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Editorial

COVID-19: Mitigation or suppression?



In spite of all scientific developments over the last decades, the world is hit by COVID-19; totally unprepared. In an unprecedented challenge to mankind, healthcare systems all over the world are subjected to the most extreme pressure and are forced to fight against a viral disease we still do not know enough about. Suddenly healthcare providers are overwhelmed with problems of diagnosing and screening a virus, managing a disease which has a spectrum that ends in ARDS and death and preventing the spread of infection with still no vaccine available. The demands for medical supplies and personal protective equipment (PPE) increased exponentially matching the exponential increase in the numbers of infected persons. Some countries imposed marked restrictions on medical supplies and PPE. Shortage in medications become evident. The supply chain in the health sector is threatened to collapse.

Of course, these extreme challenges affected all aspects of human life: Social, political, economic, cultural, educational, religious and spiritual. Human health and healthcare are becoming central, as they should have been not only to healthcare providers, but to everyone. Every single individual is made responsible for the spread or prevention of the disease irrespective of one's practice or discipline. Not only infectious disease experts, epidemiologists and ICU specialists are involved in this challenge, but also each individual in every community: Either as potential victim of COVID-19 or as an actual or potential care provider to infected persons in a bigger sense. Simply, the future of mankind is at stake!

We are currently experiencing a unique situation in which science and scientists are getting all the attention of politicians, economists, clerics, media... etc. Scientists are in a race against time to combat a potentially fatal disease which healthcare systems even in the most developed world have to surrender to. So there is no other option but science, science and science. Therefore, it was not strange to find nowadays scientists often side by side with presidents, prime ministers and ministers. Researchers are directly influencing decision making at highest levels without the usual "switches" and "relays" in bureaucratic systems.

It is quite evident that one of the reports which had great impact on decision making during the current crisis is the report of Neil Ferguson et al. on the impact of non-pharmaceutical interventions (NPIs) to reduce COVID-19 mortality and healthcare demands [1]. In their report, using a transmission model founded on an individual-based simulation model for pandemic influenza, the authors investigated the effects of 2 intervention strategies in a UK and a USA context: 1 – Mitigation strategy with the aim of slowing down transmission but not necessarily stopping epidemic spread (reproduction number R not necessarily <1) with protection of more vulnerable groups and reducing the peak healthcare demand, 2 – Suppression strategy in which epidemic spread is

reversed to reproduction number (R) <1 . Interventions in the mitigation strategy would be case isolation, quarantine of household contacts of a case and social distancing of the elderly (>70 years). In the suppression group social distancing of all age groups, household quarantine and closing schools and universities are further interventions. In the mitigation strategy interventions have to be timely instituted (not too early) to give chance for herd immunity to develop. With the suppression strategy the more successful the interventions are applied the less possibility of herd immunity and hence another epidemic is expected later this year after relaxing the instituted interventions. The authors concluded that the mitigation strategy, although associated with a herd immunity would result in overwhelming the healthcare system in both the UK and the USA and that it will never be able to completely protect those at risk from severe disease or death and the resulting mortality would therefore still be high.

Although the authors used the model in the USA and UK context, decision makers and healthcare providers in many parts of the world were tempted to extrapolate the results in their own context. The hypothesis that the mitigation model with the herd immunity it implies is already de facto existing (with relatively limited and late interventions of social distancing deployed if any) is even more tempting. This is particularly the case in developing countries where fragile healthcare systems are already overwhelmed. This would, for example, explain the still limited numbers of diagnosed cases in most developing countries. This assumption can even be boosted by observations of increased and unexplained surge of upper and lower respiratory tract infections which are poorly documented, and which is claimed to have occurred in previous months. Collectively this would argue for the development of a kind of a herd immunity described with the mitigation model of Ferguson et al. which in turn means that the peak of the crisis is already historical. Of course, such "wishful thinking" ignores the relatively limited numbers of testing for COVID-19 in such countries as well as morbidities and mortalities which pass unnoticed by the formal healthcare system in the respective country. This is not intended to undermine such a hypothesis but to alert to the need to fill knowledge gaps by facts and solid data.

The extrapolation of models and assumptions made in a particular context in completely different settings would be imprudent unless enough data and evidence can be generated in the respective country. Simple statistics can provide precious information even with the least resources available. Demographic data of infected individuals, clinical history, laboratory and radiologic findings of diagnosed cases as well as seroepidemiological research, particularly the latter are important for prediction and planning.

The world is unified again, unfortunately by an infectious threat which necessitates orchestrated international efforts. Although political boundaries are closed to protect countries against the virus, scientists' exchange of ideas and results is extensive as never before and boundaries between disciplines and specialties, between researchers and politicians, between theory and practice are melting in this fierce combat.

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