

Saving 100 million lives by improving global treatment of hypertension and reducing cardiovascular disease risk factors

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Each year, cardiovascular disease (CVD) kills more than 18 million people worldwide, a third of all global deaths, with this proportion expected to increase further.¹ High blood pressure is the leading cause of CVD and it will kill nearly 10 million people this year—half of the CVD total and more people than all infectious diseases combined.²

CVD rates are higher and the burden on younger populations is greater in lower- than in higher-income countries. Four in five CVD-related deaths occur in low- or middle-income countries, and a higher proportion of these deaths occur in people younger than 70 years old in lower-income countries than in higher-income countries (about 50% vs 15%-20%, respectively).

The global direct medical costs of hypertension are estimated at \$370 billion per year, with the health care savings from effective management of blood pressure projected at roughly \$100 billion per year.³ For every death from CVD, there are up to 3 other serious CVD events, which also incur medical and social costs;⁴ it is estimated that CVD costs 2%-4% of gross national income in low- and middle-income countries.⁵

Even though most CVD is preventable through simple, effective, and inexpensive interventions, control rates of blood pressure remain very low on a global scale because these interventions are underused in most of the world. Although rates of hypertension control are currently only about 14% worldwide,⁶ Canada, some Scandinavian countries, and some health systems in the United States have achieved control rates approaching 70%.^{7,8} Pilot programs in Barbados and Malawi show that it is possible to increase control rates rapidly.⁹

Improved prevention and treatment have decreased mortality rates from CVD in higher-income countries, and accounted for 60% of the decline in CVD-related mortality and nearly 3 quarters of the decline in all-cause mortality in the United States between 1950 and 2000.¹⁰ Achieving similar declines worldwide would have dramatic health and economic benefits. The decline in heart disease deaths from 1980

to 2000 in the United States was roughly attributable equally to improved clinical services and prevention programs.¹¹

The publication of updated hypertension treatment guidelines, such as the recent Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults, authored by the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and others,¹² generates much needed interest in, and attention to, hypertension treatment. However, dissemination of updated treatment recommendations alone is not sufficient to improve hypertension control; rather, it is the systematic implementation of the guideline content that improves the quality of care.

Effective treatment of large populations with hypertension is urgently needed now, as more than 25 000 deaths per day occur due to hypertension. To help address this public health emergency, the Resolve to Save Lives (Resolve) Cardiovascular Health Initiative has been established. Resolve is a 5-year, \$225 million initiative housed at Vital Strategies, a global health non-profit organization, that will support key organizations and engage new partners to accelerate global and national action.¹³ Funded by Bloomberg Philanthropies, the Chan Zuckerberg Initiative, and the Bill and Melinda Gates Foundation, with global partners that include the World Health Organization (WHO), the World Bank, the CDC Foundation, and The Johns Hopkins Bloomberg School of Public Health, Resolve is focused on helping low- and middle-income countries accelerate and scale-up implementation of proven tools and strategies to prevent CVD. This is aligned with many countries' internal non-communicable disease prevention initiatives and goals and supports the United Nations Sustainable Development Goals.¹⁴

Resolve focuses on 3 key interventions to reduce CVD—improving treatment of hypertension from the current global control rate of 14% to a target of 50%, reducing current levels of sodium intake by 30%, and completely eliminating artificial trans-fat from the food

supply. Improved treatment of high blood pressure, which rapidly and substantially reduces risks of stroke, heart attack, kidney damage, and other health problems, can also improve primary care as a component of a universal health coverage system. Modeling suggests that more effective control of hypertension could save more lives than any other clinical intervention,¹⁵ and that together, these 3 interventions can prevent 100 million deaths worldwide over the next 30 years.

Blood pressure can be controlled in most people, and improving hypertension treatment can be achieved by existing health systems through the use of inexpensive, once-daily medications.¹⁶ However, because treatment is generally life-long and patients are usually asymptomatic, achieving high levels of control is difficult. Health systems that are successful in supporting their patients to bring blood pressure under control do so by ensuring provision of a technical package with 5 key components.

- Treatment protocols that establish a standard treatment of patients that is simple and practical yet provides sufficient detail, including specific medications and dosages and a schedule for titration or the addition of medications if blood pressure is uncontrolled.
- Community-based care and task sharing so health care workers who are most accessible to patients can provide care, including adjusting and intensifying medication regimens that follow physician-directed protocols, allowing every member of the health care team to be optimally involved in supporting patient care.
- A regular and uninterrupted supply of quality-assured medications and equipment for accurate monitoring of blood pressure, including blood pressure measurement in homes, pharmacies, and other public settings.
- Patient-centered services that reduce barriers to adherence, including low-cost or free medical visits and medications; convenient medical visits and medication refills; once-daily treatment regimens with 3-month refills for stable patients; the use of fewer tablets through combination medications; ready access to free blood pressure monitoring; and public education to increase awareness of the importance of controlling blood pressure.
- Information systems that allow for real-time feedback on adherence and blood pressure control of individual patients, and assessment of control rates by different treatment systems to strengthen tracking and accountability and facilitate continuous, real-time program improvement.

From a clinical standpoint, 1 essential element is the use of detailed, standardized treatment protocols. Standardized treatment protocols have been shown to be superior to individualized treatment.¹⁷ Progress on other health problems that require long-term treatment, such as tuberculosis and HIV infection, was slow. This was due to the belief that individually tailored treatment provided by specialists at referral institutions was superior to care delivered by providers more readily accessible to patients. However, successful approaches can be scaled up to help millions, while individualized treatment approaches, by their nature, help only one patient at a time. Although specialist treatment is important for patients who do not respond to first-line

treatment or who have complicated medical conditions, the great majority of patients can be effectively treated in a primary care setting, and in some cases, will not be cared for at all unless they are treated through the primary care system.

Use of a standardized, evidence-based treatment protocol reduces unwarranted clinical variability.¹⁸ A protocol sends a strong signal to clinical staff that hypertension control is a priority and enables the health care team to advance patient safety and efficiently support patients along a single, well-defined treatment pathway. Implementing a more efficient and cost-effective selection of medications and treatment approaches simplifies logistics, training, supervision, evaluation, and overall program implementation, thereby increasing the impact of treatment programs.¹⁹ A standard treatment protocol can also potentially be incorporated into electronic health records through clinical decision support tools, registry functions, and measurements to facilitate quality improvement. Analysis of performance metrics can better identify health systems using successful strategies to enable improvements in care and increased patient retention in treatment, as well as to identify successful practices that can be shared with other provider groups.

The best performing health systems use standardized treatment protocols to improve quality of care (eg, Kaiser Permanente, US Veterans Administration). Several treatment protocols have been proven effective and all are acceptable options depending on local prescribing experiences and health system capacity.²⁰ Selection of a specific regimen is less important than the level of blood pressure control achieved. Simpler protocols are more likely to be used correctly and are more likely to result in higher quality care in any health system or country. Most patients will be treated effectively with standardized treatment, but providers can deviate from the standard and tailor treatment when clinically appropriate.

Clinical treatment can be further simplified through use of fixed-drug combinations of antihypertensive medications included in a treatment protocol. This approach could facilitate medication adherence if dosage issues, cost, and availability are addressed. It is worth noting that delaying medication initiation for several months while lifestyle changes are attempted is rarely effective and often results in loss of the patient to further treatment.

Reducing the sodium content of food will also reduce blood pressure and save lives.²¹ High sodium intake is strongly correlated with high blood pressure, which is the leading risk factor for heart disease and stroke. Most of the world's people consume far more salt than they need, with excess sodium consumption responsible for an estimated 1.65 million CVD-related deaths per year globally.²² Because the risk of cardiovascular disease begins to increase at blood pressure levels lower than those generally treated, but at levels high enough to increase mortality, reduction of dietary sodium will also benefit those with elevated blood pressure who are not currently candidates for medical treatment.

Reduction of sodium intake is best accomplished by reducing sodium at the source, which in many countries is primarily contained in commercially processed and restaurant food, and in others comes mostly from salt added during cooking and at the table.²³

Consumers can't take sodium out of food once it's been added, and studies show that when they are offered lower-sodium food, they will add back only a small fraction of the removed sodium at the table.²⁴

Experience shows that with concerted and coordinated effort, food manufacturers can substantially reduce the sodium content of food and that sodium intake can be reduced population-wide. In the UK, voluntary reductions by industry resulted in a 15% decrease in sodium consumption and were associated with a 40% decline in cardiovascular disease deaths between 2003 and 2011.²⁵

Combining reductions in sodium intake with improved clinical treatment of hypertension will provide maximum health benefit, as fewer people will need pharmacological treatment, and those on treatment will have a better response to medications. Lifestyle modification is important and should be encouraged, but cannot replace effective treatment for hypertension. Increasing physical activity, reducing obesity, and other measures could also reduce blood pressure and cardiovascular disease, but at present no effective interventions have been shown capable of being scaled up sufficiently rapidly and broadly to have sustainable population impact.

The world is at a tipping point in its ability and commitment to save lives from CVD. The WHO targets for non-communicable disease reduction²⁶ and the WHO Global Hearts initiative to reduce heart attacks and strokes²⁷ are a start, and success in some countries has laid the foundation for rapid progress against CVD. In order to adequately address the current and growing global epidemic of uncontrolled hypertension, coordinated action at a sufficiently large scale will be required to accelerate efforts to reduce premature deaths from cardiovascular disease with a focus on low- and middle-income countries.

Of the more than \$35 billion dollars per year devoted to development assistance in health, less than 1% is estimated to be spent on prevention of cardiovascular disease. More support to accelerate global and national action is needed to scale up hypertension treatment and sodium reduction initiatives. Clinical support from primary care providers and cardiovascular specialists to increase the number of people with hypertension receiving effective treatment will be essential to achieving the Resolve to Save Lives goal of preventing 100 million deaths from cardiovascular disease worldwide over the next 30 years. We don't need to reinvent treatment strategies to reduce hypertension and cardiovascular disease—we need to more rapidly scale up and implement models that have been proven to be effective and can save lives today.

CONFLICT OF INTEREST

No conflicts of interest or financial disclosures.

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