

# Cardiovascular health and COVID-19: time to reinvent our systems and rethink our research priorities

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Global trends in cardiovascular health have reached a worrisome inflection point. Decades of innovation led to a slew of drugs, devices and programmes that translated into reduced mortality from cardiovascular diseases in many countries. Unfortunately, progress on cardiovascular mortality since 2010 has slowed; in some countries, it has even reversed.<sup>1</sup> Compounding the problem, political actions on cardiovascular health have been inadequate, and health systems across many low-income and middle-income countries are woefully under-resourced to scale up basic cardiovascular services. These factors could increase global health inequalities in coming decades.<sup>2</sup>

## COVID-19 THREATENS TO DERAIL PROGRESS ON CARDIOVASCULAR HEALTH EVEN FURTHER

Cardiovascular practitioners are now under greater pressure to deliver the same or better care in the context of a pandemic. COVID-19 has hit cardiovascular care particularly hard: WHO surveys recently found that cardiovascular services have been partially or completely disrupted in nearly half of countries with community spread of COVID-19, raising the chance of increased cardiovascular mortality in these locations.<sup>3</sup>

Two studies published in this issue of *Heart* shed more light on the specific effects of COVID-19 on health systems in Brazil and the UK. Brant *et al* looked at cardiovascular mortality in six Brazilian capital cities.<sup>4</sup> Ball *et al* tracked disruptions in acute cardiovascular services across nine UK hospitals.<sup>5</sup> Taken together, these two studies quantify what many readers of this Journal have experienced firsthand: the restructuring of hospital services to cope with an influx of COVID-19 cases, combined with social distancing measures,

has severely limited access to cardiovascular care, adversely impacting patient outcomes.

Although Ball *et al* did not attempt to link reduced service delivery to mortality outcomes, other studies from the UK have estimated excess cardiovascular deaths during COVID-19.<sup>5</sup> Brant *et al* posited that excess cardiovascular mortality in Brazil was partly due to avoidance of care (ie, increases cardiovascular deaths occurring at home).<sup>4</sup> They also found that healthcare system collapse in more socioeconomically deprived states was associated with increased acute coronary syndrome and stroke deaths in these states, independent of the uptick in deaths at home.

## A COMPREHENSIVE RESPONSE

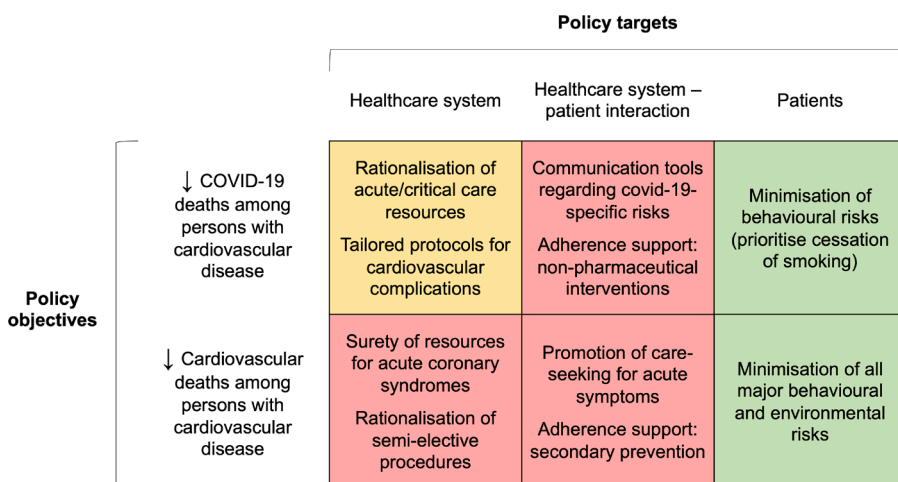
What can be done about these disruptions? The relationship between COVID-19 and cardiovascular health can be separated into two issues that require different responses. First, persons living with cardiovascular diseases have worse outcomes when they acquire COVID-19. On the other hand, persons living with cardiovascular disease or major risk factors are also at increased risk of

death from cardiovascular mechanisms (eg, thrombotic events or heart failure) when their access to acute care services is interrupted. Health systems, patients and patient-system interactions are implicated in both of these issues.

Figure 1 illustrates how an appropriate policy response should consider all of the elements mentioned above, with the overarching goal being to reduce deaths from any cause (COVID-19 or otherwise) among persons living with cardiovascular diseases or major risk factors. Importantly, the actions specified in the figure 1 can be adapted to all populations and countries, regardless of health system resource levels. With such a framework in mind, practitioners and researchers could then structure their work and advocacy around two key messages.

## MESSAGE 1: THE GLOBAL AND NATIONAL PANDEMIC RESPONSES CANNOT BE SEPARATED FROM THE CARDIOVASCULAR HEALTH AGENDA

Outcomes from infectious diseases are usually worse among patients with multimorbidity, and COVID-19 is no different. As cardiovascular practitioners, scientists and advocates, we need to articulate the substantial benefits of pandemic mitigation efforts to persons living with cardiovascular diseases or risk factors. In parallel, accelerated investment in population-level prevention efforts would reduce the future burden of cardiovascular disease on health systems and reduce the number of persons at high risk of complications from future pandemics or outbreaks.



**Figure 1** Critical elements of a comprehensive policy response to cardiovascular disease during COVID-19. The elements proposed above can be modified to fit the resource levels and epidemiological contexts of different countries. Areas marked in red are those likely to translate into the largest short-term mortality gains. Areas marked in yellow or green, while important for prevention, health promotion or stewardship objectives, are less likely to reduce mortality.

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In much of the global health community, investments in acute care and in cardiovascular diseases are often perceived to be non-essential—or even anti-equity—and are almost never given serious consideration within health and development programmes. We need to forcefully push back on such short-sighted thinking. Collaborators on the Disease Control Priorities Project recently released guidance for low-income and middle-income and humanitarian settings, including a list of 120 essential health services to protect during the pandemic. On value-for-money grounds, basic cardiovascular disease prevention and care are just as ‘essential’ as immunisation programmes, maternal healthcare and screening and treatment of HIV infection.<sup>6</sup>

At the same time, locations with advanced cardiovascular care systems need guidance on how to balance the need to treat severe cardiovascular disease against the need to adapt quickly to increased COVID-19 caseloads. Ball *et al* found that emergency department visits and percutaneous coronary intervention procedure rates in UK hospitals had partially rebounded by the end of May 2020.<sup>5</sup> Assuming the top objective is to maximise health, emergency cardiac care and interventional services should be brought back online before phasing in other semi-elective vascular procedures (even if the latter provide substantial revenues to hospitals). Critically, more must be done to encourage patients with acute cardiac or neurological symptoms to seek care even in the face of potential COVID-19 exposure. Initiatives like the American Heart Association’s ‘Don’t Die of Doubt’ campaign<sup>7</sup> should be examined, adapted and disseminated widely to complement supply-side efforts to improve access.

**MESSAGE 2: PRIORITIES FOR CARDIOVASCULAR SCIENCE MUST PIVOT, CAPITALISING ON LESSONS LEARNT DURING THE PANDEMIC**

It is increasingly clear that pandemics and emerging infections, driven by globalisation and climate change, will continue

to threaten health systems in the coming decades. Cardiovascular research and development priorities must adapt to this emerging reality. We need new technologies, programmes and care systems that protect what is working during COVID-19 and transform what is not. In addition, the pandemic has illuminated—and in many cases magnified—inequalities in cardiovascular health. Cardiovascular research funders should prioritise development of truly ‘global’ public goods that can immediately benefit the health of the world’s poorest as well as vulnerable populations in the global North.<sup>2</sup>

How could the cardiovascular research community make this pivot? Table 1 proposes several principles for cardiovascular research and development priorities amid and beyond the COVID-19 pandemic. Not every concept in table 1 will be directly applicable to every research initiative, but they could be used by funders as benchmarks for developing or revising their strategies and scoring proposals.

Management of acute coronary syndromes exemplifies the need for a research and development pivot. Our ability to reduce case fatality from acute coronary syndromes is based on prompt delivery of interventions or fibrinolysis. Researchers and planners have worked for years to improve referral and triage systems to increase access to these life-saving technologies. Yet when viewed through the lens of COVID-19, it is problematic that the cornerstone of acute coronary syndrome management is early access to a referral hospital. We need new technologies, like home-based diagnostics and smartphone-based triage and referral processes, that can circumvent time and distance bottlenecks. We also need new drugs (available at home) that bridge to interventions or replace them entirely. Such technologies are especially needed in low-income and middle-income countries, where systems are less advanced and timely access is more difficult to achieve (eg, in majority-rural countries).

More generally, new technologies should ‘disrupt’ care systems in a way that makes cardiovascular care more patient-centred, community-facing and responsive to population needs. The notion that healthcare by default requires a physical building (separate from one’s home or work) should quickly become antiquated. The greater use of telemedicine during the pandemic is a big step in this direction, but we have yet to harness the full potential of mobile devices and wearables—technologies that are already widely available and will become ubiquitous in low-income and middle-income countries much more quickly than new clinics or hospitals. Innovators and health planners in resource-limited countries could collaborate to develop ‘leap-frog’ cardiovascular health programmes that do not rely on the inefficient, slow-to-adapt and labour-intensive models used in the global North.

**THE FUTURE OF CARDIOVASCULAR HEALTH AND RESEARCH**

In the midst of the debate over the future of cardiovascular care, we should not to lose sight of the ‘endgame’.<sup>8</sup> In the long term, it would be far better to live in a world where the prevalence of ideal cardiovascular health is high and the lifetime disease risk is low. In such a world, the impact of another pandemic on cardiovascular services and patients would be lessened greatly. Aggressive action is needed to fully implement policies and health services that we know can help achieve this goal in a cost-effective manner. Still, in order to accomplish the endgame, we need better evidence on how to design policy instruments that can minimise dietary risks and barriers to optimal physical activity—the most challenging of the risk factors to tackle.<sup>2</sup>

COVID-19 has left an indelible mark on human health. At the end of 2019, many of us in the cardiovascular health community were probably quite comfortable with business as usual and with incremental improvements in science and clinical practice. The events of 2020 have

**Table 1** Proposed principles to guide cardiovascular research and development priorities

Overarching principle	Example subprinciples or criteria
Ethics and stewardship	Research findings are immediately translatable and applicable in low-resource settings/countries. Research products are likely to provide very good value for money or control cost escalation in cardiovascular care. <sup>2</sup>
Patient-centred healthcare	Research findings/outputs could reduce patient barriers to use of CVD services or technologies in a wide range of settings. When applicable, research project strives to engage patients in all stages of research, from design to dissemination/implementation.
The CVD ‘endgame’ <sup>8</sup>	Research contributes substantially to reduced incidence of cardiovascular disease (ie, primordial/primary prevention). Research increases the probability of collective/policy action on CVD (eg, dynamic surveillance, implementation research).

CVD, cardiovascular disease.

raised the stakes, forcing us to become more accepting of disruptions (creative or otherwise). We must use this opportunity to think more boldly.

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