

THE ROAD TO UHC: WHY INTEGRATION OF CIRCULATORY HEALTH INTERVENTIONS IN PRIMARY CARE IS ESSENTIAL

A GLOBAL COALITION FOR CIRCULATORY HEALTH POSITION PAPER



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Executive Summary

The incidence of circulatory disorders is increasing worldwide, affecting both low- and middle-income countries and some high-income countries. There is evidence of rising incidence and prevalence rates, even among younger individuals, along with an increasing prevalence of risk factors such as high blood pressure, diabetes, and obesity. These indicators suggest that current approaches are not effective in managing and reducing the burden of conditions affecting circulatory health.

In the process of achieving Universal Health Coverage (UHC), countries must determine the essential health services to be provided through health benefit packages (HBPs) that are cost-effective, taking into account criteria such as disease burden, financial risk protection, as well as social and economic impact. Circulatory diseases, as the leading cause of death and disability worldwide, pose significant financial burdens on individuals and households, due to their chronic nature, making financial risk protection a crucial factor in HBP decision-making. Nevertheless, coverage of non-communicable diseases (NCDs) services in UHC packages is still lagging behind compared to other health areas, such as infectious diseases or maternal and child health.

UHC is closely tied to the establishment of a strong, high-quality Primary Health Care (PHC) system, as the first point of contact between communities and the health system. Strengthening PHC is crucial for achieving UHC goals, as it improves access to quality and affordable healthcare services, reduces mortality rates, promotes equity, and plays a significant role in preventing deaths from circulatory diseases through better prevention and health promotion, treatment and follow-up.

At the global level, the HEARTS Technical Package, WHO Package of Essential Non-communicable Diseases (PEN) interventions for primary health care provide useful guidance on essential health services to be provided at primary care level for the management of circulatory diseases. In addition, Appendix 3 of the WHO Global NCDs Action Plan and Disease Control Priorities 3rd edition (DCP3) offer a comprehensive list of interventions to be implemented at different levels of care, including an analysis of their cost-effectiveness.

Drawing on these existing initiatives, the Global Coalition for Circulatory Health (GCCH) recommends decision-makers to prioritize the following interventions in UHC benefit packages at primary health care level:

Primary prevention interventions:

1. Simple screening for and counselling on risk factors (unhealthy diet, tobacco use, harmful use of alcohol and physical inactivity)
2. Opportunistic screening for hypertension and CVD/stroke, including use of digital tools for risk reduction, regardless of the level of individual circulatory disease risk.
3. Pharmacological treatment of hypertension prescribing one or a combination of the four classes of anti-hypertensive drugs existing, depending on availability at primary care. Polypill is recommended, when available, for individuals at intermediate absolute risk of CVD.
4. Primary prevention of rheumatic fever and rheumatic heart diseases by providing treatment of streptococcal pharyngitis.
5. Glucose screening test for diabetes, including for pregnant women.
6. Metformin initiation for people diagnosed with diabetes, if no contraindications have been identified.
7. Screening for albuminuria for people living with diabetes and hypertension.
8. Management of albuminuric kidney disease with Angiotensin Converting Enzymes inhibitors (ACEi) or Angiotensin Receptor Blockers (ARBs).

Secondary prevention interventions:

1. Provision of aspirin for suspected cases of myocardial infarction.
2. Management of ischemic heart disease, stroke and peripheral artery disease through provision of antiplatelet, anticoagulant, blood pressure lowering, blood lipid lowering.

Nevertheless, despite the availability of evidence-based, cost-effective interventions for circulatory diseases at primary care, particularly in low- and middle-income countries (LMICs) inadequate investment in PHC, heavy reliance on out-of-pocket

payments, and insufficient government funding for noncommunicable diseases (NCDs) is undermining efforts to reduce the burden of circulatory conditions.

The GCCH therefore calls on decision-makers to:

- Take action to expand coverage of essential health services for circulatory conditions to all by 2030, with the aim of reducing catastrophic out-of-pocket expenditures.
- Prioritize primary care in public health funding and human resources for health allocation plans.
- Include existing evidence-based, cost-effective interventions for circulatory diseases in UHC benefit packages at primary care level.

We believe that implementing these three key actions at the national level will contribute to significantly reduce the burden of circulatory diseases, decreasing the incidence of catastrophic expenditures for health driving individuals and households into poverty and ultimately promoting social and economic development. ■

Introduction

The global burden of circulatory disorders^{1,2}, such as stroke, ischemic heart disease, heart failure, pulmonary embolism, aortic dissection/aneurysm, chronic kidney disease, deep vein thrombosis, pulmonary hypertension and arrhythmia, continues to grow with a tendency towards increasing age-standardized incidence rates, not only in low- to middle-income countries (LMICs) but also in some high-income countries (HICs) where they were previously declining.^{1,2} Alarming, there is also evidence of increasing age-standardized incidence of circulatory disorders in younger individuals (under 55) in both HICs and LMICs³ as well as growing age-standardized prevalence of high systolic blood pressure (SBP), age-standardized disability-adjusted life-years (DALYs) lost due to high fasting plasma glucose, high body mass index (BMI)¹ and age-standardized incidence and prevalence of diabetes mellitus (DM) across the globe.⁴ These indicators of fast deteriorating circulatory global health and their major risk factors strongly suggest that current approaches are insufficient for containing, let alone reducing, the rising global burden of diseases of the circulatory system.

Considering that circulatory diseases share a range of modifiable risk factors and, all together, are the No. 1 cause of death and disability, causing over 20 million deaths and 374 million years of life lost each year, it is beneficial for health systems to address all these conditions together. The Global Coalition for Circulatory Health was formed in 2017 to provide support to global, regional and national health administrations in their efforts to reduce the burden of circulatory diseases.⁵

As the COVID-19 pandemic disrupted access to health services, particularly at primary health care level, diverting important resources to pandemic response, people living with non-communicable diseases (NCDs), and particularly circulatory conditions, were significantly impacted. In the meantime, while the movement toward UHC has been gaining momentum, the effective inclusion of NCDs, including circulatory diseases, in government plans for the expansion of Universal Health Coverage (UHC) remains low, particularly in LMICs.

This position paper will highlight the need to prioritize the inclusion of essential circulatory health services in

UHC benefit packages, in order to protect individuals and households from catastrophic out-of-pocket expenses that would contribute to rising poverty rates and further slow down economic and social development. While recognizing that the complexity of managing circulatory conditions often requires access to more specialized health services at tertiary care level, the focus of this paper is on primary care, as the first point of contact between individuals and the health system and an essential component of achieving UHC. We will start by illustrating the concept of UHC in the context of circulatory health. Spelling out the different criteria to define what to include in a health benefit package will contribute to reinforcing our message on the need to include coverage of circulatory health services in UHC plans. A detailed overview of the main tools available at the global level to guide countries on most cost-effective interventions for circulatory diseases is also provided, with particular focus on those interventions that can be implemented at primary care level. Case studies will then illustrate the different challenges to implementing these tools, followed by suggestions on how to overcome such challenges.

Before making concrete recommendations on which interventions should be included in UHC benefit packages at primary care level, the document will provide a global overview of the evidence available on services for circulatory diseases, particularly for primary and secondary prevention, and their relation to UHC benefit packages. Recommendations included in this document will be based on available evidence from existing global guidance listed in the paper. The issue of financing primary care will also be discussed, as one of the main barriers to the expansion of UHC benefit packages is indeed lack of financial resources allocated to the health system and particularly to primary care.

Toward the end of this paper, we will also provide evidence on the health and other benefits of expanding coverage for circulatory diseases at primary care, in order to strengthen our advocacy message and stimulate action by policymakers.

We will then conclude with a set of recommendations summarizing the key points made throughout the paper, suggesting a way forward for governments and the global UHC movement. ■

Context: Universal health coverage and circulatory health

UNIVERSAL HEALTH COVERAGE: A BRIEF OVERVIEW

The World Health Organization defines Universal Health Coverage (UHC) by its main objective of guaranteeing that **“all people have access to the full range of quality health services they need, when and where they need them without financial hardship. It covers the full continuum of health services, from health promotion to prevention, treatment, rehabilitation and palliative care”**.⁶

Although not explicitly named, the concept of UHC dates back to the WHO Constitution of 1948, declaring health a fundamental human right, and the Alma-Ata Declaration of 1978. However, it was at the 58th World Health Assembly (WHA) in 2005, through a resolution urging countries to embed UHC in their health systems, that the concept received greater attention. The 2010 World Health report represents another milestone in the history of UHC, linking its achievement to increased health financing. In 2017, the movement toward UHC gained further momentum with resolution endorsed by the United Nations General Assembly proclaiming Dec. 12 as UHC Day.⁷ The international UHC movement culminated with the UN High-Level Meeting on UHC in 2019 and the Political Declaration through which countries committed to the ambitious goals of achieving UHC by 2030 and to *“progressively cover one billion additional people by 2023 with quality essential health services and quality, safe, effective, affordable and essential medicines, vaccines, diagnostics and health*

technologies, with a view to cover all people by 2030.” Countries further stated their commitment to reducing or eliminating catastrophic out-of-pocket health expenditures by 2030.⁸

Health financing and access to quality essential health services for everyone, everywhere are therefore two key UHC principles. The three dimensions of UHC are summarized in the WHO UHC cube, published in the 2010 World Health Report (Figure 1). Three essential components of UHC are the types of services covered, the proportion of direct costs individuals incur for health services and what is covered (Services, direct costs and population).⁹ Figure 2 summarizes the timeline and progress in making UHC a priority in the global agenda.

To advance health-related Sustainable Development Goals (SDGs), the UHC2030 multi-stakeholder partnership was launched in September 2016, with the aim of bringing together diverse voices and perspectives for the common goal of achieving UHC. UHC 2030 is the most prominent global initiative bringing together governments of 81 countries and territories, 17 multilateral organizations and global health initiatives, including the World Bank and WHO, four philanthropic organizations and a long list of non-governmental organizations active in different health domains.¹⁰ Other initiatives are also contributing to the global movement toward UHC. For example, the Universal Health Coverage Coalition unites a number of health and development organizations under the common goal of health for all.¹¹ A number of initiatives are now available at the global level, dedicated to UHC, driven by the SDGs and particularly SDG 3.8 on achieving UHC, including financial risk protection, access to quality essential health care services and access to safe, effective, quality and affordable essential medicines and vaccines for all.¹² ■

Figure 1: WHO UHC Cube

Source: [The World Health Report 2010 \(who.int\)](http://www.who.int)

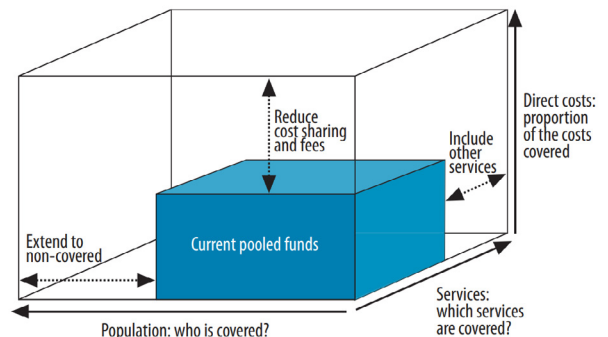


Figure 2: The road to Universal Health Coverage

Source: [A History of Universal Health Coverage in the UN - UHC2030](#)



Integrating circulatory health in the path toward UHC

In the process of achieving UHC, countries need to establish health benefit packages (HBPs), defining the number and types of health services that are deemed essential and should be delivered to the population free of charge or at an affordable cost. As defined by Glassmann *et al.* (2016), a health benefits package (HBP) is “a set of services that can be feasibly financed under the actual circumstances a given country finds itself.” Therefore, the decision over what services will be included in such packages should primarily consider the limits imposed by the health system financing mechanism of choice and the funding available; secondly, with limited financial resources available to cover such services, the definition of a HBP should be based on strong evidence from cost-effectiveness analysis performed for the services included.¹³ While these are the two main aspects to consider when designing the ideal HBP, certainly other factors will influence this process.

While several criteria must be evaluated to define what should be included in a health benefit package, the WHO “Principles of Health Benefits Packages” provides a useful framework for countries to decide what services to include in HBPs. It further details criteria to support decision making on HBPs, including burden of disease, availability of cost-effective interventions, financial risk protection, and the social and economic impact.¹⁴ Furthermore, if essential services for primary and secondary prevention are not available or use by individuals is low, the likelihood of diseases of the circulatory system and related complications to occur. People experiencing circulatory health events may need expensive and invasive procedures to prevent recurrent symptoms and subsequent circulatory health events, often resulting in catastrophic financial consequences when such costs must be covered by the individual.¹⁵

Based on morbidity, mortality and disability, as previously mentioned, circulatory diseases are the No. 1 cause of death and disability worldwide. People living with diabetes are two to four times more likely of dying from heart disease, and cardiovascular disease (CVD, including stroke) is the leading cause of death for people with kidney disease.¹⁶ Moreover, due to their chronic nature and high cost of specialized care to manage them, circulatory diseases contribute significantly to driving individuals and households into poverty through out-of-pocket costs. In some cases, individuals borrow money to pay for the health services they need, while in other

circumstances, they avoid seeking care because they can’t afford it, raising questions of equity in access to health services.¹⁷ Across different WHO regions, medicines and outpatient care, which are critical components of circulatory disease management, are the main drivers of households’ catastrophic health expenditures.¹⁸ Therefore, financial risk protection against catastrophic health expenses due to circulatory diseases represents a prominent criterion in the HBP decision-making process. In this context, decision-makers should consider the impact on equity and prioritize those with circulatory conditions. Nevertheless, WHO reports that since 2000, coverage of infectious diseases in UHC packages has rapidly improved within countries, while coverage of non-communicable diseases (NCDs) services has been lagging behind.

A study in Pakistan examined the association between blood pressure and diabetes medication expenditures and household resource allocation, as the two conditions have been found to be major drivers of out-of-pocket expenditures in the country. The authors found that on average 25.4% of household spending is dedicated to blood pressure and diabetes medications, to the detriment of other household expenditures, such as food and education. This may further reduce nutrition security and hinder the country’s development.¹⁹

Furthermore, renal treatments represent a challenge for many low- and middle-income countries on their path to UHC. An analysis by Teerawattanon *et al.* of expenses for renal treatment in Thailand and the Philippines, renal dialysis accounted for the most expensive treatment to be covered as part of their UHC packages. ‘The amount spent on renal replacement therapy, as a percentage of the total UHC budget, was 4.16% of \$1.3bn in Indonesia, 7.7% of \$1.9bn in the Philippines, and 5.1% of \$5.2bn in Thailand. This is a high expenditure on one disease since dialysis patients constitute only a small proportion of the UHC beneficiaries (0.03% (63 818 patients) in Indonesia, 0.06% (61 763) in the Philippines, and 0.11% (53 234) in Thailand).’²⁰

The availability of action plans, strategies or policies more generally may affect whether NCD interventions are included in UHC benefit packages. Globally, 85% of the countries have a policy, strategy or action plan that includes diabetes and CVDs. Although only 72% and 73% have an operational policy, strategy or action plan for CVDs and diabetes, respectively. When looking at risk factors, such as unhealthy diets, tobacco use, physical inactivity, harmful use of alcohol, and overweight and obesity, the percentage

of countries with a policy, strategy or action plan is 89%, 92%, 91%, 86% and 47%, respectively.²¹ Even when available, these policies or plans are often not fully implemented. Moreover, only 70% of countries include NCD services in their national essential health benefit packages, and the percentage is considerably lower in low-income countries, where only about 50% of the countries include NCD services in their UHC packages.²² Poor understanding of the importance of CVDs and circulatory diseases, their burden, as well as external pressures from donors, are cited as possible explanations for the absence.⁹ The Political Declaration of the third High-level Meeting of the General Assembly on UHC of 2019 offers an important opportunity to increase efforts to achieve UHC. It explicitly mentions NCDs, including CVDs, in UHC as a way to address their growing burden on countries.²³ It is critical for the circulatory health community to leverage this global momentum toward improving NCD management and aggressively advocate for including circulatory diseases in the movement to achieve UHC. ■

Context: Universal Health Coverage and primary care

The achievement of UHC is fundamentally connected to the realization of a robust PHC system. PHC was first defined in the Alma-Ata Declaration of 1978 as a prerequisite for achieving health for all. Following the WHO definition, PHC provides promotive, preventative, curative, rehabilitative and palliative care to individuals and families throughout their life course. At the same time, one of the main objectives of a system based on PHC is to systematically address determinants of health, from economic and social to environmental and commercial. Finally, PHC puts individuals and families at the forefront and empowers them to promote and protect their well-being and participate in developing health and social services.²⁴ A different world in 2018, with the disease burden shifting towards NCDs, an aging population and population growth, resulting in more frequent contacts with the health system, required a renewed commitment by countries on PHC through the Declaration of Astana, emphasizing the importance of community engagement in the design and delivery of primary health care services and elevating the goal of strengthening PHC in the global health agenda.²⁵

Quality, affordable and easily accessible health care that is close to the communities is a core aspect of PHC, which is also the ultimate goal of UHC. Several studies and country experiences have demonstrated the importance of strong PHC services in reducing health expenses, promoting better health outcomes in the population, increasing equity, as well as resulting in better screening, care and follow-up for a wide range of diseases, including those affecting circulatory health.²⁶ However, a systematic review published in the Lancet highlights that ensuring access to health services through primary care and expanding the range of services covered through UHC are not enough to avert preventable deaths. For instance, poor quality of care was the cause of 84% mortality due to cardiovascular disease. Particularly in LMICs, poor quality represented the main cause of excess mortality that could be averted, followed by not using health services.²⁷

Because one of the central goals of UHC and PHC is to improve access to health care services without financial hardship, establishing a well-defined package of health services provided free of charge or at an affordable cost at PHC level is instrumental to achieving UHC. It has been estimated that \$200 billion a year of additional investment on PHC will be needed to achieve UHC by 2030.¹⁰ Increasing investments in the health workforce and infrastructure, particularly adding 77,000 PHC facilities in LMICs, are two of the main actions necessary to effectively strengthen PHC. In addition, expanding the number of interventions provided at PHC, including for CVDs, could help avert 60 million deaths between 2020 and 2030. All this evidence suggests the inextricable link between realizing UHC and expanding PHC as the backbone of health systems. As demonstrated, focusing on expanding quality and affordable health services closer to communities, coupled with initiatives to ensure skilled health workers are available, are successful strategies to avert excess mortality due to CVDs. ■

Global Initiatives on circulatory health

At the global level, several resources are available to countries to support them in determining the list of interventions for circulatory diseases to include in health benefit packages at the primary care level. Appendix 3 of the WHO Global NCD Action Plan 2013-2020, in its updated version, offers a menu of policy options and cost-effective interventions for the prevention and control of NCDs, including circulatory diseases. Its purpose is to guide Member States in implementing some of these interventions. The document includes interventions to prevent NCDs, such as enacting and enforcing comprehensive bans on tobacco advertising, promotion and sponsorship, front-of-pack labelling to promote healthy diets and physical activity assessment, counseling and behaviour change support as part of routine PHC services. Appendix 3 dedicates its fourth objective to addressing the prevention and control of NCDs by strengthening PHC systems and UHC. It lists the integration of very cost-effective interventions for NCDs into the basic primary care package of a given country as one of the main ways to attain this objective.²⁸

While Appendix 3 is certainly one of the most relevant resources available providing cost-effective interventions to be included in basic primary care package, it is not the only one. The HEARTS Technical Package and the WHO Package of Essential NCD interventions for PHC (PEN) represent two additional tools supporting Ministries of Health in strengthening CVD and circulatory diseases management at primary care level. Both documents provide a set of interventions that are considered excellent economic investments, as they can help reduce the need for more expensive treatment when implemented at primary care level. Such interventions can be delivered at an acceptable quality level even in resource-poor settings.^{29,30} A review of 14 studies on the implementation of the PEN Package, however, revealed numerous gaps and challenges, despite practical evidence of its cost-effectiveness compared to no intervention at all.³¹ This demonstrates that countries are still failing to prioritize NCDs and circulatory health in their UHC agenda.

The 3rd edition of the Disease Control Priorities (DCP3) provides evidence and model packages supporting governments in priority setting, economic evaluation and developing, updating or implementing UHC packages of health services in low- and middle-income settings. The volume dedicated to Cardiovascular, Respiratory and Related Diseases

(CVRDs) recommends including CVRDs care in UHC, as it provides benefits beyond individual health. The volume offers a menu of 36 specific interventions for CVRDs by level of implementation, starting from primary care up to referral and specialized hospitals. They are all based on evidence and feasible in low-resource settings. The authors further recognize that particularly LICs might not be able to implement all of them and therefore include a set of highest priority interventions to be implemented based on available resources and disease burden. Interestingly, all these interventions can be easily delivered at community and primary care level.³² Once again, evidence on the benefits and cost-effectiveness of integrating circulatory health interventions in HBPs at primary care level are illustrated in DCP3, demonstrating the need to take action on this front.

In 2021, the WHO released the Guidelines on the Pharmacological Treatment of Hypertension in Adults. Based on the accumulated body of evidence, the new (2021) WHO guideline on hypertension established new recommendations on the thresholds for initiating such treatment, which are not solely based on the CVD risk threshold. The guideline also suggests that pharmacological treatment of hypertension can be provided by an inter-professional health care team, including nurses, pharmacists, among other health professionals, provided they have proper training, have prescribing authority and follow specific management protocols and physician oversight.³³ There is also evidence that a single 10-year CVD risk threshold is not the optimal approach for statin prioritization in the primary prevention of CVD^{34,35,36} and, therefore, countries need to carefully determine their own treatment thresholds to optimize benefits of statins while minimizing related harms and economic burden.³⁷

While the WHO CVD risk charts for risk-based CVD management^{38,39} could be used where feasible for targeting individuals with high CVD risk and applying blood pressure and lipid lowering treatment thresholds for primary prevention for an identified minority, this strategy alone leaves the majority of people at risk neglected, although 80% of all CVDs/stroke events occur in these people⁴⁰ Bridging the gap between high CVD risk prevention strategy and population-wide prevention strategies could be achieved with the wide use of a digital tool for self-assessment and management of CVD risk in all people at increased level of CVD risk, regardless of the level of the risk. Such an ideal tool is the validated Stroke Riskometer App, which has already been tested in multiple populations. It has received wide attention and was awarded the **WHO Western Pacific Innovation Challenge award**.^{42,43,44,45}

It has been endorsed by the WSO, WHF, WFN and European Stroke Organisation.^{46,47,48} This free-to-use app is already translated into 19 languages spoken by over 5.3 billion people around the world.⁶⁶ There are also major initiatives of screening and treating hypertension such as the India Hypertension Control Initiative (IHCI). This program was initiated in 26 districts and five states with five core strategies: standard treatment protocol, reliable supply of free antihypertensive drugs, team-based care, patient-centred care, and an information system using a simple app to track individual patient treatment and blood pressure control. The BP control was 1.4-5% at baseline, which improved to 43%. Currently, IHCI is being implemented in 138 districts of 23 states. More than 3.4 million people with hypertension are being treated in government health facilities through the UHC package of services.⁴⁹ This program received the **UN award** in September 2022.

Another example of use of digital technologies for prevention, detection and treatment of circulatory diseases is the MyCKDCPG mobile app developed for Malaysian primary care providers. An integrated digital tool for easy reference of the Malaysian kidney disease Clinical Practice Guidelines (CPG) Mobile App and decision aid tools. eHealth has the potential to address several resource challenges of UHC for circulatory diseases such as enabling task shifting, improving access to healthcare in rural areas, and increase disease awareness through remote consultations, telemedicine, and health education delivered via digital platforms.

A detailed overview of the primary resources for implementing cost-effective interventions to address NCDs and circulatory diseases is provided below:

WHO Package of Essential Noncommunicable Disease interventions for primary health care (WHO PEN package): This document includes a set of cost-effective interventions to address noncommunicable diseases, particularly focusing on the PHC sector in low-resource settings. The PEN package provides protocols and tools for scaling up NCD interventions at primary care level; it provides a minimum set of interventions for the detection, diagnosis, treatment and care of cardiovascular diseases, diabetes and chronic respiratory diseases. It further includes aspects of healthy lifestyle counseling, self-care and palliative care. The tool is divided as follows:

- o Protocol for cardiovascular risk, as well as hypertension assessment and management.
- o Protocol on the management of diabetes
- o Protocol on the management of respiratory

diseases, including asthma and chronic obstructive pulmonary disease (COPD).

- o Cancer early diagnosis, with a specific focus on cervical and breast cancer.
- o Manual on healthy lifestyle counseling, including health education and counseling on cessation of tobacco use.
- o Manual on self-care among patients with cardiovascular disease, diabetes or respiratory disease.
- o Manual on palliative care with practical points for care.

The PEN Package ends with a detailed step-by-step guide on how to successfully implement the package.

HEARTS: Technical package for cardiovascular disease management in primary health care: The HEARTS technical package is part of the broader initiative called Global Hearts, which was launched in 2016 by the World Health Organization and the United States Centers for Disease Control and Prevention (CDC).

The HEARTS technical package features six modules accompanied by an implementation guideline, and it is aligned with the WHO PEN package. Content of the modules follows:

- o **Healthy lifestyle counseling:** This module focuses on four behavioural risk factors for CVDs and provides guidelines for counseling on adopting healthy lifestyle. It is more appropriate for implementation at sub-national and primary care levels.
- o **Evidence-based protocols:** The second module focuses on the clinical management of hypertension and diabetes through standardized protocols. It can be implemented at national, sub-national and primary care levels.
- o **Access to essential medicines and technology:** Ensuring continuous access to medicines and technologies for prevention, treatment and care is fundamental for the effective management of circulatory diseases. The third module provides effective strategies for the procurement, distribution, management and handling of medical and technological supplies at facility level. Policymakers and health workers at all three levels of health care can adapt it to their situations.
- o **Risk-based CVD management:** In this module, country-specific risk charts are included to support health care providers in assessing and managing CVD risks in individuals.

Such risk charts are relevant for health personnel operating at all levels of care.

- o Team-based care: Particularly in countries where human resources for health are limited or not well-distributed, this module is particularly useful as it provides guidance and concrete examples of and some training material for team-based care, as well as task-shifting for the care of CVDs. It is mostly relevant for health professionals operating at the sub-national and primary care level.
- o Systems for monitoring: This last module offers useful guidance on monitoring and reporting on the prevention and management of CVDs, including standardized indicators and data collection tools. It can be implemented at all levels of care.

Appendix 3 of the WHO Global NCD Action Plan 2013-2030

To ensure that the WHO Global NCD Action Plan 2013-2030 is in line with the latest scientific evidence on preventing and controlling noncommunicable diseases, after decision WHA72(1), the WHO updated Appendix 3 of the WHO Global NCD Action Plan in 2022. Appendix 3 includes a menu of policy options that are cost-effective and that should be prioritized in the control of NCDs.

The value for money and efficiency of most of the interventions listed in the updated Appendix 3 have been assessed through the WHO-CHOICE approach of cost-effectiveness analysis. This type of analysis takes into account setting-specific factors, including burden of disease, economic conditions, as well as how the health system is organized and operates. Moreover, the WHO-CHOICE method evaluates all interventions based on a “null” scenario, in which no intervention is implemented.

In its revised version, the document lists 81 interventions, 31 of which were already present in the 2017 update, although cost-effectiveness estimates for these interventions have been updated. Nine interventions were updated from the 2017 update to reflect updates in the WHO policy or scientific evidence. WHO also performed cost-effectiveness analysis for seven other interventions that were included in the 2017 version without previous analysis. Ten more interventions were added, based on new

guidance and tools from WHO, and 24 interventions are listed, although no cost-effectiveness analysis has been performed yet. The document is divided into six different objectives, addressing noncommunicable diseases and their risk factors:

- o **Objective 1:** To raise the priority accorded to the prevention and control of noncommunicable diseases in global, regional and national agendas and internationally agreed development goals, through strengthened international cooperation and advocacy.
- o **Objective 2:** To strengthen national capacity, leadership, governance, multisectoral action and partnerships to accelerate country response for the prevention and control of noncommunicable diseases.
- o **Objective 3:** To reduce modifiable risk factors for noncommunicable diseases and underlying social determinants through creation of health-promoting environments.
 - o Tobacco use interventions
 - o Harmful use of alcohol interventions
 - o Unhealthy diet interventions
 - o Physical activity interventions
- o **Objective 4:** To strengthen and orient health systems to address the prevention and control of noncommunicable diseases and the underlying social determinants through people-centered primary health care and universal health coverage.
 - o Cardiovascular disease
 - o Diabetes
 - o Chronic respiratory diseases
 - o Cancer
- o **Objective 5:** To promote and support national capacity for high-quality research and development for the prevention and control of noncommunicable diseases.
- o **Objective 6:** To monitor the trends and determinants of noncommunicable diseases and evaluate progress in their prevention and control.

A summary of cost-effective interventions included in the Appendix 3 document is provided in the Annexes section.

• Disease Control Priorities 3 (DCP3)

The Disease Control Priorities series was launched in 2017. The third edition (DCP3) provides an evaluation of what health interventions can be considered cost-effective. The goal of DCP3 is to inform governments that are designing policies and interventions to address different health concerns. Volume 5 is specifically dedicated to cardiovascular, respiratory, and related disorders, although other volumes contain guidance that is relevant for circulatory diseases. DCP3 is a comprehensive document divided into different parts, providing more details on the global burden of cardio-metabolic disorders, as well as their risk factors.

It then describes vascular and respiratory conditions and diseases in Part 3 and offers a detailed overview of policies and platforms to deliver health services for vascular and respiratory diseases in Part 4. Part 4 takes the management of diabetes as a starting point to highlight the need for integrated approaches to addressing comorbidities in patients living with diabetes.

The second chapter of Part 4 offers important guidance on task-shifting and self-management, with or without support from family or peers. This chapter is particularly relevant in situations where there is a severe shortage of health care professionals. The final part of DCP3 is devoted to the economics of addressing vascular and metabolic disease. Sections of this part provide detailed guidance on costs and cost-effectiveness of policies to prevent and treat cardiovascular and respiratory diseases, extending cost-effectiveness analyses to risk factors and risk reduction policies. It further highlights new evidence on interventions for the management of hypertension and dyslipidaemia. ■

Why are these initiatives important to achieve UHC?

Effective coverage of health services is an important measure of UHC, and even with significant progress made in improving effective coverage in many countries over the past few decades, UHC is extremely non-uniform not only between countries but also within the same country for different diseases and there is still much work to be done to achieve truly universal coverage.⁵⁰ Despite the availability of a large body of knowledge and evidence on cost-effective interventions that if scaled up at the primary care level would significantly contribute to reducing the health and financial burden of circulatory diseases, UHC packages often do not include interventions to address circulatory diseases.³¹ Indeed, the State of UHC Commitment Review found that while countries committed to UHC almost doubled between 2019

and 2021 and the majority of countries state UHC as a clear objective in their national plans and strategies, programs and interventions are generally disease- and service-specific, without addressing issues of financial protection in some cases.⁵¹

The Alma Ata Declaration of 1978 made explicit the link between strengthening PHC and attaining the goal of ensuring a level of health for all people that will allow them to “lead a socially and economically productive life.” In the Declaration, PHC is seen as the first point of contact between communities and the formal health system and addresses the main causes of ill health through promotive, preventive, curative and rehabilitative health services.⁵² In this context, the latest report of the WHO High-Level Independent Commission on Noncommunicable diseases (NCDs) recommends including NCDs and mental health conditions in UHC plans and urges countries to make PHC the “[...] cornerstone of delivering NCD and mental health services,” ranging from health promotion and prevention, to treatment, care and follow-up services.⁵³

Moreover, in the movement toward UHC, discussion on establishing or expanding the pool of funding necessary to cover health services provide free of charge requires important prioritization efforts, particularly in LMICs. Given financial constraints in the health budgets of LMICs, interventions included in HBPs should be deemed of high value and proven cost-effectiveness. According to Glassman *et al.*, cost-effectiveness analyses (CEA) are increasingly being applied to define what interventions should be included in health benefit packages, based on their cost compared to the additional benefits they would yield.⁵⁴ It is therefore evident that tools such as DCP3 and the Appendix 3 of the Global NCD Action Plan become useful in defining what services for noncommunicable and circulatory diseases should be covered at a given budget level.

Indeed, premature mortality from NCDs can be reduced and even avoided by implementing recommendations included in the DCP3 and Appendix 3 of the WHO Action Plan for noncommunicable diseases.⁵⁵ A systematic review by Kane *et al.* (2017) found that passive NCD case finding approaches, in which every consultation represents an opportunity for screening and detection of NCDs, are the most cost-effective in low-income settings. It cites task-shifting to less-specialized health care workers, as well as standardized protocols for diagnosis and treatment of NCDs, as other viable strategies to adopt at primary care level.⁵⁶ Useful guidance on implementing such measures and others is included in the WHO PEN Package and the HEARTS technical package, focusing on primary care level in resource-constrained settings. ■

Challenges for implementation

As detailed in the previous section, evidence-based policies to address noncommunicable diseases are largely available and their implementation is feasible even in low-income settings. Indeed, the 2018 report of the WHO High-Level Commission on noncommunicable diseases reaffirmed the need for immediate action on noncommunicable diseases, given the availability of evidence-based solutions. However, in many countries commitments have often not translated into concrete actions to increase financing for NCDs and particularly circulatory diseases or to enact legislative measures and policies targeting NCDs risk factors and increasing access to health services. While lack of political will, commitment, capacity and action, which results into general absence of policies and plans for NCDs, is cited as a major barrier to implementing these interventions, other systemic challenges have also been identified.

The Commission found that several countries struggle with priority-setting efforts, often influenced by external economic, market and commercial factors.⁵³ Then, as Breda *et al.* point out, the health system structure is a determining factor for implementing evidence-based interventions for NCDs. Gaps in investments for NCDs at the national and international level, coupled with poor technical and operational capacity, may severely undermine the implementation of effective policies.⁵⁵

The World Heart Federation (WHF) has been organizing a series of roundtables in Sub-Saharan Africa, focusing on hypertension and examining barriers to effective hypertension management in Uganda, Ghana, Mozambique, Senegal and Nigeria. A common challenge that emerged in all five countries was the chronic underinvestment in cardiovascular and noncommunicable diseases more broadly, deemed less of a priority than infectious diseases. The influence of external donors appears to play a critical role in directing the focus of policies and investment toward other areas of health. In Uganda, for example, a country-mapping conducted by WHF and Uganda Heart Institute found that while 17% of the total health budget was supposed to be dedicated to NCDs, the country only invested 12% of the national health budget to NCDs, resulting in insufficient budget allocated to NCDs. Lack of national investment on NCDs also translated into overreliance on and overdependence from external partners and non-profit

institutions, resulting in fragmentation of measures implemented and general lack of coordination and prioritization among the different actors.

The Ghanaian Society of Cardiology and the Stroke Association Support Network-Ghana, in collaboration with WHF, conducted a similar analysis ahead of the roundtable in Ghana. They found that beside lack of budget allocation for NCDs, the Ghana Health Service, which coordinates health services and implements government policies, does not have enough capacity to fulfil its role, often to the detriment of dealing with noncommunicable diseases. Moreover, shortage of health workers, including general practitioners and specialists, was a common challenge in the five countries where WHF organized roundtables on hypertension and a factor that undermined access to care, particularly in remote areas. In addition, lack of operational capacity in managing cardiovascular diseases contributes to a divide between policies and plans and their implementation. Overall, these case studies help illustrate why despite the availability of numerous resources to design effective strategies for circulatory diseases, these do not translate into effective implementation and adequate allocation compared to other disease areas.

Besides prohibitive costs and limited resources, lack of awareness and limited political will are further challenges to including some circulatory diseases and complications in primary care service packages. In India, chronic kidney disease was only added to the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) six year after its launch and only as recently as 2022 was the Medical Officer's manual for prevention and management of chronic kidney diseases published for extensive roll out and implementation.⁵⁷ ■

How to overcome these challenges

When discussing the barriers to effective management of circulatory diseases and how to overcome these barriers, social, economic and commercial factors should be of primary consideration. Breda *et al.* suggest placing social validity, defined as general acceptance of any menu of policies by all stakeholders from policy makers to implementers, at the center of all intervention efforts. Overcoming context-specific barriers would then require concerted multistakeholder and multisectoral efforts, with the involvement of less-obvious players, such as the business sector, media, civil society organizations, religious leaders and regulatory and financing bodies.⁵⁵ Technical support from international agencies, such as WHO, is also critical.

For example, Giraldo *et al.* explored barriers for implementation of the HEARTS Technical Package through the initiative HEARTS in the Americas and identified actions that contributed to facilitating the uptake process. Technical and methodological support from PAHO was a fundamental measure to overcome potential challenges for implementation.⁵⁸ More boldly, the WHO Commission suggests the establishment of a multi-donor trust fund to ensure funding is available for NCDs from international donors, together with the integration of NCDs in the Human Development Index as effective strategies to stimulate financing for and action on NCDs.⁵³

Potential solutions lie in strengthening advocacy and communication efforts, particularly in educating policy makers on the overall burden of circulatory diseases through solid evidence and surveillance data. As a first step, it is crucial to understand the potential challenges undermining implementation of available cost-effective interventions to address circulatory diseases, in order to define the best strategies to overcome them. Roundtables and multistakeholder dialogues may help. ■

Circulatory health interventions and UHC benefit packages

The WHO “Principles of Health Benefits Packages (HBP)” provides a useful framework for countries to decide what services should be included in HBP. It further details criteria to support decision-making on HBPs, including burden of disease, availability of cost-effective interventions, financial risk protection and the social and economic impact.²⁵ When considering the burden of disease criteria, defined by morbidity, mortality and disability, circulatory diseases are the number one cause of death and disability worldwide, they contribute to more than 374 million of lives lost each year. People living with diabetes are two to four times more likely to die from heart disease and CVD is the leading cause of death for people with kidney disease.⁵⁹

Moreover, due to their chronic nature and high cost of specialized care often needed to manage them, circulatory diseases contribute significantly to driving individuals and households into poverty when they need to pay for such services out of pocket. In some cases, individuals borrow money to be able to pay for the health services they need, while in other circumstances they avoid seeking care due to their inability to pay, raising questions of equity in access to health services.³¹ Financial risk protection against catastrophic health expenses due to circulatory diseases represents a prominent criterion in the decision-making process over HBPs. In this context, decision-makers should consider the impact on equity and prioritize financial risk protection for those with circulatory health conditions.

In the recent WHO Global action plan 2013-2030 Appendix 3⁵⁵ and WHO Package of essential NCD interventions,⁵⁸ emphasis has been placed on the importance of scaling up early detection using multitargeted screening for elevated BP, blood glucose, cholesterol (by dipstick) and BMI; educational programs for lifestyle changes (including smoking cessation), with priority given to cost-effective intervention to control behavioural risk factors; expanding the use of digital technologies to increase health service access and efficacy for NCD prevention; reducing the costs in health care delivery, and a list of essential drugs and tools for free use. Therefore, evidence-informed polypill⁴⁰ and digital technologies (such as the free Stroke Riskometer app or MyCKDCPG app)^{46,47,48,49} for prevention of circulatory disorders should be used widely and added to the existing WHO list of Core Medicines and Essential Tools, respectively.

Based on the totality of evidence, a tripartite approach to circulatory disorders prevention, comprising behavioural, pharmacological and structural interventions, is recommended.⁶⁰ Such strategies and interventions should be included in the Universal Health Coverage-Priority Benefits Package (UHC-PBP) because they are evidence-informed, account for economic realities and social preferences, ensure equity in access to preventative tools across all populations/countries, and allow the reduction of the burden of not only CVDs/stroke but also other circulatory and major NCDs with common risk factors, such as dementia, diabetes mellitus, chronic obstructive pulmonary disease, all types of cancer, deep vein thrombosis, pulmonary embolism, chronic kidney disease etc.^{61,62}

By accepting these additional approaches for enhancing circulatory disease prevention at primary care level, WHO Member States can immediately take necessary concrete steps for improving global circulatory health and reducing the burden of these disorders in the world.

UHC BENEFIT PACKAGE AND PRIMARY CARE: THE EXPERIENCE OF THAILAND

In 2002, Thailand expanded coverage of social welfare insurance to the whole population, although the national GDP was still relatively low. Thanks to a strong civil society network, commitment from health professionals and policy makers and a well-established health system with adequate technical capacity, the government of Thailand managed to pursue its UHC policy plans, despite concerns over its sustainability.⁶³ The role of civil society in expanding coverage was critical: A civil society group formed in 2000 to support UHC produced a draft National Health Security Bill, which was submitted to the Parliament along with another bill drafted by the government.

While the civil society bill was rejected, civil society members who contributed to drafting it were involved in finalizing the National Health Security Bill drafted by the government, which was enacted in November 2002. An interesting aspect of the Thai comprehensive benefits package is its primary care focus.

The package, in its first formulation, included inpatient, outpatient, diagnostics, medicines and medical supplies included in the Essential Medicines List, special investigations, as well as dental care, accident and emergency services. It is usually updated based on technological and medical innovations.⁶³ High-cost interventions, such as open-heart surgery including prosthetic cardiac valve replacement, Coronary Artery Bypass Grafting (CABG) or renal

replacement therapy for people with kidney disease, are also included in the UCS package.⁶⁴ As a result, Thailand experienced a significant decrease in the number of households experiencing catastrophic out-of-pocket expenses for health. Health outcomes, particularly for vulnerable groups, have significantly improved. Moreover, by leveraging community pharmacies as the first entry point to primary care, patients are able to receive medicines for common diseases, such as hypertension, without traveling to hospitals, among other positive results of introducing a UCS.⁶⁵ ■

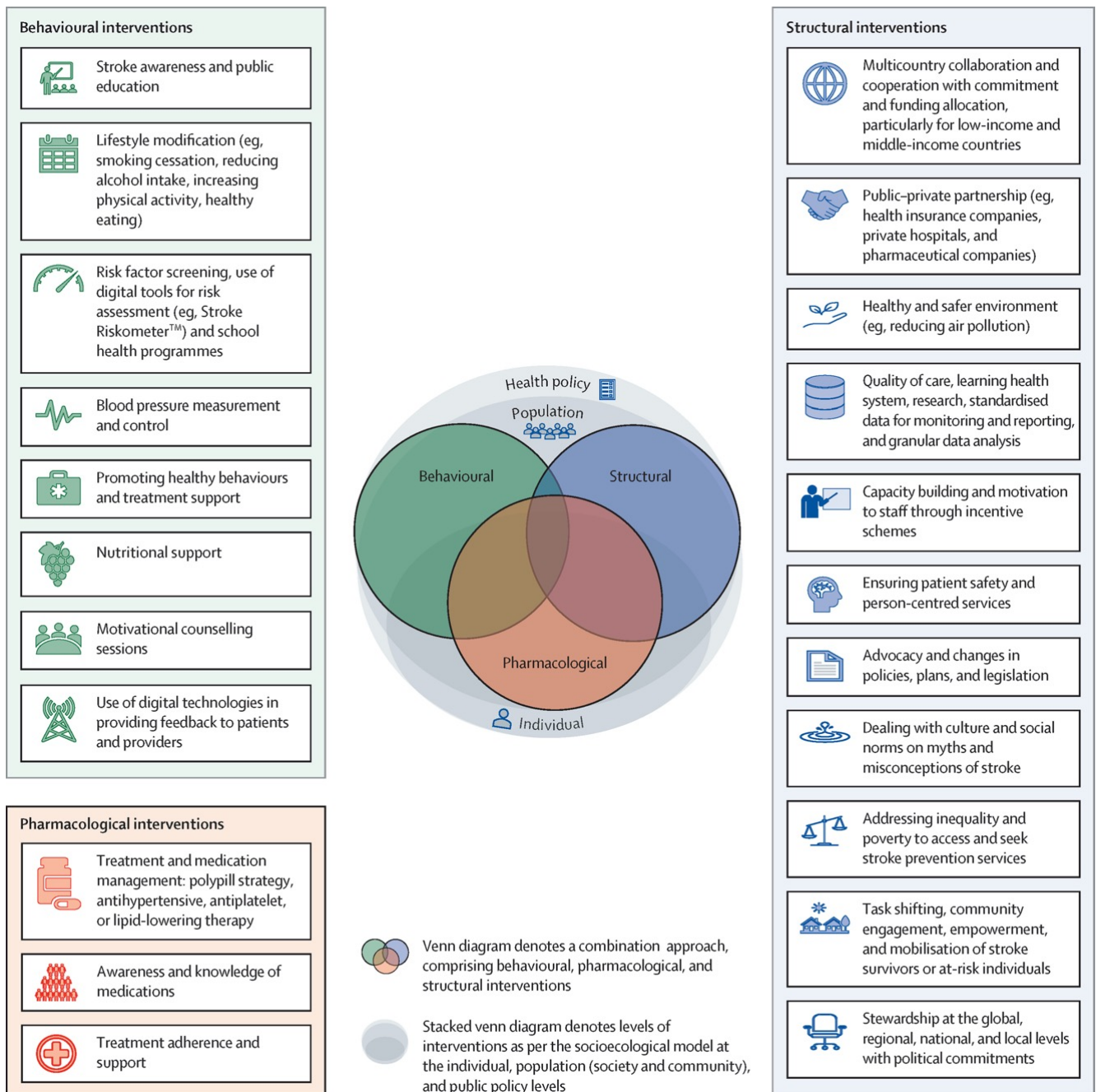
CASE STUDY: CIVIL SOCIETY CONTRIBUTION TO ENSURING ACCESS TO THE BEST BUYS FOR NCD PREVENTION AND CONTROL

The Brazilian Stroke Network, an NGO with the purpose of improving education, assistance and research in stroke in Brazil, is a collaboration between health care professionals, health authorities, patients and caregivers. A taskforce of the Brazilian Stroke Network created a National Stroke Project plan to address key challenges to implementing stroke care:

- Educational campaigns for the public and professionals
- Training emergency medical services
- Development of stroke centres in secondary and tertiary hospitals
- Improving prevention of risk factors in public outpatients' clinics
- Implementation of programs for early rehabilitation and family support

After visiting all hospitals, plans for local networks were established according to identified needs, available resources and suggestions from all collaborators for changes to the structure and facilities of local hospitals. Training was implemented for stroke teams, emergency services, and ICU staff of all hospitals with implementation of basic stroke care protocols. In order to ensure quality and minimal standards, hospitals were invited to participate in a national stroke registry, linked to the Ministry of Health and Sociedad Iberoamericana de Enfermedad Cerebrovascular and Safe Implementation in Treatments in Stroke (SIECV-SITS) Registry.

Figure 3. Tripartite combination interventions to primary CVD/stroke prevention (adopted from Bam K et al.,⁹³ with permission)



Recommended interventions to improve circulatory health at primary health care level

As discussed throughout this paper, the HEARTS Technical Package, as well as the WHO Package of essential NCDs interventions, are useful tools to improve the management of CVDs by providing strategies to improve access to PHC for circulatory diseases. These documents provide a set of comprehensive interventions to promote healthy lifestyle, evidence-based treatment protocols that are adapted to the country context, interventions aimed at improving access to essential medicines and technologies, risk-based management guidance, as well as team-based care and task-sharing to address the shortage of health care workers and finally a module dedicated on systems for monitoring.⁵⁷

Technical support offered to countries by WHO for the implementation of the HEARTS Technical Package and PEN Package is a compelling reason for recommending the adoption of these two essential tools.

Given evidence available on their cost-effectiveness, the Global Coalition for Circulatory Health recommends governments, policymakers and other stakeholders adopt and implement the HEARTS Technical Package and the PEN Package.

Appendix 3 of the WHO Global NCD Action Plan 2013-2020, updated in 2022, includes the so-called “best buys,” and other recommended interventions that are considered cost-effective to address noncommunicable diseases, including CVD, stroke, diabetes and kidney disease. WHO-CHOICE Analysis has been performed for most of the interventions listed and their cost-effectiveness is clearly indicated in the document. For this reason, the Global Coalition for Circulatory Health recommends governments and policymakers adopt and implement interventions included in Appendix 3, alongside the ones included in the HEARTS Technical Package and the WHO PEN Package.

In particular, the GCCH recommends including the following interventions in UHC benefit packages at PHC level as a starting point before expanding coverage of other services:

Intervention
Primary prevention
Simple screening for and counseling on healthy diet, physical activity, harmful use of alcohol and tobacco smoking cessation
Opportunistic screening for hypertension and CVD/stroke risk using, for example, free Stroke Riskometer app or similarly validated digital tools for reducing CVD/stroke risk in all individuals at risk, regardless of the level of increased CVD/stroke risk
Pharmacological treatment of hypertension for individuals with persistent high blood pressure, existing risk factors, and/or severe hypertension, with: <ul style="list-style-type: none"> - Thiazide and thiazide-like agents - Angiotensin converting enzyme inhibitors (ACEis) - Angiotensin receptor blockers (ARBs) - Calcium channel blockers (CCBs) Depending on availability in primary health centre
Use of polypill for individuals at intermediate absolute risk of CVD, where possible
Primary prevention of rheumatic fever and rheumatic heart diseases by providing treatment of streptococcal pharyngitis
Glucose screening test for diabetes, including for pregnant women
Blood pressure, lipid and glucose management combined with foot care for people living with diabetes, combined with healthy lifestyle counseling
Metformin initiation for people diagnosed with diabetes, if no contraindications have been identified
Screening for albuminuria for people living with diabetes and hypertension
Management of albuminuric kidney disease with ACEi or ARBs
Secondary prevention
Provision of aspirin for suspected cases of myocardial infarction
Management of ischemic heart disease, stroke and peripheral artery disease through provision of antiplatelet, anticoagulant, blood pressure lowering, blood lipid lowering drugs.

All these interventions are included in the WHO PEN, HEARTS and Appendix 3 of the WHO Action Plan on NCDs, as well as in the Disease Control Priorities 3rd edition. Cost-effectiveness analysis has been performed for all of them and some, such as opportunistic screening for hypertension, have been found to be cost-saving. The Global Coalition for Circulatory Health believes that such interventions should be provided in UHC benefit packages, as their implementation will not require a significant investment, while returns on investments in terms of healthy life-years and economic development resulting from these interventions are greater than the initial costs of implementing them. However, in one study, no evidence for the effectiveness of any best-buy interventions was found in 74 of the 83 low-income and LMICs,⁶⁶ and evidence supporting efficacy and cost-effectiveness of risk-based CVD management guidelines is scarce.^{67,68}

To be sustainable, strategies to improve circulatory health should not only be effective but sufficiently funded. Just in England, annual costs of screening of 40 to 74-year-old adults for the risk of developing a chronic condition such as heart disease, stroke, kidney disease, type 2 diabetes or dementia (“NHS Health Check”) amount to 165 million GBP.⁶⁹

A greater proportion of these funds, or access to other funds, is required to implement effective population-wide and individual strategies of circulatory health prevention, minimize inequality in targets for prevention and provide UHC. Taxation on tobacco, salt, sugar and alcohol is one of the most efficient ways to reduce their consumption and promote healthy behaviours⁷⁰ (with the associated benefits for circulatory diseases and overall health at the population level) and generate significant revenues for governments,⁶⁶ we believe these revenues can and should be re-invested in the public health sector, UHC and health research to improve health of the taxpayers, including appropriate funding of primary prevention strategies for circulatory diseases and other major NCDs⁴⁸ Such uses of the tax revenue would also be important to ensure public acceptance of these taxes.^{71,72}

It was also suggested that organizations committed to circulatory health control in high-income countries could provide some funding for resource-poor countries to help them with the development and implementation of primary prevention strategies.⁶⁹ The properly implemented primary prevention interventions will, in turn, generate significant additional cost savings from preventing diseases, which can be further used for improving well-being of the population and various social programs. Unique political, social and financial circumstances may require scaling of the population approach to successfully meet such challenges in prevention.^{48,73} ■

Financing primary care for circulatory health

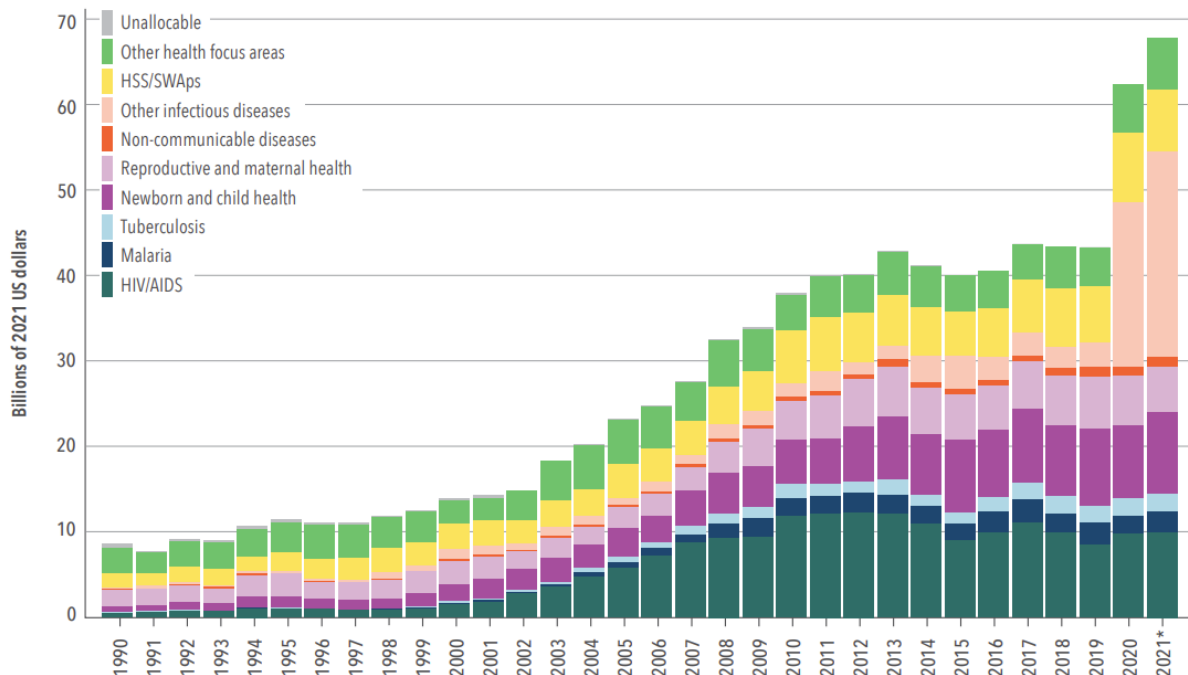
Health system financing is one of the six health system building blocks that the WHO mentions in its framework for strengthening health systems to improve access to quality and safe health services.⁷⁴ WHO defines health system financing through its three main functions of revenue raising, pooling of funds and purchasing of services. Revenue raising includes the different sources of funding, including government spending, compulsory or voluntary insurance plans, out-of-pocket payments and external aid. Pooling funds refers to the risk-sharing component of health financing systems, whereby financial risk of paying for health care is spread across the population.

Finally, the third function is linked to the allocation of resources to or payment of health service providers.^{75,76} This definition summarizes the need for any health system financing arrangement to not only focus on raising sufficient funding, but also ensuring people do not incur financial hardship when using health services.⁷³ This last goal of health system financing is strictly linked to the achievement of UHC, which has been elevated to global priority in the Sustainable Development Goal 3.8.⁷⁷

Global spending on health has been growing from 1995 to 2016 at an average rate of 4% annually, with

the most substantial growth in government per capita spending on health observed in upper-middle-income and in development assistance for health per capita spending in lower-middle-income countries. Countries' economic development has been positively associated with increased government spending on health. This factor helps explaining why the lowest increase in government health spending was observed in low-income countries, which are still relying on out-of-pocket payments for health and development assistance for health (DAH) as the main sources of health financing often targeted at specific disease areas.^{78,79}

Indeed, the latest report of the Institute of Health Metrics and Evaluation on Global Health spending found that out-of-pocket expenses for health decreased only by 1.2% from 1995 to 2019, from 19.4% of total global health spending to 18.4%, demonstrating how they still remain a prominent source of funding for health in many countries. Then, as many low and lower-middle-income countries count on DAH funding to finance their health system, they will need external aid to ensure access to services for circulatory health and NCDs more broadly. However, when looking at the breakdown of DAH by health area from 1990 to 2021, NCDs represent a tiny fraction of DAH spending, amounting to \$1.1 billion in 2021, compared to \$24 billion for infectious diseases not including HIV/AIDS and malaria.⁸⁰ This finding might help explaining why HBPs often do not include services related to the circulatory system, particularly in LMICs. ■



Source: **Financing Global Health 2021: Global Health Priorities in a Time of Change** | Institute for Health Metrics and Evaluation (healthdata.org)

When shifting the attention to the primary care level, after its definition was first formulated in the Alma Ata Declaration, PHC has become closely associated with UHC and of essential health services that are close to communities, provided at little to no cost. In a world that is experiencing an epidemiological transition from communicable to chronic noncommunicable diseases, strengthening PHC could ensure prevention and treatment in a timely, efficient and equitable manner, if well-financed and managed.

Nevertheless, the Lancet Global Health Commission on financing PHC found that not only are LMICs not investing enough in PHC, but sources of PHC expenditure are over-reliant on out-of-pocket expenditures, undermining affordable access to health care. Currently, PHC spending in LMICs is \$24 per capita; however, government spending is only \$3 per capita, compared to \$840 in high-income countries. Out-of-pocket expenses for PHC services account for 44% of total PHC spending in LMICs.⁸¹ The WHO report of the 2019 global survey assessing the capacity of health systems to delivery NCD services found that only 35% of low-income countries used health insurance revenues as a major source of funding for NCDs.³⁹

These trends have a particularly negative impact on the management of circulatory diseases, which require frequent visits to health centres and daily treatment. In countries where out-of-pocket payments represent one of the main sources of health financing,

particularly in Sub-Saharan Africa, households with one or more members affected by CVD are significantly more likely to experience catastrophic health expenditures, defined by the World Bank as health expenses exceeding 10% of household income.^{82,83,84}

Increasing government funding on PHC would also contribute to improving circulatory disease management through an integrated approach including prevention, diagnosis, treatment and palliative care.⁸⁵ Despite this recognized benefit, funding for NCD detection and screening at PHC level remains insufficient in many low-income countries. For instance, the report of the WHO global survey from 2019 indicates that while 96% of high-income countries had all six essential NCD tests (measurement of height and weight, blood pressure devices, urine strips for albumin assay, measurement of total cholesterol and blood glucose), the proportion was only 16% for low-income countries, demonstrating considerable gaps in funding for NCDs at PHC level.²¹

Countries across regions have adopted different payment mechanisms for primary care, ranging from fee-for-service, capitation, integrated capitation and salary. Evidence shows that capitation-based systems whereby providers are paid a certain amount per patient they have been assigned to are the most appropriate payment method for primary care physicians, as they promote income security for providers, improve access to care for patients, as well as equity and accountability, among other benefits.⁸⁶ ■

CASE STUDY: NATIONAL STROKE ASSOCIATION MALAYSIA

The National Stroke Association of Malaysia (NASAM) was set up in 1996 with a mission to provide affordable, stroke specific rehabilitation therapy and post-stroke support to stroke survivors and their families. Over the years, NASAM has achieved many significant milestones but, with the rising numbers of stroke cases, there's still more that needs to be done. Today more than 50,000 people have a stroke every year in Malaysia. The work of NASAM continues to be as important as ever. Public hospitals in Malaysia cannot provide daily rehabilitation services for stroke survivors and not everyone can afford private care. NASAM's unique extended programmes provide a holistic service for stroke survivors as part of the healing process that is so crucial following a stroke.

"After I had a stroke, I lost my job and was left with severe disability and depression. I stayed indoors for months before seeing a private physiotherapist, but I stopped because of finances. A nurse referred me to Stroke Action. I started attending the Life after Stroke Centre in 2020. My mobility and self-confidence improved after a few sessions of rehabilitation and exercise training as well as psycho-social support.

My advice to other stroke survivors is not to lose hope, and to engage in early rehabilitation."

Health and other benefits of providing circulatory health services at primary care

To maximize the benefits of strengthening PHC for circulatory diseases, care should be provided in a comprehensive manner; it must be accessible at the local level, clear referral systems to higher levels of care should be in place and equitable payments for PHC providers, such as capitation, should be adopted, alongside regular trainings.

The economic benefits of investing in PHC for the management of chronic diseases are often difficult to quantify, given its multifaceted nature and broad definition. Nevertheless, several studies managed to demonstrate an association between expanding primary care and better population health, fewer unnecessary hospital visits, lower health costs and generally increased health equity.^{87,88} A systematic review conducted by Egström *et al.* compared the effectiveness of specialist and primary care and found an association between increased availability of primary care doctors and lower total mortality rates, together with lower stroke mortality.

Absence of primary care doctors was also linked to greater risk of developing severe hypertension. Moreover, evidence shows that a stronger PHC system is generally associated with lower health care costs, as primary care physicians tend to order fewer diagnostic tests and procedures, compared to specialists and due to increased continuity of care that in turn led to less frequent hospitalizations and therefore less need for costly procedures.^{89,90} A study conducted in 18 OECD countries found that health systems placing greater emphasis on primary care experience not only decrease in all-cause mortality, but also better population health at lower cost and improved quality of care demonstrated by user satisfaction.⁹¹ The Republic of Seychelles established a primary care CVD prevention program in 1991 following an epidemiological survey revealing that the high CVDs burden was linked to harmful behaviours, such as consumption of saturated fatty foods, increase in salt and calories intake, increase in smoking prevalence and sedentary lifestyle. The program had the objectives of conducting health promotion, through awareness campaigns, risk factors screening in schools, public places and work sites, combined with follow-up visits through defined protocols for

those who received a diagnosis of hypertension, diabetes or dyslipidaemia. This community-based program resulted in improved knowledge of CVD in the community, including awareness of the different activities carried out through the program, reduction in the prevalence of smoking and better engagement from public authorities and other organizations that could potentially be translated into further policies or interventions for CVDs. The Seychelles experience showed the benefits of bringing health care closer to communities living in rural areas, with difficult access to transportation, ensuring equipment to screen for the main CVD risk factors at PHC level, as well as the importance of involving other health care providers, such as nurses, pharmacists and community health workers in CVD prevention and treatment programs. The authors of the study note that such interventions require a health insurance scheme to be in place in the selected country avoiding high out-of-pocket payments, combined with an effective referral system from primary to higher levels of care.⁹²

Health care providers other than physicians, such as nurses and pharmacists, play a critical role in the management of circulatory conditions. Particularly, the role of nurses has become increasingly important in the management of conditions such as high blood pressure and diabetes. Through proper training and provision of evidence-based protocol, nurses have been able to integrate multidisciplinary teams composed by primary care providers, pharmacists, physician assistants, community health workers and nutritionists among others, taking over tasks related to medication management, patient follow-up and adherence support. This interprofessional team approach to hypertension management has been yielding positive results by improving hypertension control, according to several systematic reviews.⁹³ A systematic review and meta-analysis found robust evidence that nurse-led care may be able to respond to the care needs of health systems that are increasingly suffering from a shortage of physicians. Nurses have also been found to be better than physicians at counseling and advising patients on health prevention and promotion, as well as treatment adherence, thanks to their good communication skills.⁹⁴ The division of Nephrology and Hypertension at the University of Minnesota launched a comprehensive quality improvement project entitled “chronic kidney disease (CKD) Care Map” geared toward increasing the awareness, diagnosis, and management of CKD by primary care physicians (PCP). The initiative also aimed at increasing the rate of referral to nephrology whenever appropriate. Awareness and knowledge were improved through a series of presentations

both live and recorded, to PCPs that outlined the epidemiology, definition, management, and interventions to decrease progression of CKD including the use and indications of medications known to delay progression such as angiotensin receptor inhibitors ACE-i and SGLT2 inhibitors. In addition, a series of best practice alerts were implemented through the electronic health record system to prompt providers to add the diagnosis of CKD to the patient's problem list, to use ACE-I and blockers of the angiotensin system whenever there is presence of proteinuric CKD, monitor laboratory studies, and to refer the patient to nephrology whenever the risk of progression, determined by the Tangri equation, was greater than 5% at either two or five years.

Bindu Menon Foundation

The Bindu Menon Foundation started free monthly health camps in 2013. These include consultation, medicines, blood tests and physiotherapy for stroke survivors and those at risk of stroke. The health camps were based in the city, and the foundation became increasingly aware that they were only reaching stroke patients who could travel to the foundation every month. The foundation therefore established 'Neurology on Wheels', a project in rural areas with three components:

- **We Reach** – reaching patients in resource poor rural areas, this saves the community time and cost in accessing health facilities.
- **We Teach** – tailored to stroke risk factors, recognition of symptoms, importance of time in accessing treatment.
- **We Treat** – screening for hypertension and diabetes, and identify people who have had a stroke. Individuals are counseled about their stroke risk and individuals not accessing medicines due to cost are supported by the foundation.

Idriss Kassim, Malawi

“When my wife, Mrs Thresamma had a stroke in 2013, our family was shattered. I was completely clueless as to how to manage, as was the family. Then I was told about the Dr Bindu Menon Foundation. At the foundation, I have been a witness not only to my wife's recovery but also several other patients who are now regular attendees to the camps and other foundation activities.

The EuroAspire III Primary Care study was conducted in Romania to implement European prevention recommendations for individuals with high CVD risk, particularly focusing on expanding lifestyle modifications offered by primary care physicians based on the ESC Prevention Kit, recommend cardioprotective treatment at primary care level, control CVD risk factors through prescription of appropriate medications included in the European Guidelines for the Prevention of CVD and generally create a model of care that could be scaled up to other countries. In the follow-up study conducted in 2007, authors estimated the CVD costs for both the patient and the state. They found that by implementing proper prevention measures at primary care level, the total CVD cost for patients could be reduced by a percentage between 13% and 86% of the cost of not conducting any prevention activity, while the state may reduce its expenses by 87%.

With regards to income ratio allocated to health, in the scenario where no prevention activity is conducted, patients will most likely spend more than their income on health care in case of a CVD event with maximal consequences, thus falling into poverty. In the short term, the state seems to incur the same costs by promoting prevention and primary care or only dealing with severe cases at higher level of the health system. Nevertheless, authors found that in the medium- to long-term, strengthening primary care contributes to reducing supplementary expenditures for CVDs.⁹⁵ As expected, expanding primary care has also showed positive results in the reduction of inequities in access to health services, as well as in health outcomes, since one of the prerequisites of a strong PHC system is accessibility. However, as De Maeseneer *et al.* argue that in order to improve equity, quality of the PHC services is also essential.⁸⁶ As the range of services provided at PHC level expands, high-quality PHC is critical to preventing inappropriate use of medicines, reducing visits to hospitals and ultimately saving costs for patients and the health system.⁹⁶

While the COVID-19 pandemic further highlighted the intrinsic link between a strong PHC system and better outcomes in the management of the pandemic and delivery of essential health services, as well as the direct relation between the economy and PHC, recent data demonstrated that financial resources are increasingly being directed to hospitals and higher levels of care, to the detriment of PHC.⁸¹ The COVID-19 pandemic also revealed the need to rearrange roles and responsibilities of health care providers to expand the responsibilities of care to community pharmacists and nurses, so they can take over less complex tasks

originally performed by doctors. The OECD report on policy responses to COVID-19 cites several case studies of countries that implemented this model successfully. In Slovenia, for example, community nurses were engaged in care for elderly people living with chronic conditions during the first COVID-19 wave, providing services ranging from prevention, health education but also support with treatment and long-term care. Overall, models of care based on multidisciplinary teams at PHC level improved access to care for underserved populations and people living with chronic conditions during the pandemic, demonstrating that such models could become the standard in how health systems are organized at primary care level.⁹⁰

Despite available evidence of the benefits of integrating circulatory health services at PHC level, health systems are still holding on to a model in which chronic noncommunicable diseases are managed at specialist and sub-specialist level.⁸¹ Advocacy efforts towards integrating circulatory health services at PHC level need to be scaled up in order to promote health, economic and other benefits of providing circulatory health services at primary care level. ■

Recommendations on the way forward

In September 2023, countries and other stakeholders will gather together in New York for the United Nations High Level Meeting on UHC. This meeting represents an invaluable opportunity for the global circulatory community to advocate for the inclusion of basic circulatory health services in UHC benefit packages and ensure that circulatory diseases are prioritized in governments' plans to expand UHC. In a world that is now recovering from the devastating effects of the COVID-19 pandemic that left behind weakened health systems, depleted of essential resources to fight against circulatory diseases, it is now the time to build back a health infrastructure that is well-equipped and organized to reduce the burden of the No. 1 cause of death worldwide. The global circulatory community should not lose momentum. The GCCH would like to call on countries to prioritize the following:

- Take action to expand coverage of essential health services for circulatory conditions to all by 2030, with the aim of reducing catastrophic out-of-pocket expenditures
- As the fulcrum of UHC, primary care should be made a priority for public health funding and health workforce allocation
- Prioritize the list of evidence-based cost-effective interventions included in this paper in the design of health benefit packages at PHC.

Annexes

Annex 1

SUMMARY OF INTERVENTIONS INCLUDED IN THE HEARTS TECHNICAL PACKAGE (ADAPTED FROM THE PEN PACKAGE)

Hypertension detection and treatment	
When to measure blood pressure	BP measurements should be conducted on adults during routine visits to primary health care facilities, including all adults at first presentation to the facility and, if normal, periodically thereafter (e.g. every 1 to 5 years)
	Every patient with elevated blood pressure readings requires immediate follow-up, according to the protocol
How to measure blood pressure	Use the appropriate cuff size, noting the lines on the cuff to ensure that it is positioned correctly on the arm (use large cuff if the arm circumference is >32cm)
	Although at the initial evaluation it is preferable to measure blood pressure in both arms and use the arm with the higher reading thereafter, this may not be practical in a busy primary care environment
	The patient should be sitting with back supported, legs uncrossed, empty bladder, relaxed for 5 minutes and not talking
	For persons who are getting their blood pressure measured for the first time, it is preferable to take at least two readings and to use the second reading
	Blood pressure can be measured either by a conventional sphygmomanometer, using a stethoscope, or by an automated electronic device. The electronic device, if available, is preferred because it provides more reproducible results and is not influenced by variations in technique or by the bias of the observers
	If the primary health care facility has electricity or regular access to batteries, then consider an automated validated blood pressure device with a digital reading. If the primary health care facility has no electricity or batteries, then a manual BP cuff will have to be used with a stethoscope.

Hypertension detection and treatment	
Diagnosing hypertension	The diagnosis of hypertension should be confirmed at an additional patient visit, usually 1 to 4 weeks after the first measurement
	Hypertension is diagnosed if, on two visits on different days: systolic BP on both days is ≥ 140 mmHg and/or diastolic blood pressure on both days is ≥ 90 mmHg
Hypertension treatment	Lifestyle counseling (healthy diet, physical activity, tobacco use, and harmful use of alcohol) is often recommended as a first step for patients with blood pressure of SBP 130–139 mmHg and/or DBP 80–89 mmHg who do not have other CVD risk factors
	Any of the four classes of antihypertensive medications available (angiotensin converting enzyme (ACE) inhibitors, angiotensin receptor blockers (ARB), calcium channel blockers (CCB), and thiazide and thiazide-like diuretics) may be used unless there are specific contraindications. Proper treatment of hypertension usually requires a combination of hypertension medications
	Pregnant women and women of childbearing age not on effective contraception should not be given ACE inhibitors, ARBs, or thiazide/thiazide-like diuretics; CCBs should be used. If not controlled with intensification dose of medication, refer to specialist
	Beta blockers are not recommended as first-line therapy. If a heart attack has been diagnosed within the previous three years, or there is atrial fibrillation or heart failure, then a beta blocker should be added to the starting dose of antihypertensive medication. Patients with angina may also benefit from treatment with a beta blocker
	For most patients, blood pressure is considered controlled when SBP < 140 mmHg and DBP < 90 mmHg. For patients with diabetes or a high risk of CVD lower targets may be recommended (SBP < 130 mmHg and DBP < 80 mmHg)
	Start a statin at the same time as other antihypertensive medication if patient had prior stroke, heart attack or the person is at high risk of CVD. Statins should not be used in women who are or may become pregnant.

Diabetes detection and treatment	
Diagnostic testing	Test adults who are 40+ years old and who are overweight (BMI>25) or obese (BMI>30) or follow national guidelines. Diagnostic values: ≥ 7 mmol/l or ≥ 126 mg/dl
	Fasting plasma glucose (FPG) is the recommended test for low-resource settings. Diagnostic values: ≥ 11.1 mmol/l or ≥ 200 mg/dl. HbA1c can also be used, although more expensive. Diagnostic values: ≥ 48 mmol/l or $\geq 6.5\%$
	Plasma glucose two hours after a 75 g oral glucose load (OGTT) can also be used to screen for and diagnose diabetes. Diagnostic values: ≥ 11.1 mmol/l or ≥ 200 mg/dl
	If patient is not fasting and has symptoms, a random plasma glucose (RPG) test can also be performed. It is the least accurate of the diagnostic tests
Treatment	Metformin is recommended as the first-line drug in the treatment of diabetes. Sulfonylurea is recommended as the second-line treatment, and human insulin as the third-line treatment
	Thiazolidinediones (TZDs), DPP-4 inhibitors, SGLT2 inhibitors, and GLP-1 receptor agonists may also be recommended as second and third-line treatments, although more costly
	Hypertension treatment is indicated when SBP ≥ 130 and/or DBP ≥ 80). Statins are recommended for all people with type 2 diabetes older than 40 years, but only if this does not negatively impact access to glucose-lowering and blood pressure lowering medication
Monitoring glycaemic control	Monitor glycaemic control every three months until diabetes is controlled, then every six months after that. HbA1c $< 7\%$ is generally considered to be adequate glycaemic control. In people with frequent severe hypoglycaemia, severe complications and low life-expectancy, the goal for HbA1c could be relaxed, e.g. to $< 8\%$.

Diabetes detection and treatment	
Clinical practice recommendations	Provide counseling about lifestyle change, including diet, physical activity and smoking cessation
	Initiate diabetes self-management education to reinforce treatment goals
	Prescribe aspirin for patients with CVD
	Measure blood pressure at every visit
	Measure weight and calculate BMI at every visit
	Take A1c measurements every three to six months; every six months if stable on unchanging treatment
	Arrange fasting lipid panel annually if available
	Conduct foot exam for amputation risk annually, or every visit if high-risk
	Conduct annual urine protein dipstick (microalbuminuria dipstick if available to calculate albumin to creatinine ratio) and serum creatinine measurement (GFR calculation) for CKD screening. CKD is defined by GFR
	Conduct dilated pupils retinal exam every two years if treatment available
Treatment adherence	Explain the diagnosis of diabetes, discuss the possible symptoms and inform patient of the complications of untreated diabetes
	Show the patient the appropriate dose and prescribe once-daily medications, less expensive generics and longer-lasting supplies of medicines whenever possible. Explain adverse effects of the medications and what to do if the patient experiences them
	Explain how many times a day the patient should take the medication and at what time. Label and package the tablets and check the patient's understanding before they leave the health center to help them adhere to the guidelines
	Explain to patient the importance of keeping an adequate supply of medications safely at home and take the medicines regularly as advised, even if there are no symptoms
	Provide tools such as pill boxes and medication logs to help patient remember to take their medications
	Assess adherence and discuss barriers at every visit
	Reconcile clinician's medication list with patient's list, adjust dose, and eliminate unneeded medications.

Annexe 2

OVERVIEW OF HEARTS TECHNICAL PACKAGE MANAGEMENT OF TOTAL CVD RISK (ADAPTED FROM PEN PROTOCOL 1)

Risk <10%	Counsel on diet, physical activity, smoking cessation and avoiding harmful use of alcohol. Risk <5%, follow up in 12 months. Risk 5% to <10%, follow up every 3 months until targets are met, then 6-9 months thereafter.
Risk <10% to <20%	Counsel on diet, physical activity, smoking cessation and avoiding harmful use of alcohol. Persistent BP \geq 140/90 mmHg consider drugs. Follow up every 3-6 months.
Risk <20%	Counsel on diet, physical activity, smoking cessation and avoiding harmful use of alcohol. Persistent BP \geq 130/80, consider drugs. Give a statin. Follow up every 3 months. If there is no reduction in cardiovascular risk after six months of follow-up, refer to the next level.
	Consider drug treatment for: <ul style="list-style-type: none"> • All patients with established DM and CVD (coronary heart disease, myocardial infarction, transient ischaemic attacks, cerebrovascular disease or peripheral vascular disease), renal disease. If stable, should continue the treatment already prescribed and be considered as having risk >20%. • People with albuminuria, retinopathy, left ventricular hypertrophy. • All individuals with persistent BP \geq160/100 mmHg. • All individuals with total cholesterol at or above 8 mmol/L (320 mg/dL)

Annexe 3

SUMMARY OF APPENDIX 3 OF THE WHO GLOBAL NCD ACTION PLAN (ONLY INTERVENTIONS THAT CAN BE IMPLEMENTED AT PRIMARY CARE HAVE BEEN INCLUDED)

	Appendix 3 of the WHO Global NCD Action Plan
Area of intervention	WHO-CHOICE and other Interventions
Tobacco use	Provision of cost-covered effective population-wide support (including brief advice, national toll-free quit line services and mCessation) for tobacco cessation to all tobacco users
Harmful use of alcohol	Provide brief psychosocial interventions for persons with hazardous and harmful alcohol use
	<p>Other interventions</p> <p>Provide prevention, treatment and care for alcohol use disorders and comorbid conditions in health and social services</p>

	Appendix 3 of the WHO Global NCD Action Plan
Area of intervention	WHO-CHOICE and other Interventions
Unhealthy diets	Behaviour change communication and mass media campaigns for healthy diets
	Protection, promotion and support of optimal breastfeeding practices
	Other interventions
	Nutrition education and counseling in different settings (for example, in preschools, schools, workplaces and hospitals) to promote healthy diets
Physical inactivity	Provide physical activity assessment, counseling, and behavior change support as part of routine primary health care services through the use of a brief intervention
Cardiovascular disease	Pharmacological treatment of hypertension in adults using either of the following: thiazide and thiazide-like agents; angiotensin-converting enzyme inhibitors (ACE-Is)/angiotensin-receptor blocker (ARBs); calcium channel blockers (CCBs)
	Drug therapy (treatment with an antihypertensive and statin) to control CVD risk using a total risk approach and counseling to individuals who have had a heart attack or stroke and to persons with high risk ($\geq 20\%$) of a fatal and non-fatal cardiovascular event in the next 10 years using the updated WHO CVD risk charts
	Drug therapy (treatment with an antihypertensive) to control CVD risk using a total risk approach and counseling to individuals who have had a heart attack or stroke and to persons with high risk ($\geq 10\%$) of a fatal and non-fatal cardiovascular event in the next 10 years using the updated WHO CVD risk charts
	Treatment of new cases of acute myocardial infarction with either: acetylsalicylic acid, or acetylsalicylic acid and thrombolysis, or acetylsalicylic acid, thrombolysis and clopidogrel, or primary percutaneous coronary interventions (PCI) initially treated in a hospital setting with follow up carried out through primary health care facilities at a 95% coverage rate
	Primary prevention of rheumatic fever and rheumatic heart diseases by increasing appropriate treatment of streptococcal pharyngitis at the primary care level
	Secondary prevention of rheumatic fever and rheumatic heart disease by developing a register of patients who receive regular prophylactic penicillin
	Low-dose acetylsalicylic acid within 24 to 48 hours for secondary prevention of ischemic stroke
Diabetes	Foot care to prevent amputation in people with diabetes (including educational programmes, access to appropriate footwear, multidisciplinary clinics)
	Glycaemic control for people with diabetes, along with standard home glucose monitoring for people treated with insulin to reduce diabetes complications
	Screening of people with diabetes for proteinuria and treatment with angiotensin-converting enzyme inhibitor for the prevention and delay of renal disease
	Control blood pressure in people with diabetes Statin use in people with diabetes > 40 years old

Annexe 4

INTERVENTIONS INCLUDED IN DISEASE CONTROL PRIORITIES 3RD EDITION – INCLUDING COST OVERVIEW FOR EVERY INTERVENTION

1. Essential package of interventions: Interventions targeted toward the prevention or management of shared risk factors for cardiovascular and respiratory disease:

Intervention	Type of intervention or delivery platform
Opportunistic screening for hypertension for all adults	Primary health centres
Screening for diabetes in all high-risk adults, including pregnant women	
Combination therapy for persons with multiple risk factors to reduce risk of CVD	

2. Summary of interventions to address cardiovascular and circulatory diseases by level of care

Disease condition	Intervention	Level of care
Ischemic heart disease, stroke and peripheral artery disease	Long-term management with aspirin, beta-blockers, ACEi, and statins (as indicated) to reduce risk of further events	Primary health centres
	Use of aspirin in all cases of suspected myocardial infarction	
Heart failure	Medical management with diuretics, beta-blockers, ACEi, and mineralocorticoid antagonists	Primary health centres
	Secondary prophylaxis with penicillin for rheumatic fever or established rheumatic heart disease	
	Treatment of acute pharyngitis (children) to prevent rheumatic fever	
	Prevention of long-term complications of diabetes through blood pressure, lipid and glucose management as well as consistent foot care	
	Screening and treatment for albuminuria	
Kidney disease	Treatment of hypertension in kidney disease, with use of ACEi or ARBs in albuminuric kidney disease	Primary health centre

3. DCP3 interventions to include in UHC benefit package with cost estimation for low-income countries

Intervention	Level	Unit cost in LI countries	Disease area
Long-term combination therapy for persons with multiple CVD risk factors, including screening for CVD in community settings using non-lab based tools to assess overall CVD risk	Health centre	\$ 19.22	Cardiovascular diseases
Opportunistic screening for hypertension for all adults and initiation of treatment among individuals with severe hypertension and/or multiple risk factors	Health centre	\$ 1.48	
Provision of aspirin for all cases of suspected myocardial infarction	Health centre	\$ 0.03	Ischemic heart disease
Screening and management of albuminuric kidney disease with ACEi or ARBs, including targeted screening among people with diabetes	Health centre	\$ 41.06	Chronic kidney disease
Screening and management of diabetes among at-risk adults, including glycaemic control, management of blood pressure and lipids and consistent foot care	Health centre	\$ 73.62	Diabetes mellitus
Secondary prophylaxis with penicillin for rheumatic fever or established rheumatic heart disease	Health centre	\$ 0.13	Rheumatic heart disease
Treatment of acute pharyngitis in children to prevent rheumatic fever	Health centre	\$ 0.13	Rheumatic heart disease
Long term management of ischemic heart disease, stroke and peripheral vascular disease with aspirin, beta blockers, ACEi, and statins (as indicated) to reduce risk of further events	Health centre	\$ 64.39	Cardiovascular diseases
Medical management of heart failure with diuretics, beta blockers, ACEi, and mineralocorticoid antagonists	Health centre	\$ 244.40	Cardiomyopathy and myocarditis
Screening and management of hypertensive disorders in pregnancy	Health centre	\$ 1.08	Maternal hypertensive disorders

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