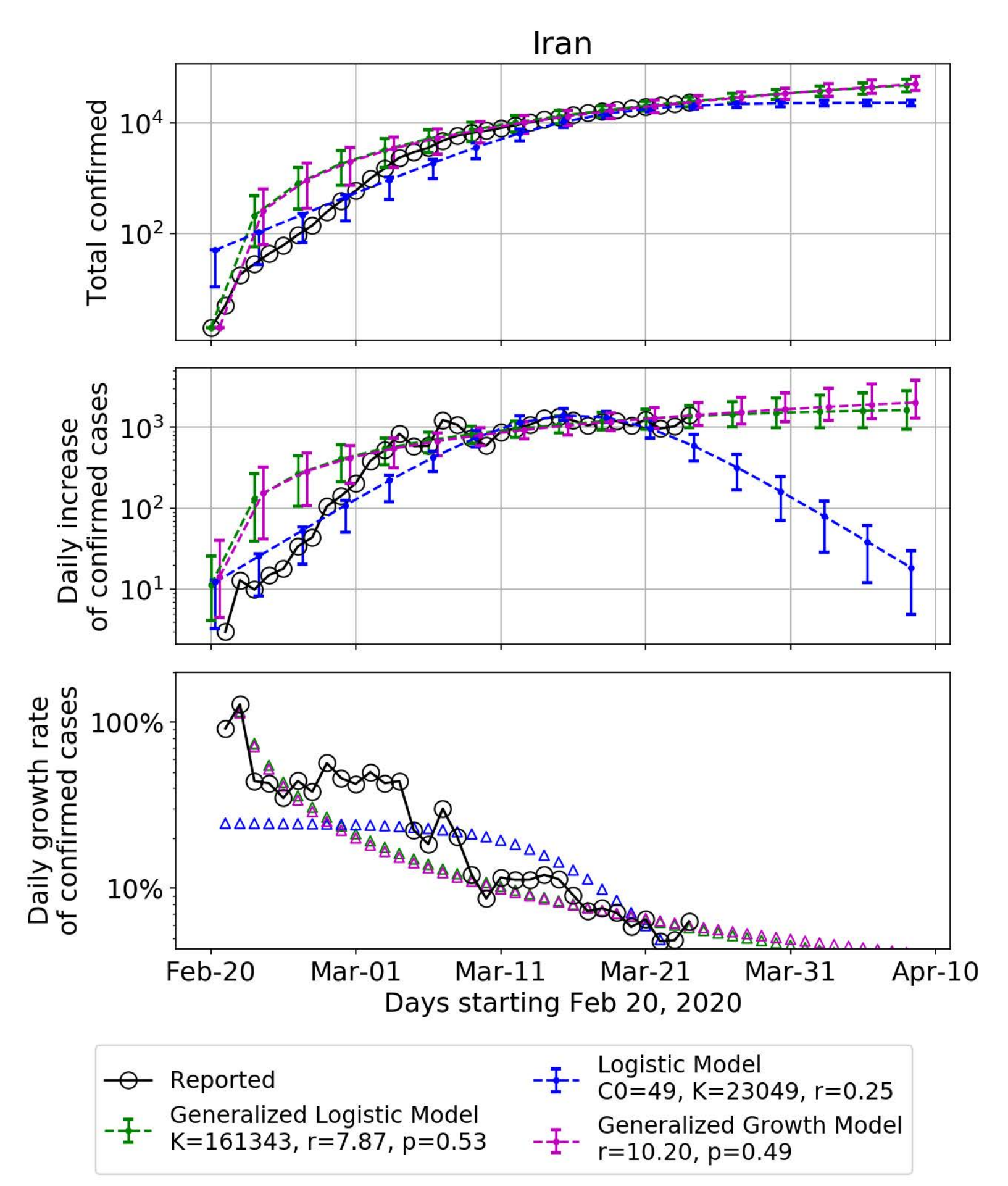

Europe
Total confirmed
10^6
10^4
10^2
Daily increase of confirmed cases
10^5
10^3
10^1
Daily growth rate of confirmed cases
100%
10%
Jan-25
Feb-04
Feb-14
Feb-24
Mar-05
Mar-15
Mar-25
Apr-04
Days starting Jan 25, 2020
Reported
Generalized Logistic Model
K=971230, r=0.81, p=0.87
Logistic Model
C0=435, K=485615, r=0.21
Generalized Growth Model
r=1.20, p=0.82

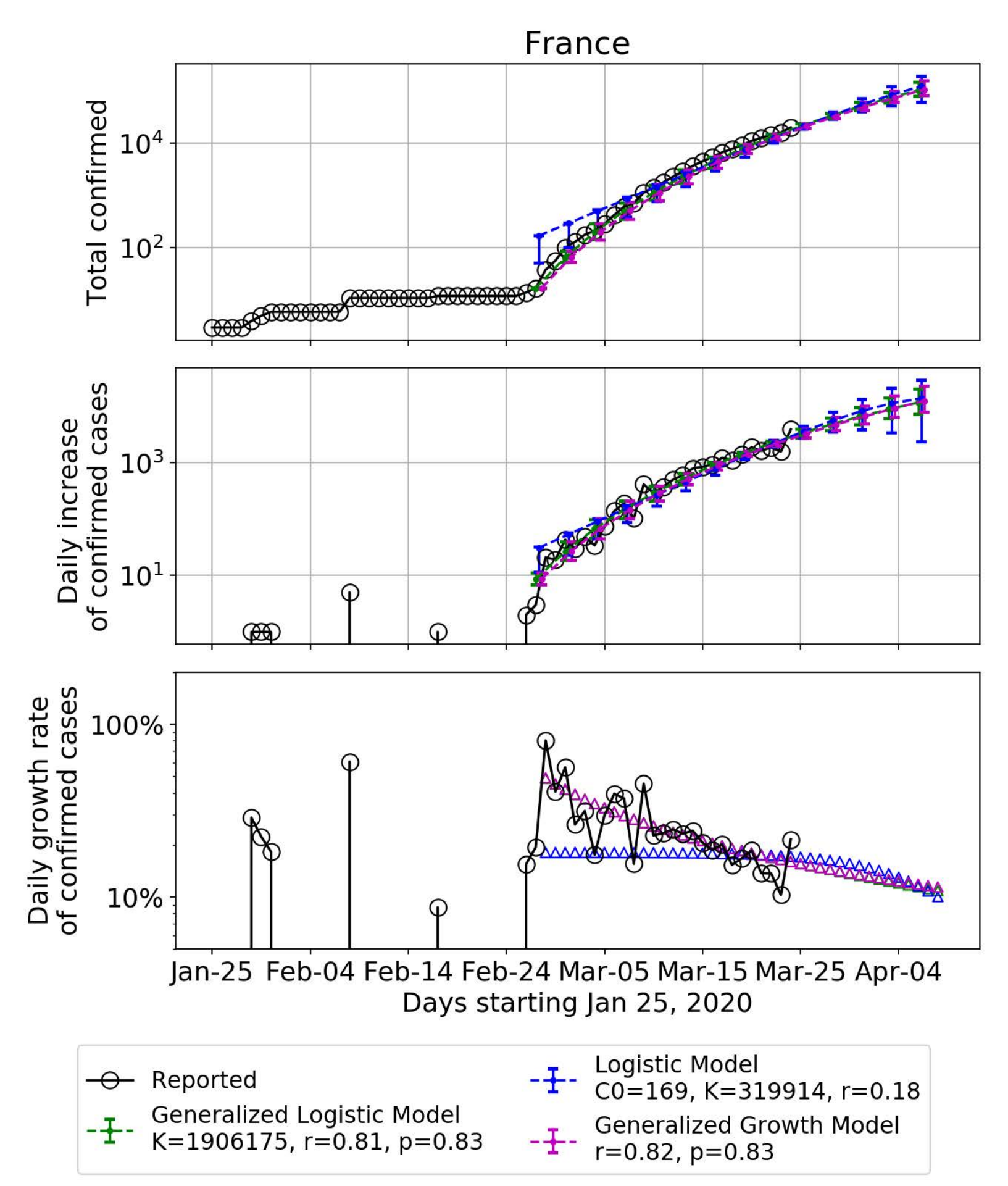

Italy
Total confirmed
10^4
10^2
Daily increase of confirmed cases
10^4
10^3
10^2
10^1
Daily growth rate of confirmed cases
100%
10%
Jan-31
Feb-10
Feb-20
Mar-01
Mar-11
Mar-21
Mar-31
Apr-10
Days starting Jan 31, 2020
Reported
Generalized Logistic Model
K=831051, r=2.05, p=0.73
Logistic Model
C0=169, K=102782, r=0.22
Generalized Growth Model
r=2.36, p=0.72

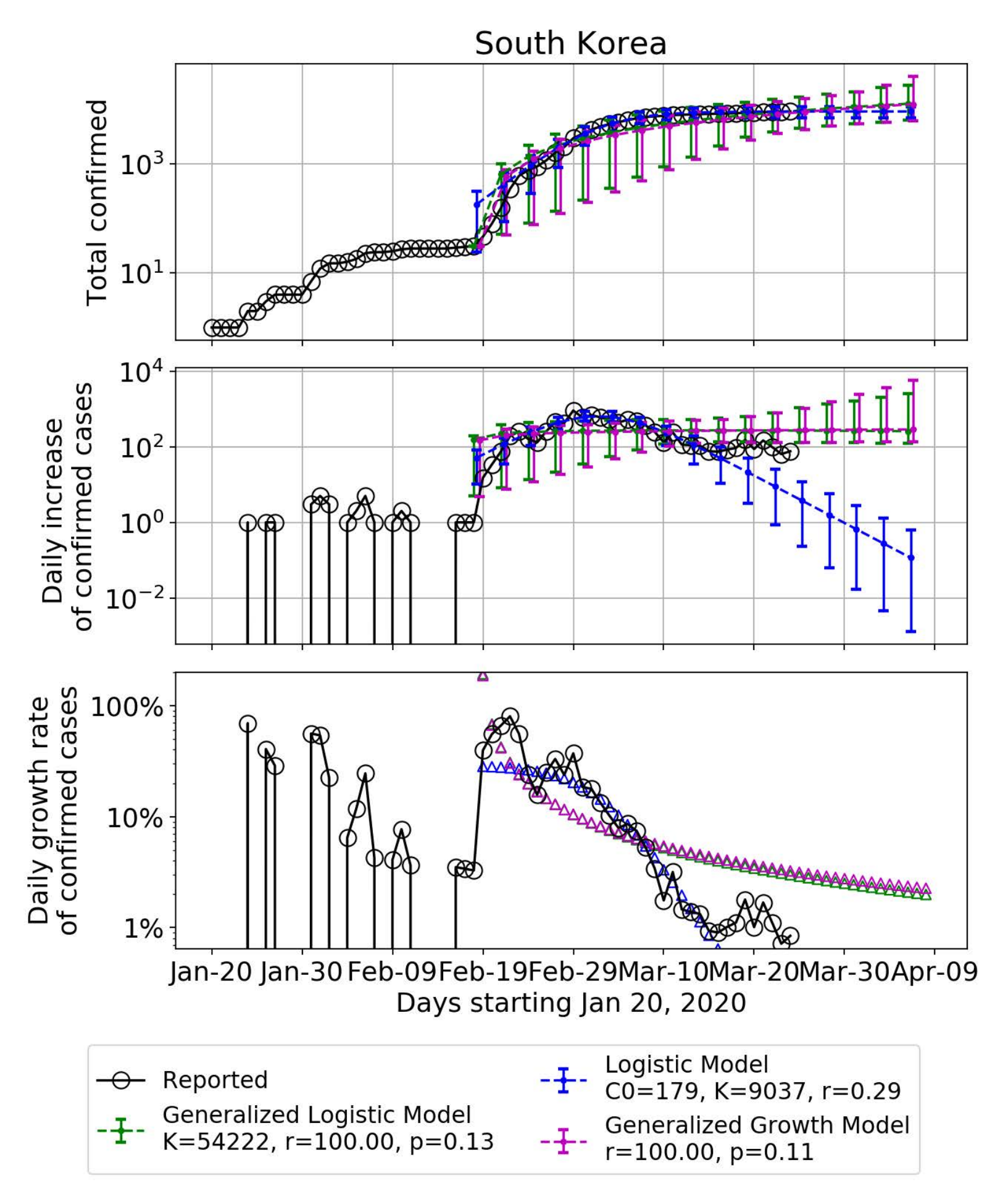

United States
Total confirmed
10^5
10^3
10^1
Daily increase of confirmed cases
10^5
10^3
10^1
Daily growth rate of confirmed cases
100%
10%
Jan-21
Jan-31
Feb-10
Feb-20
Mar-01
Mar-11
Mar-21
Mar-31
Apr-10
Days starting Jan 21, 2020
Reported
Generalized Logistic Model
K=557304, r=0.29, p=1.00
Logistic Model
C0=35, K=185768, r=0.35
Generalized Growth Model
r=0.33, p=0.98

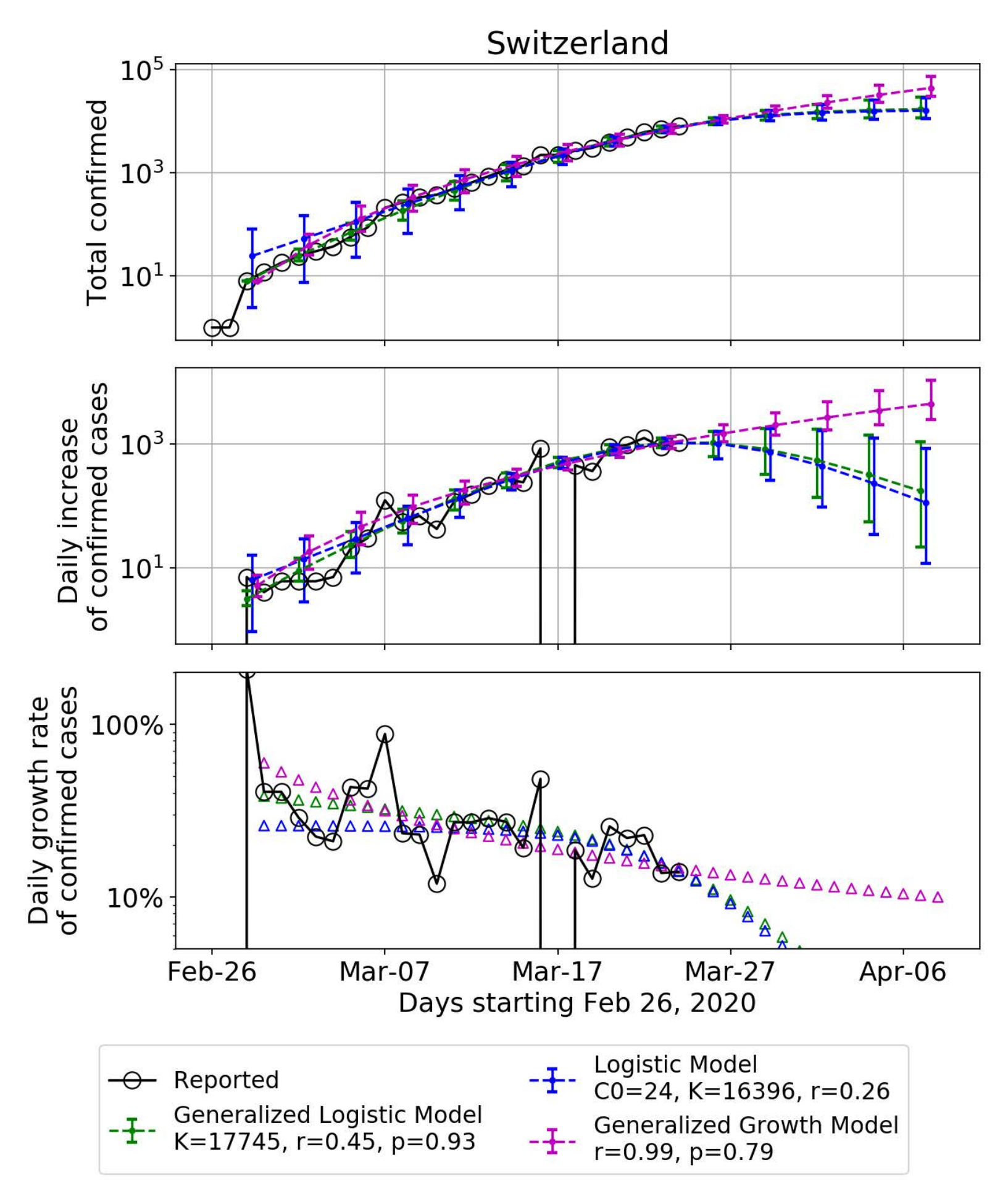

Spain
Total confirmed
10^5
10^3
10^1
Daily increase
of confirmed cases
10^3
10^1
Daily growth rate
of confirmed cases
100%
10%
Feb-01
Feb-11
Feb-21
Mar-02
Mar-12
Mar-22
Apr-01
Apr-11
Days starting Feb 01, 2020
Reported
Generalized Logistic Model
K=99278, r=0.73, p=0.88
Logistic Model
C0=29, K=66178, r=0.27
Generalized Growth Model
r=1.17, p=0.80

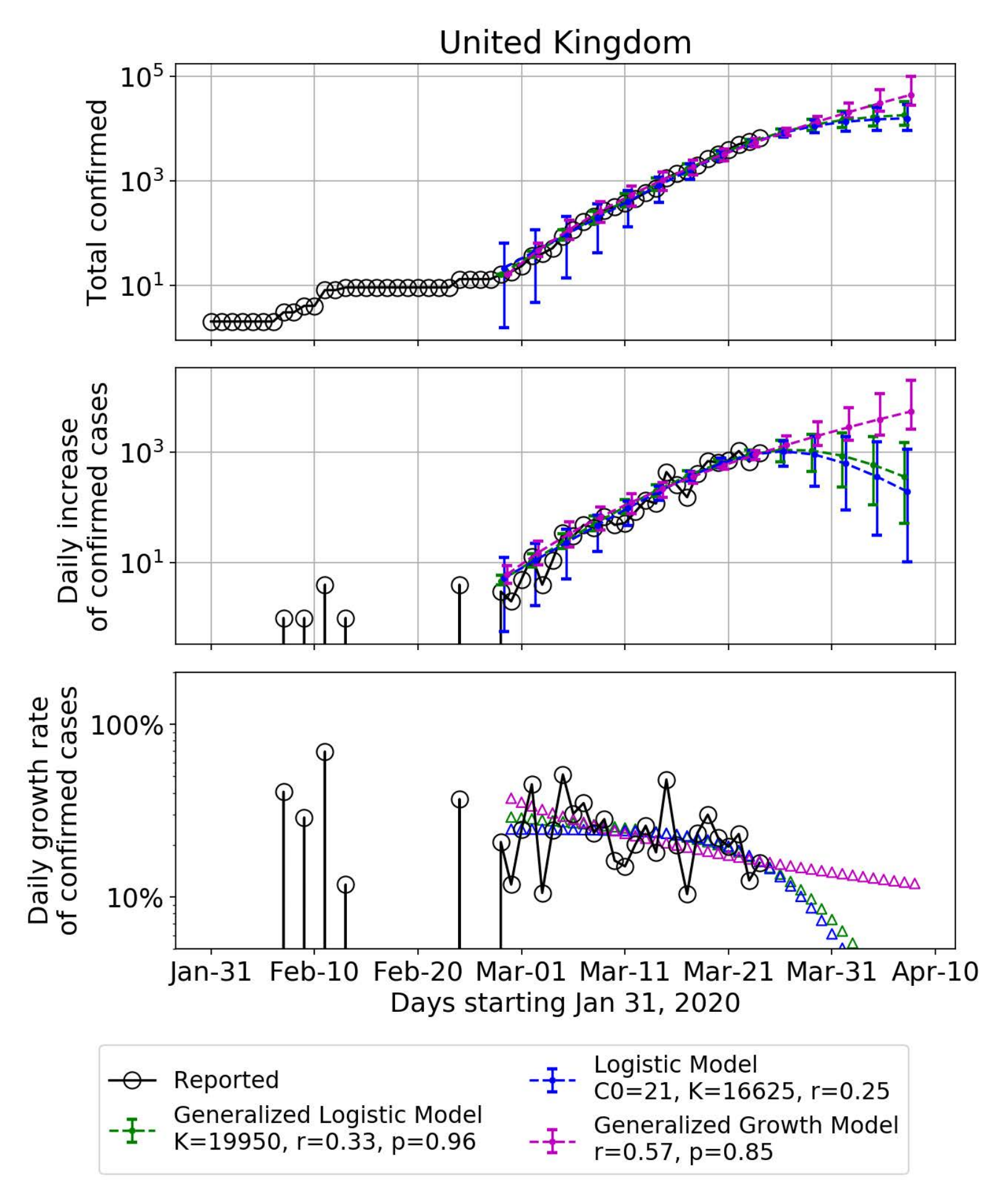

Germany
Total confirmed
10^4
10^2
Daily increase of confirmed cases
10^4
10^3
10^2
10^1
Daily growth rate of confirmed cases
100%
10%
Feb-24
Mar-05
Mar-15
Mar-25
Apr-04
Days starting Feb 24, 2020
Reported
Generalized Logistic Model
K=329231, r=0.55, p=0.90
Logistic Model
C0=119, K=253465, r=0.21
Generalized Growth Model
r=0.62, p=0.88

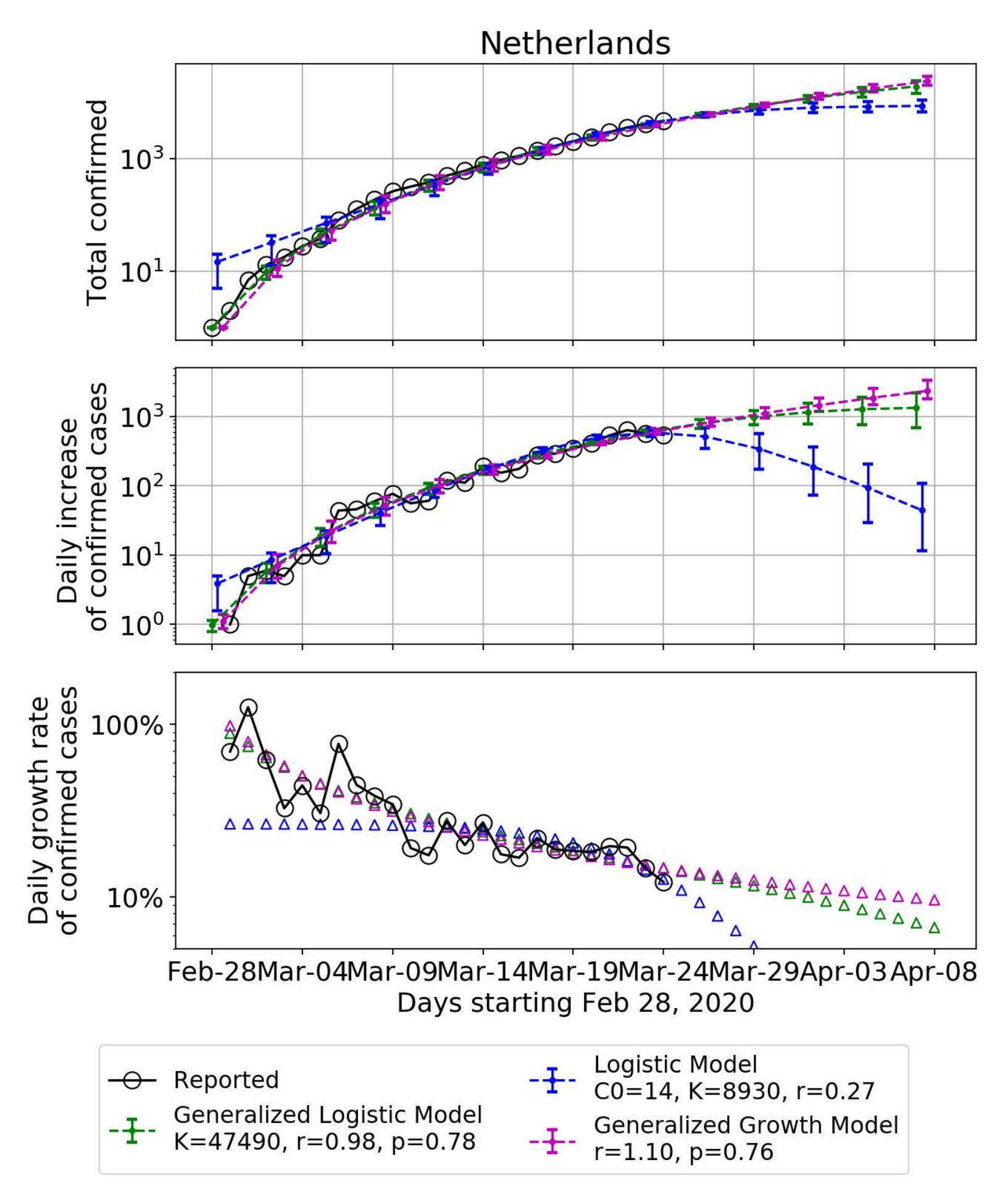

Iran
Total confirmed
10^4
10^2
Daily increase of confirmed cases
10^3
10^2
10^1
Daily growth rate of confirmed cases
100%
10%
Feb-20
Mar-01
Mar-11
Mar-21
Mar-31
Apr-10
Days starting Feb 20, 2020
Reported
Generalized Logistic Model
K=161343, r=7.87, p=0.53
Logistic Model
C0=49, K=23049, r=0.25
Generalized Growth Model
r=10.20, p=0.49

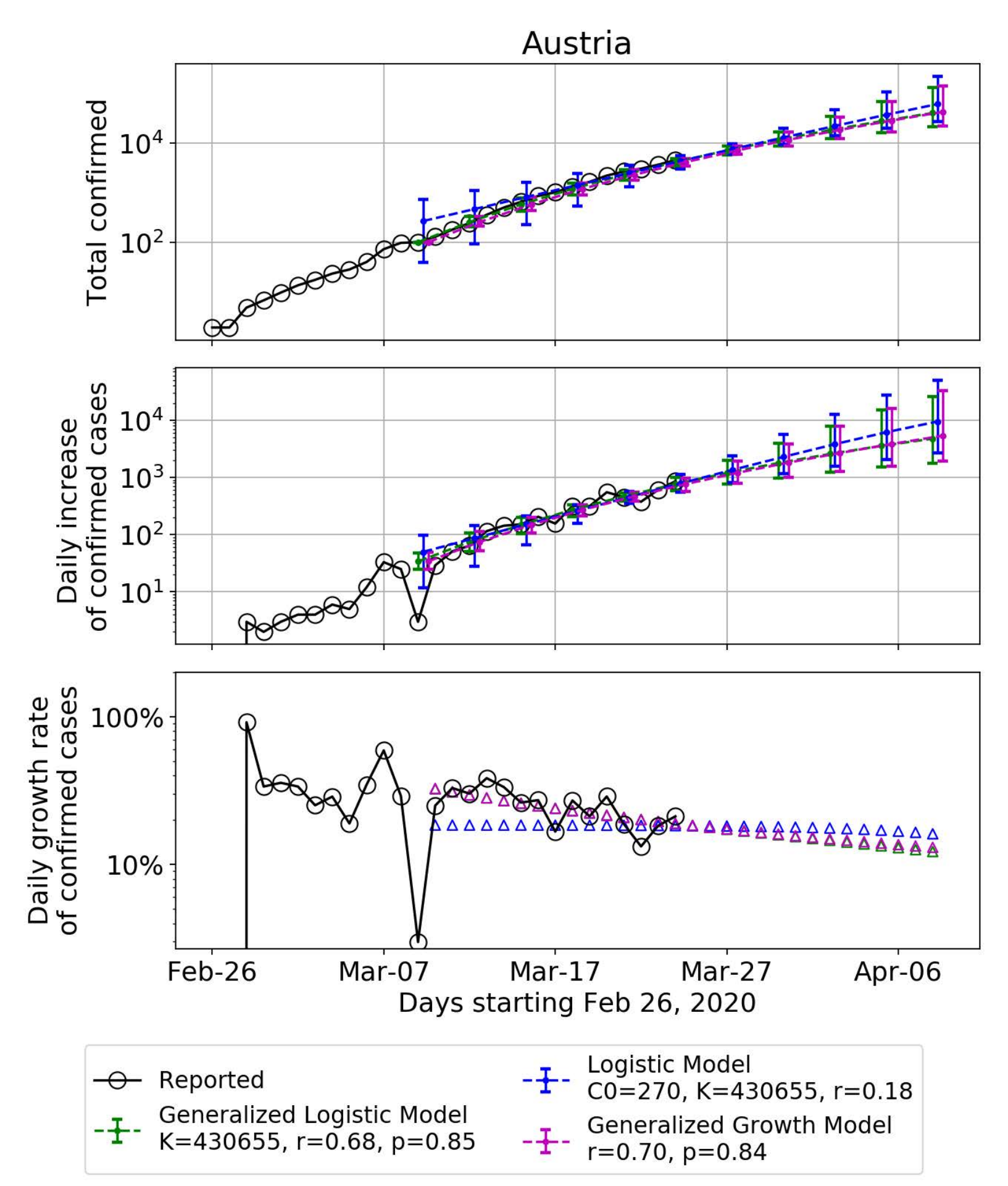

France
Total confirmed
10^4
10^2
Daily increase
of confirmed cases
10^3
10^1
Daily growth rate
of confirmed cases
100%
10%
Jan-25
Feb-04
Feb-14
Feb-24
Mar-05
Mar-15
Mar-25
Apr-04
Days starting Jan 25, 2020
Reported
Generalized Logistic Model
K=1906175, r=0.81, p=0.83
Logistic Model
C0=169, K=319914, r=0.18
Generalized Growth Model
r=0.82, p=0.83

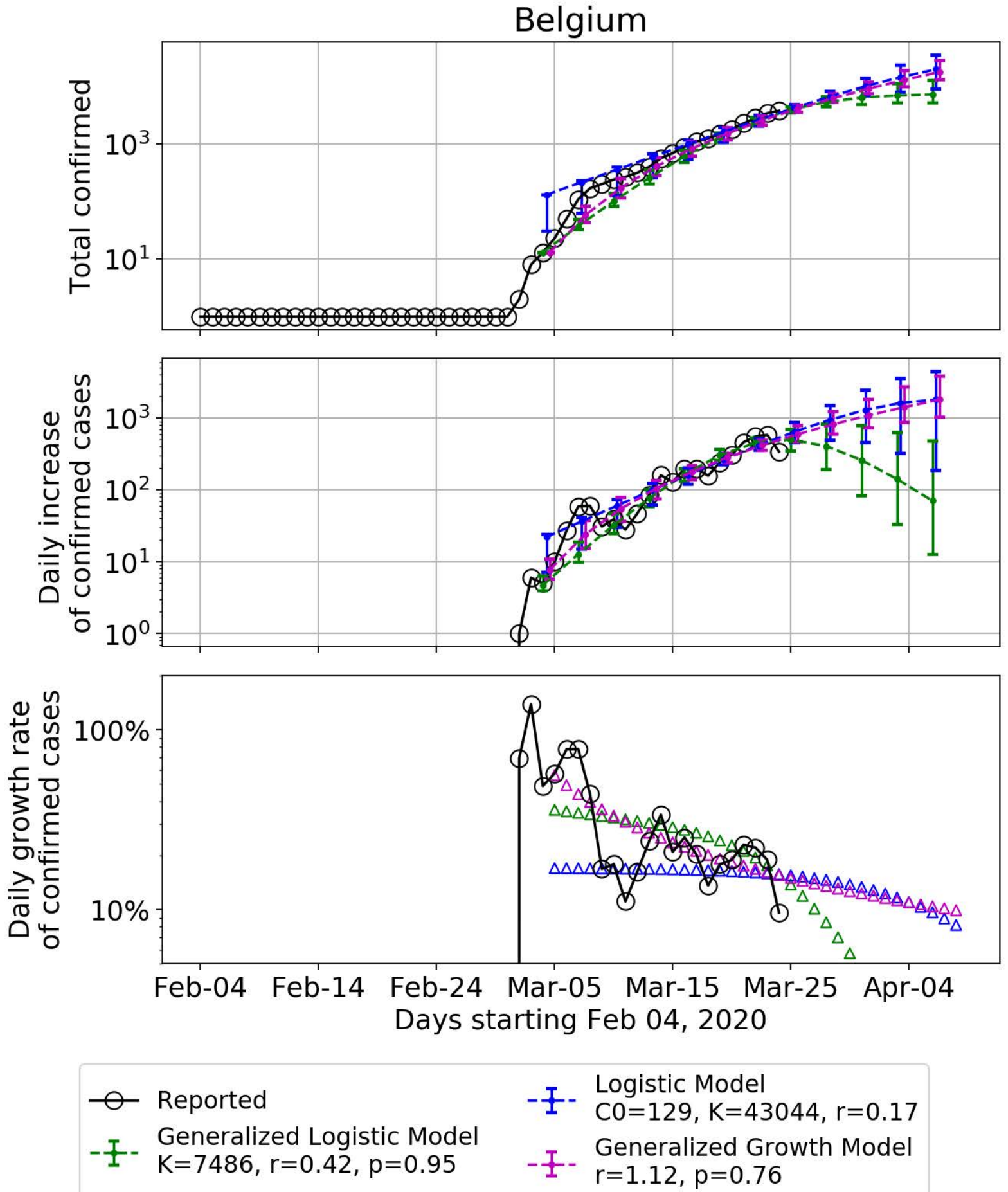

South Korea
Total confirmed
10^3
10^1
Daily increase of confirmed cases
10^4
10^2
10^0
10^{-2}
Daily growth rate of confirmed cases
100%
10%
1%
Jan-20
Jan-30
Feb-09
Feb-19
Feb-29
Mar-10
Mar-20
Mar-30
Apr-09
Days starting Jan 20, 2020
Reported
Generalized Logistic Model
K=54222, r=100.00, p=0.13
Logistic Model
C0=179, K=9037, r=0.29
Generalized Growth Model
r=100.00, p=0.11

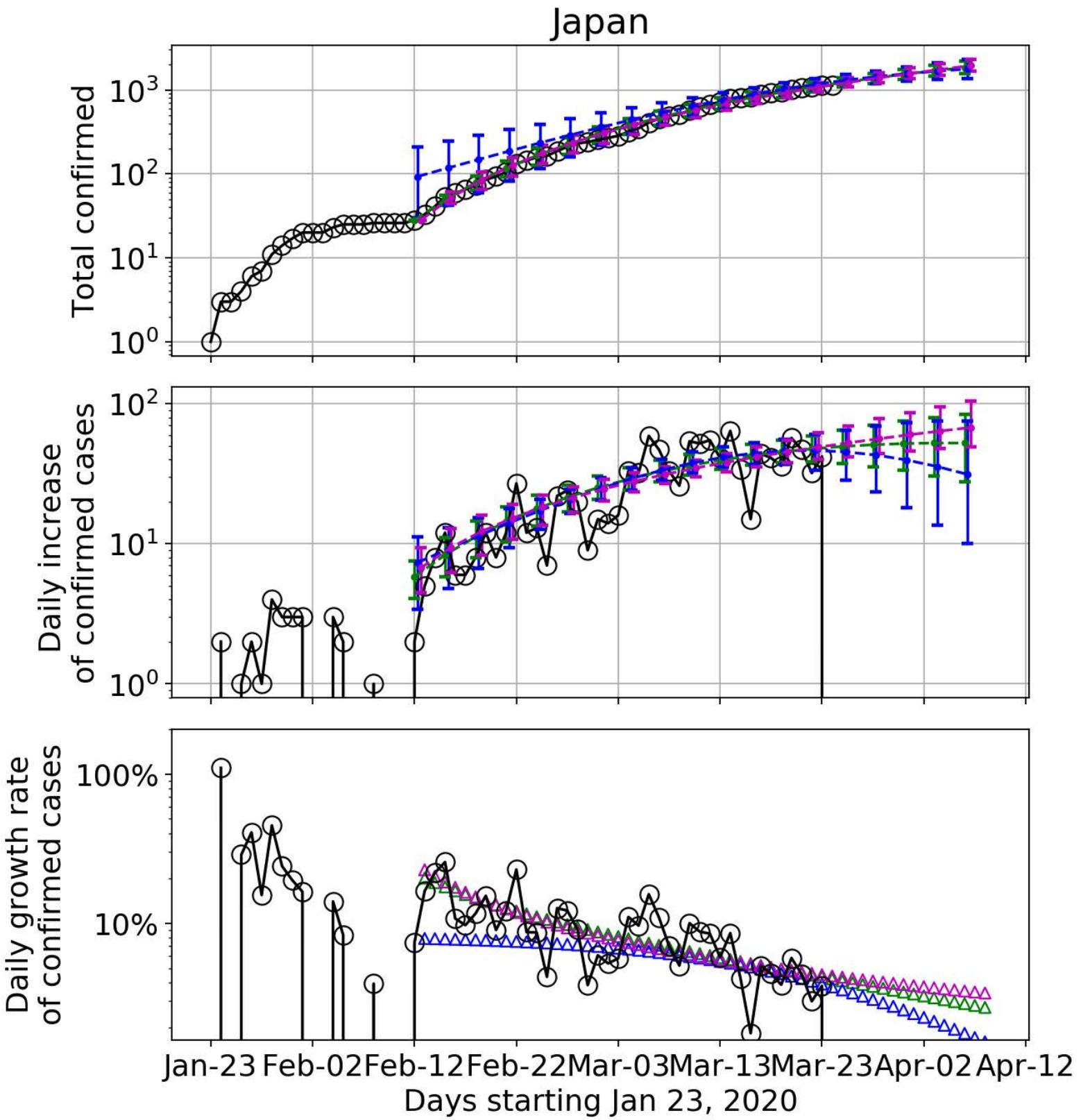

Switzerland
Total confirmed
10^5
10^3
10^1
Daily increase of confirmed cases
10^3
10^1
Daily growth rate of confirmed cases
100%
10%
Feb-26
Mar-07
Mar-17
Mar-27
Apr-06
Days starting Feb 26, 2020
Reported
Generalized Logistic Model
K=17745, r=0.45, p=0.93
Logistic Model
C0=24, K=16396, r=0.26
Generalized Growth Model
r=0.99, p=0.79


United Kingdom
Total confirmed
10^5
10^3
10^1
Daily increase of confirmed cases
10^3
10^1
Daily growth rate of confirmed cases
100%
10%
Jan-31
Feb-10
Feb-20
Mar-01
Mar-11
Mar-21
Mar-31
Apr-10
Days starting Jan 31, 2020
Reported
Generalized Logistic Model
K=19950, r=0.33, p=0.96
Logistic Model
C0=21, K=16625, r=0.25
Generalized Growth Model
r=0.57, p=0.85


Netherlands
Total confirmed
10^3
10^1
Daily increase of confirmed cases
10^3
10^2
10^1
10^0
Daily growth rate of confirmed cases
100%
10%
Feb-28
Mar-04
Mar-09
Mar-14
Mar-19
Mar-24
Mar-29
Apr-03
Apr-08
Days starting Feb 28, 2020
Reported
Generalized Logistic Model
K=47490, r=0.98, p=0.78
Logistic Model
C0=14, K=8930, r=0.27
Generalized Growth Model
r=1.10, p=0.76


Austria
Total confirmed
10^4
10^2
Daily increase of confirmed cases
10^4
10^3
10^2
10^1
Daily growth rate of confirmed cases
100%
10%
Feb-26
Mar-07
Mar-17
Mar-27
Apr-06
Days starting Feb 26, 2020
Reported
Generalized Logistic Model
K=430655, r=0.68, p=0.85
Logistic Model
C0=270, K=430655, r=0.18
Generalized Growth Model
r=0.70, p=0.84


Belgium
Total confirmed
10^3
10^1
Daily increase of confirmed cases
10^3
10^2
10^1
10^0
Daily growth rate of confirmed cases
100%
10%
Feb-04
Feb-14
Feb-24
Mar-05
Mar-15
Mar-25
Apr-04
Days starting Feb 04, 2020
Reported
Generalized Logistic Model
K=7486, r=0.42, p=0.95
Logistic Model
C0=129, K=43044, r=0.17
Generalized Growth Model
r=1.12, p=0.76


Japan
Total confirmed
Daily increase of confirmed cases
Daily growth rate of confirmed cases
100%
10%
Jan-23
Feb-02
Feb-12
Feb-22
Mar-03
Mar-13
Mar-23
Apr-02
Apr-12
Days starting Jan 23, 2020
Reported
Generalized Logistic Model
K=4512, r=0.67, p=0.65
Logistic Model
C0=92, K=2256, r=0.08
Generalized Growth Model
r=1.09, p=0.54