**COVID-19**

# The Modified National Early Warning Score (m-NEWS) for COVID-19-Infected Patient Evaluation: a Proof-of-Concept

Luca Galassi[1] · Daniele Schena[1]

## Abstract

The second wave of Sars CoV 2 pandemic in Italy still represents an important concern for the Italian health system (IHS). Despite the experience gained during the first phase of the pandemic in January 2020, COVID-19 patients are still arising, putting on a strain resources of local authorities and emergency services. The aim of this research project is to analyze the feasibility of using the modified National Early Warning Score (m-NEWS) as a way to rapidly identify COVID-19-infected patient with high risk of clinical deterioration, helping the clinical pre-evaluation in a moment of overwhelming request for the Italian out-of-hospital emergency system (Perlini et al., Intern Emerg Med 15(5):825–833, 2020) as during the initial coronavirus outbreak.

**Keywords** SARS CoV2 · Novel coronavirus · Modified National Early Warning Score · COVID-19

Although the first coronavirus cases in Italy can be dated back to mid-January 2020 [1], the novel Sars CoV2 outbreak in Italy has recently reached a new record of cases with 40,902 newly infected people on the 13 of November [2] evenly distributed all over the Italian territory.

The first wave that hit the northern regions of Italy and in particular Bergamo Hinterland caused important problems for the management of the critical number of COVID-19-infected patients with the collapse of the most part of hospitals emergency departments, ordinary internal medicine wards, as well as critical care units [3].

Currently, we are witnessing the second wave of the pandemic while still trying to find solutions to manage a progressive increase in the number of COVID-19 cases [4]. To date, Italy has reached a total of 1,205,881 confirmed cases and has reported 45,733 deaths due to COVID-19 infection [5].

The lack of medical specialists trained for the critical care management of patients combined with hospital insufficiencies and shortcomings in medical facilities is slowly aggravating the clinical situation. In addition, the introduction of local regional lockdowns or closure of high schools due to an outbreak of contagions does not appear to have helped stem the tide of new cases [6].

Despite all of the measures taken in order to slow down the spread of COVID-19, the number of infected patients continues to rise and with it and increased pressure on emergency services and departments all over Italy.

In order to guarantee the best level of care, our main objective is to develop a fast and simple scorecard that can be easily used by general practitioners across the country on COVID-19-infected patients.

Correspondingly with this innovative approach, we have started a research project in order to evaluate the potential usage of modified National Early Warning Score (m-NEWS), already hypothesized during the first COVID-19 epidemic in Wuhan [7] and suggested in other review [8], as a tool to be used in the pre-evaluation of COVID-19 patients even before their possible hospitalization.

The use in primary care of m-NEWS score could quickly identify patients at high risk of clinical deterioration, indicating whenever a patient may need early hospitalization, critical care, or can be treated at home by their general practitioner.

m-NEWS score may be adopted as a common and standardized language to rapidly describe patients' clinical conditions among different healthcare professionals (GP, nurses, ambulance service, or the emergency department admitting team).

This rapid and simple score [9] can perfectly fit an emergency situation in which GP may have only one occasion to visit patients (due to the large volume of cases and to limit the

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✉ Luca Galassi
lucagalassimd@gmail.com

1 Orthopedics and Traumatology Unit, A.O. ASST Bergamo Est, P.O. Pesenti Fenaroli, Alzano Lombardo, Bergamo, Italy

number of Sars-CoV2-related contagions) and decide their diagnostic and therapeutic process.

The calculation of the score, together with the full clinical context of the patient, will prioritize and triage the patients that need fast admission and transfer to hospital and critical care helping in managing a large volume of patients as it happened in the COVID-19 epidemic.

Although m-NEWS score can give important information for clinical assessment of COVID-19-infected patients, the score should be always interpreted within the full clinical context of the patient and could not replace clinician's ability to properly assess the acuity of the patient [10, 11].

We are inviting general practitioners and COVID-19-dedicated hospitals to use the m-NEWS score during this second wave of the epidemic in the attempt to obtain multi-centric data that could provide further evidence to encourage the innovative use of this tool, which in turn would eventually lighten the workload on hospitals and hopefully reduce the number of deaths.

## Compliance with Ethical Standards

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