



INNOVATIVE APPROACHES TO PREVENTION

TACKLING THE GLOBAL BURDEN OF CARDIOVASCULAR DISEASE

Report of the WISH Cardiovascular Disease Forum 2016

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FOREWORD

Policymakers and healthcare professionals in many countries have driven a substantial reduction in death rates from cardiovascular disease (CVD) over the last several decades. However, this accomplishment must not turn into complacency about the work left to do in this field. Despite being well versed in the high health and economic burdens of CVD and consequential unnecessary loss of life, policymakers rarely make CVD prevention a major focus of their attention. For a set of preventable conditions that kill more people than any other, CVD prevention is not given as much recognition by governments, civil society and the public press as diseases that are perceived as more life-threatening or which pose a greater risk to population health, such as cancer or infectious diseases like Ebola.

We convened this Forum to push ourselves and our colleagues beyond the typical approaches to tackle CVD, and to answer the question: how can innovation help policymakers prevent early deaths from heart attacks and strokes?

Nearly every single population shares the burden of this disease, across all nations and economies. This shared challenge means there are many innovators around the world focused on trialing and testing new solutions to the problem. The all-pervasive influence of digital technologies means the findings can be shared very quickly.

In this report, we speak to policymakers who want to organize their health systems to confront this most formidable of threats and invest their resources in innovative approaches that will make a difference in addressing CVD prevention. We encourage them to be bold in their aspirations and deliberate in their implementation, making use of a suite of tools that have been tested in the field and studied in the literature. We have aligned the recommendations in this report with the World Health Organization (WHO) and World Heart Federation's (WHF) ambitions to reduce the mortality from CVD by 25 percent by 2025.

It has been a privilege to work with esteemed colleagues to develop the report and we gratefully acknowledge their helpful and diverse perspectives. Our hope is that this report contributes to a shift in thinking that looks favorably on the contributions of several different kinds of innovation to perhaps the most significant public health threat in the world today.



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EXECUTIVE SUMMARY

Cardiovascular disease causes 17.5 million deaths each year. Most of these deaths are from heart attacks and strokes, and many are premature. Although outstanding progress has been made in CVD awareness, prevention and treatment, three out of every 10 deaths this year will still be result of CVD.

The role health systems can play in reducing the impact of CVD through prevention by improving tobacco control, hypertension management and secondary prevention has been well established. However, progress in delivering the promised gains has been overwhelmed by demographic changes and progress has plateaued. For example, the basic elements of tobacco control have been widely implemented, but the number of smokers worldwide still grows each year. And although age-specific mortality rates* have declined, the number of deaths from CVD continues to rise, most quickly in the developing world. At the same time, political will to overcome the challenges is often insufficient and lacks a sense of urgency.

Meaningful improvement can still be made, and pioneers around the world are demonstrating this through innovative approaches. To extend prevention to remote places, underserved segments of society and future generations, there are at least five levers that systems can use. These are: regulatory innovation; workforce innovation; digital patient-centered technologies; public health intelligence; and behavioral economics. They are complementary and often not expensive. Aggressive anti-smoking regulations can raise revenue, and the application of behavioral economic theory has the potential to make these programs vastly more effective using the same resources. Community health workers can go where the need is greatest, delivering digital interventions to hot spots identified in accessible datasets.

Policymakers can use these new tools alongside their established policies and programs to redouble their commitment to improving CVD mortality. To meet the WHF goal of reducing CVD mortality globally by 25 percent by 2025, health systems would have to reduce prevalence of hypertension by 25 percent, reduce daily tobacco use by 30 percent, and provide secondary prevention to more than 50 percent of the eligible population. Although no country has yet achieved this ambitious goal, case studies of programs in Brazil, South Africa, India, the United Kingdom (UK) and Bhutan all provide evidence of how innovative approaches are delivering results.

Implementing new policy is difficult and there are few opportunities to do so. Each policymaker must consider the unique tradeoffs among impact, cost and feasibility in the local context. However, the innovative approaches that are described in this report are broadly applicable in a wide range of health systems. Taken together, they represent a comprehensive, next-generation response to CVD.

* A mortality rate which is specific to a particular age group: the numerator is the number of deaths in that age group and the denominator is the number of people within that age group in the population.

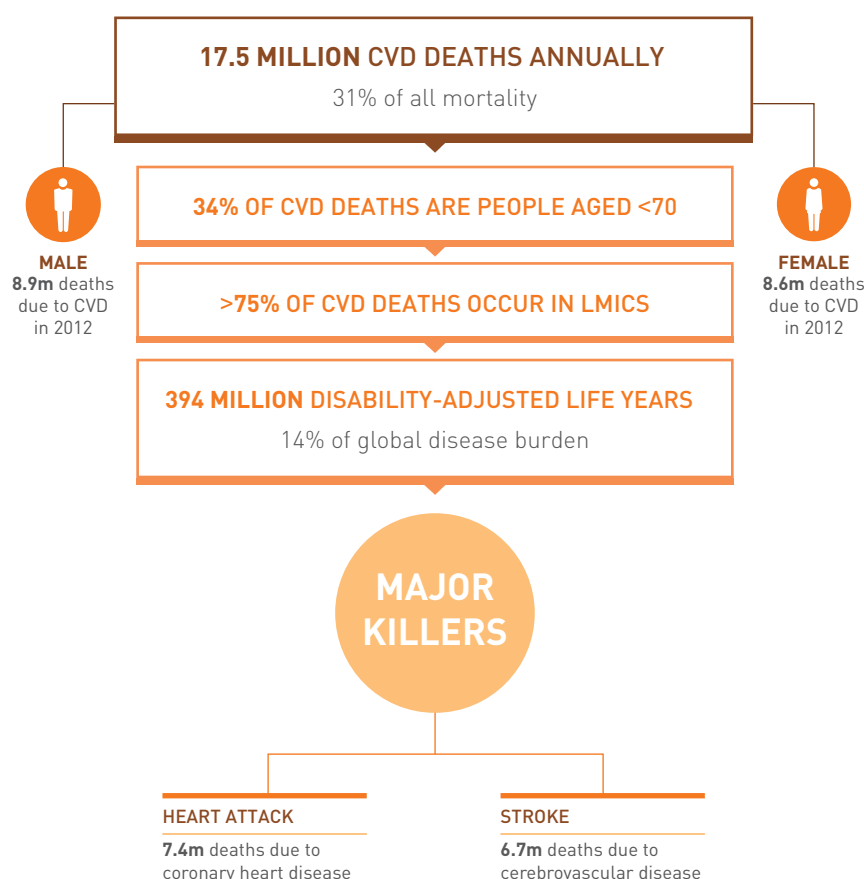
Cardiovascular disease is a global epidemic. It is the leading cause of mortality and morbidity worldwide, affecting all regions regardless of income. Low- and middle-income countries make the largest contribution to the burden of CVD, particularly in terms of deaths in people aged 30 to 70 years, and those figures are still rising. However, CVD deaths and disability are not inevitable and up to a quarter could be avoided with more effective strategies for primary and secondary prevention. The 'what' is well-known, with a range of well-established, evidence-based and effective interventions. But knowing what to do has not proved enough to ensure effective implementation at scale. The 'how' still eludes us in some areas, and for some populations.

This report focuses on the role of innovative delivery models to extend the reach, accelerate the uptake and increase the impact of the most effective interventions. It provides clarity for policymakers on which areas to prioritize to achieve the most substantial reduction in CVD burden over the next 10 to 15 years, namely: hypertension diagnosis and management, tobacco control and effective secondary prevention. It highlights the evidence-based interventions that have been shown to work, and advocates their broader use. It offers innovative approaches to accelerate the implementation of these interventions and offers suggestions on how to deploy limited resources most effectively through regulatory and workforce innovation; patient-centered digital tools; public health intelligence; and behavioral insights. Finally, it proposes a strategic framework to guide the sequencing of policy at the national level to create maximum impact.

SECTION 1: INTRODUCTION TO THE CHALLENGE – THE BURDEN OF CARDIOVASCULAR DISEASE

CVD is a global epidemic. It is the leading cause of mortality and morbidity globally, and it affects all regions of the world, regardless of income (see Figure 1).

Figure 1: Cardiovascular disease – call for global action

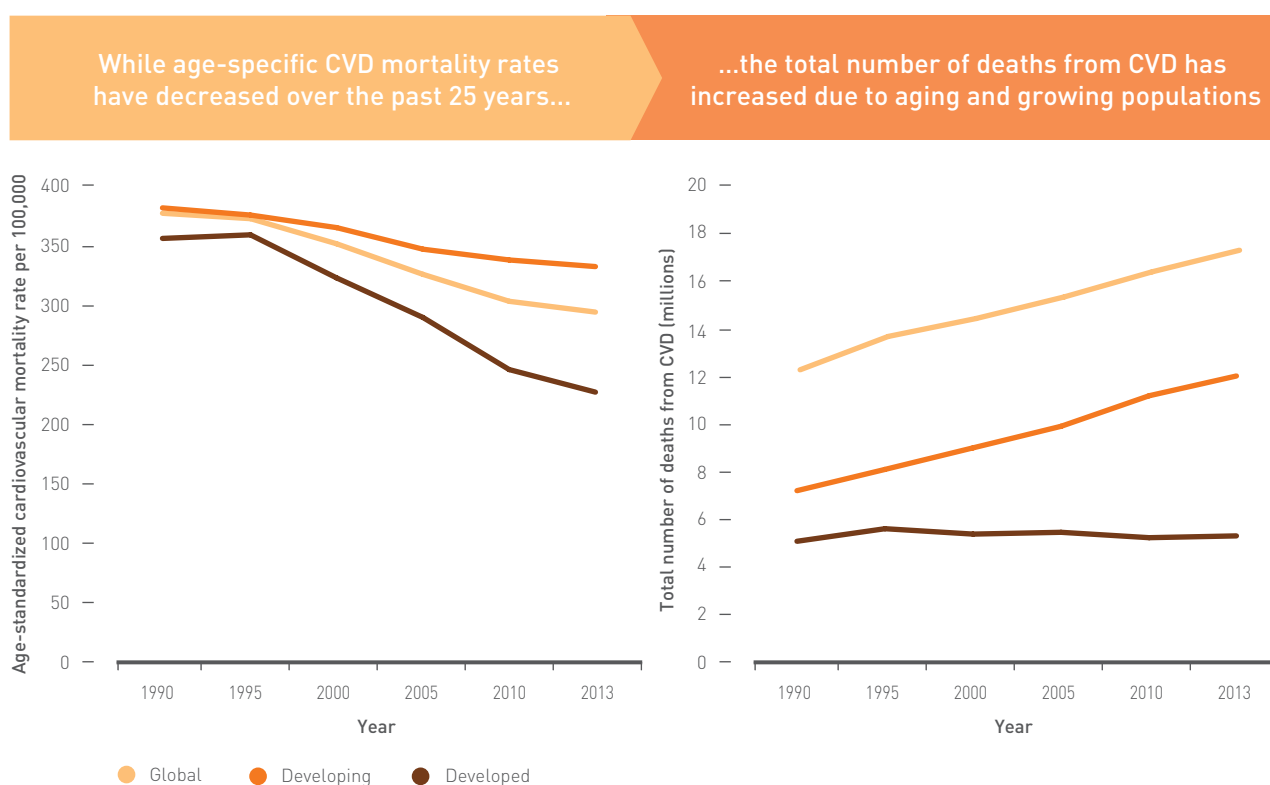


Sources: WHO (2015), WHO (2012)^{1,2}

Despite significant progress on many fronts – including measures to limit tobacco use, advances in medical treatment options and improvements in management of acute ischemic* events – deaths as a result of CVD mortality have risen 40 percent globally in the past 25 years.³ While age-specific mortality has been reduced, driven by treatment advancements and the progress made in some geographies to decrease underlying age-specific incidence rates, this has been offset by population growth and increases in life expectancy. The increase in the number of deaths occurring as a result of CVD and the concurrent reduction in age-specific mortality, along with the combined effects of these different factors, are set out in Figure 2.

* Ischemia is a reduction of blood supply to tissues, causing a shortage of oxygen and potentially damaging the tissue.

Figure 2: Deaths from CVD – age-specific mortality



Source: Global Burden of Disease Study (2013)⁴

The substantial fall in age-specific death rates is a laudable achievement (as seen in Figure 3). This shows that evidence-based, rigorously implemented interventions can save lives.⁵ Despite their known effectiveness, not all of these 'foundational' elements are commonly in place. Both across and within countries, there remain opportunities for these proven tools to be used better and more fully. Policymakers should be guided by the evidence of what works well. The WHF roadmaps provide a model and a suite of practical tools to support health system leaders to develop local plans based on the best evidence in a range of income settings.⁶ This report focuses on innovative healthcare that can increase the success of CVD treatment.

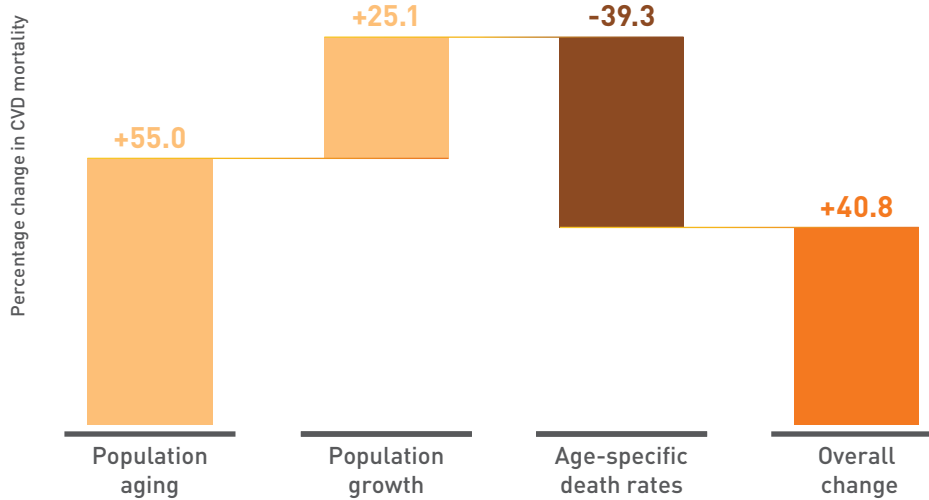
As policymakers consider how to adopt new approaches, they should also ask whether they have minimized variation between disadvantaged groups and the better-off with respect to foundational interventions such as:

- taxation on tobacco products;
- smoking bans in public places;
- bans on tobacco advertising;
- access to essential antihypertensive medication; and
- comprehensive secondary prevention.

Figure 3: Demographic changes and increase in CVD mortality



Estimated change in cardiovascular mortality due to population aging, population growth and life expectancy, 1990–2013



Source: JAMA (2015)⁷

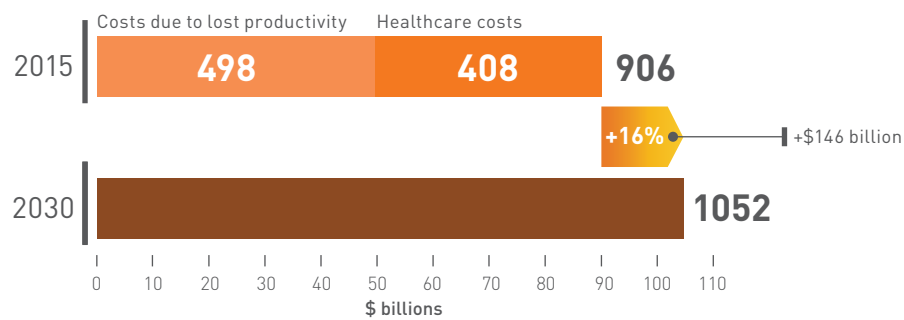
For example, even within countries that have achieved relatively dramatic reductions in overall smoking rates, a proportion of the population remain stubbornly hard to reach. As these persistent smokers often belong to the most deprived sectors of society, a broadly effective tobacco control strategy may have the unintended consequence of exacerbating health inequalities.⁸

Yet, at the same time, policymakers should aspire to make a step change in reducing the remaining disease burden across the entire population. It is evident from the sheer number of global deaths each year that this is an issue deserving of consistent attention and the very best and most innovative approaches to tackling what is not just a healthcare issue, but a humanitarian imperative.

See WISH 2016
Investing in
Health report

The economic consequences of CVD mean smart investments could reap considerable rewards (see also the **WISH 2016 Investing in Health report**). Not only are healthcare expenses and lost productivity themselves troubling, but non-communicable diseases (NCDs) exacerbate inequality – costing poorer households a far greater proportion of their income than wealthier households – and are a significant trigger for families to suffer catastrophic loss of income.⁹ The World Economic Forum, working with the Harvard School of Public Health, estimates that global annual costs will top \$1 trillion by 2030 (see Figure 4). NCDs such as CVD accelerate poverty – and reducing the burden of NCDs will support economic development in addition to human health.

Figure 4: Global costs of cardiovascular disease



NCDs, including CVD, **accelerate poverty** – and conversely, **reducing** the burden of NCDs supports development

Sources: World Economic Forum (2011),¹⁰ Horton et al. (2015)¹¹

Reducing mortality from CVD has been consistently highlighted by international organizations as an issue that national governments should prioritize. The urgency of this issue has been underscored by the United Nations (UN) General Assembly Special Session on non-communicable diseases in 2011,¹² the WHO NCD Global Monitoring Framework of 2013,¹³ and the UN’s Sustainable Development Goals (SDGs) of 2015.¹⁴

Despite the scale of the problem and its recognition from leading international organizations, CVD is not always as high on national political agendas as it could be.¹⁵ There are many reasons for this:

- Reduction in NCD prevalence and mortality requires co-operation between government departments such as health, finance, food and agriculture, transport, education and welfare, but such co-operation is often absent.
- An effective response requires co-ordinated action across sectors of society that often work at cross-purposes, including governments, industry (multinational corporations in pharmaceuticals, food and beverage, and many other sectors), the health system, the general public and academia.¹⁶
- There is a lack of urgency. Because this epidemic develops slowly and seemingly inevitably, it does not create the panic-driven response of a flu pandemic or other infectious outbreak (in comparison to recent responses to Zika and Ebola, as well as earlier reactions to the emergence of multidrug resistant tuberculosis or HIV/AIDS). As identified in the **WISH 2016 Behavioral Insights report**, health professionals and politicians tend to focus on immediate problems, while prevention policies can seem distant and abstract.¹⁷
- Responsibility for CVD is fragmented – across public health, environmental health, medicine and regulators – leading to a lack of clear ownership, inertia, silos and, in some cases, a focus of investment on ‘downstream’ treatment, rather than ‘upstream’ prevention.
- Policymakers face opposition from powerful lobby groups, including the tobacco industry.

See WISH 2016 Behavioral Insights report

SECTION 2: THE FIRST STEPS TOWARD A SCALED SOLUTION TO CVD

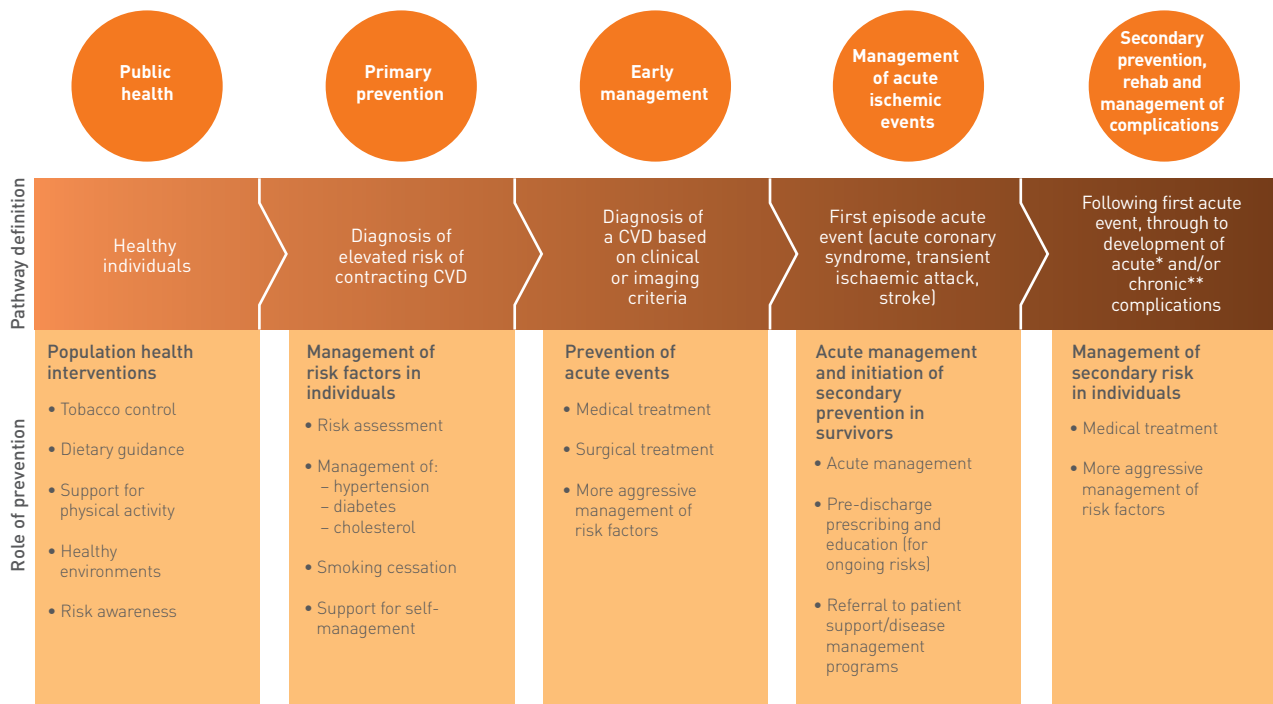
Coronary heart disease (CHD) and stroke account for around 80 percent of all CVD deaths.¹⁸ These conditions are both predominantly atherosclerotic CVDs.¹⁹ It is estimated that 50 to 80 percent of CVD is caused by modifiable risk factors.^{20, 21} These behavioral and biological risks are well understood and apply to all populations. They can be briefly summarized as tobacco use; unhealthy diet and obesity; physical inactivity; and harmful use of alcohol.*

While it is true that evidence-based therapies for heart attack and stroke save lives, improving and expanding access to treatment will still leave too many lives at risk. At the population level, prevention interventions yield large benefits for relatively limited investment, demonstrating cost-effectiveness. Yet these interventions receive less attention and investment, for the reasons we have described above. This report therefore focuses mainly on the roles of primary and secondary prevention,** without which countries cannot effectively address the morbidity and mortality burden at the population-wide scale. Fortunately, the atherosclerotic CVD pathway includes opportunities for prevention at every step (see Figure 5).

* The behavioral and biological risk factors, such as tobacco use, unhealthy diet, physical inactivity and harmful use of alcohol create pathways for biological factors like high blood pressure, overweight/obesity, high blood glucose, raised blood lipids and increased thrombogenicity of blood to result in heart attacks and strokes.

** Primary prevention refers to strategies to protect individuals and populations from acquiring a disease. Secondary prevention refers to strategies to prevent or delay disease progression in individuals who have already acquired the disease.

Figure 5: The atherosclerotic cardiovascular disease pathway



Many countries and regions have successfully reduced age-specific incidence and mortality rates for coronary heart disease and stroke over the past 25 years.²² These countries have used a number of strategies that include the full range of policy interventions (fiscal, legal and regulatory) that relate to the availability and affordability of harmful products; risk awareness; support for healthier lifestyles; and improvements to treatment. However, the impact varied according to the range of interventions used; resources allocated; how ready the health system was to undertake an expanded mandate; and political appetite for multi-sectoral policy interventions.

Health systems that undertake prevention initiatives must craft locally appropriate answers to questions of affordability and sustainability (including considering how to embed behavioral and lifestyle changes), and make difficult trade-offs against other potential investments.

WHO and WHF assessed the relative potential contribution of different prevention CVD measures and identified the three priority areas that they think have the greatest potential for impact over the next decade that will together capture around 80 percent of the current morbidity and mortality burden.^{23,24} They are:

1. Hypertension (high blood pressure) diagnosis and treatment
2. Tobacco control
3. Secondary prevention***

* For example, cardiac arrest or ventricular fibrillation in CHD, and subsequent strokes/TIAs/seizures in patients with stroke.

** For example, heart failure, arrhythmia or aneurysm of the heart in CHD, and loss of function following stroke.

*** Secondary prevention refers to treatment (usually medications and counselling) to reduce and/or delay the risk of disease progression and onset of complications in people with established disease.

According to WHO and WHF, the risk of premature mortality due to CVD mortality could be reduced by 25 percent by 2025 globally if the three key targets are met (see Figure 6). Before considering how innovative approaches can be applied to these familiar challenges, it is worth reiterating the important role of tobacco control, hypertension management and secondary prevention in preventing CVD, and why each presents a credible opportunity to improve the health of local populations.

Figure 6: Reducing global CVD mortality by 25 percent by 2025



Source: World Heart Federation²⁵

Hypertension

Hypertension (high blood pressure) affects 1 billion people worldwide, increasing their risk of heart attack and stroke.²⁶ Hypertension rarely causes any symptoms in its early stages, meaning that many people are unaware that they are affected and remain undiagnosed and untreated. Hypertension is both preventable – through diet, exercise and smoking cessation – and treatable with cost-effective medications (most of which have no patent restrictions).

Hypertension disproportionately affects populations in low- and middle-income countries where health systems are weak and evolving.²⁷ The challenge for health system leaders is to support people with hypertension to be properly diagnosed and to achieve blood pressure target levels. They can do this by creating sufficient health-care provision; training the required health workforce; ensuring a reliable supply of high-quality medicines; integrating the hypertension effort with strategies for other primary care conditions and services; and empowering citizens to make changes in their own health behavior and lifestyles.

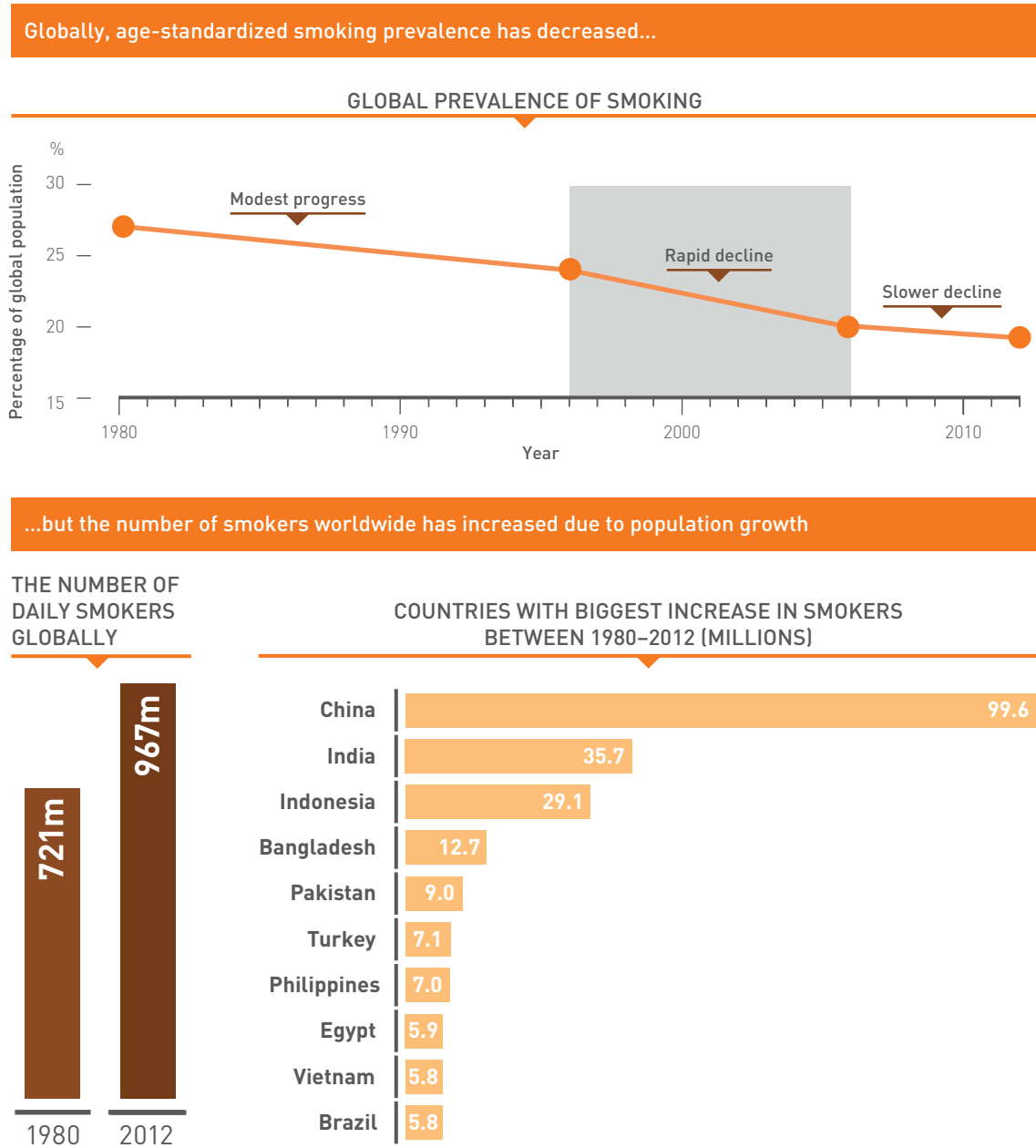
Tobacco control

Tobacco use and exposure to secondhand smoke are major causes of CVD, contributing to approximately 10 percent of all CVD deaths worldwide. Globally, tobacco kills at least six million people every year, and all of these deaths are potentially

* People who have survived an acute ischaemic event – primarily, heart attack and stroke – provided with approved medication and education.

avoidable.²⁸ Moreover, although smoking rates globally are decreasing, the number of smokers in the world is still increasing (see Figure 7).

Figure 7: Tobacco use rising despite smoking rates falling



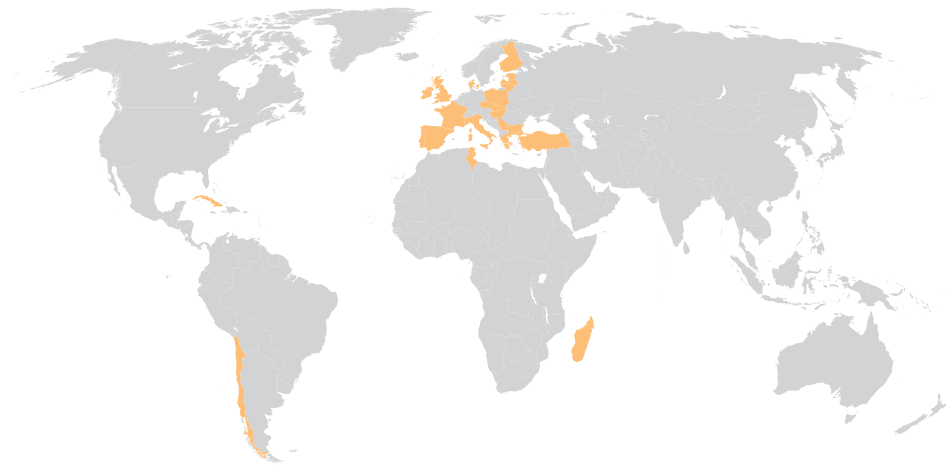
Sources: Institute for Health Metrics and Evaluation,²⁹ Ng et al. (2014)³⁰

Effective tobacco control measures can significantly reduce the burden of stroke and coronary heart disease.³¹ These policies also bring many other benefits, including reductions in mortality and morbidity due to tobacco-related cancers and respiratory diseases. Furthermore, they will benefit future generations who will grow up in an environment where tobacco use is not the norm.

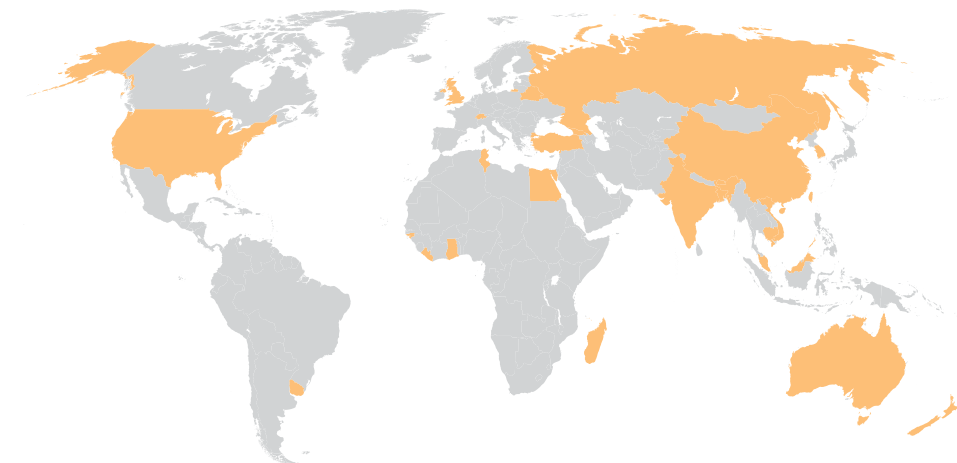
Eighty percent of countries have ratified the WHO Framework Convention on Tobacco Control (WHO FCTC) and adopted new, or strengthened existing, tobacco control legislation.³² However, take-up is highly variable in terms of the nature and extent of tobacco control measures introduced (see Figure 8). Furthermore, many of the strategies with the greatest potential impact – such as taxation on tobacco products and smoking bans in public places – are not yet employed effectively in many low- and middle-income countries. And, despite many countries' success in decreasing smoking rates by 25 to 30 percent over the past decade,³³ rates of tobacco use are growing or stable in much of the world, particularly around Africa and the Middle East.³⁴

Figure 8: Countries with most advanced tobacco control measures (2012)

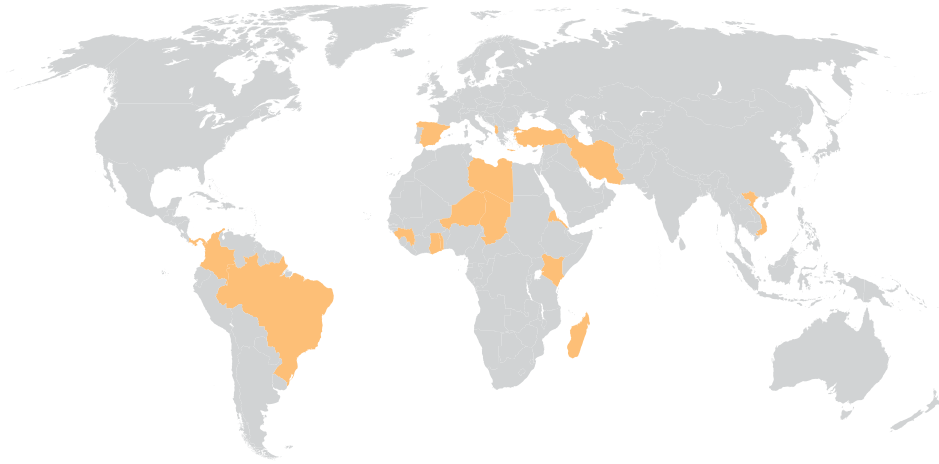
TOBACCO TAX RAISED



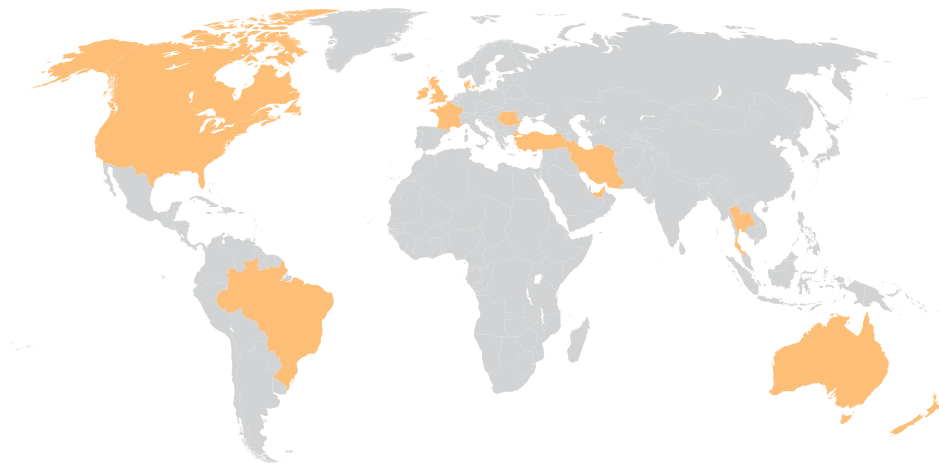
ANTI-TOBACCO MASS MEDIA CAMPAIGNS



BANS ENFORCED ON TOBACCO ADVERTISING, PROMOTION AND SPONSORSHIP



TOBACCO DEPENDENCE TREATMENT



Source: Adapted from WHO³⁵

While there is clearly more to do to implement tobacco control measures in almost every country, there are a number of success stories that are worthy of replication. Uruguay was the first country in Latin America to outlaw smoking in enclosed public spaces in 2006, and the first country in the world to prohibit manufacturers from selling multiple sub-brands of cigarettes in 2010. According to WHO, in the last decade Turkey has become a “model of political commitment and willingness to avert the tobacco epidemic”.³⁶ It has introduced some of the most stringent tobacco control legislation in the world, with changes to taxation, regulation of advertising and bans in public spaces, as well as extensive public information and support for cessation. Ten years ago, smoking rates in Turkey were among the highest in the world, with the majority of men smoking regularly – today they have fallen by 15 percent.³⁷

Even as control of conventional tobacco products calls for urgent action, new controversies engage the attention of policymakers – such as e-cigarettes. While a section of the tobacco control community believes this is a potentially useful ‘harm reduction’ product, another warns against the vascular damage, tumor promotion and strong addiction harms that are associated with nicotine.^{38,39}

Secondary prevention

Effective secondary prevention strategies are critical for patients with established atherosclerotic CVD. Fundamental elements of secondary prevention include: smoking cessation; hypertension management; diet; lipid management; physical activity; weight management; diabetes management; and medication. Better management of just one of these elements can have a significant impact. For example, controlled low-density lipoprotein (LDL) cholesterol in patients with coronary artery disease and high cholesterol can reduce the risk of acute myocardial infarction (AMI) by 40 percent.⁴⁰ Healthy diets, such as the Mediterranean diet, have also been shown to be very effective in primary and secondary prevention of CVD.⁴¹ Revascularization, in the form of angioplasty or other surgery (for example, coronary artery bypass graft), may also form part of a comprehensive secondary prevention strategy, further reducing mortality risk and also relieving symptoms for some patients.

The challenges to overcome in the delivery of secondary prevention are broadly similar to those found in treating hypertension with some key differences. In particular, people eligible for secondary prevention are easy to identify, as survivors of acute coronary syndrome or stroke will be in contact with health services as part of the management of the acute episode. The main difficulties thus involve:

- access to medicines;
- sustained adherence to medical treatment and lifestyle changes;
- ongoing performance monitoring and accountability; and
- support for appropriate medication prescribing through the development and dissemination of standardized clinical guidelines.

Helping policymakers to improve CVD prevention

In many health systems – particularly those affected by resource constraints – the three priority areas (hypertension, tobacco control and secondary prevention) can best be addressed in ways that are affordable, scalable and sustainable (and we believe these elements are interrelated) by focusing on the following actions and opportunities:

- Regulatory innovation – particularly in the case of tobacco control and access to quality-assured drugs.
- Workforce innovation – particularly support for the development and deployment of community health workers (CHWs) and the broad non-physician workforce.
- Digital health – particularly support for mobile/digital tools in risk factor and disease management that incorporate lessons from behavioral economics in the design of interventions to drive, support and sustain lifestyle change in individuals and groups.
- Public health intelligence – gathering better population-level data to support prevention efforts and opening up outcomes data to promote continuous improvement.
- Expanding health coverage – addressed in detail in the **WISH 2015 Delivering Universal Health Coverage report**.⁴²

See WISH 2015
Delivering
Universal Health
Coverage report

The report supports policymakers in five ways:

1. Highlighting areas to focus on with the highest potential for impact.
2. Sharing examples of evidence-based, high-impact, scalable programs from around the world.
3. Identifying and showcasing promising innovative approaches that have yet to have evidence of impact at scale. In many cases, we have selected examples that have been delivered in resource-constrained settings.
4. Identifying the factors that drive successful implementation and the challenges that need to be overcome.
5. Helping to think through the right sequencing of interventions, given the particular situation in each country.

SECTION 3: THE RESPONSE – USING THE MOST INNOVATIVE APPROACHES

In this section, we expand on and provide examples of the five areas of innovation that are best positioned to help policymakers reduce the burden of atherosclerotic CVD.

1. Regulatory innovation
2. Workforce innovation
3. Digital, patient-centered technologies
4. Public health intelligence
5. Behavioral economics

Regulatory innovation

Governments and policymakers can most directly change the trajectory of mortality from CVD through regulatory policy. This has already had a considerable impact on prevention, particularly in tobacco control. WHO's MPOWER package* for tobacco control has provided countries with an evidence-based menu of policy options. Enacting and implementing regulations that reduce the availability and affordability of tobacco products has also been significantly helped by public education efforts that have increased public acceptance of, and support for, these measures.

Some policymakers are increasingly experimenting with new and bolder approaches such as:

- Setting specific, very low smoking prevalence goals. For example, in New Zealand, the Smokefree 2025 declaration in 2011 set the goal of 5 percent smoking prevalence by 2025 and provided NZ\$5 million funding per year to spur innovation toward that purpose.⁴³
- Raising the minimum age to purchase tobacco to 21. This has been done in Honduras; Kuwait; Sri Lanka; Palau; Samoa; Uganda; and implemented in the United States (US), in California, Hawaii and 145 municipalities in 11 states, including New York City and Chicago.^{44,45}
- Proposing legislation for 'tobacco free generations' for whom tobacco use will never be legal. For example, this has been developed in Tasmania, Australia.⁴⁶

* MPOWER stands for:

- Monitor tobacco use and prevention policies
- Protect people from tobacco smoke
- Offer help to quit tobacco use
- Warn about the dangers of tobacco
- Enforce bans on tobacco advertising, promotion and sponsorship
- Raise taxes on tobacco

The scope for regulatory innovation is not limited to tobacco control. There are also major opportunities for improving reliable access to high-quality, affordable medicines for both hypertension control and secondary prevention. In this area, there is a lot to learn from the Stop TB Partnership Global Drug Facility. Over the past decade, it has driven innovation in tuberculosis drug formulation to improve adherence and simplify stock keeping, lowered prices for quality-assured drugs and ensured a stable and reliable supply, even during emergencies.

A similar approach to CVD could help solve one of the most important barriers to successful hypertension management and secondary prevention. Priorities for such a program would include:

- channeling donor funding into a single, unified strategic program and consolidating demand to support bulk procurement and drive down prices;
- standardizing and simplifying drug availability – specifically through fixed-dose combinations for first-line therapy and patient kits – to streamline the market, make health workers’ tasks easier, and support adherence; and
- standardizing quality assurance requirements in all procurement contracts.

Workforce innovation

In many countries, the population that would benefit from primary and secondary prevention interventions is large and widely dispersed, while skilled healthcare workers are few in number and concentrated in major cities. Innovating the healthcare workforce, for example, by expanding the role of nurses and CHWs by providing appropriate levels of training at scale, can allow health systems to reach target populations cost-effectively.⁴⁷

Case study 1: Family Health Program (FHP) Brazil

The FHP,⁴⁸ called the Saúde da Família program in Brazil, is the world's largest community-based primary care initiative. The FHP is present in 95 percent of local municipalities and currently provides primary care to more than 50 percent of Brazil's population.⁴⁹ Areas with the lowest pre-existing healthcare access and infrastructure receive priority FHP investment.

Approach

FHP activities include health promotion, primary prevention and management of CVD risk factors, as well as risk management for high-risk individuals (monitoring of hypertension and diabetes) and rehabilitation of patients with CVD. These services are delivered by primary care teams composed of a doctor, a nurse, an auxiliary nurse and at least four CHWs. The bulk of time spent on service provision falls to the CHWs in the form of domiciliary visits and community interventions (see Figure 9). In the FHP model, CHWs ensure consistent and equitable provision of services by visiting every household in their catchment area of approximately 750 households, every month.

Impact

In the 20 years since implementation, the FHP has contributed to significant reductions in hospital admissions for ambulatory care-sensitive conditions, improvements in screening take-up and reductions in measures of health inequalities. In short, the gap in health outcomes between rich and poor has narrowed.

In the past decade, age-standardized mortality for CHD and stroke has decreased by 20 percent in Brazil. FHP coverage is negatively associated with mortality rates from CVD in both unadjusted and adjusted models for demographic, social and economic confounders. Moreover, FHP coverage has increased the number of health education activities, domiciliary visits and medical consultations, as well as reduced hospitalization rates for stroke and heart disease.⁵⁰

Key lessons

The FHP is an extremely cost-effective model. Brazil currently spends approximately US\$ 50 per person per year on the program,⁵¹ and enjoys high levels of user satisfaction.⁵²

However, the scaling-up of FHP has required continuous adaptation and investment to address differences in population health needs in different communities and geographies; gaps in municipal capacity and healthcare resources; and evolving medical practice. These challenges are likely to apply in other regions and countries implementing a program of this type.⁵³ Furthermore, the introduction of CHWs into an established health and social care space, in more developed settings, requires careful consideration of task-sharing and task-shifting to ensure engagement and acceptability, and to create a system that adds value rather than complexity.

Figure 9: Family Health Program (FHP) Brazil

	Area	Specific activities
Primary care	Chronic disease management	<ul style="list-style-type: none"> • Support adherence to medications for diabetes and hypertension. • Early identification of symptoms and signs of chronic disease and referral into the family health unit. • Design, organize and deliver group education meetings for individuals with chronic diseases such as diabetes and hypertension.
	Triage	<ul style="list-style-type: none"> • Low level referral support to ensure appropriate use of primary care services. • Early identification of clinical problems and referral into the family health unit. • Support with appointment booking, call and recall.
	Clinical care	<ul style="list-style-type: none"> • Use of Integrated Management of Childhood Illness (IMCI) decision support tool to identify children at risk of serious illness.
	Social determinants	<ul style="list-style-type: none"> • Identification of household determinants of ill health and health seeking behavior.
	Vertical disease programs	<ul style="list-style-type: none"> • Tuberculosis Directly Observed Treatment Short-course (DOTS) service support providing daily home visits.
	Healthy pregnancy/child development	<ul style="list-style-type: none"> • Ensure early booking and healthy lifestyle during pregnancy. • Antenatal consultation support. • Design, organize and deliver low-risk pregnancy health education groups. • Monthly or bimonthly weight measurement in all children less than 2 years of age.
Public health	Screening	<ul style="list-style-type: none"> • Improve uptake of cervical and breast screening through identification of target groups and signposting.
	Immunizations	<ul style="list-style-type: none"> • Identification of children with incomplete vaccine schedules and referral into the GP practice.
	Breastfeeding support	<ul style="list-style-type: none"> • Peer support for breastfeeding providing one-to-one advice in the household. • Design, organize and deliver group education meetings for breastfeeding mothers.
	Health promotion	<ul style="list-style-type: none"> • Delivery directly into the household of healthy lifestyle messages such as stop smoking, hand hygiene, weight loss, healthy diet and physical exercise with referral and signposting where appropriate.
	Health protection	<ul style="list-style-type: none"> • Contact tracing for common infectious diseases such as typhoid fever. • Household risk assessment and advice for vector-borne diseases such as dengue fever.
	Household data collection	<ul style="list-style-type: none"> • Monthly collection and update of basic household data on occupancy, socio-demographic data, education level, occupation, deprivation and predominant health issues including smoking and alcohol use of every member in each household.
Community	Health education groups	<ul style="list-style-type: none"> • Includes, but not limited to, breastfeeding support, diabetes, hypertension, low-risk pregnancy and immunizations health education groups.
	Planning and performance	<ul style="list-style-type: none"> • Engage with the community to ensure health services are satisfactory and appropriate in their design and delivery.
	Community liaison	<ul style="list-style-type: none"> • Act as a liaison between the health service and community leaders. • Act as a community leader.

Source: Johnson et al. (2013)⁵⁴

Case study 2: PACK program South Africa

The Knowledge Translation Unit at the University of Cape Town Lung Institute in South Africa has been developing the Practical Approach to Care Kit (PACK) program over the past 15 years.^{55,56} It aims to support and empower nurses operating at the front line where resources – in particular a medical workforce and advanced health facilities – are scarce.

PACK was initially developed to improve access to diagnosis and treatment for people with tuberculosis, and later HIV/AIDS.⁵⁷

Since these early initiatives, PACK has been refined and expanded to cover a wide range of the most common chronic conditions, which includes CVD. This is largely in response to evidence of very high rates of multimorbidity and high levels of unmet need as the result of low levels of hypertension control.⁵⁸

In 2017, an adapted version of PACK will be rolled out to CHWs in South Africa that will support further expansion of the frontline healthcare workforce.

Approach

The PACK program consists of a series of interrelated components:

- Evidence-based treatment algorithms, decision aids, and check lists (see Figure 10).

Figure 10: PACK program South Africa



Source: Eastman et al. (2016)⁵⁹

- A case-based interactive training program, delivered to groups and teams in the field and designed according to principles of adult learning.
- A cascade-based train-the-trainer approach – usually delivered in 8 to 12 sessions.
- A set of health system improvement tools to identify opportunities relating to: tasking-shifting and task-sharing in specific referral pathways; prescribing responsibilities; training and certification; and expanding the permitted scope for prescribing practice for non-medical prescribers.

- Monitoring and evaluation, including feedback from trainers, audits, quality improvement programs and clinical trials.

Decision support tools are revised annually to incorporate additions to the evidence base and changes in guidelines and policy, and refined and improved based on user feedback. The cascade-based training program is also continuously improved by incorporating frequent, brief return visits by clinician trainers.

Impact

Over the past 15 years, the impact of PACK has been evaluated in three randomized controlled trials, and many observational, qualitative and economic evaluations. The evidence shows:

- small and consistent improvements in prescribing, referral, screening and health outcomes for patients with communicable and non-communicable conditions. This suggests that PACK work in one area does not have a detrimental effect on care in other areas;
- shifts in healthcare usage to lower-intensity settings, including reductions in the length of hospital stays; and
- a dose-response effect of training, suggesting training is effective and more training is more effective.

Key lessons

PACK is also being adapted and implemented in Malawi, The Gambia, Brazil,* Mexico and Botswana.

Experience to date suggests that implementation of PACK in new countries requires an extensive period of consultation and engagement with local clinicians and other stakeholders, which often takes around six months.

Furthermore, translating the PACK model to NCDs is made more difficult – relative to communicable diseases – for several reasons: patients' visits to health facilities are less frequent, so there are fewer occasions to reinforce the health education messages; treatment literacy is poor, so a patient may, for example, believe that once their blood pressure has reached an acceptable level, they can stop treatment; and care, in some cases, has become negatively 'ritualized' – meaning that patients and health workers go through the 'ritual' of measuring blood pressure, but do not consistently record, or act effectively on, the results. In addition, effective CVD management does not provide immediate benefits, so positive reinforcement for patients and health workers is limited and intangible. Consequently, policymakers should anticipate similar interventions to have a longer 'embedding' period, as compared to similar programs for infectious diseases.

* PACK is currently being evaluated in Brazil.

Case study 3: SPREAD program India

In 2015, India trialed a program called Secondary Prevention of Coronary Events after Discharge (SPREAD), a CHW-delivered intervention, at 14 hospitals across nine states.⁶⁰ The program supports patients and their primary caregivers in achieving medication adherence and lifestyle changes in the year following an acute cardiovascular event.

Approach

Each patient in the program is assigned a dedicated CHW, who conducts a discharge consultation with the patient and arranges six follow-up visits over the next 12 months.

In the discharge consultation, the CHW builds rapport with the patient and caregiver and collects basic patient information. Together, they identify potential barriers to adherence to both drug and lifestyle plans and develop strategies to overcome them. The CHW provides the patient with two tools (translated and adapted to the patient's local language and cultural setting) to support adherence and educate the patient in their use:

1. Visual Tool for Adherence (VITA) 12-month calendar, which acts as both a reminder and a record of drug intake, with checkboxes for up to six cardiovascular medicines.
2. A patient diary with education information, motivational messages and contact details for the patient's physician and CHW (see Figure 11).

Figure 11: SPREAD program India

HEART HEALTHY TIPS

TIME TO CALL MY DOCTOR/ CHW

- Chest pain
- Breathless
- Giddiness

MY HEART WILL LIKE IT IF I.....

- Eat **small meals** at frequent intervals
- Eat more of **green leafy vegetables** and **fruits**
- Eat foods made of **wheat, ragi & jowar**
- Eat **fish, lean chicken** meat
- **Exercise regularly** (Brisk walks or jogging)
- Do **yoga / relaxation techniques**
- Try to stay in a relaxed, cheerful, **happy state of mind**
- Completely stop **Smoking**
- Avoid a **sedentary life**
- Avoid **consumption of alcohol**
- Reduce or avoid **high fat foods** like fat rich curries, cakes etc
- **Reduce salt** consumption (Especially salt containing foods like papad/pickle)
- Try to completely **avoid red meat** like mutton/ beef in any cooked form & deep fried chicken
- Avoid **deep fried foodstuff** like potato chips
- Avoid **high sugar** containing cold drinks, fruit juices (specially if diabetic)

ABOUT MY MEDICATIONS

- Take my **medications on time** in the right dose
- Report any discomfort like head ache, acidity, indigestion, dry cough, giddiness etc to my doctor/ CHW

BUT WILL NOT STOP MEDICINES BY MYSELF

In case of Medical Emergency call:- Hosp. No. _____ Ambulance No. _____

Source: Images provided by Dr Denis Xavier, Professor and Head, Dept. of Pharmacology, St John's Medical College, Bangalore, India as additional materials to the article Xavier et al. (2016)⁶¹

The CHW arranges six follow-up visits, each for one hour. In months one, five, seven and 12, the consultations take place at the health facility outpatient clinic. In months three and nine, the consultation takes place in the patient's home. The patient is encouraged to contact the CHW between visits if they have concerns about their health or ability to observe medication or lifestyle changes.

During all meetings, the CHW monitors the use of the calendar and patient diary, asks the patient and caregiver about barriers to adherence, and helps them develop and adapt strategies to overcome the barriers. At each visit, the CHW assesses the patient's adherence to prescribed secondary prevention drugs as well as diet, exercise, tobacco and alcohol use.

CHWs have a high school level education, good communication and motivational skills, and three months' training. Each CHW supports approximately 40 patients.

Impact and key lessons

The intervention improved adherence to medicines and healthier lifestyles and led to an improvement in a number of clinical risk markers associated with disease progression and further acute cardiovascular events.

The results from the analytical phase of the 750-patient trial were as follows:

- Overall adherence (more than or equal to 80 percent) to prescribed, evidence-based drugs for cardiovascular secondary prevention was 97 percent for patients receiving the intervention, compared with 92 percent for patients receiving usual care ($p=0.006$).
- Adherence to smoking cessation was 85 percent, compared with 52 percent ($p=0.0001$).
- Participation in regular physical activity was 89 percent, compared with 60 percent ($p=0.0001$).
- Among patients receiving the intervention, 87 percent stopped drinking alcohol, compared with 46 percent ($p=0.01$).
- At 12 months, patients in the intervention group had lower mean systolic blood pressure ($p=0.002$) and weighed less, with lower body mass index ($p=0.0001$). The high rate of adherence to drugs in both groups resulted in lowered cholesterol levels.⁶²

The study suggests that while physician prescription practice was good in both groups, CHWs provided additional benefit for smoking cessation, physical activity and weight loss (which are areas usually neglected by physicians, who focus more on medicines).

Digital, patient-centered technologies

Digital technologies offer a scalable and cost-effective route to increase public awareness and change perceptions about CHD prevention.

The initial challenge lies in making individuals aware of the risks of tobacco, hypertension and subsequent cardiac conditions, such as heart attacks. The task is then to empower people to take control practically and psychologically by simple lifestyle choices and following prescribed medication.

Tobacco is highly addictive, and smoking has now reached high levels, even in low- and middle-income populations. Many smokers need support to help them reduce and stop tobacco use, and mobile phones provide a new and low-cost means to support them. High mobile phone use has the added benefit of helping to target the hard-to-reach communities that do not access traditional health services.

Case study 4: mTobaccoCessation

In general, programs intended to help people stop using tobacco are underestimated as a public health measure. This lack of prioritization has meant that health systems are frequently unable to reach tobacco users to give them the treatment and support they need, particularly in rural or marginalized populations.⁶³ Mobile technology is now closing this access gap. The joint WHO and International Telecommunication Union Be He@lthy, Be Mobile initiative is helping to introduce mobile-based cessation support and advice as part of national health services.

Approach

Users self-enroll by calling or texting a short code and answering questions that put them into the correct segment for their profile and tobacco usage. Over the course of six months, they receive a series of free, customized text messages on their phone, offering motivation and advice on how to stop using tobacco. The service is two-way, and users can send their own responses for help on specific areas such as how to cope with cravings. This real-time support increases the chances of the individual successfully quitting tobacco use permanently.⁶⁴ The aim is not for mobile services to replace traditional cessation support, but rather to expand service access.

Impact and key lessons

In January 2016, the Indian Government launched their mTobaccoCessation service across all 29 states. After seven days, there were more than 170,000 registrations for cessation support through the program. Within the first 60 days, this number rose to almost 800,000. The level of interest highlights both user demand and the acceptability of mobile as a health delivery channel. It also shows how mTobaccoCessation can expand access outside a primary care setting to give users access to support in their own homes. Using an existing technology platform owned by the Government (mSeva), the program has demonstrated cost-effectiveness and shown that it can successfully integrate into a broader national digital health agenda.

Clinical trials have indicated that mobile support could double or triple cessation rates in comparison to traditional approaches.⁶⁵ However, it remains to be seen whether this can be replicated at a larger scale. India is the largest case study, but other countries, such as Tunisia and Costa Rica, are also running mTobaccoCessation programs for between 2,000 and 10,000 users in their capital cities and targeted rural areas.

Case study 5: mHypertension UK

Hypertension affects more than one in four adults in England and it is the second-biggest risk factor for premature death and disability,⁶⁶ yet public attitudes are indifferent. High blood pressure is not typically perceived as a major health threat, and most people would not consider themselves at risk or understand the impact of their own behavior on blood pressure levels.

The local (public sector) health and social care commissioners in Cheshire and Merseyside are collaborating with Public Health England, WHO, the International Telecommunication Union and the health insurer BUPA to find ways to break the communication barrier around hypertension – by starting from the user’s perspective.

Approach

The program is focused on finding out what the concept of ‘health’ means to people. Then, armed with this information, the program uses key trigger points to motivate people to become aware of their blood pressure and to adopt positive behavior to keep it under control. The emphasis is on incremental change that can be physically felt and monitored by individuals. It makes the impact of positive behavior noticeable and creates a virtuous cycle of healthy decisions and actions.

Cheshire and Merseyside have used in-depth interviews with the local community to generate strategies to speak to people in the workplace, their homes and public places, such as supermarkets. The dialogue will talk about what blood pressure is and how controlling it will benefit important areas of people’s lives. The dialogue will be used to develop a suite of SMS messages and smartphone applications to keep people connected to their goals. mHypertension will show them in real time how their health decisions are affecting their blood pressure. The initiative works alongside the broader national ‘One You’ campaign, which is raising awareness of risk factors for all chronic diseases and contributes to an understanding of blood pressure as a proxy for health and wellbeing.

Impact

The approach heralds a new method for population behavior change: away from top-down health warnings and toward positive patient empowerment. Clinical trials show a statistically significant improvement in blood pressure control when SMS messages are used.⁶⁷ The UK program aims to engage the population one step earlier, using technology to help people to not only control their blood pressure, but also to want to.

The program is currently in the design phase. Early findings on impact and a full evaluation will be available in due course.*

* Another example for raising public awareness is the ‘Know Your Numbers’ annual one-week campaign led by UK Blood Pressure Association, that encourages adults across the UK to know their blood pressure numbers and take the necessary action to reach and maintain a healthy blood pressure.

Public health intelligence

Continuous improvement in healthcare requires effective performance management, monitoring and follow-up at the system and population levels. This function is weak or absent in many health systems. New systems can be challenging and costly to implement, particularly in regions with limited pre-existing health system infrastructure and co-ordination. However, some national health systems have made progress in this area and demonstrate effective models.

For example, the National Health Service (NHS) in England and Wales has implemented clinical guidelines for the acute management and secondary prevention of acute cardiovascular illness (AMI and stroke), monitored in national provider-level audits. Audit results are in the public domain to create information transparency, an evidence base for improvement efforts, and peer and public pressure to make improvements.⁶⁸

Another example is the Government of the Abu Dhabi Emirate's launch of the Weqaya program in 2008. This web-based health portal for patients captures patient-level information on take-up of screening; prevalence of risk factors; measurement of cardiovascular risk; and primary and secondary prevention strategies. All consenting adults are screened for CVD risk factors every three years and individuals at elevated risk are followed up. To date, 94 percent of adult Abu Dhabi citizens have been screened. An early indicator used to demonstrate the program's impact is diabetes control. To date, 42 percent of those passing through Weqaya had control of their diabetes,* compared with 24 percent in the control group.⁶⁹

* HbA1c less than 7.5 percent.

Case study 6: Hypertension and diabetes screening Bhutan

Bhutan is a mountainous country in South Asia that suffers from a high burden of NCDs. Hypertension has a prevalence of 26 percent in the population and is by far the largest health burden.⁷⁰

Approach

The continually rising rate of NCDs prompted the government to introduce a program based on WHO's *Package of Essential Noncommunicable (PEN) disease interventions* – a framework for strengthening primary care in low-resource settings. The pilot launched in 2009 in two of the country's 20 regions, and aimed to increase early diagnosis and management of hypertension and diabetes at the primary care level. WHO provided support for the first six months, and tailored the framework to fit local needs and Bhutan's health service delivery model. This included training of non-physician health workers and the provision of health education material and supplies.⁷¹

When patients arrive at a basic health unit (BHU), health workers screen them for both hypertension and diabetes. If the patient has high blood pressure or high glucose levels, staff have the authority to prescribe from a set list of blood pressure medication and other drugs to manage hypertension and reduce cardiovascular risk. All staff are trained on the detection and management of hypertension and diabetes, as well as when to refer patients to hospital if further treatment is needed.

Impact

Despite the challenges, the pilots showed significant impact. The use of medication among the people diagnosed with hypertension increased by 8.8 percent, and high blood pressure decreased by 50 percent. As a result, a national program was rolled out in 2014. While it is still too early to determine the impact at a national level, the number of people in Bhutan who seek medical consultation has increased significantly.

Key lessons

Several key lessons occurred during the pilot that included the need for:

- drug supply and management;
- patient record maintenance and follow-up activity;
- national guidelines on risk factors such as proper diet and physical activity; and
- consistent use of measurement equipment across staff and BHUs.⁷²

Community outreach and mobilization also played a key role in overcoming the challenges of difficult geographical terrain and the limited financial resources of the country.

Behavioral economics

Prevention of CVD through tobacco control, hypertension management and secondary prevention involves significant, sustained behavior change by at-risk individuals. Although well-designed programs and access to care are vitally important, human psychology remains central in making the effort to quit smoking, change diet, or adhere to medication. A central belief in behavioral science is that a person's actions do not flow simply or directly from their intentions. This is consistently demonstrated when people fail to start or sustain healthy behaviors they want to make habitual – this is commonly referred to as the 'intention-behavior gap'.⁷³

Secondary prevention in particular is challenging for patients (and health systems). It requires patients to adhere – often for the rest of their life – to a potentially complex medical treatment and to a series of behavioral and lifestyle changes to limit disease progression. In addition to access to medication, adherence requires understanding, education, motivation and support. Furthermore, a patient's ability to adhere to treatment and lifestyle changes may be influenced by the level of support from family members – and social environmental factors – that might or might not facilitate and reinforce the changes.

Behavioral studies have identified that people are more receptive to health-related messages and interventions at certain points in time, for a range of psychological and pragmatic reasons. For example, the Hamad Medical Corporation in Qatar identified that an opportunistic diabetes screening intervention was most likely to be successful during the holy month of Ramadan. This was because the target population was already fasting, which is a necessary pre-requisite for the diagnostic test they were using.⁷⁴ Similarly, Ramadan was found to be a particularly timely moment to ask Muslims to join a smoking cessation program in Singapore: over 18 times as many Malay Muslims joined the program during Ramadan alone (3,342) compared to all other months (2,010).⁷⁵ These examples emphasize the importance of considering the wider context of a patient's lifestyle and routine when implementing health-related changes.

It is also important to consider an individual's state of health and the timing of interventions targeted at CVD prevention. For example, patients who are recovering in hospital following an acute cardiac condition may be particularly receptive to interventions. This is not only because they are in a healthcare setting, but also because they are much more focused on their health than at most other times. Even situations that aren't directly related to cardiac health, such as when a patient requires surgery, can be a particularly effective time to implement an intervention. For example, research suggests that people are more likely to quit smoking in advance of surgery, and the impact of smoking cessation interventions are particularly noticeable at this time.

Social networks can also influence an individual's health. There is much evidence that behavior spreads through social networks in rapid and potentially unexpected ways. A US study analyzed decades of health behavior across social networks and found a decrease in tobacco use by a person's spouse of 67 percent when the partner quit smoking. Friends quitting increases the likelihood that another member in the

friendship group will give up smoking by 36 percent. For co-workers, the decrease in smoking is 34 percent, and for siblings it drops by 25 percent.⁷⁶ Studies looking into managing obesity have produced similar findings.⁷⁷ The results highlight the potential effectiveness of interventions targeted at the social networks of patients rather than addressing each patient on a one-to-one basis.

Behavioral economic theory can be used to understand an individual's behavior better and take more account of their choice architecture. When combined with effective interventions, behavioral insights strategies can maximize the impact of interventions while improving their cost-effectiveness. For example, policymakers and healthcare providers can select specific times to roll-out an intervention when it is known to be effective, instead of providing services all year round. Alternatively, they can make it easy for people to behave in the desired way at the start if they design services that take account of the individual's environment, rather than compelling them to overcome small barriers.⁷⁸

It is therefore important for policymakers to consider the wider factors that contribute to an individual's behavior when they design and implement schemes to prevent and reduce CVD. Further information on this topic can be found in the **WISH 2016 Behavioral Insights report**.

See WISH 2016
Behavioral
Insights report

SECTION 4: POLICY IMPLICATIONS

Policymakers have a range of policy levers at their disposal to use for hypertension management, tobacco control and secondary prevention. Some levers are fiscal and legal, and others are regulatory policies that limit population exposure to risk factors. For example:

- Taxation of tobacco products and sugary beverages.
- Legislation and regulation relating to the sale, advertising and promotion of tobacco products and their use, including smoking bans.
- Regulation to limit the salt and sugar content of prepared foods.
- Ensuring access (affordability, availability and quality) to medicines to reduce CVD risk as part of a program of universal health coverage.

Other policy levers create the conditions necessary to implement and scale-up innovative prevention activities. For the priority areas covered in this report, they include:

- Support for the development and deployment of CHWs to:
 - provide professional recognition for a CHW career and career path within the health system – including role specification, prerequisites and requirements;
 - launch training programs for CHWs; and
 - establish clinical standards for CHWs that set out their scope of practice, particularly in relation to other health professionals.
- Support for the use of digital tools in the management of risk factors and disease to:
 - determine a regulatory approval pathway for digital health tools to set and enforce minimum quality standards;
 - create regulations relating to patient data storage and sharing standards and requirements;
 - review incentives for providers who want to use digital tools to support the management of risk factors and disease. This will ensure there is no disincentive for clinicians to promote and support the use of cost-effective tools; and
 - consider engagement strategies for target populations that can lead to positive, sustainable behavior change.

- Support for outcomes data availability and transparency to:
 - capture levels of risk factor exposure and prevalence in the population;
 - monitor access to diagnosis and treatment – and appropriateness of care provided; and
 - monitor and evaluate the impact of treatment.

Policymakers should also consider the sequence in which they use the levers, based on the following issues (see Figure 12):

- **Relative prevalence of risk factors:** The prevalence of smoking, hypertension and other risk factors for CVD varies significantly from country to country and should be taken into account when deciding where to start.
- **Scope of impact:** Policies that directly affect the behavior of whole populations are likely to have bigger and faster impact than those that affect subpopulations, and can enable the roll-out of other activities over time.
- **Fiscal impact:** Different countries have different amounts of ‘fiscal space’ available to fund prevention. Policies also vary in terms of level of investment required to translate into amount and timing of financial benefit.
- **Speed of impact:** While prevention always delivers long-term health benefits, some policies can also deliver visible short-term health or economic benefits, which can be important for gaining or sustaining political support for a government’s broader CVD and prevention agenda.
- **Political and operational feasibility:** Political issues (for example, ideological opposition, domestic or international political constituencies) and operational issues, such as the level of existing healthcare delivery infrastructure, vary from country to country and can make particular policies more or less useful.

Figure 12: Policy recommendations for an implementation framework

	Scope of impact	Fiscal impact	Speed of impact	Political feasibility	Operational feasibility
Taxation on harmful products	Universal reach/ proven	Revenue generating	Rapid to implement	Industry may obstruct	Not complex
Prohibitions, restrictions	Universal reach/ proven	Neutral (or cuts revenue)	Rapid to implement	Industry may obstruct	Not complex
Access to medicine initiatives (e.g. GDF)	Universal reach/ proven	Investment required	Takes time to implement	Complex collaboration	Relatively complex
National screening programs	Depends on uptake	Investment required	Takes time to implement	Unlikely to create dissent	Depends on infrastructure
CHW/non-physician workforce	Variable	Relatively low cost	Takes time to implement	Likely to create tension	Relatively complex
Digital tools for behavior change	Limited evidence	Relatively low cost	Takes time to implement	Unlikely to create dissent	Requires co-operation

Feasibility ■ High ■ Medium ■ Low

For example, in a low-income country, one possible policy sequence might be to start with the MPOWER tobacco control policy package, which has a particular focus on tobacco taxation, advertising and bans on smoking in public places. This method could deliver relatively quick health benefits at low cost. The fiscal impact could also be positive, and revenues from tobacco taxes could be made available to support the implementation of the next wave of policies. The second wave could then focus on strengthening existing community-based resources to manage the cardiovascular risk of people with high blood pressure, as well as to find and support people who need secondary prevention. A third wave could follow, or happen in parallel, which could focus on expanding the group of community health workers and improving access to medicines.

Also, national and international organizations could consider following the successful example of the MPOWER package for tobacco control. They could develop similar policy packages for other risk factors affecting CVD, such as diet, alcohol, exercise and medication adherence. A major strength of MPOWER⁷⁹ is that it helped make the WHO FCTC guidelines into a reality by providing clear technical guidance on how to realistically implement tobacco control. Similar packages have played a critical part in the success of public health programs: governments that are offered a limited number of high-priority, evidence-based policies can focus on implementation rather than policy selection.⁸⁰

CONCLUSION

Investment in CVD prevention has often been disadvantaged because it is difficult to demonstrate cost-effectiveness compared to the outcomes for acute treatments. This is the result of the time lag between intervention and its impact on primary clinical outcomes, and because there is no attempt to create a synergy between the population approach and the high-risk targeted approach. The problem is exacerbated by evidence that the people who are at highest risk are often the hardest to reach.

This report addresses both of these challenges by:

- Identifying the priorities – management of hypertension, tobacco control and secondary prevention, which will, overall, have the most favorable time-to-impact profiles and deliver significant results in the short and medium term.
- Highlighting case studies that show how:
 - the cost of (some) prevention interventions can be dramatically reduced by using innovative delivery ‘vehicles’ that improve overall cost-effectiveness, which include digital tools and CHWs; and
 - prevention strategies can target hard-to-reach groups and be tailored to different segments of the population.

The benefits of investing in CVD prevention extend beyond the direct health benefits to individuals and populations. Many people with CVD are of working age, and some are the primary earners for their families. Better CVD outcomes will therefore support greater economic security for individuals and families, and higher workforce productivity for economies. The healthy behaviors promoted by CVD prevention for one generation also reduce risk exposures for future generations, creating a significant inter-generational health and economic benefit.

The tremendous loss of life as a result of CVD is well known across the world. Millions of lives are at risk today and in the future unless greater emphasis is placed on its prevention. It is therefore important that policymakers deliver, enable and accelerate the implementation of CVD prevention strategies to halt the growth of this global epidemic – improving health outcomes and increasing life expectancy for individuals around the world.

APPENDICES

Appendix 1

Case study selection

A long list of potential case studies was drawn up from a range of sources, including both existing literature and input from the experts who constitute the CVD Forum membership and their professional networks. This list was pared down using a set of criteria including relevance, existing or emerging evidence for impact, scalability and access to those knowledgeable about the example. The process is described in this Appendix.

Figure A1: Case study selection criteria

STEP 1: Creating the long list	STEP 2: Applying prioritization criteria	STEP 3: Agreeing on a short list
<ul style="list-style-type: none">• Suggestions from Forum members• Suggestions from the McKinsey and Imperial teams and their respective expert networks• Follow-up on case studies highlighted in previous WISH and other relevant reports to identify those that have proven sustained impact over time (and provide lessons on how to achieve sustainability)• Additional case studies identified in the literature	<ul style="list-style-type: none">• Primary priorities:<ul style="list-style-type: none">– Relevance*– Evidence for impact– Scalability– Sustainability– Access**• Secondary criteria – we will aim to get a spread across:<ul style="list-style-type: none">– Degree of innovation:<ul style="list-style-type: none">· well-established· proven but not well-known· experimental– Geographies/income groups– Different risk factors	<ul style="list-style-type: none">• Develop preliminary perspective on the best case studies to illustrate each theme• Test with Forum members

* Scope: The three priority areas as described in the report.

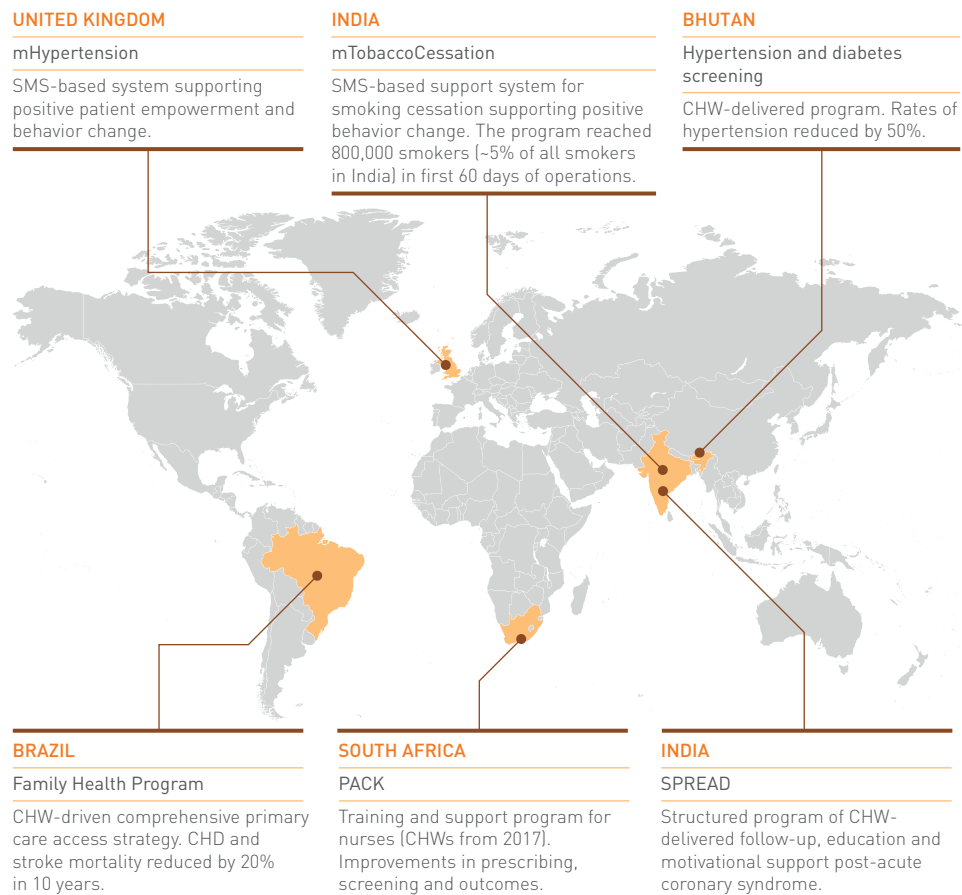
** The documentation, published papers and the opportunity to conduct primary interviews that allow the creation of a rich and insightful case study covering the key success factors, challenges and implementation journey.

Appendix 2

Map of case studies

The selection process resulted in a set of case studies from around the world, focusing on the three priority areas articulated by WHF that include a range of strategies, including government-led, multi-sectoral strategies; digital health; and CHW-led interventions. The full set of case studies is shown in Figure A2.

Figure A2: Case studies



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Any errors or omissions remain the responsibility of the authors.

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