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Coronavirus Disease 2019 (COVID-19)

National Surveillance Report as of 21/04/2020

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Contributors: Annalisa Quattrocchi, Ioannis Mamais, Valentinos Silvestros, Anna Demetriou, Maria Athanasiadou, Theopisti Kyprianou, Androulla Stylianou, Sotiroula Sotiriou, Fani Theofhanous, Christos Charalambous, Ioanna Gregoriou, Maria Koliou, Georgios Nikolopoulos and Elisavet Constantinou

Scientific Committee: Elisavet Constantinou, Constantinos Constantinou, Niki Paphitou, Georgios Nikolopoulos, Maria Koliou, George Panos, Eirini Christaki, Zoi – Dorothea Pana, Constantinos Tsioutis, Leondios Kostrikis, Peter Karayiannis, George Petrikkos, Petros Agathangelou, George Mixides

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Summary

- As of April 21st, a total of 784 COVID-19 cases and 17 deaths (case fatality rate: 2.2%) have been reported in the Republic of Cyprus.
- Among these cases, 22.5% are health-care workers (n = 177) – 4.8% physicians (n = 38), 11.1% nurses (n = 87), 1.5% other health occupations (n = 12), and 5.1% auxiliary staff (n = 40).
- The median age of cases is 47 years (interquartile range - IQR: 33-60 years); 50.5% are female.
- Overall, of 645 cases for which the place of exposure was known, locally acquired infections (index cases and close-contacts of confirmed cases) were 535 (83.0%) - of these 10.3% (n = 55) were related to a health-care facility (General Hospital in Pafos) and 14.4% (n = 77) were reported in Aradippou municipality.
- In total, 20% (n = 157) of cases received hospital care, of which 123 (78.3%) have been discharged alive from the hospital. Median age of all hospitalized patients is: 63 years (interquartile range: 51-73 years), and 66.9% are males.
- Fourteen (8.9% of all hospitalized patients) patients were still in intensive care units (for part of the day if he/she died, was discharged or transferred on that day or for the whole day, by April 21st).
- Overall, 148 (18.9%) cases have recovered (two negative tests after their diagnosis).
- A total of 36,982 tests have been performed as of April 21st (4,222.2 per 100,000 population).

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Epidemiological surveillance in the Republic of Cyprus

Analyses are based on laboratory-confirmed cases notified to the Epidemiological Surveillance Unit of the Ministry of Health.

As of April 21st, 784 laboratory-confirmed cases of coronavirus disease 2019 (COVID-19) have been reported (Figure 1 and 2).

The median time between symptoms onset and date of sampling was 4 days (IQR: 2-7 days). It should be noted that for 12 cases the date of sample collection was before the onset of symptoms because of immediate testing of contacts of possible and laboratory-confirmed cases.

On April 21st, the 14-day cumulative incidence rate of COVID-19, a measure which reflects the number of active COVID-19 cases in the population (prevalence)[1], is 29.7 per 100,000 population (Figure 3).

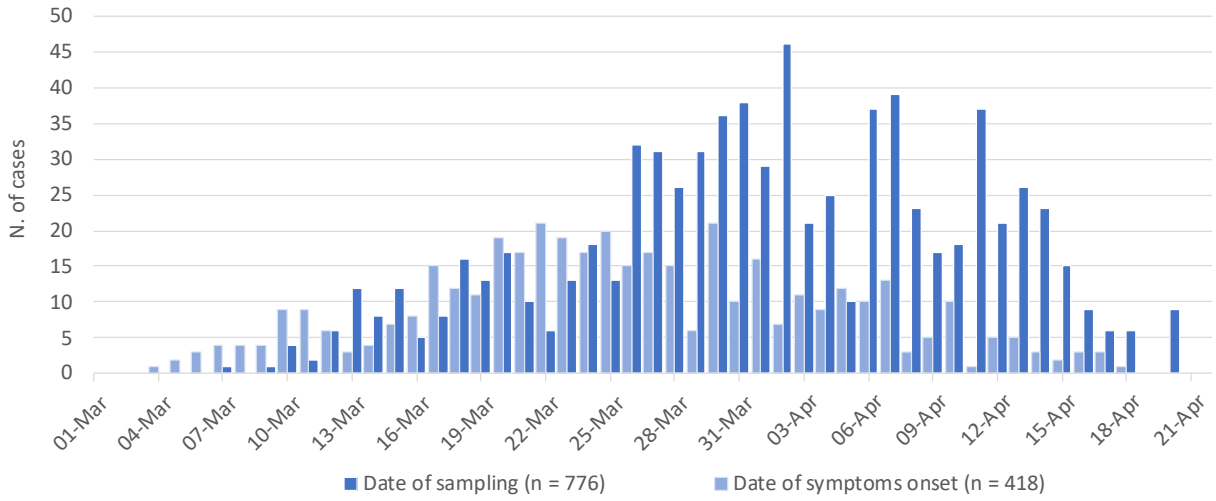

Figure 1: Number of laboratory-confirmed COVID-19-cases in Cyprus since 01/03/2020 by date of sample collection and date of symptoms onset (n = 776 and n = 418 with data available, respectively).
Recent data should be interpreted with caution due to the possibility that cases with date of onset within the reporting period have not yet been diagnosed.

[1]Coronavirus disease 2019 (COVID-19) pandemic: increased transmission in the EU/EEA and the UK – seventh update, 25 March 2020. Stockholm: ECDC; 2020. https://www.ecdc.europa.eu/sites/default/files/documents/RRA-seventh-update-Outbreak-of-coronavirus-disease-COVID-19.pdf

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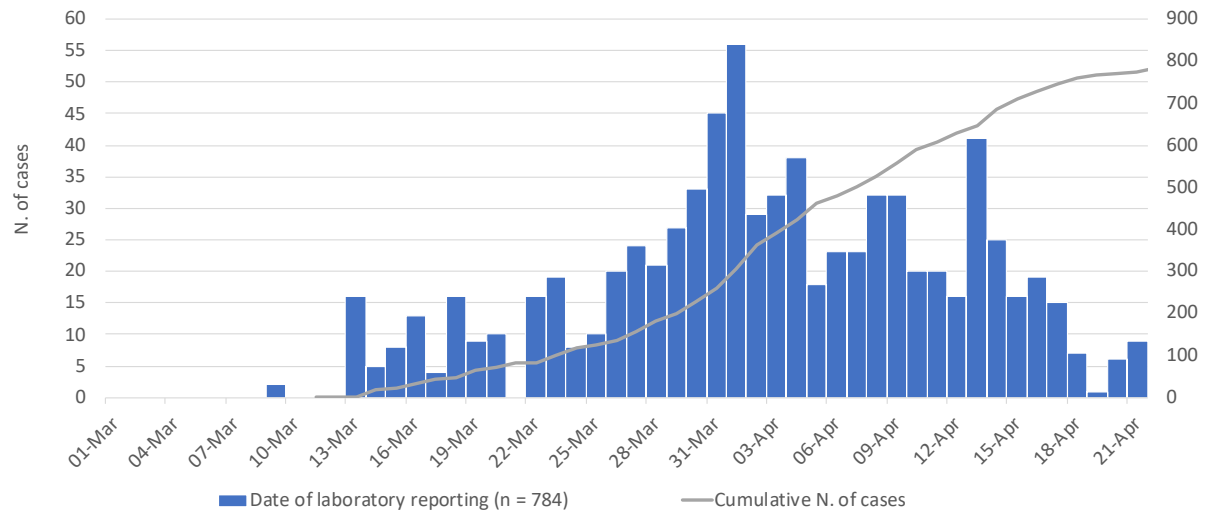

Figure 2: Number and cumulative number of laboratory-confirmed COVID-19-cases in Cyprus since 01/03/2020, by date of laboratory reporting (n = 784).
Recent data should be interpreted with caution due to the possibility that cases with date of onset within the reporting period have not yet been diagnosed.

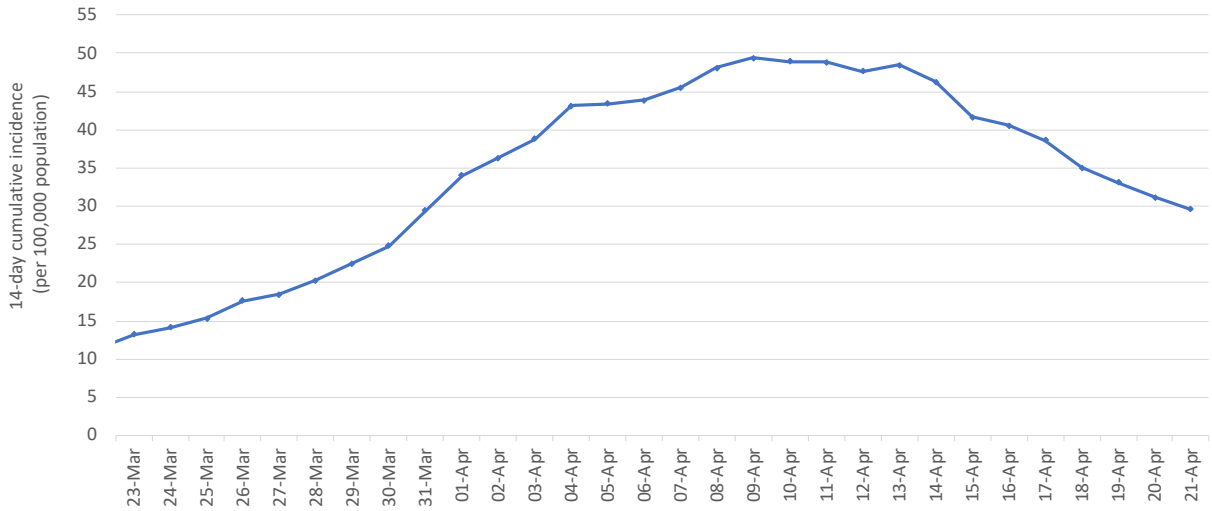

Figure 3. COVID-19 14-day cumulative incidence rate per 100,000 population (proxy of COVID-19 prevalence).
March 23rd represents the first 14th day since cases have been reported.

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Characteristics of the cases

Among these cases, 49.5% are male (n = 388) and 50.5% female (n = 396).
The median age of cases is 47 years (interquartile range: 33-60 years). By age groups, cases included 47 infants, children and adolescents aged 0-17 years-old (6.1%), 527 adults aged 18-59 years (67.8%), and 203 persons aged 60 years and older (26.1%). The age of seven notified cases has not been recorded at the moment (Figure 4).

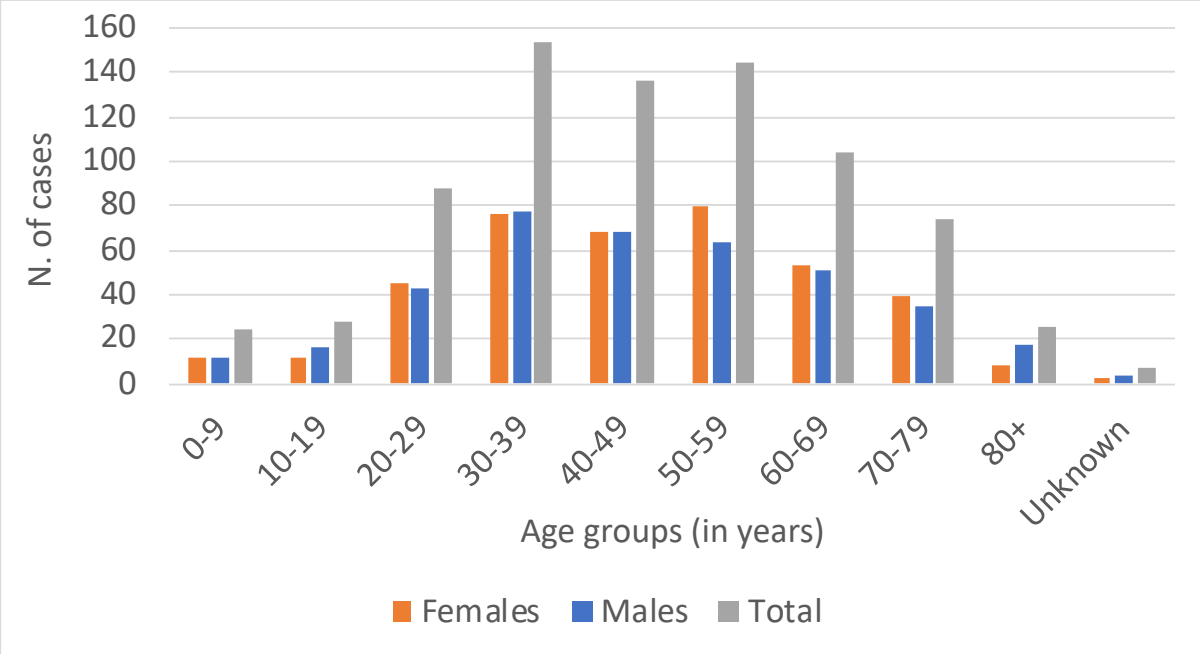

Figure 4: Laboratory-confirmed COVID-19-cases in Cyprus by sex and age groups.

Among all cases, 290 (37.0%) were reported in Nicosia district, 209 (26.7%) in Larnaka, 146 (18.6%) in Pafos, 83 (10.6%) in Limassol, 40 (5.1%) in Ammochostos, and 17 (2.0%) were reported either in British bases or had a residence abroad, or information was not available (Table A1 in appendix).
Figure A1 in appendix shows the distribution of cases by postal code.

Notably, 119 cases (15.2%) were reported in Aradippou, a municipality in Larnaka district (Table A1 in appendix). Cases in Aradippou, including a cluster in a local bakery production line, are mainly males (58%; n = 69) and the median age is 49 years (interquartile range: 33-63 years). If the cluster is excluded, cases are mainly female (55%; n = 50) and the median age is 55 years (interquartile range: 39-70 years).

Among the 784 cases, 22.5% are health-care workers[2] (n = 177) - 4.8% physicians (n = 38), 11.1% nurses (n = 87), 1.5% other health occupations (n = 12), and 5.1% auxiliary staff (n = 40).
Table 1 shows the distribution of health-care workers by district of residence.

District	Health-care worker	Physicians	Nurses	Other health occupations	Auxiliary staff
Ammochostos	16	3	7	1	5
Larnaka	39	7	21	3	8
Limassol	15	3	9	1	2
Nicosia	49	11	19	5	14
Pafos	58	14	31	2	11
Total	177	38	87	12	40

Table 1: Health-care workers by district of residence (n=177).

Epidemiological link

As of April 21st, place of exposure is available for 645 cases (82.3%).
In total, 17% (n = 110) of laboratory-confirmed COVID-19-cases had history of travel or residence abroad during the 14 days prior to symptom onset (imported). These cases have a direct link to the UK and Greece, mainly.
Locally acquired infections (index cases and close-contacts of confirmed cases) occurred in 83% (n = 535 of 645 with known place of exposure) of the cases, of which 10.3% (n = 55) were related to a health-care facility (General Hospital in Pafos).
Of all cases in Aradippou (Larnaka district) (n = 119), 77 (64.7%) were locally-acquired, 10 (8.4%) imported and for 32 cases (26.9%) the epidemiological link was not recorded at the moment.
Table A1 in the appendix shows the number and the rate (per 100,000 population) of locally-acquired cases by district of residence.

[2] The term "health-care worker" is based on the occupation and not on the place of exposure. Health-care workers are defined as all health care professionals, allied health workers, and auxiliary health workers.

Clinical features

Of the 784 laboratory-confirmed COVID-19-cases, clinical information is available for 95.9% (n = 752), of which 28.1% (n = 211) reported no symptoms at diagnosis and 71.9% (n = 541) reported at least one symptom. The most commonly reported symptoms were:

- cough (283/726; 39.0%),
- fever (250/737; 33.9%),
- myalgia (182/734; 24.8%),
- sore throat (140/733; 19.1%),
- anosmia (101/591; 17.1%), and
- shortness of breath (102/705; 14.5%).

Other reported symptoms were diarrhoea, runny nose, and headache.
Table A2 in appendix reports the sex and age distribution of asymptomatic cases at diagnosis.

Pre-existing conditions

Information on comorbidities was available for 656 (83.7%) cases. Of these, 284 (43.3%) reported at least one comorbidity.
The most commonly reported comorbidities were:

- hypertension (115/637; 18.1%),
- diabetes (63/639; 9.9%),
- heart disease (57/633; 9.0%), and
- cancer (15/387; 3.9%).

Other reported comorbidities were chronic kidney disease, autoimmune disease, and chronic respiratory disease.

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Deaths

As of April 21st, 17 deaths were reported in Cyprus (Case Fatality Rate - CFR: 2.2%). The mortality rate for COVID-19 is 1.9 per 100,000 population.
Thirteen deaths (76.5%) occurred in men and four (23.5%) in women; the median age of all deaths was 76 years (IQR: 66-79 years). Six deaths were reported among residents in Larnaka, five in Pafos, and 2 in Nicosia, Limassol and Ammochostos, each (Appendix Table A3).
The median time from date of sampling to death was 6 days (IQR: 3-12 days) (for one case information on date of sampling was not available, thus date of reporting was used). Figure A3 shows the Kaplan-Meier curve of the time from date of sampling to death.
For 12 deaths, COVID-19 was the underlying cause of death (COVID-19 CFR: 1.5%).
Figure 5 reports the number of deaths by date.

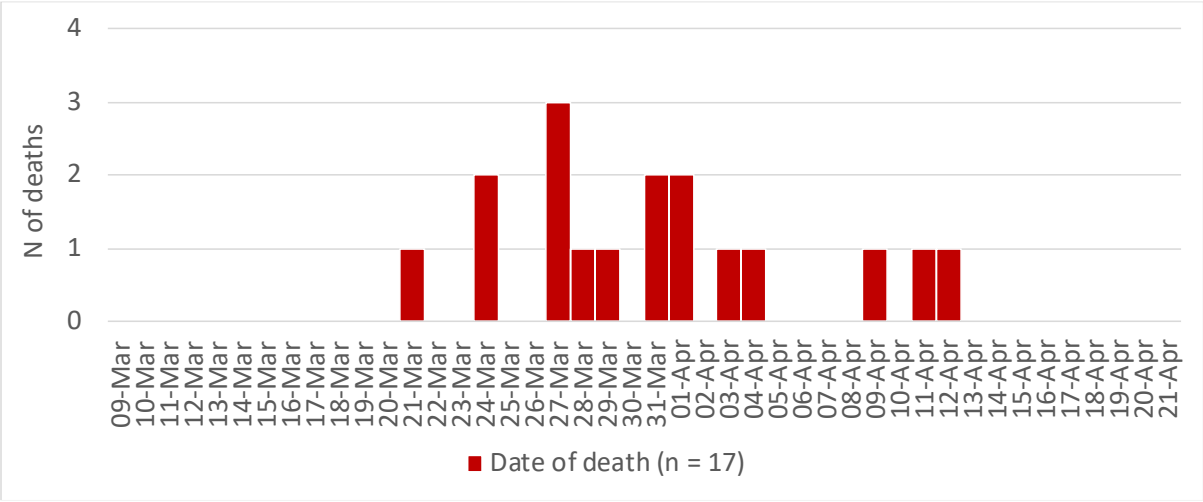

Figure 5: Number of deaths among COVID-19 cases in Cyprus by date of death (n = 17).

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Hospitalization and intensive care unit (ICU) admissions[3]

In total, 20% (n = 157) of patients received hospital care, and 123 patients (78.3%) have been discharged alive from the hospital. When age was available (n = 155), the median age of hospitalized patients was 63 years (interquartile range: 51-73 years). Hospitalized cases were mainly males (n = 105; 66.9%).
Figure 6 shows the total number of hospital admissions by date.

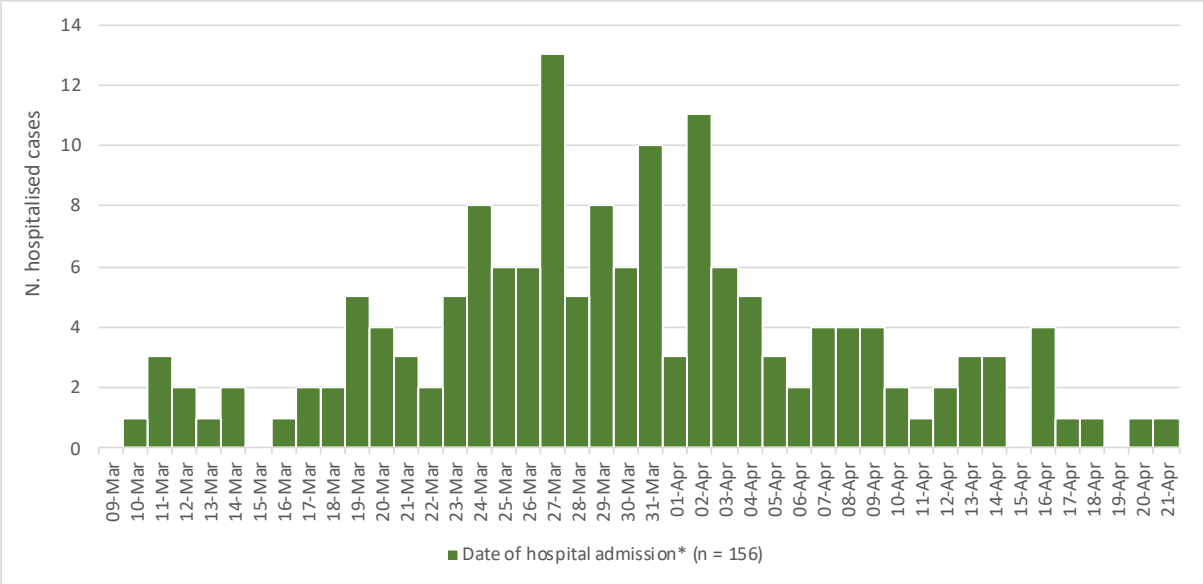

Figure 6: Number of laboratory-confirmed COVID-19 cases by date of hospital admission (n = 156).
**For one patient date of hospital admission was not available at the moment. Date of hospital admission, for inpatients hospitalised prior the beginning of the epidemic, was replaced with date of sampling.*

Overall, 30 cases (19.1% of all hospitalized patients) have been admitted to ICU[4], of which 14 (8.9% of all hospitalized patients) were still in ICU (as of April 21st).
A total of 25 ICU patients (83.3% of all ICU patients) have been intubated, of which 10 are still intubated.

[3] Data on hospitalisation and ICU are provisional and should be interpreted with caution because delay in data reporting is likely; for the construction of the curve, people are no longer in an ICU the day next to the date of their discharge, death or transfer.
[4] Intensive care unit (ICU) refers only to the ICU in Limassol General Hospital and to the ICU in Nicosia General Hospital.

The overall median length of stay in ICU (for all 30 ICU cases, considering those still in ICU until 21st April) was 10 days (interquartile range: 6-22 days). Figure A4 shows the Kaplan-Meier curve of the length of stay in ICU.

In patients who died while in ICU (n = 10), the median length of stay in ICU was 8 days (IQR: 2-10). Figure A5 shows the Kaplan-Meier curve of the length of stay in ICU for the people who died.

For patients transferred/discharged from ICU (n = 6), the median length of stay in ICU was 7.5 days (IQR: 6-10 days).

The median age of patients ever admitted to ICU was 68 years (interquartile range: 58-76 years); for one patient age is not recorded at the moment. ICU patients are mainly male (n = 22; 73.3%).

The number of cases currently in ICU is 1.6 per 100,000 population. For comparison, Italy and Lombardia reported the highest rates of 6.7 per 100,000 population (n = 4,068) and 13.8 per 100,000 population (n = 1,381) on April 3rd. The ICU rates in Italy and Lombardia on April 21st are 4.1 per 100,000 population (n = 2,471) and 8.1 per 100,000 population (n = 817) (https://github.com/pcm-dpc/COVID-19/blob/master/dati-andamento-nazionale/dpc-covid19-ita-andamento-nazionale-20200414.csv; https://github.com/pcm-dpc/COVID-19/blob/master/dati-regioni/dpc-covid19-ita-regioni-20200414.csv).

Figure 7 shows the number of patients in ICU, by day and intubation. Table A4 in the appendix shows the total number of ICU admissions by date.

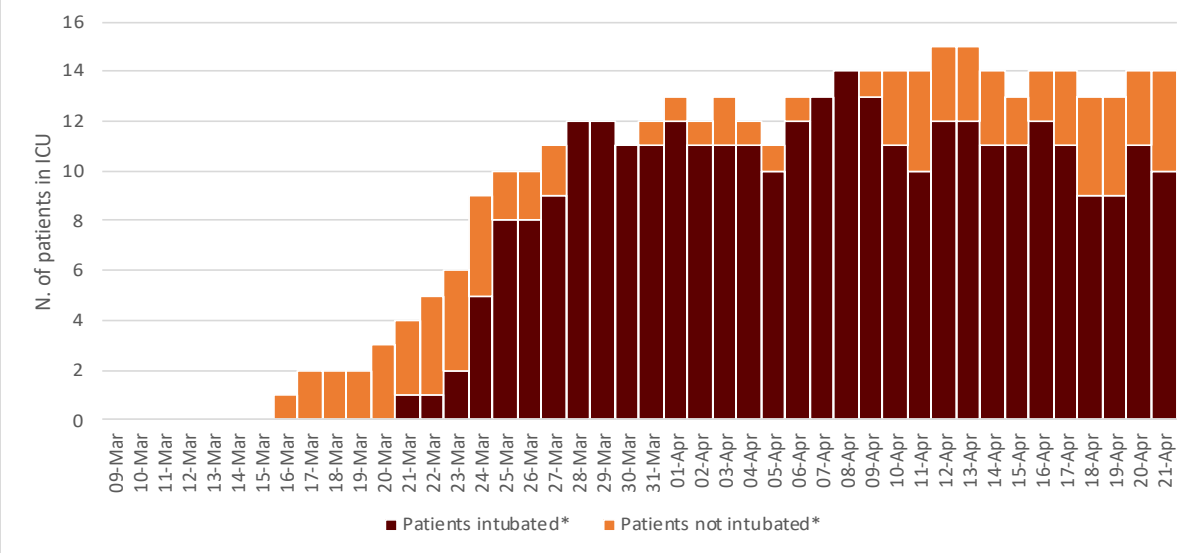

Figure 7: Number of laboratory-confirmed COVID-19 cases in ICU by day and intubation.

**Date of discharge/transfer/death included*

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Recovered

As of April 21st, 18.9% (n = 148) of COVID-19 cases have recovered[5].
The median time between the second negative result and the first date of sampling was 17 days (IQR: 15-20 days).
Table 2 shows the number and percentage of recovered cases and their characteristics.

Characteristics	Total	Recovered	
	N	n	%
Total	784	148	18.9
Sex			
Male	388	66	17.0
Female	396	82	20.7
Age groups (years)			
0-9	24	2	8.3
10-19	28	3	10.7
20-29	88	15	17.0
30-39	154	28	18.2
40-49	136	31	22.8
50-59	144	30	20.8
60-69	104	21	20.2
70-79	74	15	20.3
80+	25	2	8.0
Unknown	7	1	14.3

Table 2: Characteristics of recovered cases (n = 148).

[5] For symptomatic cases, or for cases hospitalised, a COVID-19 case can be considered cured after the resolution of symptoms and two negative tests for SARS-CoV-2 at 24-hour interval at least.
For asymptomatic cases, or for persons isolated at home, the negative tests to document virus clearance should be obtained at a minimum of 14 days after the initial positive test (end of the quarantine period). Novel coronavirus (SARS-CoV-2). Discharge criteria for confirmed COVID-19 cases- When is it safe to discharge COVID-19 cases from the hospital or end home isolation? - Technical Report, 10 March 2020. Stockholm: ECDC; 2020.

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Comparison with selected countries

As of April 21st, in Cyprus the reporting rate was 89.5 cases per 100,000 population, the mortality rate was 1.9 deaths per 100,000 population and the CFR was 2.2%. Table 3 shows COVID-19 indicators for Cyprus and other selected countries.

Figure A2 in appendix reports the rates of cumulative tests and cases (per 100,000 population) in Cyprus and other selected countries. In Cyprus the testing rate is 4,222.2 per 100,000 population.

It should be noted that the number of cases, tests and deaths for Cyprus are aggregated and include people from abroad and the British bases, while the total population does not include inhabitants from abroad or from the British bases.

Table 3: COVID-19 indicators by selected countries, as of 21/04/2020

Country	N. of cases †	N. of cases (per 100,000 pop)	N. of tests §	N. of tests (per 100,000 pop)	N. of deaths †	CFR° (%)	Mortality rate (per 100,000 pop)	Pop. (in thousands) †
Cyprus	784	89.5	36,982	4,222.2	17	2.2	1.9	875.9*
Italy	181,228	299.9	1,450,150	2,399.7	24,114	13.3	39.9	60,431.3
USA	787,752	240.8	4,035,860	1,233.6	42,539	5.4	13.0	327,167.4
UK	124,743	187.6	535,342	805.2	16,509	13.2	24.8	66,488.9
Greece	2,245	20.9	55,666	518.9	116	5.2	1.1	10,727.7
Malta	431	89.1	25,645	5,303.7	3	0.7	0.6	483.5
Sweden	14,777	145.1	74,600	732.6	1,580	10.7	15.5	10,183.2
Netherlands	33,405	193.9	168,745	979.3	3,751	11.2	21.8	17,231
Republic of Korea	10,683	20.7	571,014	1,105.9	237	2.2	0.5	51,635.3

†Number of cases, number of deaths and population (in thousands) for all countries, but Cyprus, as reported by ECDC at https://www.ecdc.europa.eu/en/publications-data/download-todays-data-geographic-distribution-covid-19-cases-worldwide

§ Data for Cyprus: internal communication; data for other countries: https://www.finddx.org/covid-19/test-tracker/

° CFR: Case fatality ratio.

* Data from Statistical Service of the Republic of Cyprus, 2018 (Statistical Service of the Republic of Cyprus)

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Acknowledgments

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Appendix

Table A1: Laboratory-confirmed COVID-19-cases in Cyprus by district of residence and origin (n = 784).

District/ ***municipality***	**Total**		**Travel-related**		**Unknown origin**		**Locally-acquired**			**Pop.**
	N	%	N	%	N	%	N	%	N (per 100,000 pop)	
Ammochostos	40	5.1	8	7.3	9	6.5	23	4.3	47.7	48,200
Larnaka	209	26.7	16	14.5	44	31.7	149	27.9	101.4	147,000
Aradippou	*119*	*15.2*	*10*	*9.1*	*32*	*23.0*	*77*	*14.4*	*400.5*	*19,228*
Limassol	83	10.6	22	20.0	12	8.6	49	9.2	20.0	244,900
Nicosia	290	37.0	41	37.3	48	34.5	201	37.6	58.8	341,700
Pafos	146	18.6	11	10.0	26	18.7	109	20.4	115.8	94,100
Other	16	2.0	12	10.9	0	0.0	4	0.7		
Total	784	100	110	100	139	100	535	100	61.1	875,900

Other includes British Bases, abroad and unknown

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Table A2: Sex and age distribution of asymptomatic cases at diagnosis (n = 211).

	All cases (n = 784)	Asymptomatic cases (n = 211)	
Characteristics	**N**	**n**	**%**
Sex			
Male	388	115	29.6
Female	396	96	24.2
Age groups (years)			
0-9	24	10	41.7
10-19	28	12	42.9
20-29	88	28	31.8
30-39	154	50	32.5
40-49	136	35	25.7
50-59	144	33	22.9
60-69	104	17	16.3
70-79	74	21	28.4
80+	25	4	16.0
Unknown	7	1	14.3
Median age in years (IQR*)	47 (33-60)	40 (30-56)	

*IQR: Interquartile Range

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Table A3: Characteristics of all deaths (n = 17)

Characteristics	N	%
Sex		
Male	13	76.5
Female	4	23.5
Age groups (years)		
0-9	0	0.0
10-19	0	0.0
20-29	0	0.0
30-39	0	0.0
40-49	1	5.9
50-59	1	5.9
60-69	5	29.4
70-79	6	35.3
80+	4	23.5
Median age in years (IQR*)	76 (66-79)	
District		
Ammochostos	2	11.8
Larnaka	6	35.3
Limassol	2	11.8
Nicosia	2	11.8
Pafos	5	29.3

*IQR: Interquartile Range

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Table A4: Number of cases by date of sampling, laboratory reporting, death, and ICU admissions

Date	Sampling (n = 776)	Laboratory reporting (n = 784)	Death (n = 17)	ICU admission (n = 30)
01-Mar	0	0	0	0
02-Mar	0	0	0	0
03-Mar	0	0	0	0
04-Mar	0	0	0	0
05-Mar	0	0	0	0
06-Mar	0	0	0	0
07-Mar	1	0	0	0
08-Mar	0	0	0	0
09-Mar	1	2	0	0
10-Mar	4	0	0	0
11-Mar	2	0	0	0
12-Mar	6	0	0	0
13-Mar	12	16	0	0
14-Mar	8	5	0	0
15-Mar	12	8	0	0
16-Mar	5	13	0	1
17-Mar	8	4	0	1
18-Mar	16	16	0	0
19-Mar	13	9	0	0
20-Mar	17	10	0	1
21-Mar	10	0	1	1
22-Mar	6	16	0	1
23-Mar	13	19	0	1
24-Mar	18	8	2	3
25-Mar	13	10	0	2
26-Mar	32	20	0	1
27-Mar	31	24	3	2
28-Mar	26	21	1	3
29-Mar	31	27	1	1
30-Mar	36	33	0	0
31-Mar	38	45	2	0
01-Apr	29	56	2	1
02-Apr	46	29	0	0

03-Apr	21	32	1	2
04-Apr	25	38	1	0
05-Apr	10	18	0	0
06-Apr	37	23	0	1
07-Apr	39	23	0	1
08-Apr	23	32	0	1
09-Apr	17	32	1	1
10-Apr	18	20	0	1
11-Apr	37	20	1	0
12-Apr	21	16	1	1
13-Apr	26	41	0	0
14-Apr	23	25	0	0
15-Apr	15	16	0	0
16-Apr	9	19	0	2
17-Apr	6	15	0	0
18-Apr	6	7	0	0
19-Apr	0	1	0	0
20-Apr	9	6	0	1
21-Apr	0	9	0	0

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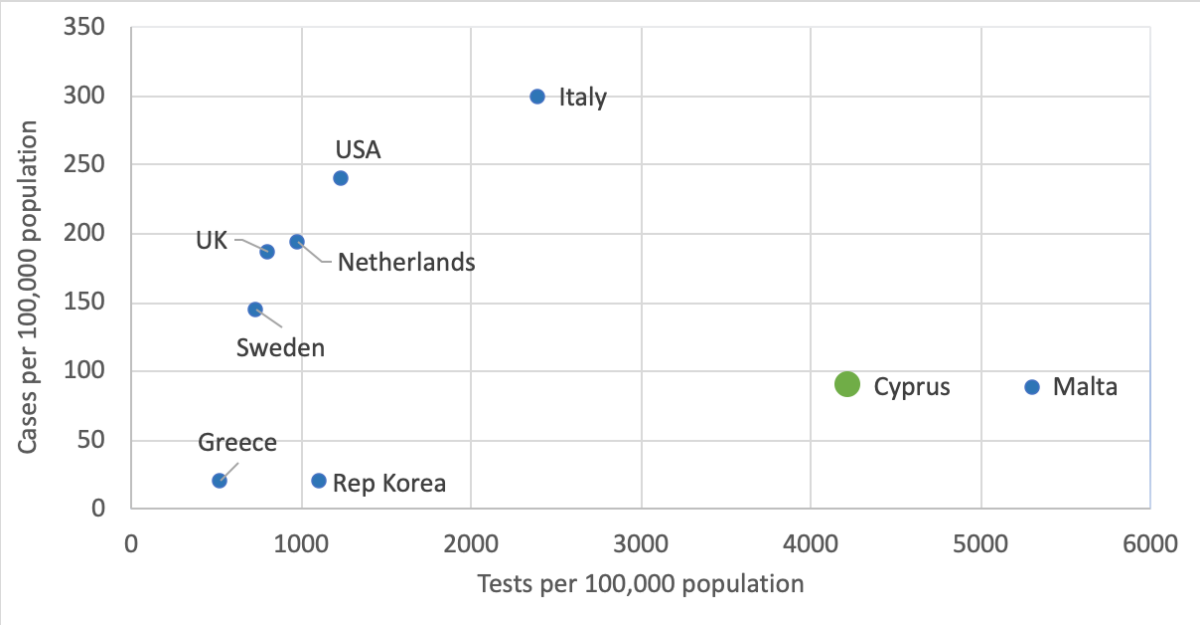
Figure A1: Distribution of cases by postal code (n = 763 with information available)

Each colour represents a different postal code and the size changes according to the number of cases.

Figure A2: Cumulative tests and cases per 100,000 population in Cyprus and other selected countries (Updated: 21/04/2020).



Data source for Cyprus: internal communication; data source for other countries: https://www.finddx.org/covid-19/test-tracker/

That number of cases, tests and deaths for Cyprus are aggregated and include people from abroad and the British bases, while the total population does not include inhabitants from abroad or from the British bases.

Figure A3: Time from date of sampling to death of COVID-19 cases who died (n = 17, for one case information on date of sampling was not available, thus date of reporting was used; for three cases who died the same day of date of sampling/reporting, the time has been considered 0.5 days).

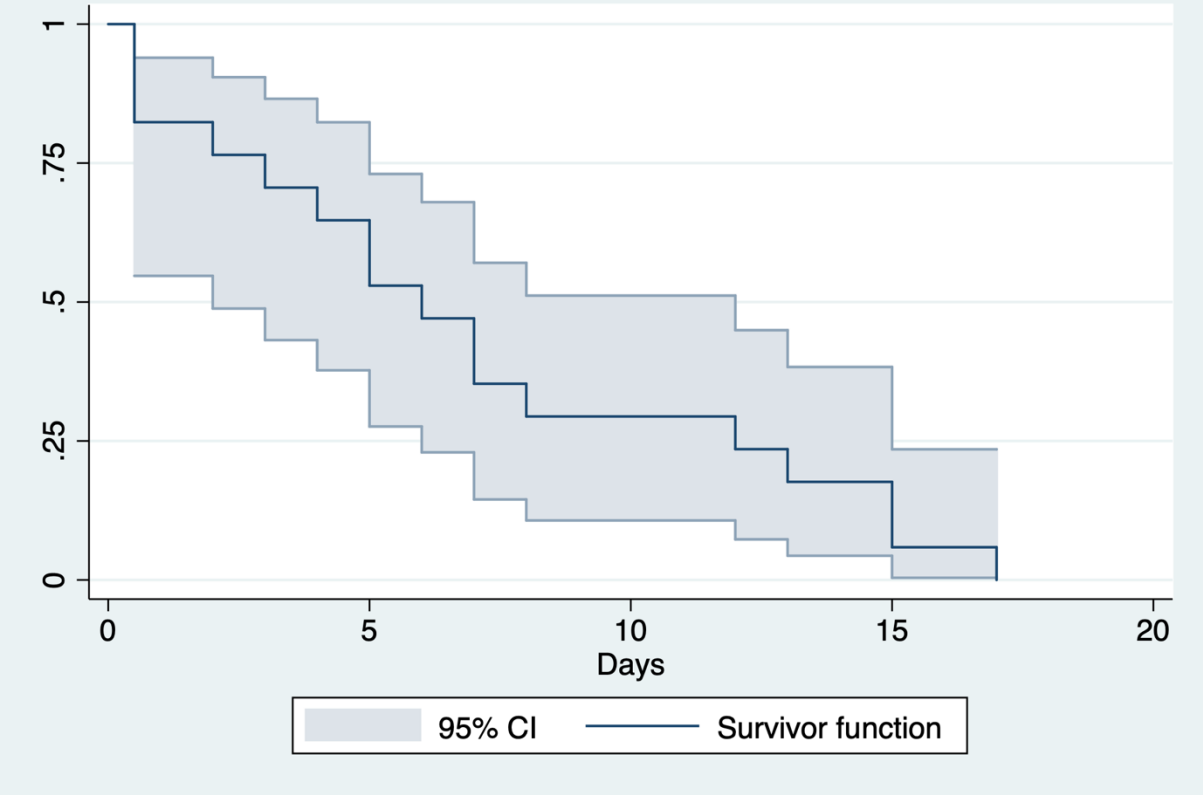


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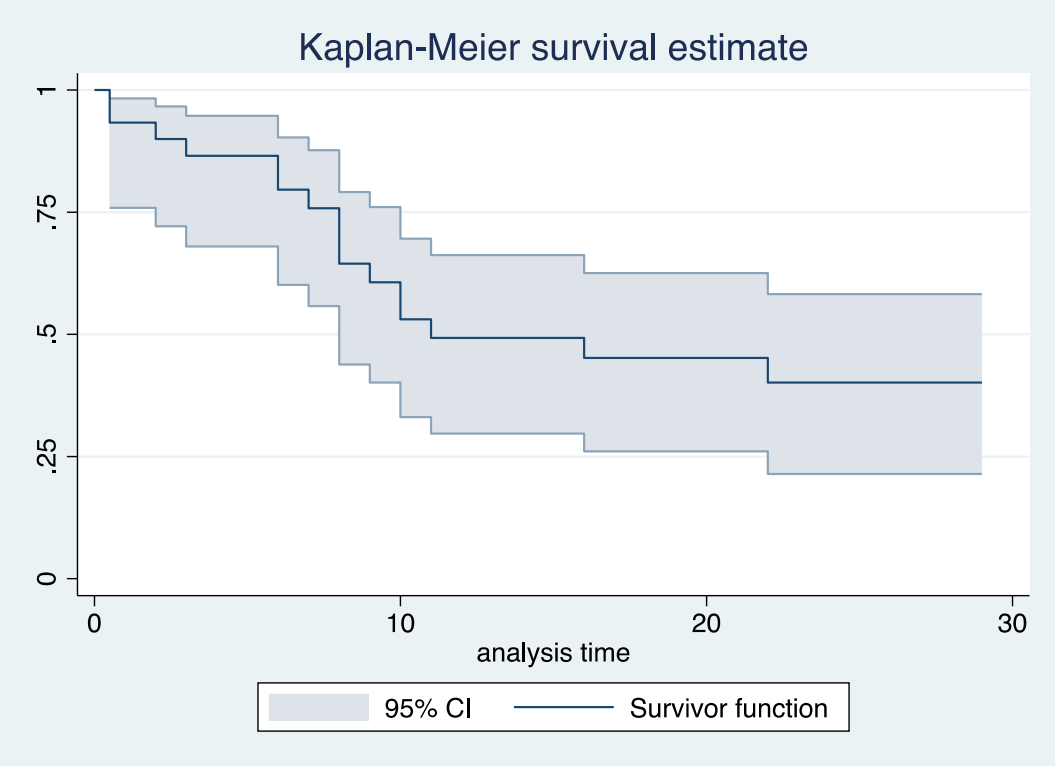
Figure A4: Length of stay in ICU (n = 30, for two cases died the same day of ICU admission the length of stay in ICU has been considered 0.5 days).



ΥΠΟΥΡΓΕΙΟ ΥΓΕΙΑΣ

Figure A5: Length of stay in ICU of patients who died and had been admitted to an ICU; for two cases who died the same day of ICU admission the length of stay in ICU has been considered 0.5 days.