

# Is home pulse oximeter monitoring for COVID-19 feasible in low-income and low-middle-income countries?

Sabina Rijal <sup>1</sup>, Bipin Poudel <sup>2</sup>

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We thank Gootenberg *et al*<sup>1</sup> for sharing the article on ‘Developing a pulse oximetry home monitoring protocol for patients suspected with COVID-19 after emergency department discharge’ and raise concerns over feasibility of such monitoring in low-income countries (LIC) and lower-middle-income countries (LMIC) in terms of availability of devices and ability to use them correctly.

Irrespective of economic status of country, hospitals have been overwhelmed with COVID-19 cases. The use of pulse oximeter at home may be feasible in countries where devices are readily available and affordable, but this seems like a far-fetched idea in resource-limited countries. With only \$6 and \$26 to spend per person for COVID-19-related social protection in LIC and LMIC, respectively, many people from those areas are struggling for basic needs like food.<sup>2</sup> The idea of distributing pulse oximeter (each of which costs \$20–\$48) with added cost of telephone calls, from emergency social fund to each suspected person discharged from emergency department in such countries, is challenging without international support.<sup>1,3</sup> Shortage of standard devices is a rising problem in such countries. Even the ones that are available in the market are either not quality-certified or expensive.<sup>4</sup> This adds to the financial burden without any potential benefit while increasing false reassurance.

The literacy rate of 61% and 76% in LIC and LMIC, respectively, which is below the global literacy rate of 86%, limits its applicability in such areas.<sup>5</sup> Remaining population would not be able to comprehend the readings. Even those who can read the numbers are not aware of the correct method to use it. Factors like poor perfusion, dye, pigmentation, movement of hands, etc lead to false reading.<sup>3</sup> Failure to identify potential sources of error adds to the problem.

The challenges faced by LIC and LMIC as mentioned above need to be addressed first to ensure sustainability of programme. Financial aid from international fraternity and provision of quality as well as cost control of the devices from government level may be helpful in solving economic hardship. Governments can mobilise community health volunteers for creating awareness about the correct use of oximeters. They can monitor the oxygen saturation of suspected or confirmed COVID-19 cases by visiting individual houses while taking necessary precautions. Overall, the protocol given by Gootenberg *et al* provides a safe and effective framework for use of pulse oximeter to identify silent hypoxia.<sup>1</sup>

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#### ORCID iDs

Sabina Rijal <http://orcid.org/0000-0003-3867-2761>  
Bipin Poudel <http://orcid.org/0000-0001-8194-6081>

#### REFERENCES

- Gootenberg DB, Kurtzman N, O'Mara T, *et al*. Developing a pulse oximetry home monitoring protocol for patients suspected with COVID-19 after emergency department discharge. *BMJ Health Care Inform* 2021;**28**:e100330.



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<sup>1</sup>Shree Military Hospital Nepalgunj, Banke, Nepal

<sup>2</sup>Patan Academy of Health Sciences, Kathmandu, Nepal

#### Correspondence to

Bipin Poudel;  
[bipinpoudel@pahs.edu.np](mailto:bipinpoudel@pahs.edu.np)



- 2 In developing countries, the COVID-19 crisis has not affected everyone equally [Internet]. World Bank Blogs, 2021. Available: <https://blogs.worldbank.org/voices/developing-countries-covid-19-crisis-has-not-affected-everyone-equally> [Accessed 30 Jul 2021].
- 3 Greenhalgh T, Knight M, Inda-Kim M, *et al.* Remote management of covid-19 using home pulse oximetry and virtual ward support. *BMJ* 2021;372:n677.
- 4 MK M. Why many of the oximeters you're buying in India may not be reliable [Internet]. The News Minute, 2021. Available: <https://www.thenewsminute.com/article/why-many-oximeters-youre-buying-india-may-not-be-reliable-135313> [Accessed 30 Jul 2021].
- 5 World Bank Group. Literacy rate, adult total (% of people ages 15 and above) | Data [Internet]. The World Bank, 2021. Available: <https://data.worldbank.org/indicator/SE.ADT.LITR.ZS> [Accessed 30 Jul 2021].