Editorial – Novel Coronavirus 2019 (Sars-CoV2): a global emergency that needs new approaches?

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On 31 December, at the end of 2019, some cases of pneumonia of unknown etiology were notified to the World Health Organization (WHO) Country Office in China, regarding Wuhan, a city in the province of Hubei[1]. This unknown agent, a few weeks later, was identified as part of the coronavirus family and named 2019 novel coronavirus. Since then, the epidemic of 2019 novel coronavirus (currently renamed SARS-CoV-2) and causing the disease Covid-19 has expanded from Wuhan throughout China and is being exported to a growing number of countries, with an increasing number of other cases with different rate of transmission[2,3]. In the last few weeks, several scientific reports have been published on the epidemiology of the infection, the clinical course, laboratory testing and treating support. At the same time, the WHO and Center for Disease Control (CDC) and European center for Disease Control (eCDC) regularly updated case definition and all procedures and activities aimed to contain the spread[3-5]. According to the evolution and the observed infection rate, it has early been understood an urgent need to develop further public health activities in order to better understand the epidemiology of the novel virus and characterize its potential impact on public health. During SARS outbreak in 2003, adherence to basic public health and infection-control measures including source containment, case management, contact investigation, infection control at health care facilities, as well as community containment, were found to be a crucial strategy to contain the infection[6]. Currently, we are still focusing and discussing on the same measures to manage a new coronavirus outbreak, while this epidemic spread seems to move forward faster than we seem to manage. Therefore, new virus, same old strategy? In almost seventeen years the approach to outbreak management does not seem to be significantly changed despite new possible tools in infectious disease controlling.

If prevention is still a better strategy compared to treatment, probably, we should focus on new strategic approaches to outbreak management. Indeed, forecasting models analyses of local and global spread of infections based on machine learning (ML) and artificial Intelligence (AI) may represent an useful tool to understand how outbreak evolves[7]. Currently, these two scientific methodologies may be helpful not only for a predictive analysis but also for assessing the seasonality of such events, in order to create a prompt and adaptive network of responses that would be as careful and precise as possible, therefore preventing and avoiding waste of public resources[7,8]. This kind of approach is currently applicable in all infectious disease outbreaks as hospital acquired infection[9], in seasonal viral hepatitis or flu outbreak[10] and many others diseases. Particularly in the case of 2019-nCoV an approach based on machine learning forecast analysis would be helpful to have a predictive evaluation on how the infection is evolving despite the current infection containment strategies, applying therefore new corrective measures to stop the trend of infection spread. For instance, a simple *Exponential smoothing* model may forecast, iteratively, future values of a regular time series of values from weighted averages of past events of the series, being more accurate updating the data[11]. This has been part of the approach we have used, performing it on Tableau

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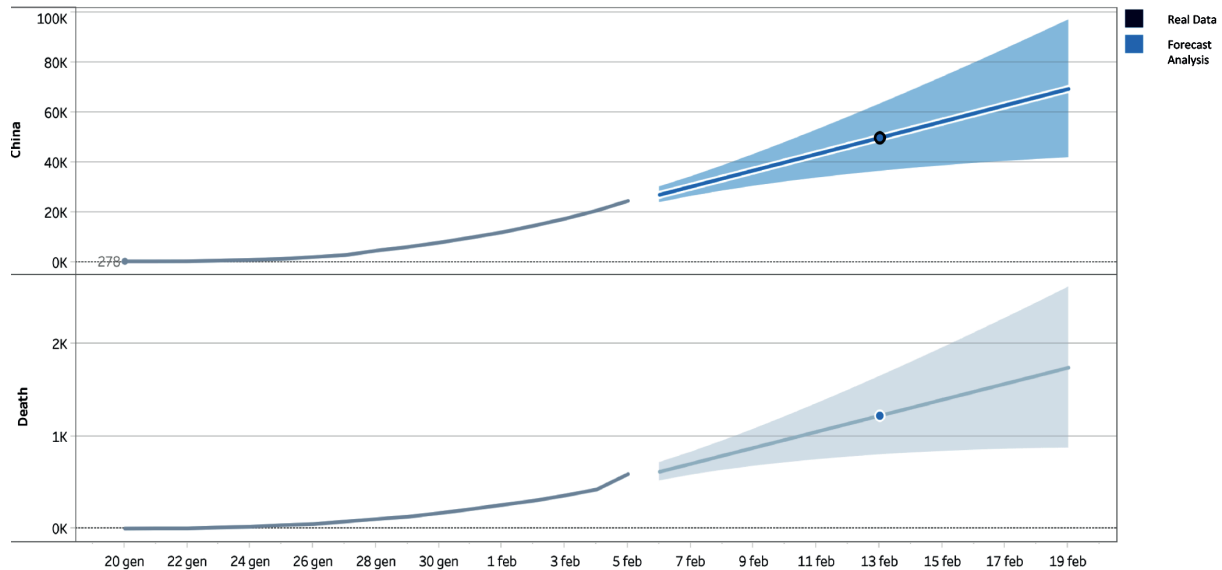
Figure 1. New registered COVID 2019 cases in China and death rate and relative forecast analysis.

app, to have a forecast trend analysis of hospital Infection in a Tertiary Care Hospital of Campania Region (A. Cardarelli), forecasting the spread of hospital acquired infections and consequently managing all required actions to reduce these, with interesting results over two years study (unpublished data). The same approach has been recently used in our Hospitals to forecast the spread of new cases as part of a wider path of preventing procedures (Figure 1) (all data are available for public analysis at https://public.tableau.com/profile/alessandro2540#!/vizhome/nCoV2019otbreaknewcasesforecastinchinaver2/COVD2019_1). Certainly, this simple analysis is just a first step and needs a more structured approach to have a deeper evaluation of those factors being related to the spread and how to change these, nonetheless currently this could be the way to face infection outbreak. Currently, COVID19 is representing an important challenge for public health, also in consideration of recent Italian spread[12]; however, existing source containment strategy, contact investigation, infection control at health care facilities, as well as in community settings coupled to new approaches based on new mathematical tools to forecast disease spread, could be useful and helpful to activate and improve strategic plan to control outbreak.

Conflict of Interest

The Authors declare that they have no conflict of interests.

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