

## The response of Milan's Emergency Medical System to the COVID-19 outbreak in Italy

The number of people infected with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the virus causing coronavirus disease 2019 (COVID-19), is dramatically increasing worldwide.<sup>1</sup> The first person-to-person transmission in Italy was reported on Feb 21, 2020, and led to an infection chain that represents the largest COVID-19 outbreak outside Asia to date. Here we document the response of the Emergency Medical System (EMS) of the metropolitan area of Milan, Italy, to the COVID-19 outbreak.

On Jan 30, 2020, WHO declared the COVID-19 outbreak a Public Health Emergency of International Concern.<sup>2</sup> Since then, the Italian Government has implemented extraordinary measures to restrict viral spread, including interruptions of air traffic from China, organised repatriation flights and quarantines for Italian travellers in China, and strict controls at international airports' arrival terminals. Local medical authorities adopted specific WHO recommendations to identify and isolate suspected cases of COVID-19.<sup>3,4</sup> Such recommendations were addressed to patients presenting with respiratory symptoms and who had travelled to an endemic area in the previous 14 days or who had worked in the health-care sector, having been in close contact with patients with severe respiratory disease with unknown aetiology. Suspected cases were transferred to preselected hospital facilities where the SARS-CoV-2 test was available and infectious disease units were ready for isolation of confirmed cases.

Since the first case of SARS-CoV-2 local transmission was confirmed, the EMS in the Lombardy region (reached by dialling 112, the European emergency number) represented the first response to handling suspected symptomatic

patients, to adopting containment measures, and to addressing population concerns. The EMS of the metropolitan area of Milan instituted a COVID-19 Response Team of dedicated and highly qualified personnel, with the ultimate goal of tackling the viral outbreak without burdening ordinary EMS activity (figure). The team is active at all times and consists of ten health-care professionals supported by two technicians.

The COVID-19 Response Team collaborated with regional medical authorities to design a procedural algorithm for the detection of suspected cases of COVID-19 (figure). Patients were screened for: (1) domicile or prolonged stay in the hot zone (ie, where COVID-19 cases first appeared), or both; (2) close contact with suspected or confirmed cases of COVID-19; and (3) close contact with patients with respiratory symptoms from the hot

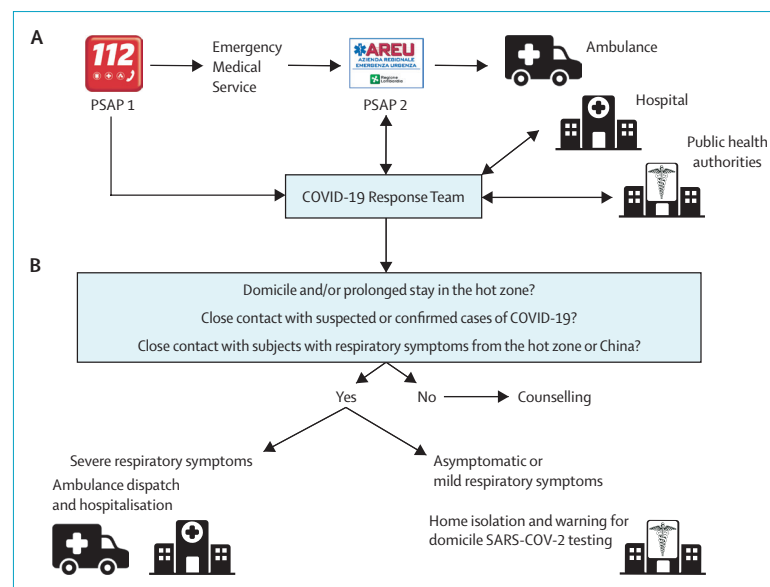
zone or China. The COVID-19 Response Team assessed the clinical condition of screened individuals to determine the need for hospital admission or for home testing for SARS-CoV-2 and subsequent isolation. Finally, recommendations to limit viral spread were provided to the other family members, especially when isolation was indicated.<sup>4</sup>

The COVID-19 Response Team handles patient flow to local hospitals and addresses specific issues about bed resources, emergency department overcrowding, and the need for patient transfer to other specialised facilities. The algorithm is constantly updated to meet regional directives about hot zone extension and modalities for SARS-CoV-2 testing.

Recent literature suggests that viral spread is still expected to grow, and the preparedness of public health systems will be challenged worldwide.<sup>5</sup> In this context, the EMS is inevitably



Published Online  
February 28, 2020  
[https://doi.org/10.1016/S0140-6736\(20\)30493-1](https://doi.org/10.1016/S0140-6736(20)30493-1)



**Figure: EMS organisation and procedural algorithm of the COVID-19 Response Team**

The activities of the EMS and the specifically instituted COVID-19 response team (A). On the basis of caller needs, the receiver operators of the primary PSAP dispatch calls to either the ordinary EMS for primary medical assistance or to the COVID-19 response team for the assessment of risk factors for SARS-CoV-2 infection. To address hospital needs and to receive medical directives, the COVID-19 response team maintains direct contacts with local hospitals and regional public health authorities. The COVID-19 response team algorithm to detect and manage suspected cases of COVID-19 (B). On the basis of risk factors for SARS-CoV-2 contagion and the clinical conditions of the screened individuals, the COVID-19 response team determines the need for hospital admission, home isolation, or SARS-CoV-2 testing. The COVID-19 response team also provides counselling (ie, hygiene recommendations and preventive actions to limit respiratory diseases spread) for non-suspected cases and for patients isolated at home, including their cohabitants. PSAP=public safety answering point. EMS=Emergency Medical System. COVID-19=coronavirus disease 2019. SARS-CoV-2=severe acute respiratory syndrome coronavirus 2.

For COVID-19 outbreak updates from the Italian Government see <http://www.salute.gov.it/nuovocoronavirus>

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involved in facing the consequences of the SARS-CoV-2 outbreak. Specific algorithms, detailed protocols, and specialised teams must be fostered within each EMS department to allocate the right resources to the right individuals when cases of COVID-19 present. The Italian EMS, along with public health authorities, has just started to fight a battle that must be won.

We declare no competing interests.

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- 1 Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China. *JAMA* 2020; **2019**: 25–28.
- 2 WHO. Statement on the second meeting of the International Health Regulations (2005) Emergency Committee regarding the outbreak of novel coronavirus (2019-nCoV). Jan 30, 2020. [https://www.who.int/news-room/detail/30-01-2020-statement-on-the-second-meeting-of-the-international-health-regulations-\(2005\)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-\(2019-ncov\)](https://www.who.int/news-room/detail/30-01-2020-statement-on-the-second-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-(2019-ncov)) (accessed Feb 24, 2020).
- 3 WHO. Global surveillance for human infection with coronavirus disease (COVID-19). Jan 31, 2020. [https://www.who.int/publications-detail/global-surveillance-for-human-infection-with-novel-coronavirus-\(2019-ncov\)](https://www.who.int/publications-detail/global-surveillance-for-human-infection-with-novel-coronavirus-(2019-ncov)) (accessed Feb 24, 2020).
- 4 US Centers for Disease Control and Prevention. Coronavirus disease 2019 (COVID-19). Prevention & treatment. <https://www.cdc.gov/coronavirus/2019-ncov/about/prevention-treatment.html> (accessed Feb 24, 2020).
- 5 Sun K, Chen J, Viboud C. Early epidemiological analysis of the coronavirus disease 2019 outbreak based on crowdsourced data: a population-level observational study. *Lancet Digit Health* 2020; published online Feb 20. [https://doi.org/10.1016/S2589-7500\(20\)30026-1](https://doi.org/10.1016/S2589-7500(20)30026-1).