

The COVID-19 Pandemic

A Massive Threat for Those Living With Cardiovascular Disease Among the Poorest Billion

The coronavirus disease 2019 (COVID-19) pandemic has significantly affected the poorest billion people worldwide. This is not only because of the challenges specific to COVID-19 infection (establishing this complex diagnosis and managing severe cases of infection), but also because of the interruptions in routine medical care, disruptions in local and global supply chains, and increase in health care costs, all leading to further poverty and food insecurity.¹ In this article, we discuss the unique vulnerabilities of the poorest billion population with cardiovascular disease (CVD) to the COVID-19 pandemic and explore possible contributions of the global CVD community to mitigate these disastrous effects.

The poorest billion people predominantly live in rural regions of low- and middle-income countries (LMICs) in sub-Saharan Africa and South Asia. In this population, CVD causes an estimated 3600 disability-adjusted life years per 100 000,² even though the majority who live in LMICs are <30 years old. There is a high burden of CVD risk factors, such as hypertension, diabetes, and smoking,² that are also associated with worse COVID-19 severity.³ Major contributors to CVD in poor countries include unrepaired congenital heart disease, rheumatic heart disease, and cardiomyopathies.² Individuals with these conditions are at particularly high risk of severe complications from COVID-19 infection because of their complex intracardiac hemodynamics.⁴

Despite the greater susceptibility of patients with CVD in LMICs to severe COVID-19 illness and sequelae, there are numerous environmental, health system, health care workforce, and patient-related barriers that facilitate viral transmission and impair access to care (Figure). Regional lockdown measures are physical barriers for the poorest billion populations who need to travel to seek routine health care during the pandemic. These measures have also caused a massive increase in unemployment in the informal sector in places like India.¹ The pandemic has exposed the lack of rudimentary supplies such as pulse oximeters and bedside oxygen at many health care facilities in LMICs,^{1,3} and preexisting gaps in essential care will become much larger if cases of acute respiratory illness in LMICs continue to climb.³ A major threat of the pandemic is also the disruption of routine health services,¹ such as rheumatic heart disease screening and treatment. Redirecting medical staff, supplies, and care areas toward the COVID-19 response in LMICs has greatly amplified the problem of undiagnosed and untreated CVD in those regions and will continue to do so as long as pandemic activities are ongoing. Concurrently, social distancing measures and border closures have been implemented internationally, disrupting fragile global supply chains for essential medicines and exacerbating food insecurity. Recommendations for self-isolation, which are central to containment efforts for COVID-19, disproportionately affect the most marginalized in society: the poor, elderly, and chronically ill, in particular, those without adequate social protection. Thus paradoxically, whereas the high burden of chronic

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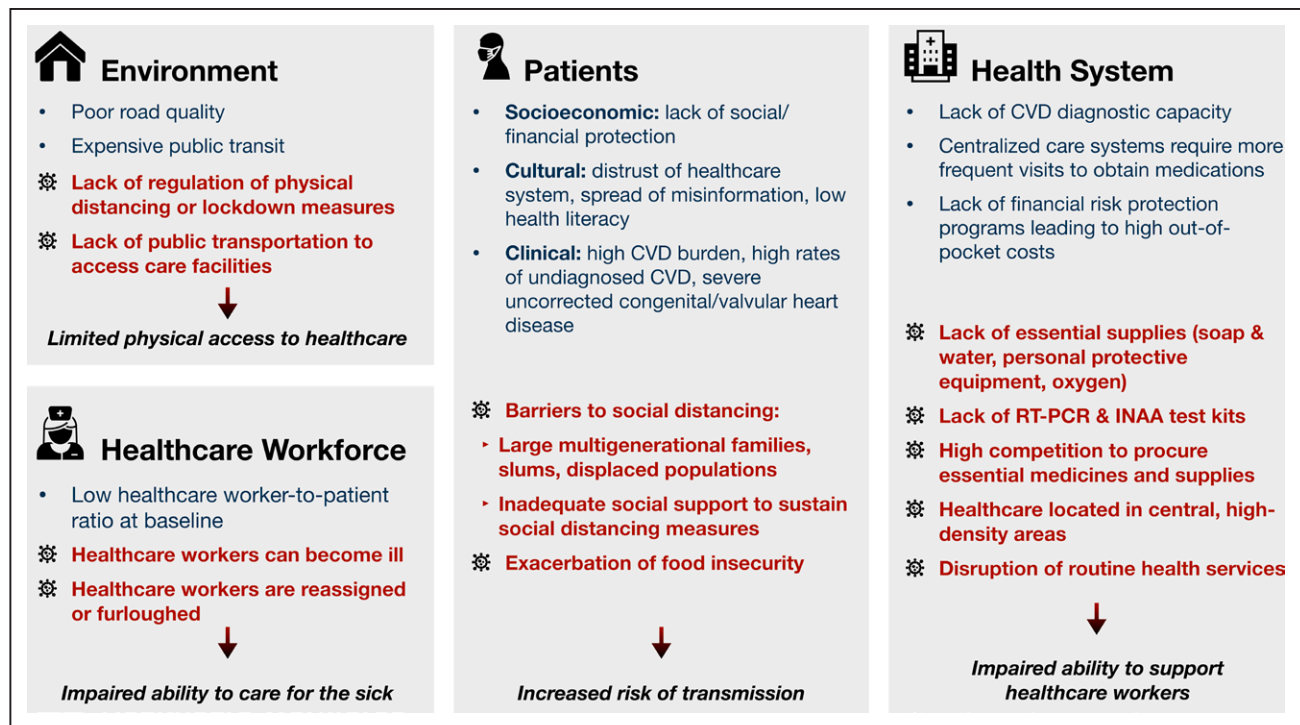


Figure. Barriers among poorest billion populations for adequate cardiovascular disease COVID-19 response.

Blue denotes chronic systems barriers, and red denotes COVID-19–specific barriers. COVID-19 indicates coronavirus disease 2019; CVD, cardiovascular disease; INAA, isothermal nucleic acid amplification; and RT-PCR, reverse transcriptase polymerase chain reaction.

CVD in poorest billion populations predisposes more individuals to severe illness, small health care budgets in many LMICs limit access to health care for these very individuals. Last, the ripple effects of job loss and a global economic recession taking place during the pandemic may make it impossible for poorest billion individuals living with chronic CVD to afford medications and medical care both in the short and long term.¹

However, there are innovative opportunities for the global cardiovascular community to respond to achieve long-lasting health system strengthening during this pandemic. One such response would be to support efforts to decentralize specialized care, such as heart failure care, to more remote communities and install cardiac care units or other high-dependency care units in rural district hospitals, easing the burden on health care systems in high-density centers. These initiatives can promote social distancing, while improving access to care among the rural poor even with concurrent regional lockdown measures. Decentralization requires both investment to extend existing supply chains and tasking shifting: reorganization of training and care models so that tasks usually performed by health care workers with specialized training at referral hospitals are shifted to workers with lower levels of training. Partners In Health in rural Malawi has been successful in adapting preexisting human immunodeficiency virus infrastructure to provide CVD care and this has been described as an effective strategy by other

groups.⁵ For many years, our group has used the PEN-Plus model of training nurses to lead outpatient clinics for patients with severe chronic disease in rural LMICs (The NCD Synergies PEN-Plus Toolkit can be found at <http://ncdsynergies.org/chronic-care-toolkit/>). New technology, such as digital disease surveillance systems, teleconferencing via mobile devices, and online training platforms, can facilitate decentralization and task shifting. During the pandemic, our group has conducted virtual training of health care providers to support care of patients with heart failure at several sites in rural Malawi. We are developing and testing an online heart failure teaching module using an open-source learning platform (Moodle Pty Ltd) in rural Rwanda. Our goal is to disseminate these technology-based tools to rural health care providers across sub-Saharan Africa. Through our decentralized clinics, we have also been able to coordinate the distribution of cash transfers to our patients in highest poverty to provide direct economic support.

Over the past several months, it has become clear that strong health systems have the ability to adapt in acute crises, whereas underresourced health systems simply shift dwindling supplies from one care environment to another. While high-income and upper middle-income countries continue to lead in COVID-19 case counts at the time of this writing, LMICs may still be waiting to experience their own surge in cases and have already felt the profound ripple effects of the

global pandemic. As COVID-19 continues to circulate for many months to come, the global CVD community must be vocal about increasing investments in health care structures that care for the most vulnerable patients. With global support, pandemic response efforts in LMICs such as facilitating access to health care and creating social protection mechanisms can bolster health systems for the poorest billion populations for years to come.

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Disclosures

None.

REFERENCES

1. Kelley M, Ferrand RA, Muraya K, Chigudu S, Molyneux S, Pai M, Barasa E. An appeal for practical social justice in the COVID-19 global response in low-income and middle-income countries. *Lancet Glob Health*. 2020;8:e888–e889. doi: 10.1016/S2214-109X(20)30249-7
2. Kwan GF, Mayosi BM, Mocumbi AO, Miranda JJ, Ezzati M, Jain Y, Robles G, Benjamin EJ, Subramanian SV, Bukhman G. Endemic cardiovascular diseases of the poorest billion. *Circulation*. 2016;133:2561–2575. doi: 10.1161/CIRCULATIONAHA.116.008731
3. Walker PGT, Whittaker C, Watson OJ, Baguelin M, Winskill P, Hamlet A, Djafaara BA, Cucunubá Z, Olivera Mesa D, Green W, et al. The impact of COVID-19 and strategies for mitigation and suppression in low- and middle-income countries. *Science*. 2020;369:413–422. doi: 10.1126/science.abc0035
4. Radke RM, Frenzel T, Baumgartner H, Diller G-P. Adult congenital heart disease and the COVID-19 pandemic. *Heart*. 2020;106:1302–1309.
5. Duffy M, Ojikutu B, Andrian S, Sohng E, Minior T, Hirschhorn LR. Non-communicable diseases and HIV care and treatment: models of integrated service delivery. *Trop Med Int Health*. 2017;22:926–937. doi: 10.1111/tmi.12901