Correspondence

Coronavirus disease 2019 pandemic in Greece, February 26 – May 3, 2020: The first wave

Dear Editor,

Starting in late 2019, the world is faced with the coronavirus disease 2019 (COVID-19) pandemic, caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). We describe the first pandemic wave in Greece (February 26 through May 3, 2020).

Data were retrieved from the national database of SARS-CoV-2 infections. SARS-CoV-2 infection was defined as a reverse-transcriptase polymerase chain reaction-confirmed SARS-CoV-2 infection regardless of symptoms. COVID-19 was defined as a SARS-CoV-2-infection with symptoms. COVID-19-associated death was defined as death with no period of complete recovery between the illness and death and in the absence of a clear alternative cause of death. Logistic regression analyses were conducted to identify factors associated with specific outcomes. The STATA 16 software (SrataCorp LLC, College Station, TX, USA) was used.

Until May 3, 79,332 respiratory specimens have been tested for SARS-CoV-2 in Greece (723 tests/100,000 population) and 2,625 cases were diagnosed (22.67 SARS-CoV-2-infected cases/100,000 population). Their mean age was 48.15 years (range: 0–102 years). Of the 2,625 cases, 1,452 (55.31%) were males and 752 (28.65%) had co-morbidities. There were 658 (25.07%) asymptomatic cases and 1,967 (74.93%) COVID-19 cases. COVID-19 cases were older than asymptomatic cases (mean age: 50.68 versus 37.57 years, p-value <0.001) and more often had co-morbidities [700 (35.59%) versus with 52 (7.90%) cases, p-value <0.001].

Among COVID-19 patients, fever was the prevalent symptom (1,689 patients; 85.87%), followed by cough (975 patients, 49.57%), weakness (571 patients, 29.03%), myalgias (417 patients, 21.20%) and headache (407 patients, 20.69%). Dyspnoea occurred in 381 patients (14.51%) while ageusia and/or anosmia in 252 patients (9.60%). Regarding presentation, 1,136 (57.75%) patients developed influenza-like illness and 47 (2.39%) fever only.

Overall, 1,042 COVID-19 patients (52.97%) were hospitalized for a mean duration of 18.33 days (range: 0–190 days). Of them, 215 cases (20.63%) were admitted to intensive care unit (ICU) for a mean duration of 19.86 days (range: 0–118 days) and 208 cases (19.96%) were intubated for a mean of 17.24 days (range: 0–118 days). In one case the

outcome was unknown. Of the remaining 1,041 hospitalized cases, 864 cases (83%) have been discharged and 177 cases (17%) died. The infection-fatality rate was 6.74%. The mortality rate was 1.61 deaths/100,000 population. Table 1 shows the morbidity of COVID-19 cases by number of co-morbidities and by age group and co-morbidities. Older age in association with co-morbidities and increased number of co-morbidities were associated with an increased risk for hospitalization, admission to ICU, intubation and death (p-value <0.05 for all comparisons). In logistic regression analyses an increased risk for hospitalization was associated with older age [Odds ratio (OR): 1.04; confidence intervals (CIs): 1.03–1.05], male gender (OR: 1.56; CIs: 1.29–1.89), and co-morbidity (OR: 3.53, CIs: 2.82–4.41); an increased risk for admission to ICU was associated with older age (OR: 1.04; CIs: 1.03–1.05), male gender (OR: 3.64, CIs: 2.54–5.20), and co-morbidity (OR: 2.68; CIs: 1.87–3.84); an increased risk for intubation was associated with older age (OR: 1.04; CIs: 1.03–1.05), male gender (OR: 3.87; CIs: 2.68–5.61), and co-morbidity (OR: 2.77; CIs: 1.92–4.02); and an increased risk for death was associated with older age (OR: 1.07; CIs: 1.06–1.09), male gender (OR: 2.30; CIs: 1.56–3.38), and co-morbidity (OR: 3.95; CIs: 2.45–6.35).

This is an overview of the first COVID-19 pandemic wave in Greece. Its early containment is attributed to the prompt implementation of social distancing measures (closure of schools and malls two weeks after the first detected case followed by strict lockdown less than two weeks later). Exhaustive contact tracing was also implemented. Until May 3, 30,000 close contacts had been traced and isolated for 14 days [Ministry of Civil Protection; unpublished data].

Fever and cough were the prevalent symptoms of COVID-19 patients, as reported by others [1]. In contrast, in a study of 3,737 patients in Marseille, France only 574 (15.6%) had fever [2]. Differences in clinical manifestations have been observed among studies, and may depend on the observation time and the observer. For example, dyspnoea, anosmia and ageusia were prevalent in the Marseille study (28.2%, 39.2% and 37.8% of patients, respectively) [2] while they were present in <15% of our patients each. In a population-based cohort study from Iceland, myalgia and headache were the prevalent presenting symptoms (55% and 51%, respectively) [3].

COVID-19 had a considerable morbidity burden in our study, since

Table 1
Morbidity of COVID-19 cases, Greece, February 26 – May 3, 2020.

| A. by number of co-morbidities | | | | |
No of co-morbidities[a]	Hospitalization	ICU admission	Intubation	Death
0 (n = 1,873)	477 (25.47%)	66 (3.52%)	60 (3.20%)	26 (1.39%)
1 (n = 483)	338 (69.98%)	83 (17.18%)	81 (16.77%)	64 (13.25%)
2 (n = 199)	164 (82.41%)	46 (23.12%)	46 (23.12%)	54 (27.14%)
3 (n = 52)	45 (86.54%)	17 (32.69%)	17 (32.69%)	18 (34.62%)
4 (n = 16)	16 (100%)	2 (12.50%)	3 (18.75%)	6 (37.50%)
5 (n = 1)	1 (100%)	0 (0%)	0 (0%)	1 (100%)
6 (n = 1)	1 (100%)	1 (100%)	1 (100%)	1 (100%)
B. by age group and co-morbidity status				
No co-morbidity				
Age group[b]	Hospitalization	ICU admission	Intubation	Death
<18 (n = 107)	19 (17.76%)	1 (0.93%)	0 (0%)	0 (0%)
18-64 (n = 1,435)	357 (24.88%)	40 (2.79%)	35 (2.44%)	9 (0.63%)
≥65 (n = 136)	97 (71.32%)	25 (18.38%)	25 (18.38%)	17 (12.5%)
With co-morbidity (ies)				
Age group	Hospitalization	ICU admission	Intubation	Death
<18 (n = 4)	2 (50%)	1 (25%)	1 (25%)	0 (0%)
18-64 (n = 358)	230 (64.25%)	57 (15.92%)	53 (14.8%)	35 (9.78%)
≥65 (n = 390)	333 (85.38%)	91 (23.33%)	94 (24.1%)	109 (27.95%)

COVID-19: coronavirus disease 2019; ICU: intensive care unit.
[a] Chronic cardiovascular disease (337), hypertension (198), diabetes mellitus (157), chronic pulmonary disease (155), malignancy (78), chronic renal disease (51), immunosupression (45), obesity (41), chronic neurologic disease (23), pregnancy (14), chronic hepatic disease (6), chronic neuromuscular disorder (2), other (5).
[b] In years.

more than half of COVID-19 patients were hospitalized, while 20.63% of them were admitted to ICU and 17% died. In contrast, 7.32% of 710 patients hospitalized in China were admitted to ICU and 61.5% died at a 28-days timeframe [1]. The high hospitalization rate in our study compared to others [2,3] is most probably overestimated, given the rather limited number of tests performed in Greece during the first pandemic wave compared to other countries [4]. In our series COVID-19 patients were hospitalized for a mean duration of 18.33 days, which is comparable to China, but longer than elsewhere [2,5]. Differences in morbidity and mortality rates and hospitalization duration have been noted among countries and should be interpreted with caution, since factors, such as demographic profile, co-morbidities, criteria of testing, admission, treatment and discharge, multi-drug resistant co-infections, and response of the healthcare system may play a role [2–4].

Similar to others, men, older patients, and patients with co-morbidities were more likely to be hospitalized, admitted to ICU, intubated and/or die [1,2,4,6]. The number of co-morbidities also had a considerable impact on morbidity and mortality. The infection-fatality rate was 6.74% in the first pandemic wave in Greece, which approximates the 5.65% case fatality rate among 82,719 laboratory-confirmed cases in China [6]. The rather small number of diagnostic tests in Greece compared to other countries [3,4], indicates that asymptomatic or people with mild symptoms most likely were not tested, which may explain the increased hospitalization rate and infection-fatality rate in Greece. The COVID-19 associated infection-fatality rate should also be interpreted with caution since it represents crude rather than attributed fatality, given that other co-existing factors that may impact the outcome of the cases were not considered, e.g. multidrug-resistant infections. As of February 20, 2021 the infection-fatality rate is estimated at 3.50% while the mortality rate at 57.05 deaths/100,000 population in Greece.

In conclusion, the current study offers insight on the first COVID-19 pandemic wave in Greece. The early measures attributed to keep the wave at relatively low scale. Differences in presentation were found compared to other studies, which are partially explained by the time of observation. The rather small number of diagnostic tests may also partially explain the increased infection-fatality rate. The role of other factors (e.g. multi-drug resistant infections) should be studied.

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Declaration of competing interest

All authors: nothing to declare.

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