

## Editorial



# COVID-19; critical care challenges in resource-limited countries

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On January 30, 2020, World Health Organization (WHO) declared the outbreak of novel coronavirus disease 2019 (COVID-19) as a Public Health Emergency of International Concern (PHEIC). Now, the COVID-19 has been found in almost all countries across the world (Figure 1). Evolving situation in resource-limited countries (RLCs) is very concerning. Most of the guidelines are developed in high income countries (HICs) which are totally different from RLCs regarding economic situation, healthcare standards, genetic factors and virulence. About 69% of population  $\geq 60$  years old, as a susceptible group for severe illness and death due to COVID-19, are in these countries.<sup>1</sup> This is very alarming and troublesome in RLCs which have already obstacles in providing basic primary healthcare such as maternal and childhood health or vaccination programs. Since most of the RLCs do not already have a preparedness plan for outbreaks, the challenges to suppress COVID-19 spread may become insuperable. Denial of the pandemic in Latin American countries leads to lack of coordination and delayed effective steps such as lockdown and also misuse of medications.<sup>2</sup> In Middle East countries, armed conflicts in the region targets health care facilities of borders and destroys them.

The economic status affects the provision of high-cost intensive care in RLCs. Due to COVID-19 pandemic, critically ill patients outnumber the available intensive care unit (ICU) beds. In HICs like China, in a short time, general beds were converted to ICU beds and critical care health workers were transferred to most affected regions; but RLCs with limited health budgets cannot afford these costs.<sup>3</sup> American Centers for Disease Control and Prevention (CDC) has provided guidelines regarding work restriction and monitoring for health care workers having an exposure to COVID-19. Also, WHO has recommended airborne isolation. However, most of these recommendations are not possible to be implemented in

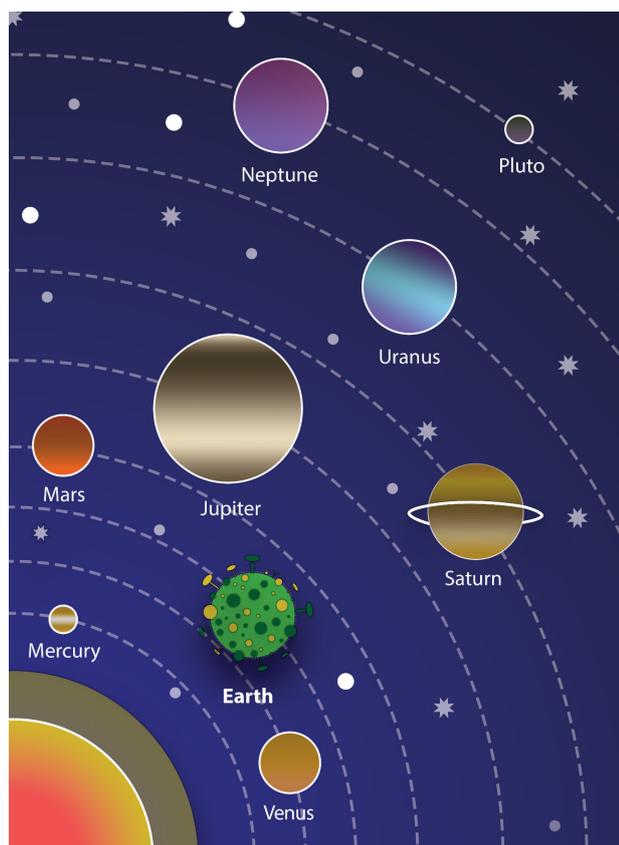
RLCs because of lower level of infrastructures, which can harm the healthcare workers and managements of patients in terms of human resources.<sup>4</sup>

For diagnosis, the CDC recommends collection of specimens to test for COVID-19 virus from the upper respiratory tract and, if possible, the lower respiratory tract. Limitations made clinicians to use serum C-reactive protein (CRP), lactate dehydrogenase (LDH) and other inflammatory biomarkers beside most prevalent symptoms and lung computerized tomography (CT) scan as a diagnostic tool in RLCs.<sup>5</sup> This can lead to both lack of diagnosis and high number of false positive patients and also delay in identification of patients, which can lead to more need for intensive care.

Basic care standards are in place prior to the introduction of costly interventions whose effect might otherwise be compromised. For severe cases of COVID-19 patients who develop refractory hypoxemia, extracorporeal membrane oxygenation (ECMO) is now a rescue therapy. Unfortunately, ECMO is not available in most of the RLCs. The situation becomes more concerning when we know that over half of medical facilities in RLCs have insufficient oxygen supply,<sup>6</sup> which equals to losing more critically ill patients.

Critical care for COVID-19 seems to be cost-effective in RLCs, but more comprehensive assay at a macro- and micro-economy level is needed. Comparing the costs of intensive care in RLCs to the ICUs of HICs, it is much cheaper. Nevertheless, the expenses for intensive care in RLCs are mostly paid by the patient's family, which can lead to some unwanted consequences such as refusal of ICU admission of poor patients or premature withdrawal of life-saving interventions.<sup>7</sup> In these countries, critical care services are usually offered in four types of hospitals as governmental, public charity, private hospitals and private nursing homes. This can lead to a great diversity in the care of critically ill patients, especially when a patient

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**Figure 1.** Earth dealing with COVID-19

has a long ICU stay.<sup>8</sup>

Researches from RLCs may have lower standards and this should be taken into consideration for decreasing the publication bias. Publishing poor-quality research may influence the management of patients which can be inadvisable. It is essential to correctly answer high priority scientific questions in order to inform policymakers about the expected things and address their response capacities. Lower adherence to evidence-based practice in these countries is another problem, which can lead to higher mortality and more consequences.<sup>2</sup>

Management of COVID-19 pandemic is an unexplored frontier having essential opportunities for training and research in RLCs. Crisis management plans should be ready in each of these countries and involvement of the international community should catalyze such preparedness. These include the construction of health laboratories and infectious disease centers, significant increase in the number of negative-pressure isolation beds in hospitals; reservoir of personal protective equipment (PPE) and masks, training of health professionals including the correct use of PPE, establishment of formal platforms for multi-ministry and cross-agency coordination, development of the capability to perform quick contact tracing, and building biosafety level 3 and 4 laboratories.<sup>9</sup> In addition to an extreme public health and medical response, a great research response is needed to respond to such pandemics. Policymakers should call

on research funding agencies in order to prioritize the research on COVID-19 by providing multi-center, large-scale, long-term and certainly well-designed studies.

It is vitally important that all countries pay attention to this situation. Consideration should be addressed toward intensified surveillance and capacity building in RLCs with low facilities to detect infected cases and to limit onward transmission. Important factors to improve performance of ICUs in RLCs includes directing toward not only disease-specific, but also setting-specific points. Developing safe and effective vaccine alone will not end this pandemic until the situation becomes stable in all countries. We should know that “*nobody wins the race until everyone wins*”. COVID-19 Vaccine Global Access Facility (COVAX) is one of global efforts to guarantee equitable access for COVID-19 vaccine for every country in the world,<sup>10</sup> which should be supported by HICs and vaccine developers, to cross this pandemic as soon as possible.

#### Competing Interests

None.

#### Funding

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