


COVID-19 suspicion and diagnosis: Are we still chasing epidemiological criteria?

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The first person-to-person SARS-CoV-2 transmission in Italy was reported on 21 February 2020 in Lombardia region.¹ Eight weeks later, while we were writing this article, Italy had already reached 218 000 coronavirus disease (COVID-19) confirmed cases with at least 28 000 deaths, thus positioning Italy fifth in the world for total cases and sadly the third for COVID-19-related deaths (National Health System Institute data from <https://www.epicentro.iss.it/coronavirus/>).

We hereby discuss a few issues we think worth considering, hoping that these points will be useful for nations or geographical regions that chronologically follow Italy's pandemic peak.

- I. When assessing incoming patients in the emergency department presenting either with fever, respiratory failure, cough, or even mild symptoms as headache, weakness or generic "sore throat," healthcare personnel is likely to be asked for epidemiological criteria investigation to obtain the swab test or to choose whether to admit the patient into a "clean" or COVID-19 area. These criteria may include previous contacts with confirmed COVID-19 patients, recently staying or traveling through Lombardia Italian region or China.

Despite this, two recent papers from Lai and Zehender^{2,3} clearly demonstrate that, among the first 16 COVID-19 patients registered in northern Italy after 21 February, none of them reported a recent history of traveling outside Italy. By their genetical virus analysis the authors state that SARS-CoV-2 was allegedly already circulating in Italy by the end of January 2020, demonstrating therefore that Italian cases of SARS-CoV-2 are strictly related with the Latin America ones and both possibly follow the German strain that came first in Europe during January 2020.

To our experience, in our Trauma Intensive Care Unit (ICU) at Maggiore Hospital in Bologna, was admitted by the end of February a trauma patient who was presumed healthy at the

circumstance of trauma and turned out SARS-CoV-2 positive at the swab test on ICU admission. Same results for a case of presumed "clean" ROSC after out-of-hospital cardiac arrest (OHCA), found to be COVID-19 case.

Moreover, after publication of the largest case series to date regarding COVID-19 in China by Wu and McGoogan,⁴ then followed by the confirmation for the SARS-CoV-2 to be transmitted by asymptomatic carrier by Bai et al,⁵ the Italian independent foundation "GIMBE Evidence for Health" at the end of March 2020 cross-matched the first available Chinese cohort with the Italian data coming to envision that official statistics may be missing roughly 65% of COVID-19 cases (<https://coronavirus.gimbe.org>), being these asymptomatic or mild-symptom patients (Figure 1). If from one side this is good news as it would flatten down the death and critically ill patients rate, from the other side this would mean that 65% of COVID-19 patients were free to circulate before the implementation of quarantine. These findings were further confirmed by Bay⁶ that this raises the asymptomatic patients ratio to 78% after considering China's National Health Commission's new data, while the MRC Centre for Global Infectious Disease Analysis of the Imperial College of London estimates this to be approximately 40% to 50% of all infections (<http://www.imperial.ac.uk/mrc-global-infectious-disease-analysis/covid-19/covid-19-planning-tools/>).

- II. Italy has unfortunately got the record for COVID-19 cases among healthcare workers (HCWs) and, apparently, the majority of these are found among Surgical and Operatory Theatre personnel. This may mean that HCWs infections are likely to be greater within hospital paths meant to be "clean," and we can hypothesize that this happened because this personnel felt less degree of risk and was thus prone to use less personal protective equipment (PPE) or used it in an inappropriate way. Furthermore, another HCWs

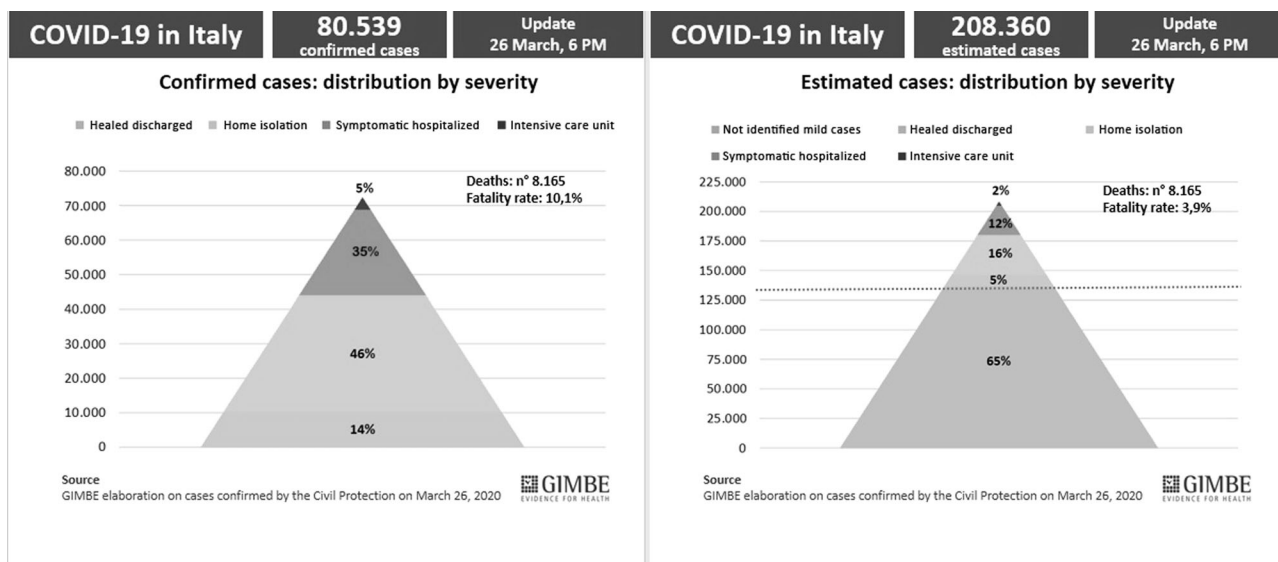


FIGURE 1 Difference between confirmed and estimated COVID-19 cases upon 26 March in Italy, based on Chinese cohort projection. Critical patient's estimation goes from 5% to 2% while case fatality rate from 10.1% to 3.9%. Infographic with permission from the independent health data foundation "GIMBE Evidence for Health"

category that is hugely affected is the General Practitioners' one: this time maybe because out of hospital there are less barrier between patients and staff and there are no filter zones where HCWs can dress-up in a proper way and decontaminate at the end of a patient's assessment. Thus, to avoid the personnel to underestimate the risks, despite the need and recognized importance of separated paths between suspected/confirmed COVID-19 and clean patients, we ensured that HCWs began to manage each patient as suspected until both negative swab and imaging are obtained, since even swab tests have a negative predictive value well below certainty. Moreover, this gains relevance especially in the context of urgent patient's assessment and procedures where COVID-19 risks criteria (clinical, imaging, and laboratoristical findings) cannot be easily ruled out.

CONCLUSION

The first Italian COVID-19 cases are likely to be dated back to early February 2020. A huge percentage of infections may have happen through asymptomatic people who, up to today, have no connections with northern Italy or China cases. Suspicion or diagnosis of COVID-19 cases need not match the epidemiological criteria. When managing a patient suspected for COVID-19 and even when assessing a healthy patient, all HCW personnel should use PPE based both on the grade of probability of SARS-CoV-2 infection, which considers clinical, laboratorial, and imaging criteria, and also the risk of procedure that has to be done.

CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

AUTHOR CONTRIBUTION

MT, LG, and FS conceptualized and wrote the manuscript; CL, CC, and GG supervised and reviewed it. All authors had approved the manuscript and agreed for submission of this article.

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