Coronavirus pandemic gaining pace in Europe and the U.S.A.

Date: Sunday 22nd March 2020
Sources: Several: see below.

Situation update for the EU/EEA and the UK, as of 21 March 2020 (1)
As of 21 March 2020, 121,061 cases and 5,925 deaths have been reported in the EU/EEA and the UK.

WHO World report (2)
There are now 234,073 confirmed cases with 9,840 deaths. The pandemic is spreading, especially in Europe and the United States.

Key papers from the literature:

SARS-CoV-2 Viral Load in Upper Respiratory Specimens of Infected Patients (3).
The viral load that was detected in asymptomatic patients was similar to that in the symptomatic patients, which suggests the transmission potential of asymptomatic or minimally symptomatic patients. Our analysis suggests that the viral nucleic acid shedding pattern of patients infected with SARS-CoV-2 resembles that of patients with influenza.

SARS-CoV-2 Infection in Children (4).
Lu X et al. NEJM March 18, 2020 DOI: 10.1056/NEJMc2005073
Of the 1391 children assessed and tested from January 28 through February 26, 2020, a total of 171 (12.3%) were confirmed to have SARS-CoV-2 infection. Fever was present in 41.5% of the children at any time during the illness.

Epidemiological Characteristics of 2143 Pediatric Patients With 2019 Coronavirus Disease in China (5)
Yuanxuan Dong et al. DOI: 10.1542/peds.2020-0702
Despite that finding, investigators said that children of all ages and both sexes were clearly at risk due to the coronavirus. "Although clinical manifestations of children's COVID-19 cases were generally less severe than those of adult patients, young children, particularly infants, were vulnerable to infection."

Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1 (6)
"Our results indicate that aerosol and fomite transmission of SARS-CoV-2 is plausible, since the virus can remain viable and infectious in aerosols for hours and on surfaces up to days (depending on the inoculum shed)". The study was done in experimental conditions and does not mean that aerosols can transmit infection in the real life.

A Trial of Lopinavir–Ritonavir in Adults Hospitalized with Severe COVID-19 (7)
In hospitalized adult patients with severe COVID-19, no benefit was observed with lopinavir–ritonavir treatment beyond standard care.

**An Analysis of 38 Pregnant Women with COVID-19, Their Newborn Infants, and Maternal-Fetal Transmission of SARS-CoV-2: Maternal Coronavirus Infections and Pregnancy Outcomes (8).**

At this point in the global pandemic of COVID-19 infection there is no evidence that SARS-CoV-2 undergoes intrauterine or transplacental transmission from infected pregnant women to their fetuses.

**Impact of non-pharmaceutical interventions (NPIs) to reduce COVID-19 mortality and healthcare demand (9).**

The model estimated up to 260,000 deaths in the UK if the policy of building herd immunity to control the pandemic was followed.

**Substantial undocumented infection facilitates the rapid dissemination of novel coronavirus (SARS-CoV2) (10).**

We estimate 86% of all infections were undocumented (95% CI: [82%–90%]) prior to the 23 January 2020 travel restrictions. Per person, the transmission rate of undocumented infections was 55% of documented infections ([46%–62%]), yet, due to their greater numbers, undocumented infections were the infection source for 79% of documented cases. These findings explain the rapid geographic spread of SARS-CoV2 and indicate containment of this virus will be particularly challenging.

**Critical Care Utilization for the COVID-19 Outbreak in Lombardy, Italy. Early Experience and Forecast During an Emergency Response (11).**

The goal is to ensure that an ICU bed is available for every patient who requires one. Other health care systems should prepare for a massive increase in ICU demand during an uncontained outbreak of COVID-19. This experience would suggest that only an ICU network can provide the initial immediate surge response to allow every patient in need for an ICU bed to receive one. Health care systems not organized in collaborative emergency networks should work toward one now.

**Comment from ESMID Emerging Infections Task Force**

Several important studies have been published since our last update. We now have data on infections in children (4,5) demonstrating that children are infected, can develop clinical disease and transmit infections. These data are important as they inform why school closures are an important element of the social distancing imposed by many countries.

The study of COVID-19 in pregnant women (8) showed no indication that the virus is transmitted across the placenta.

The study by Ruiyun Li et al. (10) found that undocumented infections were the infection source for 79% of documented cases. This may explain why the pandemic has been so difficult to control without extensive testing.
With the epidemic expanding rapidly in Europe it is not possible to estimate when we will reach the peak. In Lombardy northern Italy, the epicenter in Italy, we are now 3.5 weeks into the outbreak and hopefully it will soon peak.

So far, Lombardy (population 10 million) as the 19th March has 19,884 cases, a population attack rate of 1 per 500 population (0.2%). There have been 2,168 deaths in Lombardy or 22 per 100,000 population. It should be noted that these rates are very much dependent of the age-structure of the population.

These numbers give an indication of what countries earlier in the pandemic can expect despite the efforts to implement social distancing by closing schools, discouraging or prohibiting gatherings and restricting travels.

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ESCMID Emerging Infections Task Force

Sources
5. Epidemiological Characteristics of 2143 Pediatric Patients With 2019 Coronavirus Disease in China. Yuanyuan Dong et al. DOI: 10.1542/peds.2020-0702

Also in the literature


The study does not viral load, no demonstration of live virus and has a low sample size (n=26). The study does not demonstrate that recovered patients can transmit virus to others for a prolonged period.


At least in Wuhan, children were less likely to be infected by the virus but were more likely to die from it than were adults 30 to 59 years old. Compared to those aged 30–59 years, those aged below 30 and above 59 years were 0.6 (0.3–1.1) and 5.1 (4.2–6.1) times more likely to die after developing symptoms.


More related to critical illness than to viral infection of the CNS.

U.S. Virus Plan Anticipates 18-Month Pandemic and Widespread Shortages


A serological assay to detect SARS-CoV-2 seroconversion in humans. Fatima Amanat et al. doi: https://doi.org/10.1101/2020.03.17.20037713 https://www.medrxiv.org/content/10.1101/2020.03.17.20037713v1.

COVID-19 and Italy: what next?

Andrea Remuzzi, Giuseppe Remuzzi. The Lancet March 12, 2020 https://doi.org/10.1016/S0140-6736(20)30627-9
The proximal origin of SARS-CoV-2
Kristian G. Andersen, Andrew Rambaut, W. Ian Lipkin, Edward C. Holmes & Robert F. Garry

Breadth of concomitant immune responses prior to patient recovery: a case report of non-severe COVID-19

Coronavirus Infections in Children Including COVID-19. An Overview of the Epidemiology, Clinical Features, Diagnosis, Treatment and Prevention Options in Children
Petra Zimmermann, Nigel Curtis,
Ped Infect Dis J 2020. DOI: 10.1097/INF.0000000000002660

From Containment to Mitigation of COVID-19 in the US

https://doi.org/10.2807/1560-7917.ES.2020.25.10.2000180

Staff safety during emergency airway management for COVID-19 in Hong Kong.

Post-discharge surveillance and positive virus detection in two medical staff recovered from coronavirus disease 2019 (COVID-19), China, January to February 2020.
Yuanyuan Xing1,3, Pingzheng Mo2,3, Yu Xiao1,3, Oiu Zhao4, Yongxi Zhang2, Fan Wang4 Eurosuv. 2020
https://eurosurveillance.org/content/10.2807/1560-7917.ES.2020.25.10.2000191#abstract_content

Real estimates of mortality following COVID-19 infection
David Baud et al. Lancet Infectious Dis March 12, 2020 DOI:https://doi.org/10.1016/S1473-3099(20)30195-X.
The estimated mortality rates are not adjusted for the age composition of the patient population, which varies very much from country to country.

Evaluation of the Effectiveness of Surveillance and Containment Measures for the First 100 Patients with COVID-19 in Singapore — January 2–February 29, 2020
Yixiang Ng et al. MMWR 2020;69:1-5