

# Avoiding the Coming Tsunami of Common, Chronic Disease

## What the Lessons of the COVID-19 Pandemic Can Teach Us

Robert M. Califf<sup>1</sup>, MD,  
MACC

**D**uring the past year, clinicians and the public have been focused on the coronavirus disease 2019 (COVID-19) pandemic and its associated societal and economic effects. However, once the acute phase of this crisis has passed, we will face an enormous wave of death and disability as a result of common chronic diseases (CCDs), with cardiometabolic diseases at the crest (Figure). A tsunami results when an earthquake on the ocean floor creates huge waves that can wreak devastation far distant from the original upheaval, especially when warnings are ignored. Similarly, underlying global and national demographic and risk factor profiles have for some time presaged an overwhelming burden of CCDs. However, although the pandemic has created additional impetus that unless heeded will amplify the consequences of this burden, the rapid adaptations and innovations in care and research prompted by the urgent response to it may also offer us the means to stem this flood.

### THE DATA

Well before the pandemic, we were already experiencing a global wave of death and disability attributable to CCDs,<sup>1</sup> stemming from declines in childhood mortality and increases in life expectancy in low- and middle-income countries and an overall increase in global population. In other words, while age-adjusted rates of deaths from CCDs (including cardiovascular disease) have fallen, absolute numbers are increasing massively.

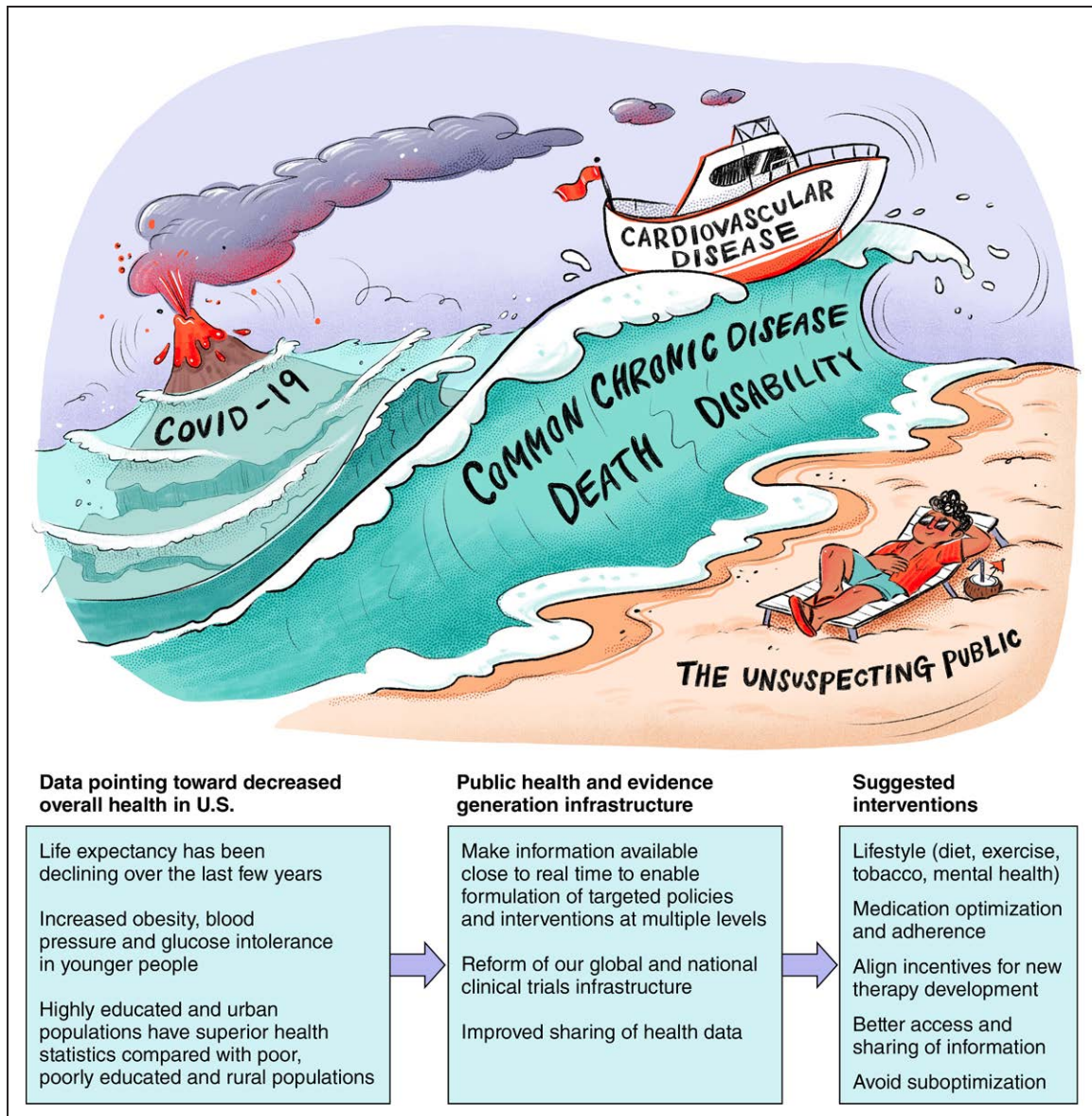
The story for the United States versus other high-income countries is more complex.<sup>2</sup> Unlike its peers, the United States has seen declining life expectancy over the past few years after decades of steady progress. This reversal is attributable chiefly to increases in drug overdose and suicide, but deaths from cardiovascular disease—particularly stroke—have also increased. These challenges are coupled with adverse patterns of risk among younger people, including increases in obesity, hypertension, and glucose intolerance driven by poor diet and lack of exercise—patterns that portend increases in cardiometabolic disease for decades to come. This concerning situation is compounded by an alarming increase in deaths directly from COVID-19 together with rising CCD- and drug-related deaths. The net effect is a substantial increase in excess death and a correspondingly steep drop in average US life expectancy, perhaps by as much as 3 years.

These dire statistics are occurring amid growing awareness of demographic, socioeconomic, and structural factors driving disparities in health outcomes.<sup>3</sup> These differences are not new, but we can now measure them much more accurately. The relationships of race and ethnicity to outcomes are well established and deserve continued intense corrective effort. The effects of wealth, education,

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**Figure.** Recognizing and dealing with the tsunami of common chronic disease.

Data point to a decline in health status in the United States that is worsened by coronavirus disease 2019 (COVID-19), which also distracts. There is an urgent need to improve our infrastructure for evidence generation and measurement of health status and specific interventions are needed to improve outcomes.

and geographic location are now more widely appreciated—wealthy, highly educated, urban populations have superior health statistics compared with poor, poorly educated, rural populations. These differences are growing as wealth gradients become steeper and people aggregate—or are aggregated—into neighborhoods and regions with similar cultural attributes. The US urban–rural divide, with its complex interplay of culture and politics, is undergoing an especially rapid evolution.<sup>4</sup> Even within US states, remarkable differences in life expectancy (up to 2 decades) exist between cities or college towns and rural areas only a county or 2 away. The outcome of these trends is predictable: continued declines in population health unless new strategies are developed.

## SUGGESTED INTERVENTIONS

Multiple partially effective interventions are available for all CCDs, but implementation has been suboptimal, especially for cardiometabolic diseases, given the many effective, low-cost interventions available. Despite adequate underlying resources, the US payment system incentivizes rescue treatment of acute conditions but generally penalizes health systems that focus on preventive strategies. In the United States, as in the rest of world, implementing lifestyle improvements for exercise, blood pressure control, obesity management, and tobacco cessation, combined with universal health care coverage and improved adherence to low-cost generic medications, could substantially reduce death and disability.

More effective implementation by itself will not suffice. The US system currently rewards novel therapies in immunology, rare diseases, and cancer. Therapies for CCDs, however, require larger, more costly clinical trials, lack regulatory incentives such as accelerated approval pathways or subsidies for development costs, and ultimately command lower market prices. These factors together suppress technological development in CCDs relative to other fields. Policies are needed to level the playing field and stimulate innovation in CCD therapies while preserving the remarkable progress in rare diseases, cancer, and immunology.

A specific challenge for all diseases is integrating knowledge into successful action at the level of individuals and groups of people who share common issues. Improving diet, exercise, and medication adherence and reducing tobacco use and drug addiction require a base of personal information and knowledge coupled with readiness to change, but these behaviors are modulated by social determinants of health. Individual-level interventions will have limited success unless they are coupled with structural measures to reduce the inequities driving deteriorating health statistics. The lower death and disability rates and improvement in economic measures associated with expansion of Medicaid illustrates how structural change can improve social, economic, and health outcomes.

Wider uptake of digital technologies offers both risks and potential solutions. The influence of health-related misinformation has been particularly acute during the current crisis. But ubiquitous cell phones plus universal access to broadband Internet could dramatically increase access to reliable medical information, digital support, and interactions between patients and clinicians over digital media, thus freeing up clinicians—especially nurses and community health workers—to function at the top of their capabilities and extend high-quality care into every community.

The US health care system reflects “suboptimization”: each component is rewarded for optimizing its own financial performance without explicitly considering the effect on the whole. Correspondingly, population health outcomes are sacrificed to optimize finances and to “teach to the test” of performance measures. We need policies that combine improved individual care with structural changes that prioritize overall health in populations. These policies should be grounded in empirical evidence produced by the evolving discipline of implementation science.

## PUBLIC HEALTH AND EVIDENCE GENERATION INFRASTRUCTURE

COVID-19 data dashboards that track testing, cases, hospitalizations, and deaths have become ubiquitous

during the pandemic. There is no fundamental technical impediment to making similar information about other diseases available in close to real time to inform targeted policies and interventions at scales ranging from national to neighborhood. The data are available, but an upfit in digital public health infrastructure is needed to enable access to reliable, granular data for planning and measuring the effect of interventions.

We have also relearned the critical importance of pragmatic clinical trials that answer essential questions in ways that inform actual clinical practice.<sup>5</sup> Infrastructure for both national and global clinical trials must be reformed to provide the capacity to answer critical questions rapidly and in ways that are people- and patient-centric, user-friendly for clinicians, and efficient. The rapid generation of evidence for COVID-19 vaccine development through the Operation Warp Speed public-private partnership should provide a template for Operation Warp Evidence, with priority given to the most important clinical trials that assess risks and benefits of new therapies and directly compare available therapies. Such efforts must also be complemented by a new societal consensus about sharing health data, as emphasized by the recent National Academy of Medicine report *Health Data Sharing to Support Better Outcomes*. Strategies for mitigating risks to privacy and confidentiality could enable sharing of information in ways that overcome obstacles to improving prevention and treatment for CCDs.

## CONCLUSION

The United States is facing an oncoming wave of death and disability from CCDs, especially cardiometabolic diseases. Reversing these trends will require the systematic application of evidence generation and implementation science to multidimensional, integrative interventions that encompass both personalized and population-based approaches, supported by a modernized data infrastructure. Intelligent deployment of carefully vetted digital technologies can free up human effort to be focused where it makes the greatest difference. The fight against COVID-19 has given us a glimpse of what is possible. If we act now, we can significantly reduce the damage from the impending tsunami.

## ARTICLE INFORMATION

### Correspondence

Robert M. Califf, MD, MACC, Verily Life Sciences, 269 East Grand Avenue, South San Francisco, CA 94080. Email robertcaliff@verily.com

### Affiliation

From Verily Life Sciences, South San Francisco, California.

## Disclosures

Dr Califf is an employee of Verily Life Sciences and Google Health (both Alphabet companies) and serves on boards for Cytokinetics, Centessa, and Clinetic.

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