

Cardiovascular disease (CVD) is the world’s main killer, causing 20.5 million deaths each year. Within CVD, atherosclerotic cardiovascular diseases (ASCVD), which develops silently throughout life until they present suddenly – often with fatal consequences – is the major causes of premature death, disability, and healthcare expenditure globally.⁽¹⁻⁴⁾ Today, there is substantial evidence to guide how ASCVD can be prevented and treated and a strong evidence-base to support the implementation of secondary prevention interventions.⁽⁵⁻⁸⁾ Yet, despite this large body of evidence, implementation remains inadequate.

ABOUT SECONDARY PREVENTION

Secondary cardiovascular prevention can be defined as a strategy aimed to reduce the probability of a recurrent cardiovascular event in patients with known atherosclerotic cardiovascular disease, including coronary artery disease, cerebrovascular artery disease, peripheral artery disease, and atherosclerotic aortic disease. Secondary prevention thus refers to counselling and drug therapy for individuals with known atherosclerotic CVD that is evidenced to prevent subsequent heart attacks and strokes.

Secondary prevention interventions include lifestyle behaviour change interventions (smoking cessation, physical activity, healthy diet); medication therapies (mainly aspirin, statins, angiotensin-converting

enzyme (ACE) inhibitors or angiotensin receptor blockers (ARB) and beta blockers) as well as cardiac rehabilitation. Even though these interventions can significantly reduce the incidence of repeat cardiovascular events and death, the proportion of individuals who receive and adhere to recommended secondary prevention interventions remains low and inequitable, particularly in LMIC.

This present update to the first WHF Roadmap for the Secondary Prevention of CVD⁽⁹⁾ sets out a conceptual framework for policymakers, healthcare systems and healthcare professionals to address barriers to the implementation of secondary prevention interventions and to develop “sustainable” and “scalable” solutions to overcome these barriers.

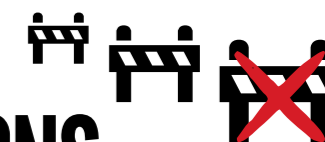
PATIENT TESTIMONY

“ My life took an unexpected turn when I was diagnosed with atherosclerotic cardiovascular disease. At first, I had a hard time accepting that I would have to take medications long-term, and to change my lifestyle, especially my diet. Fortunately, my medical team was very supportive and helped me understand how important these changes were.

Now I realise that the prescribed medications have helped manage my condition, reduce the risk of future cardiac events, and restore my confidence. In addition to medication, adopting a healthier lifestyle has helped me a lot. Regular exercise, a balanced diet, and stress management techniques have not only improved my cardiovascular health but also given me more energy.

Through my secondary prevention programme, I have discovered the power of self-care and prioritizing my health. I am grateful for the guidance and support provided by the medical team and encourage others who have experienced a cardiac event to consider joining a similar programme. ”

IDENTIFYING ROADBLOCKS – DEVELOPING ACTIONABLE SOLUTIONS



Roadblocks to implementing CVD prevention interventions are contextual, affected by geography, economic status of countries, health system organization, and sociocultural factors. They hinder optimal implementation at three different levels: Individual, Healthcare providers, and Healthcare system and policy. The update to the original WHF Roadmap for secondary prevention of CVD highlights major roadblocks and identifies actionable solutions to overcome them. Roadblocks and actionable solutions spelled out in this Roadmap are the result of an extensive literature review combined with a global survey of WHF member organisations, which generated 268 responses from 60 countries.

INDIVIDUAL LEVEL

Roadblocks	Actionable solutions
<ul style="list-style-type: none"> Lack of support from family and friends, beliefs about lifestyle, competing demands, and mental health problems like depression and anxiety lead to poor adherence to lifestyle recommendations 	<ul style="list-style-type: none"> Improve health literacy Foster self-management to support lifestyle behaviour change and medication adherence Guarantee availability, accessibility and affordability of existing secondary prevention medications through full prescription coverage, generic medications and reduction of co-payments
<ul style="list-style-type: none"> Out-of-pocket costs of medications, forgetfulness, beliefs that medication is unnecessary or causes side effects, inadequate risk perception, and low health literacy, self-efficacy and social support lead to non-adherence to cardiovascular medications 	
<ul style="list-style-type: none"> Out-of-pocket costs, language barriers, as well as difficulty accessing cardiac rehabilitation centres lead to poor participation in cardiac rehabilitation programmes 	

HEALTHCARE LEVEL

Roadblocks	Actionable solutions
<ul style="list-style-type: none"> Uneven distribution of health care providers between urban and rural locations, insufficient availability and affordability of lifestyle intervention programmes and priority medications lead to inequities in access to cardiovascular care and medicines 	<ul style="list-style-type: none"> Improve access and use of secondary prevention medicines at hospital discharge after an acute cardiovascular event by prescribing the recommended lifestyle behaviour changes and medications, focusing on long-term maintenance, as well as by increasing systematic referral of patients to cardiac rehabilitation Improve access and use of secondary prevention medicines at the cardiac rehabilitation programme, for example by using care coordinators or restructuring the medical provider decision pathway from opt-in to “opt-out” options Guarantee availability, accessibility and affordability of existing secondary prevention medications through generic medications, full prescription coverage of reduction of co-payments
<ul style="list-style-type: none"> Gaps in healthcare providers’ knowledge, attitudes and behaviours lead to clinical inertia and low implementation of secondary prevention guidelines 	
<ul style="list-style-type: none"> Limited availability of local evidence-based guidelines for CVD prevention leads to major gaps in the implementation of secondary prevention interventions 	

HEALTHCARE SYSTEM AND POLICY LEVEL

Roadblocks	Actionable solutions
<ul style="list-style-type: none"> Despite the crucial role of primary care in secondary CVD prevention, there is a lack of investments in primary care 	<ul style="list-style-type: none"> Guarantee availability and accessibility of existing secondary prevention medications through full prescription coverage, generic medications and reduction of co-payments Address the secondary prevention of CVD in the frame of a national health policy
<ul style="list-style-type: none"> Lack of supportive built environments hinders physical activity and healthy eating and are known barriers to healthy lifestyles 	<ul style="list-style-type: none"> Develop adequate fiscal policies to promote healthier purchases Foster healthy settings and environment



Generally speaking, structural bias also represents barriers to optimal implementation of secondary prevention interventions: in secondary CVD prevention, there are well-documented ethnicity and gender disparities,⁽¹⁰⁾ and sparse evidence for LGBTQI+ people (Lesbian, Gay, Bisexual, Transgender, Queer and Intersex).

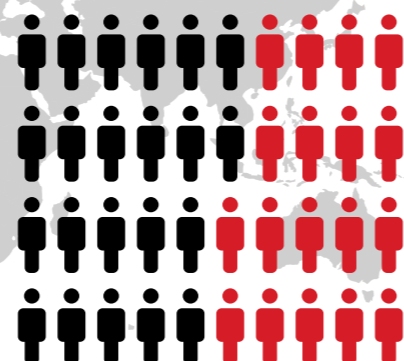
4 FIGURES SURVEY

60
COUNTRIES

268
RESPONSES



responses from cardiologists, endocrinologists, nurses, family practitioners/GPs, nephrologists, physicians, patient or patient relative



6 months post-event, around **50%** of individuals persist in **smoking** and



60% do not adhere to **physical activity guidelines**



Around **1 in 4** patients do not adhere ACE inhibitors treatment, **1 in 5** to **statins and beta-blockers**



Only **1/3rd** of patients with CVD seems to **attend some form of secondary prevention programme**



In our WHF survey, only **7%** of the respondents felt that more than **75% of their patients adhered to their physical activity programmes**



and only **3%** felt that more than **75% of their patients adhered to a healthy diet**



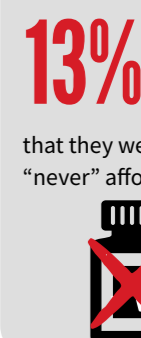
In our WHF survey **1 in 2** respondents from Low-income and Lower-middle income countries perceived lack of access to the healthcare system for patients with known CVD as a barrier



Across all country income levels, **52%** of respondents acknowledged the lack of availability of priority lifestyle intervention programmes as a roadblock



In our WHF survey, over **60%** of the respondents reported that polypills were only “sometimes” or “rarely affordable, and



In our WHF survey **40%** of the respondents from Low-income and Lower-middle income countries agreed with the statement that healthcare professionals are not aware of guidelines

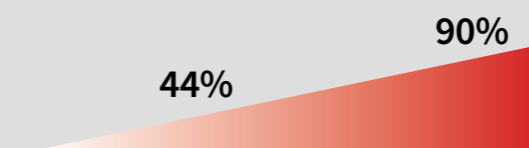


In our WHF survey, **48%** of the respondents from Low-income countries perceived the lack of affordability of priority medications (aspirin, beta blockers, ACE inhibitors, statins) as a barrier



13% that they were “never” affordable

In our WHF survey **62,78%** of all respondents reported that localized guidelines were in place in their country, with a strong gradient across country-income levels (44% in low-income countries vs 90% in high-income countries)



In our WHF survey, Strengthening the role of the primary care health system level for cardiovascular secondary prevention was perceived to be the most relevant healthcare system solution



In our WHF survey more than **1 in 4** respondents did not know whether an excise tax was in place for e-cigarettes, a figure that amounted to more than **1 in 3** for other unhealthy commodities





6

FOCUS: RECENT IMPLEMENTATION STRATEGIES FOR SECONDARY PREVENTION

Various secondary prevention interventions have gained traction in recent years and need to be considered in policy and guideline development. They include:

Digital health

Digital health can play a key role in improving the secondary prevention of CVD. It can be used to support long-term risk factor

management; to support patients' adherence to their medication and to a healthy lifestyle, to support healthcare providers in their work, or to deliver cardiac rehabilitation in a more accessible manner.

Fixed-dose combination therapy

Fixed-dose combination therapies are medications that combine multiple active pharmaceutical ingredients. Because they simplify patients' therapeutic schemes by reducing the number of tablets needed per day, they have been shown to promote medication adherence and treatment efficacy.

Innovative medical treatments

In recent years a range of novel medical strategies have been examined with respect to CVD secondary prevention including anticoagulants, novel lipid modifying agents, newer anti-diabetes agents (SGLT-2 inhibitors and GLP-1 agonists) and anti-inflammatory medicines.

Influenza vaccine

Recent studies have shown increasing evidence that influenza vaccine improves cardiovascular outcomes in people with cardiovascular disease.

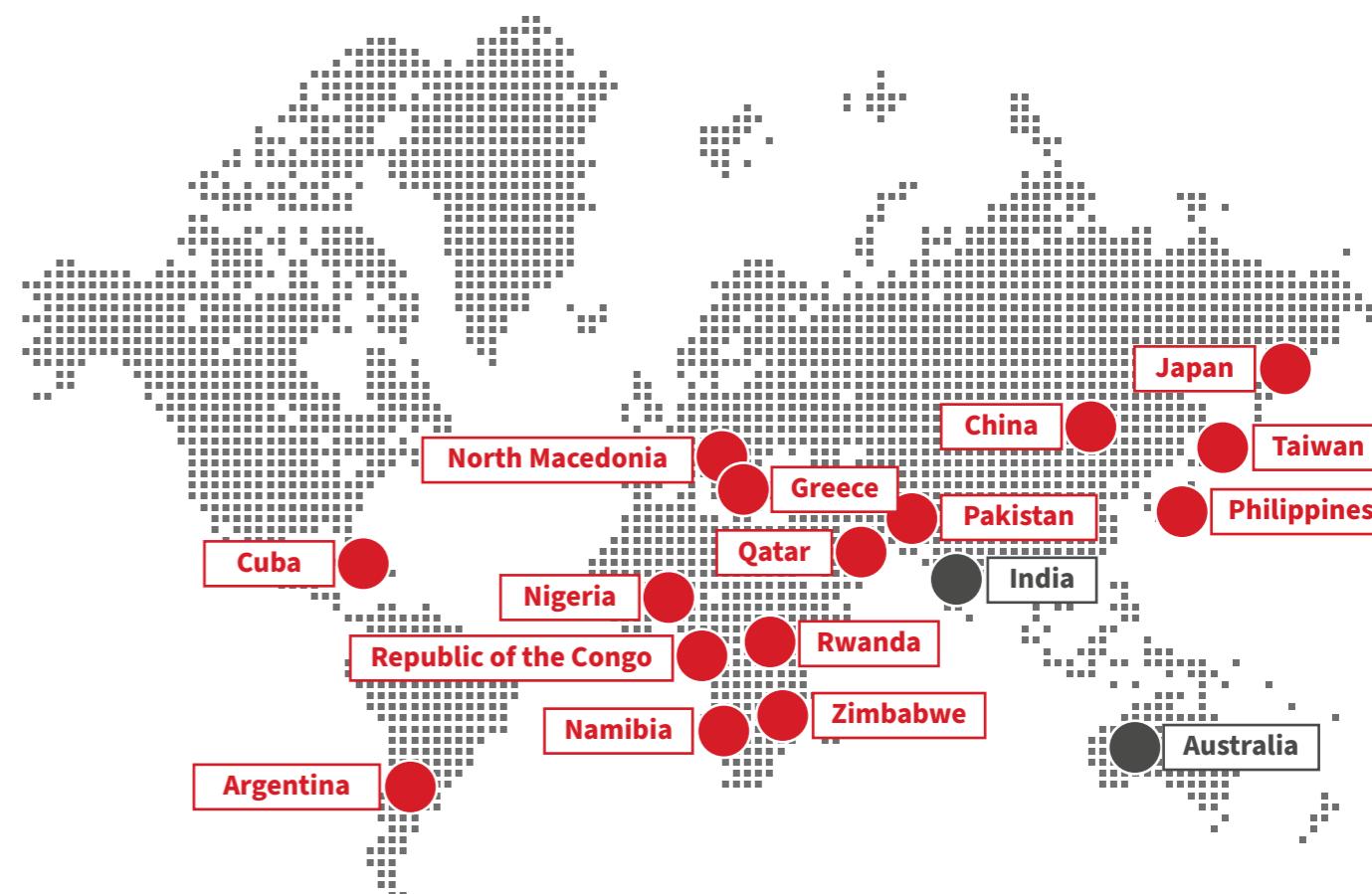
TAKING ACTION

ADAPTING THE ROADMAP FOR THE SECONDARY PREVENTION OF CVD TO LOCAL NEEDS ACROSS THE WORLD



A global framework for regional and national action, WHF Roadmaps can also be used to convene country-specific Roundtables through WHF and our Members. They allow key stakeholders to come together to identify obstacles and potential solutions that are relevant to their settings and produce national plans. Both India and Australia have held a national stakeholder discussion and used the WHF Roadmap for secondary prevention of CVD as a framework. Results from a survey to WHF members showed that **15** additional countries have used this Roadmap as a framework for discussion and meetings at national level.

USE OF WHF ROADMAP TO GUIDE NATIONAL DISCUSSIONS/MEETING AGENDAS



7

CASE STUDY

ADVOCACY, IMPACT AND CAPACITY BUILDING IN SECONDARY PREVENTION: AN AUSTRALIAN CASE STUDY

SOLVE CHD

Secondary prevention of cardiovascular disease has been an area of increasing focus for Australian researchers, clinicians, policy-makers and stakeholders. The original World Heart Federation (WHF) Roadmap for secondary prevention⁽⁹⁾ provided a platform for national reform and unity. The Australian team held a Roundtable led to a programme to modernise secondary prevention care for people with heart disease.⁽¹¹⁾ The SOLVE-CHD programme currently includes

18 collaborative projects aiming to deliver innovation in secondary prevention and supports a multidisciplinary network of 300 people from 20+ countries. The Australian ACS Guidelines now incorporate more detailed content on secondary prevention⁽¹²⁾ and the concept of a secondary prevention is now included as a National ACS Clinical Care Standard⁽¹³⁾ and a Position Statement about exercise prescription in cardiac rehabilitation was issued.⁽¹⁴⁾



“Secondary prevention is a “low-hanging fruit” in the whole field of prevention. Individuals after an atherosclerotic cardiovascular disease event are at the highest risk of recurrences, they are already identified (so we do not need to screen the population to find them), given their previous disease experience they are more willing to care for themselves, and we have simple tools to reduce their risk by three quarters. However, only a small proportion of our patients receive appropriate pharmacological treatment after an initial cardiovascular event, and even fewer reach the desired healthy lifestyle. If we want to reach the WHO targets in cardiovascular health, we need to improve our secondary prevention care urgently.”

PROFESSOR FERNANDO LANAS

Department of Internal Medicine, Universidad de La Frontera, Chile, co-chair WHF Roadmap for Secondary Prevention of CVD

“There is a good evidence base and understanding about secondary prevention treatments that can reduce subsequent cardiovascular events in people with known cardiovascular disease, however worldwide we have not been successful in implementing these. Our focus in coming years should be on the comprehensive implementation of secondary prevention. We must ensure that we address barriers and avoid creating more inequities.”

PROFESSOR CLARA CHOW

Faculty of Medicine and Health, Westmead Applied Research Centre, University of Sydney, Australia, co-chair WHF Roadmap for Secondary Prevention of CVD

WORLD HEART FEDERATION ROADMAPS

Already the **world’s number one killer**, deaths from cardiovascular disease (CVD) are increasing globally.

CVD and related conditions can often be prevented, but if not, can be detected early

and treated cost-effectively, preventing costly hospitalizations and death. But this requires coordinated national policy and health systems responses built around evidence-based strategies. Health resources are limited and so cost-effective interventions for the prevention, detection and management of CVD must be prioritized in order to plan effective health systems responses.



WHAT ARE ROADMAPS?

WHF Roadmaps are a global framework that can be adapted and used at national or regional level.

THEIR PURPOSE IS TO:

1. Summarize current recommendations to reduce the burden of CVD that are proven, practical and cost effective
2. Highlight obstacles to implementing these recommendations
3. Propose potential solutions for overcoming these obstacles
4. Provide tools and strategies to adapt solutions to local needs.



HOW DO THEY WORK?

WHF Roadmaps offer a global framework, tools and solutions that can then be used and adapted, through stakeholder collaboration, to meet the specific needs of individual regions and nations.

This requires:

- A situation analysis of the current health system based on tools such as WHF CVD Scorecards
- Roundtables with multiple stakeholders to discuss obstacles, solutions and appropriate strategies

- A plan to implement and evaluate the proposed strategies

WHO ARE THEY FOR?

WHF Roadmaps empower our Members, including CVD foundations, societies and patient associations, to lead country specific, action-oriented initiatives, including Roundtables.

These involve diverse stakeholders, such as:

- Governments and policy makers
- NGOs, health activists and advocates

- Healthcare professionals
- Corporate entities
- Academic and research institutions
- Patients and patient groups

WHY ARE THEY IMPORTANT?

To trigger effective action that can measurably reduce premature deaths and the associated global economic burden caused by CVD.

TO DOWNLOAD THE FULL ROADMAP PLEASE VISIT – CVDROADMAPS.ORG

We recognise Sanofi for their sponsorship of the WHF Roadmap for the Secondary Prevention of CVD – an Update, as well as Novo Nordisk and Daiichi Sankyo for the sponsorship of this summary document.

REFERENCES

- ¹ World Health Organization. Cardiovascular diseases (CVDs); Key facts 2021 [Available from: [https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-\(cvds\)](https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds))].
- ² Roth GA, Mensah GA, Johnson CO, Addolorato G, Ammirati E, Baddour LM, et al. Global Burden of Cardiovascular Diseases and Risk Factors, 1990-2019: Update From the GBD 2019 Study. *J Am Coll Cardiol*. 2020;76(25):2982-3021.
- ³ Mendis S, Puska P, Norrving B, World Health Organization, World Heart Federation, et al. *Global atlas on cardiovascular disease prevention and control*. 2011.
- ⁴ Goff DC, Jr., Khan SS, Lloyd-Jones D, Arnett DK, Carnethon MR, Labarthe DR, et al. Bending the Curve in Cardiovascular Disease Mortality: Bethesda + 40 and Beyond. *Circulation*. 2021;143(8):837-51.
- ⁵ Visseren FLJ, Mach F, Smulders YM, Carballo D, Koskinas KC, Böck M, et al. 2021 ESC Guidelines on cardiovascular disease prevention in clinical practice: Developed by the Task Force for cardiovascular disease prevention in clinical practice with representatives of the European Society of Cardiology and 12 medical societies With the special contribution of the European Association of Preventive Cardiology (EAPC). *European Heart Journal*. 2021;42:3227-337.
- ⁶ *Best Practices for Heart Disease and Stroke - A Guide to Effective Approaches and Strategies*. Centers for Disease Control and Prevention; 2022.
- ⁷ Schwalm J-D, McKee M, Huffman MD, Yusuf S. Resource effective strategies to prevent and treat cardiovascular disease. *Circulation*. 2016;133(8):742-55.
- ⁸ Singh K, Bawa VS, Venkateshmurthy NS, Gandral M, Sharma S, Lodhi S, et al. Assessment of studies of quality improvement strategies to enhance outcomes in patients with cardiovascular disease. *JAMA network open*. 2021;4(6):e2113375-e.
- ⁹ Perel P, Avezum A, Huffman M, Pais P, Rodgers A, Vedanthan R, et al. Reducing Premature Cardiovascular Morbidity and Mortality in People With Atherosclerotic Vascular Disease: The World Heart Federation Roadmap for Secondary Prevention of Cardiovascular Disease. *Glob Heart*. 2015;10(2):99-110.
- ¹⁰ Mufarreh A, Shah AJ, Vaccarino V, Kulshreshtha A. Trends in provision of medications and lifestyle counseling in ambulatory settings by gender and race for patients with atherosclerotic cardiovascular disease, 2006-2016. *JAMA Network Open*. 2023;6(1):e2251156-e.
- ¹¹ Redfern J, Figtree G, Chow C, Jennings G, Briffa T, Gallagher R, et al. Cardiac Rehabilitation and Secondary Prevention Roundtable: Australian Implementation and Research Priorities. *Heart Lung Circ*. 2020;29(3):319-23.
- ¹² Chew DP, Scott IA, Cullen L, French JK, Briffa TG, Tideman PA, et al. National Heart Foundation of Australia & Cardiac Society of Australia and New Zealand: Australian Clinical Guidelines for the Management of Acute Coronary Syndromes 2016. *Heart Lung Circ*. 2016;25(9):895-951.
- ¹³ Australian Commission on Safety and Quality in Health Care. *Acute Coronary Syndromes Clinical Care Standard*. Sydney: ACSQHC; 2019.
- ¹⁴ Verdicchio C FN, * Hollings M,* Gallagher R, Hendriks JM, Abell B, Briffa T, Brown A, Colquhoun D, Howden E, Hansen D, Maiorana A, Reading S, Redfern J. . A clinician guide for assessment and prescription of exercise and physical activity in cardiac rehabilitation. A CSANZ position statement. *Heart Lung Circ*. 2023;(In press, accepted 7th June 2023).



SECONDARY PREVENTION OF CVD

ROADMAP FOR SECONDARY PREVENTION OF CVD – UPDATE



WORLD HEART FEDERATION
32 rue de Malatrex
1201 Geneva
Switzerland
+41 22 512 06 95
info@worldheart.org
www.worldheart.org

