WORLD HEART REPORT 2023

CONFRONTING THE WORLD'S NUMBER ONE KILLER

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ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

Global progress against cardiovascular disease (CVD) is flatlining. Though rates of CVD deaths globally have fallen in the last three decades, this trend has begun to stall and, without concerted efforts, is at risk of reversing.

More than half a billion people around the world continue to be affected by cardiovascular diseases, which accounted for 20.5 million deaths in 2021[1] – close to a third of all deaths globally and an overall increase on the estimated 121 million CVD deaths.

Up to 80% of premature heart attacks and strokes can be prevented. The world has the tools and knowledge to mitigate harms to cardiovascular health, particularly with the advances in cardiovascular medicine in the last 50 years. But too often the tools that can help diagnose, prevent, and treat CVDs are not benefitting the communities who need them most. Around 4 in every 5 CVD deaths occur in low- and middle-income countries and progress in cardiovascular health is increasingly concentrated in High-Income countries - a glaring health inequity that must urgently be addressed.

There is no one-size-fits-all approach to improving cardiovascular health globally. Every population is susceptible to different risk factors based on where they live and their lifestyles. Whether that's having higher prevalence of tobacco and alcohol use and higher sodium intake or being more exposed to dangerous levels of air pollution and having lower levels of physical activity. This means that decision makers and stakeholders must look closely at the risk factor prevalence in their countries and regions to fully understand what policy areas need more focus to get CVD health moving in the right direction.

There are, however, baseline approaches that every country should implement to lay the foundation from which to build tailored activities to tackle CVDs. This includes implementing major policy initiatives that are essential to improving CVD health—such as National Tobacco Control Programmes, securing the availability of CVD drugs, and creating an Operational Unit in the Ministry of Health responsible for tackling non-communicable diseases (NCDs). Additionally, it requires adequately funding health systems and initiatives so that all communities can access the care they need.

The stalling progress in CVD health is not unique. Almost every health initiative around the world suffered because of the COVID-19 pandemic and countries are now grappling with which areas to prioritise as they aim to boost and protect the health of their populations. Given the severe burden of CVDs both in terms of mortality and morbidity, this area of health cannot be neglected.

The world will struggle to meet the ambitious targets it set to reduce premature mortality from NCDs by 25% compared to 2010 levels, by 2025. There is still time, however, to accelerate action toward meeting the Sustainable Development Goal 3.4 of reducing by one-third premature mortality from NCDs, including cardiovascular diseases. This goal aligns with the World Heart Federation's (WHF) World Heart Vision 2030.

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WHF, with its membership of more than 200 heart foundations, scientific societies, and patient organizations across more than 100 countries, is a committed partner to resuscitating progress on CVDs. To help promote action at every level against CVDs, this report provides the following key recommendations:

1. Countries and other relevant stakeholders should continue efforts to improve data for CVDs and their risk factors, particularly in LMICs where data gaps exist. This will help to understand why certain populations are at higher risk for certain CVDs.

2. Countries should ensure that their health expenditure as a percentage of GDP is *at least 5%*, in line with recommendations from the World Health Organization.

3. Countries should implement policies to combat CVDs, guided by the burden of disease and predominant risk factors, and ensure that their implementation is adequately resourced and monitored for progress.

4. As a matter of urgency, countries should prioritise coverage of interventions for the prevention and management of CVDs in Universal Health Coverage (UHC) benefit packages to help minimize out-of-pocket expenditure.

5. Lessons-learned in improving CVD prevention, management and improved access to care and therapies need to be implemented across all regions to address inequities and the uneven progress in CVD mortality declines.

[1]This report largely relies on 2019 data throughout, as that is the most recent year with the level of disaggregation required for analyses undertaken.

INTRODUCTION

INTRODUCTION

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INTRODUCTION

Cardiovascular diseases (CVDs) affect the heart or blood vessels and can be caused by a combination of socio-economic, metabolic, behavioural, and environmental risk factors. These include high blood pressure, unhealthy diet, high cholesterol, diabetes, air pollution, obesity, tobacco use, kidney disease, physical inactivity, harmful use of alcohol and stress.

For decades, CVDs have been the leading cause of death globally. In 2021, 20.5 million people died from a cardiovascular condition[2], a figure that accounted for around one-third of *all* global deaths and was a significant increase from the 12.1 million CVD deaths recorded in 1990. Ischaemic heart disease[3] is now the leading cause of premature death in 146 countries for men and 98 countries for women.

While CVD deaths have increased overall in the last three decades, globally the age-standardised death rate has fallen[4], indicating that some progress is being made. However, a closer look at the data reveals this progress is uneven and beginning to stall. The decline in death rates[4] for CVDs has been much faster in High-Income countries (HICs) compared to low- and middle-income countries (LMICs), where more than 80% of CVD deaths occur globally. In addition to disparities between countries, inequalities in cardiovascular outcomes within countries is also staggering, with research showing disparities according to sex, ethnicity and socioeconomic status, among others. The world is far from achieving the equitable distribution of prevention, diagnosis, treatment, and management of CVDs.

The high-level trends are clear but marked variations by region and sex for CVD death rates and risk factors show a more complex picture. Ultimately, these complexities have important implications for policy at the country, regional and global level, particularly when determining the drivers of CVDs and responses that will bring mortality and case rates down and protect people's health.

At the global level, there is an important foundation to build from in making progress against CVDs. In May 2012, the World Health Assembly (WHA) adopted a resolution setting the goal of reducing premature mortality from

noncommunicable diseases (NCDs)[6] by 25% by 2025. One year later, the NCD Global Monitoring Framework was launched to help drive progress in the prevention and control of NCDs and ensure that political commitment remains in tackling them. The Framework includes nine voluntary global targets focused on combating behavioural and metabolic risk factors and strengthening national health system responses[7].

Unfortunately, the current pace of decline in CVD death rates is insufficient to achieve the goal of a 25% reduction in mortality by 2025, despite the work of international organisations and country governments in recent years. There are myriad reasons behind this, from a lack of funding to challenges securing the political commitments necessary to comprehensively tackle an issue as far-reaching as CVDs. Further, the impact of the COVID-19 pandemic on health systems and policies means many countries are assessing how to prioritise as they attempt to reignite progress across multiple health initiatives and recover from the economic impact of the pandemic.

This first-ever World Heart Report is aimed at equipping policymakers and advocates around the world with the information needed to help reduce CVD deaths and accelerate progress in cardiovascular health. The report findings highlight the main differences between geographies in terms of CVD burden and risk factors, as well as structural barriers and inequities in CVD health, with the goal of guiding policymakers at national and international levels toward the priorities they should seek to address. Key policies to tackle CVD and its risk factors are also summarized. Future World Heart Reports, along with WHF's data hub the World Heart Observatory[8], will aim to provide easy access to CVD data to inform research and advocacy.

The report begins with a comprehensive overview of the main dimensions of cardiovascular

[2]Lindstrom M, DeCleene N, Dorsey H, et al. Global Burden of Cardiovascular Diseases and Risks Collaboration, 1990-2021. J Am Coll Cardiol. 2022 Dec, 80 (25) 2372–2425
[3]Ischaemic heart disease, also referred to as coronary heart disease, are problems caused by narrowed coronary arteries that supply blood to the heart muscles.
[4]Age-standardisation is a technique used to better compare disease outcomes, such as death rates, across populations. See page 6 for a more detailed description.
[5]Any reference to death rates in this document refers to age-standardized rates.
[6]The resolution covers NCDs broadly, and specifically mentions CVD, cancer, diabetes and chronic respiratory diseases.
[7]World Health Organization. NCD Global Monitoring Framework. Available from: https://www.who.int/publications/i/item/ncd-surveillance-global-monitoring-framework (last accessed 10 May 2023).
[8]The World Heart Observatory can be accessed via the WHF website; www.worldheart.org

health, bringing together epidemiological, policy and economic data. It then provides assessment of policy implementation through the WHF Policy Index, and provides relevant policy recommendations.

Throughout the report, the latest comprehensive sources for which data disaggregated by country, age and sex are available have been used. (Appendix Figure 1). Global, regional[9], and country level estimates from 2019 relevant to atherosclerotic CVDs[10] are presented in this report, as these are the most comprehensive and recent data set available.

We acknowledge that some of these sources use modelling to develop estimates, and that there are important gaps in the data that inform these models, particularly in certain geographies. For example, approximately 85% of countries in the Sub-Saharan Africa region do not have Vital Registration Survey data available to inform models[11]. We acknowledge that COVID-19 had an important impact on CVDs; however, because of limited data, it is outside the scope of this report[12].

GLOBAL BURDEN OF CARDIOVASCULAR DISEASES MORTALITY

CVDs are the leading cause of mortality and a major contributor to disability. Globally, the estimated number of deaths due to CVDs increased from around 12.1 million in 1990 (equally distributed between males and females) to 18.6 million (9.6 million males and 8.9 million females) in 2019 (Figure 1).

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Figure 1: Global trends in number of deaths due to cardiovascular diseases, 1990-2019.
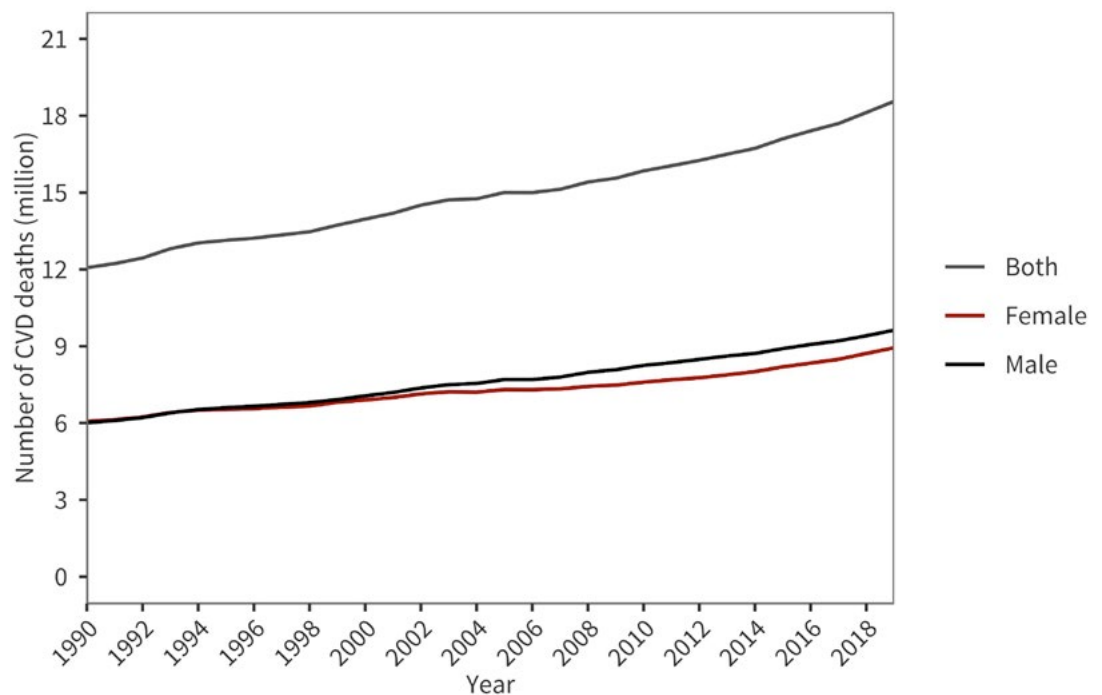
Source: Institute for Health Metrics and Evaluation (IHME). GBD Compare Data Visualization. Seattle, WA: IHME, University of Washington, 2020. Available from http://vizhub.healthdata.org/gbd-compare. (18 March 2023).

[9]Super-regions, as reported by the Global Burden of Disease. See Appendix for a detailed explanation of the regional classification.

[10]Atherosclerosis is the thickening or hardening of the arteries caused by the build-up of fats, cholesterol and other substances in the artery walls. Atherosclerotic CVDs, including coronary heart disease and stroke, represent 85% of all deaths from CVD, and are the leading cause of death worldwide.

[11]Murray, C.J.L. The Global Burden of Disease Study at 30 years. Nat Med 28, 2019–2026 (2022). https://doi.org/10.1038/s41591-022-01990-1.

[12]A separate methodological supplement, explaining in greater detail the analytical approach and data sources used to develop this report, is available on the WHF website: www.worldheartfederation.org

The number of deaths due to CVDs in 2019 represented 33% of all global deaths, with ischaemic heart disease (9.1 million deaths) and stroke (6.6 million deaths) totalling 85% of all CVD deaths worldwide.

While the number of deaths due to CVDs over the last 30 years has increased globally—in large part due to an ageing and growing population—the age-standardised death rate has declined by one third, from 354.5 deaths per 100,000 people in 1990 to 239.9 deaths per 100,000 people in 2019 (Figure 2).

> **Age-standardization is a technique used to better compare disease outcomes, such as death rates, across populations.**
>
> **It calculates what the disease outcome would be if the population age-structure were the same for all countries. This allows an assessment of whether the observed differences are due to factors related to the disease, rather than the age structure of the population.**

Figure 2: Global trends in age-standardised cardiovascular disease death rate (per 100,000 people), 1990-2019.

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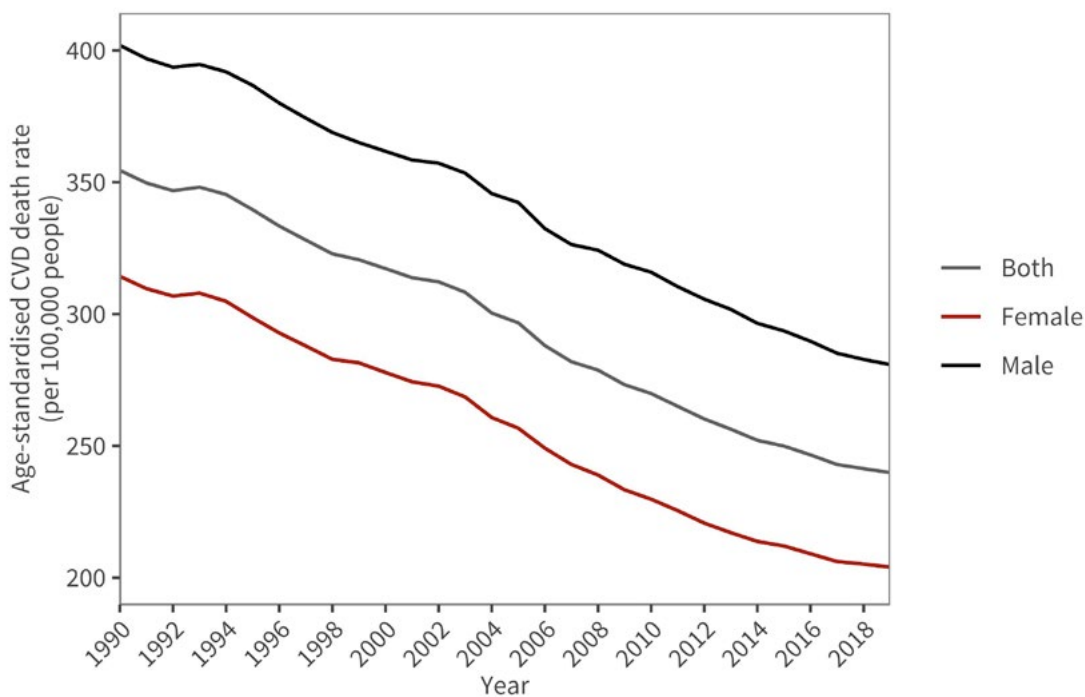
Source: Institute for Health Metrics and Evaluation (IHME). GBD Compare Data Visualization. Seattle, WA: IHME, University of Washington, 2020. Available from http://vizhub.healthdata.org/gbd-compare. (18 March 2023).

CVD death rates declined across all regions in this period, though the decline has been slowing in the past decade and is uneven across regions (Figure 3). The High-Income region, for example, experienced the fastest average rate of decline for both males and females from 1990 to 2019 (average annual rate of change of 2.6%). The slowest rate of decline in both sexes was observed in the Southeast Asia, the South Asia, East Asia and Oceania, and the Sub-Saharan Africa regions. Almost no improvement in CVD death rate for males was observed in these regions. Underscoring the disparities in progress, the death rate in the Sub-Saharan African region was 1.2 times higher than the High-Income region in 1990, whereas by 2019 the gap had grown to a death rate 2.1 times higher in Sub-Saharan Africa than in the High-Income region.

The High-Income region had the lowest CVD death rate overall (102.1 and 153.8 deaths per 100,000 people for females and males respectively).

Only the Latin America and the Caribbean region achieved a decline in female death rates in 2019 that reached the rate the High-Income region had registered in 1990. For males, in 1990 the lowest levels of CVD death rate were recorded in Latin America and the Caribbean, Sub-Saharan Africa, and High-Income regions with South Asia only achieving a decline in 2019 that reached those levels.

The Central Europe, Eastern Europe and Central Asia region had the highest age-standardized CVD death rates for males and females in both 1990 (670.2 and 467.2 deaths per 100,000 people respectively) and 2019 (524.1 and 345.7 deaths per 100,000 people respectively). The North Africa and Middle East region had the second highest rates for males and females in 2019 (376.7 and 339.8 deaths per 100,000 people for males and females respectively).

Figure 3 - Regional trends in age-standardised cardiovascular disease death rate (per 100,000 people), 1990-2019. National age-standardised CVD death rates are shown in Figure 4.
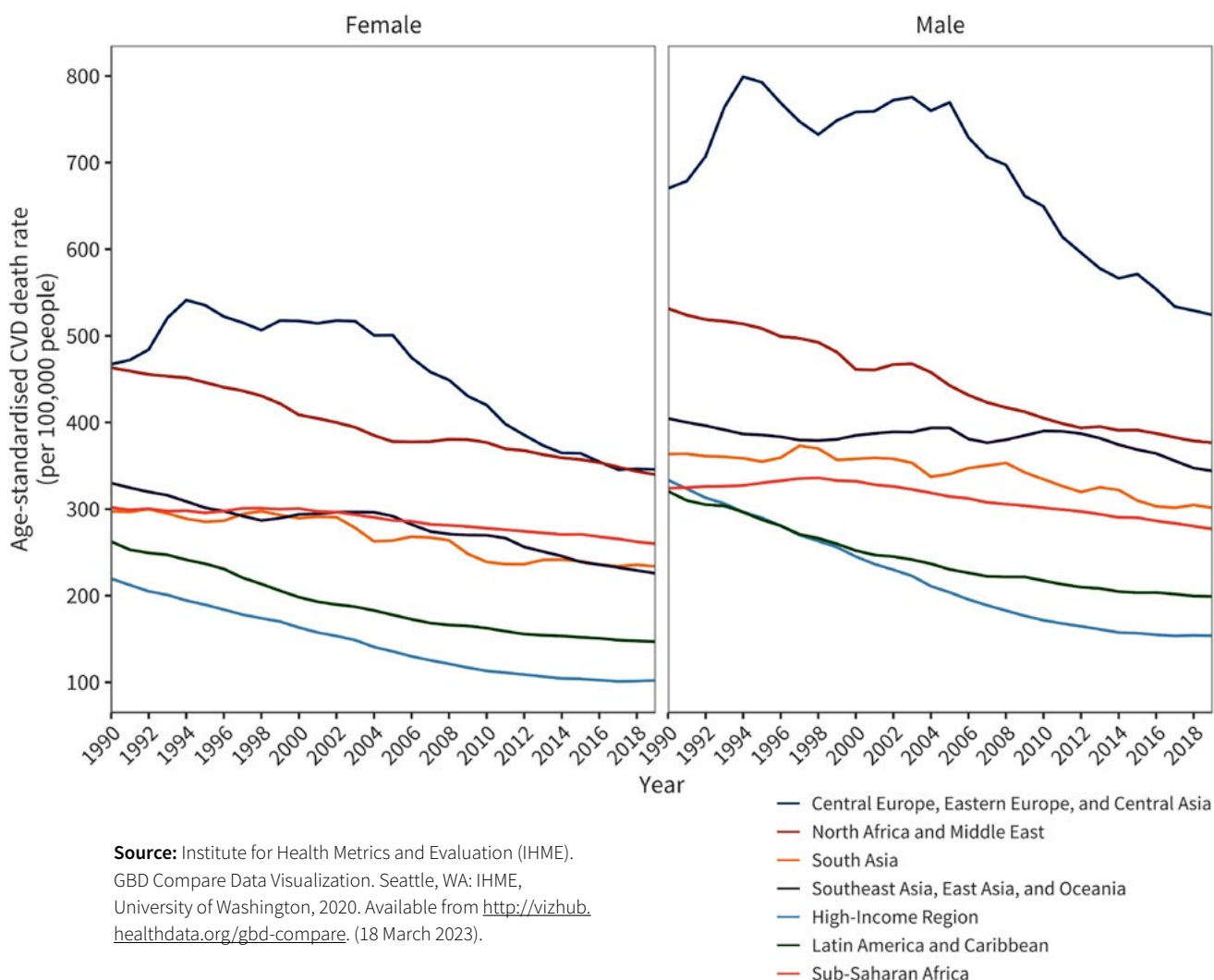
Figure 4: National age-standardised cardiovascular disease death rate (per 100,000 people, both sexes), 2019. Countries and territories without data are shown in grey.

Age-standardised
CVD death rate
(per 100,000 people)

900
825
750
675
600
525
450
375
300
225
150
75

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Caribbean

American Samoa	Fiji	Montenegro	Seychelles
Bahrain	French Polynesia	Nauru	Solomon Islar
Bermuda	Kiribati	Niue	Tokelau
Brunei Darussalam	Maldives	Palau	Tonga
Cape Verde	Marshall Islands	Samoa	Tuvalu
Comoros	Mauritius	Sao Tome and Principe	Vanuatu
Cook Islands	Micronesia, Federated States of		

Source: Institute for Health Metrics and Evaluation (IHME). GBD Compare Data Visualization. Seattle, WA: IHME, University of Washington, 2020. Available from http://vizhub.healthdata.org/gbd-compare. (18 March 2023).

CARDIOVASCULAR DISEASE DEATHS BY SEX

Globally, males have a higher age-standardized CVD death rate (280.8 deaths per 100,000 people in 2019) than females (204.0 deaths per 100,000 people in 2019) (Figure 2), though this difference is not consistent across all countries.

In 2019, CVD death rates were higher in males than females in all countries in the High-Income region, the Central Europe, Eastern Europe, and Central Asia region, and the South Asia region.

Females had higher CVD death rates than males in the following:

• Six of 21 countries in the North Africa and Middle East region, with the highest differences in Qatar (464.6 compared to 301.9 deaths per 100,000 people for females and males respectively), Egypt (600.0 compared to 491.6 deaths per 100,000 people), and Algeria (447.7 compared to 371.5 deaths per 100,000 people).

• Thirteen of 46 countries in the Sub-Saharan Africa region, with the highest gaps observed in Mali, Mauritania, Congo (Congo-Brazzaville), Ghana, and Sierra Leone (Figure 5).

Figure 5 – Male-female difference in age-standardised cardiovascular disease death rate (per 100,000 people) in Sub-Saharan Africa by country, 2019.

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CARDIOVASCULAR DISEASE DEATHS BY CAUSE

In all regions, ischaemic heart disease is the leading cause of CVD mortality across males and females, except for females in the Sub-Saharan Africa region and both males and females in South Asia where stroke is the leading cause of CVD mortality (Figure 6). Stroke is on average the second leading cause of CVD mortality across regions.

Figure 6 – Cause-specific regional age-standardised cardiovascular disease death rate, 2019.

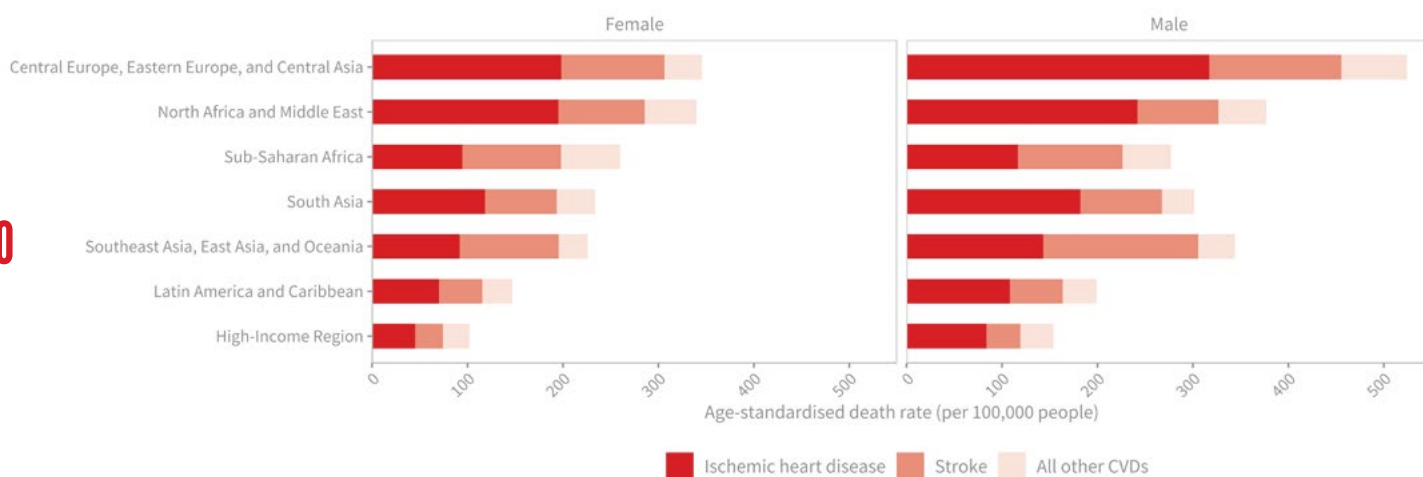**Source:** Institute for Health Metrics and Evaluation (IHME). GBD Compare Data Visualization. Seattle, WA: IHME, University of Washington, 2020. Available from http://vizhub.healthdata.org/gbd-compare. (18 March 2023).

RELATIONSHIP BETWEEN CARDIOVASCULAR DISEASE MORTALITY AND HEALTH EXPENDITURE

Many across civil society have long called for countries to invest a *minimum* of 5% of their Gross Domestic Product (GDP) into health, with the aim of reducing out-of-pocket expenditure and improving service coverage in pursuit of Universal Health Coverage. This level of investment is consistent with recommendations from WHO[13]; however, there are significant variations between regions in the proportion of countries reaching this target (Table 1).

Table 1 – Proportion of countries spending at least 5% of GDP on health, 2019.

Region	%
High-Income	97
Central Europe, Eastern Europe, and Central Asia	85
Latin America and Caribbean	71
North Africa and Middle East	53
Southeast Asia, East Asia, and Oceania	50
Sub-Saharan Africa	45
South Asia[14]	0

Countries that spend more on healthcare as a percentage of GDP on average have lower CVD death rates, whereas countries that spend less as a percentage of GDP on average have higher death rates (Figure 7).

A positive correlation is observed regarding people's out-of-pocket expenditure. In countries where people spend more out-of-pocket on their healthcare, the CVD death rates are on average higher (Figure 8).

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Figure 7 – National age-standardised cardiovascular disease death rate (per 100,000 people), 2019, by current health expenditure (CHE) as share of national income (GDP).
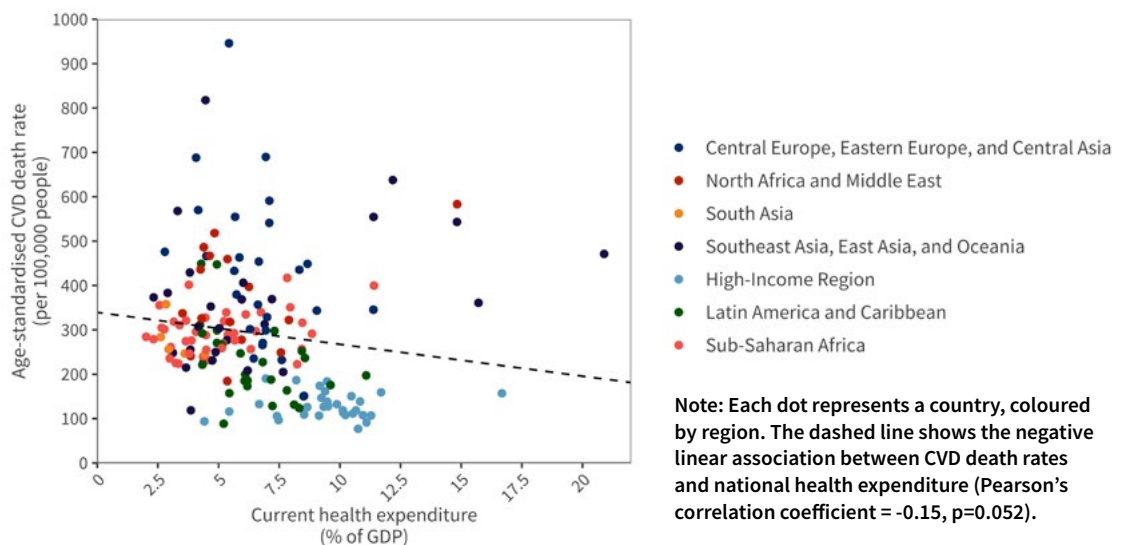
Central Europe, Eastern Europe, and Central Asia
North Africa and Middle East
South Asia
Southeast Asia, East Asia, and Oceania
High-Income Region
Latin America and Caribbean
Sub-Saharan Africa

Note: Each dot represents a country, coloured by region. The dashed line shows the negative linear association between CVD death rates and national health expenditure (Pearson's correlation coefficient = -0.15, p=0.052).

[13]World Health Organization. The World Health Report 2010. Available from: https://www.who.int/publications/i/item/9789241564021 (last accessed 10 May 2023).

[14]In South Asia, where no countries reach the 5% target, the percentage of GDP allocated for health expenditure is 2.6% in Bangladesh, 3.6% in Bhutan, 2.9% in India, 4.4% in Nepal and 2.8% in Pakistan.

Figure 8 – National age-standardised cardiovascular disease death rate (per 100,000 people), 2019, by out-of-pocket (OOP) health expenditure as share of current health expenditure (CHE).
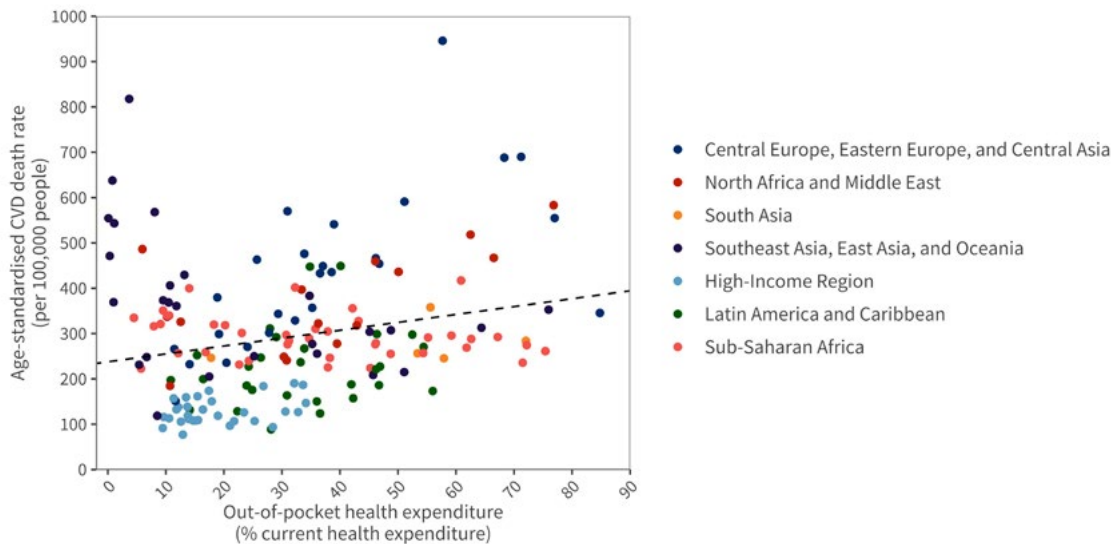
Note: Each dot represents a country, coloured by region. The dashed line shows a positive association between CVD death rates and OOP health expenditure as a share of national health expenditure (Pearson's correlation coefficient = 0.23, p=0.002).

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CARDIOVASCULAR DISEASE PREMATURE MORTALITY

Premature mortality from NCDs refer to deaths between the ages of 30 and 70 years of age. In addition to the tragedy of this loss of life, these deaths impact societies, and economies more broadly. Overall, 38% of premature deaths from NCDs were caused by CVDs in 2015[15] . Ischaemic heart disease was the leading cause of premature death among all NCDs in most countries for both men and women.

The highest risk of premature mortality[16] from ischaemic heart disease in 2015 was seen in countries in the Central Europe, Eastern Europe, and Central Asia region (men in Belarus recorded the highest risk of premature mortality, with a 20.2% probability of premature death), and in the North Africa and Middle East region. Ischaemic heart disease in men was also highest in the Central Europe, Eastern Europe and Central Asia region (Figure 9).

The risk of premature mortality due to haemorrhagic stroke was as high as 10.3% in Mongolia and 9.6% in Turkmenistan among men and 6.4% in Mongolia and 5.9% in Sierra Leone among women.

The highest risk of premature mortality due to ischaemic stroke for women was observed in countries in the Sub-Saharan Africa region (around 3.0% probability of premature death), particularly Western African countries, such as Ghana, Sierra Leone, and Côte d'Ivoire. For all other cardiovascular diseases, the risk of premature mortality among women was similarly highest in the Sub Saharan Africa region.

[15]The latest year for which data on the risk of premature mortality is available.

[16]Expressed as the probability of dying from CVD between exactly 30 years and exactly 70 years of age. The probability of death is calculated in the absence of competing causes of death so that only the risk of dying from the specific cause is measured.

Figure 9 - Probability of dying prematurely (between 30 and 70 years of age) from ischaemic heart disease, by sex, 2015. Countries and territories without data are shown in grey.

Male

Probablity of premature death (%)

17.8
15.3
12.8
10.3
7.8
5.3
2.8
0.3

Caribbean

American Samoa	Fiji	Montenegro	Seychelles
Bahrain	French Polynesia	Nauru	Solomon Islar
Bermuda	Kiribati	Niue	Tokelau
Brunei Darussalam	Maldives	Palau	Tonga
Cape Verde	Marshall Islands	Samoa	Tuvalu
Comoros	Mauritius	Sao Tome and Principe	Vanuatu
Cook Islands	Micronesia, Federated States of		

Female

Probablity of premature death (%)

17.8
15.3
12.8
10.3
7.8
5.3
2.8
0.3

Caribbean

American Samoa	Fiji	Montenegro	Seychelles
Bahrain	French Polynesia	Nauru	Solomon Islar
Bermuda	Kiribati	Niue	Tokelau
Brunei Darussalam	Maldives	Palau	Tonga
Cape Verde	Marshall Islands	Samoa	Tuvalu
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RISK FACTORS FOR CARDIOVASCULAR DISEASES

There are several modifiable risk factors for cardiovascular diseases, including:

- **Behavioural factors,** such as insufficient physical activity, high sodium intake, high alcohol consumption, and tobacco smoking.

- **Metabolic factors,** such as high blood pressure, high fasting plasma glucose, high body-mass index, high levels of low-density lipoprotein (LDL) cholesterol, and diabetes.

- **Environmental factors,** such as ambient air pollution.

Some risk factors (e.g., family history) cannot be modified, while others (e.g., tobacco use, high blood pressure) can be modified with preventive actions or treatment.

In 2021, according to the Global Burden of Disease Study, high blood pressure was the leading modifiable risk factor globally for mortality and contributed to 10.8 million CVD deaths worldwide.

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Modifiable risk factors that contributed to CVD deaths in 2021 include:

• **Elevated LDL cholesterol[17]**
  (3.8 million deaths)

• **High fasting plasma glucose**
  2.3 million deaths)

• **Air pollution (4.8 million deaths)**

• **High body-mass index (2.0 million deaths)**

• **Tobacco use (3.0 million deaths)**

• **Low physical activity (397 000 deaths)**

• **Raised blood pressure (10.8 million deaths).**

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[17]This is one type of blood lipid.

The following exploration of select risk factors provides an overview of how they contribute to CVDs in men and women by region and country, and we highlight select international policy initiatives to help mitigate them.

PHYSICAL ACTIVITY

Measure: Age-standardised total physical activity (MET-min/week). The Metabolic Equivalent of Task (MET) metric measures how much energy an activity consumes compared to being at rest. The amount of MET minutes per week expresses how much energy one has expended while performing various activities throughout the whole week.

Data: Global Burden of Disease, 2019

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Countries in the North Africa and Middle East region had the lowest levels of age-standardized physical activity, while countries in the Central Europe, Eastern Europe, and Central Asia region and South Asia region had the highest levels for males and females respectively (Figure 10).

The age-standardised levels of physical activity[18] among adults aged 25 years and older were higher among males compared to females in 75% of countries.

The lowest levels of physical activity among adults were observed in Iraq for males (2416.7 MET-min/week) and Malta for females (2048.7 MET-min/week). Both males and females in Kenya had the highest levels of physical activity (9 381.8 MET-min/week and 10 321.5 MET-min/week respectively).

Policy resources: The WHO Global Action Plan on Physical Activity 2018-2030 sets out 20 policy actions to improve physical activity, which are designed to be universally applicable to all countries. These policies act at multiple levels and aim to challenge social norms and attitudes around physical activity, create maintaining environments that promote physical activity, improve access to programmes for people of all ages, and strengthen leadership and government.

The forthcoming WHF Policy Brief on Physical Activity (to be published summer 2023) will provide further context on the impact of physical inactivity on CVDs and guidance for policymakers, WHF members, and individuals.

[18] As expressed in Total Physical Activity (MET-min/week).

Figure 10: National age-standardised total physical activity (MET-min/week) for individuals aged 25 years and above, by sex, 2019. Countries and territories without data are shown in grey.

Men

Age-standardised
total physical activity
(MET-min/week)

11550
10600
9650
8700
7750
6800
5850
4900
3950
3000
2050

Caribbean

American Samoa	Fiji	Montenegro	Seychelles
Bahrain	French Polynesia	Nauru	Solomon Islar
Bermuda	Kiribati	Niue	Tokelau
Brunei Darussalam	Maldives	Palau	Tonga
Cape Verde	Marshall Islands	Samoa	Tuvalu
Comoros	Mauritius	Sao Tome and Principe	Vanuatu
Cook Islands	Micronesia, Federated States of		

Women

Age-standardised
total physical activity
(MET-min/week)

11550
10600
9650
8700
7750
6800
5850
4900
3950
3000
2050

Caribbean

American Samoa	Fiji	Montenegro	Seychelles
Bahrain	French Polynesia	Nauru	Solomon Islar
Bermuda	Kiribati	Niue	Tokelau
Brunei Darussalam	Maldives	Palau	Tonga
Cape Verde	Marshall Islands	Samoa	Tuvalu
Comoros	Mauritius	Sao Tome and Principe	Vanuatu
Cook Islands	Micronesia, Federated States of		

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SODIUM INTAKE

Measure: Mean dietary sodium intake expressed in grams/day among individuals aged 25 years and older

Data: Global Burden of Disease, 2019

In most countries, dietary sodium intake far exceeds the recommended levels of less than 2 grams/day (Figure 11a and 11b).

The daily individual dietary sodium intake rate is highest in the Southeast Asia, East Asia, and Oceania region compared to other regions, at 6.7 grams/day for men and 5.6 grams/day for women.

For men globally, the rate is lowest in Sub-Saharan Africa (2.6 grams/day) and for women globally, the rate is lowest in the North Africa and Middle East region 2.1 grams/day.

In 92% of countries, the daily individual dietary sodium intake rate is higher among males compared to females.
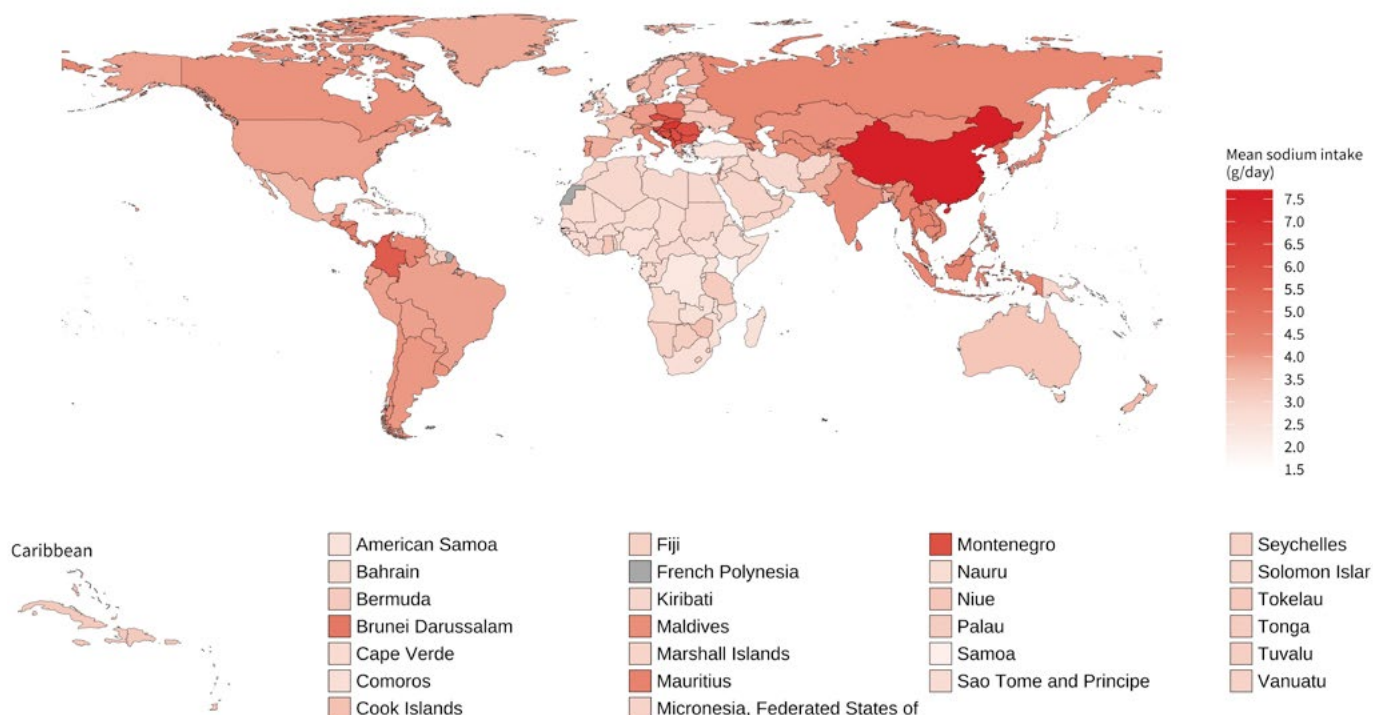
There is notable variation between countries, with intake in men ranging from a low of 1.7 grams/day in Kenya to a high of 7.6 grams/day in China and from 1.7 grams/day in Turkey to 6.5 grams/day in China among women.

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Figure 11a – National mean dietary sodium intake (grams/day) by sex, 2019. Countries and territories without data are shown in grey.

Men

Mean sodium intake (g/day)
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5

Caribbean

American Samoa
Bahrain
Bermuda
Brunei Darussalam
Cape Verde
Comoros
Cook Islands

Fiji
French Polynesia
Kiribati
Maldives
Marshall Islands
Mauritius
Micronesia, Federated States of

Montenegro
Nauru
Niue
Palau
Samoa
Sao Tome and Principe
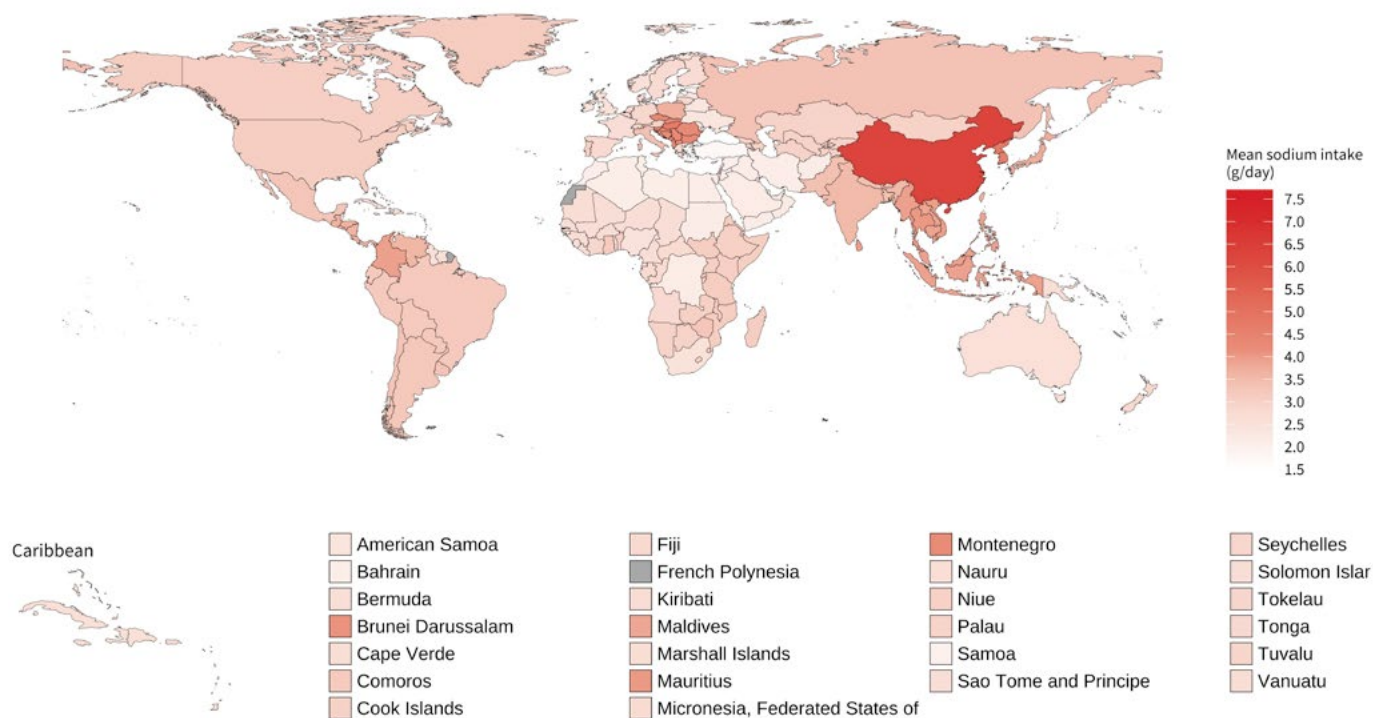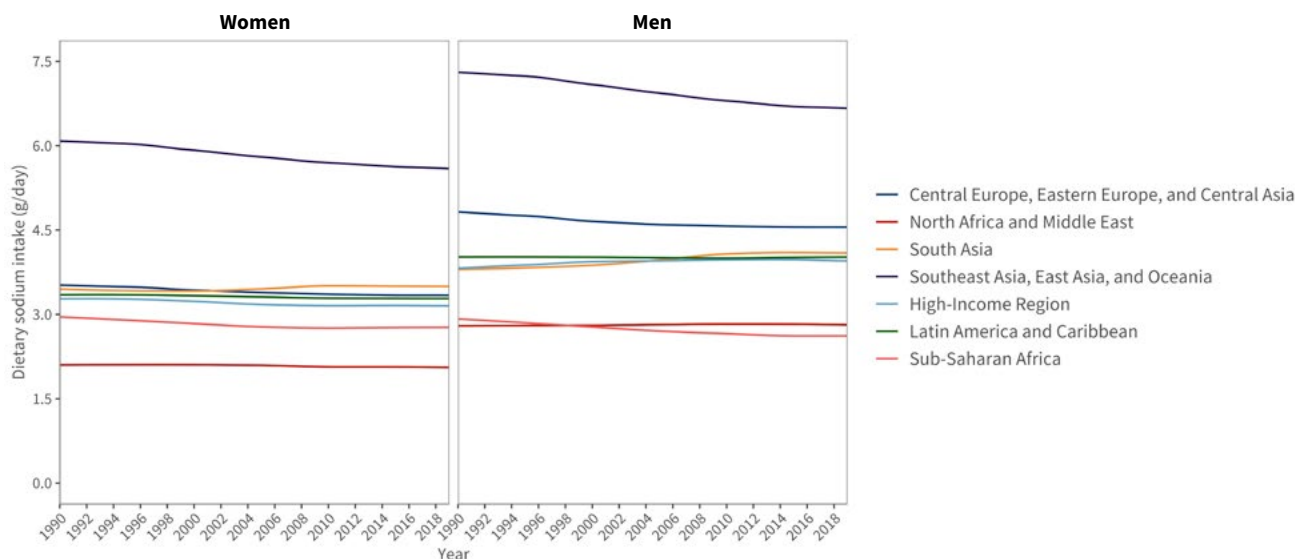
Seychelles
Solomon Islar
Tokelau
Tonga
Tuvalu
Vanuatu

Women

Figure 11b - Regional trends in mean dietary sodium intake (grams/day) for individuals aged 25 and above from 1990 to 2019, by sex.

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Policy resources: All the "best buys" for reducing unhealthy diet, as outlined in WHO's recommendations for the most cost-effective policies to tackle NCDs, relate to sodium reduction. Reformulation of food products, interventions in public institutions such as hospitals and schools, behaviour change campaigns and front-of-pack labelling schemes are all effective interventions that can be implemented at low cost. The WHO SHAKE package provides a more detailed framework for creating a successful salt reduction strategy at the national level, covering surveillance of salt use, engaging with industry, adopting labelling and marketing standards, educating and empowering individuals to reduce intake and promoting healthy eating environments. Further recommendations for sodium reduction programmes are available through the Resolve to Save Lives Sodium Reduction Framework, which includes implementation tools and examples of successful programmes.

ALCOHOL CONSUMPTION

Measure: Mean age-standardized alcohol consumption expressed in grams/day

Data: Global Burden of Diseases, 2019

Among males, levels of alcohol consumption were on average highest in the Southeast Asia, East Asia and Oceania region (mean age-standardized consumption of 23.2 grams/day) followed by the Latin America and Caribbean region (19.8 grams/day) and the High-Income region (19.0 grams/day). The lowest levels of alcohol consumption were found in the North Africa and Middle East region (3.18 grams/day). Across countries, daily mean consumption for males ranged from a low of 0.9 grams/day in Pakistan to a high of 61.8 grams per day in Puerto Rico.

Among females, levels of alcohol consumption were on average highest among countries in the Southeast Asia, East Asia and Oceania region (mean of 15.4 grams/day) followed by the High-Income region (12.2 grams/day) and the Latin America and Caribbean region (10.6 grams/day). Countries with the lowest levels of alcohol consumption were in in the North Africa and Middle East region (2.0 grams/day).

Across countries, daily mean consumption for females ranged from a low of 0.8 grams/day in

Pakistan to a high of 36.1 grams/day in Puerto Rico (Figure 12).

In 97% of countries (198 out of 204) males consumed more alcohol per day than females. Countries with the largest differences in mean age-standardized alcohol consumption include Puerto Rico (61.8 grams/day for males vs 36.1 grams/day for females), Guyana (31.0 grams/day for males vs 6.7 grams/day for females), Federated States of Micronesia (49.8 grams/day for males vs 26.3 grams/day for females), Guam (53.0 grams/day for males vs 30.9 grams/day for females) and Chad (45.3 grams/day for males vs 24.0 grams/day for females).

Countries where females consumed more alcohol per day than males in descending order are Nepal (16.0 grams/day for females vs 8.9 grams/day for males), Armenia (13.1 grams/day for females vs 9.2 grams/day for males), Indonesia (7.1 grams/day for females vs 4.1 grams/day for males), Liberia (21.0 grams/day for females vs 19.6 grams/day for males), United Arab Emirates (2.2 grams/day for females vs 1.4 grams/day for males), and Senegal (6.5 grams/day for females vs 6.0 grams/day for males).

20

Figure 12 – National age-standardised mean alcohol consumption (grams of alcohol/day), by sex, 2019. Countries and territories without data are shown in grey.
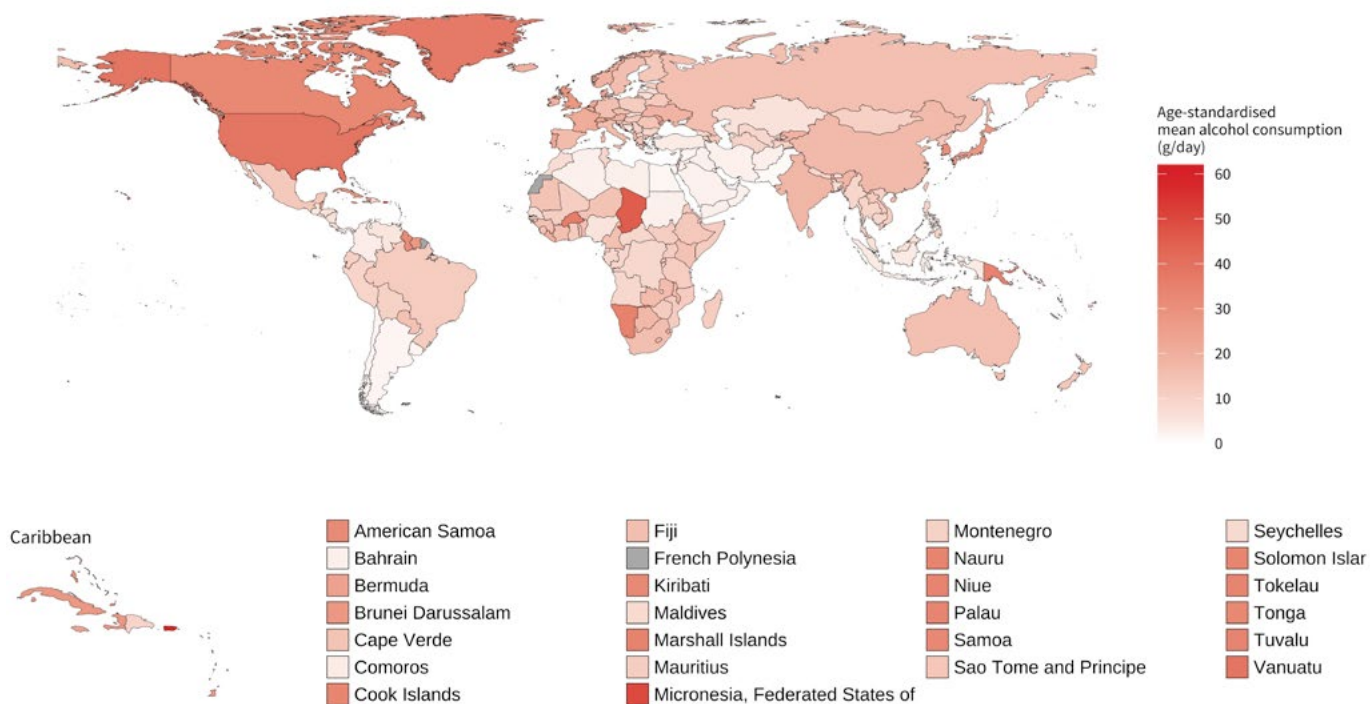
Male

Female
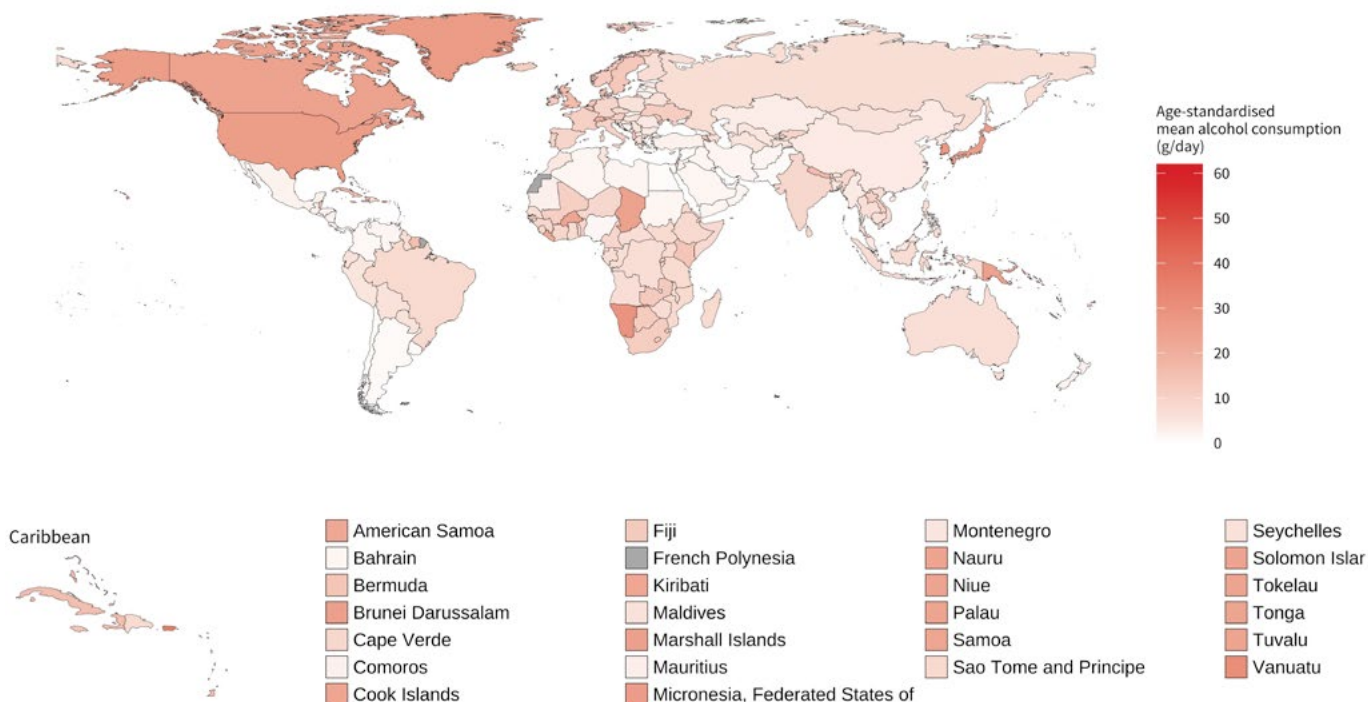
Policy resources: According to WHO, the most cost-effective interventions to reduce the harmful use of alcohol include increasing excise tax (taxes on the sale of specific goods), bans or comprehensive restrictions on alcohol advertising, and restricting the availability of alcohol retail (e.g. though reduced hours of sale). The WHF Policy Brief on The Impact of Alcohol Consumption on Cardiovascular Health provides a summary of effective alcohol policies and recommendations for how national cardiovascular societies can advocate for better alcohol control measures.

TOBACCO SMOKING

> **Measure:** Age-Standardized smoking prevalence (%) among individual aged 15 and older
>
> **Data:** Global Burden of Disease, 2019

The prevalence of tobacco smoking declined in all regions for males between 1990 and 2019, with the fastest rate of decline observed in the Latin America and Caribbean region and the slowest in the North Africa and Middle East region. The fastest rate of decline in females was observed in the Latin America and the Caribbean region followed by the South Asia region. Prevalence of tobacco smoking for females increased in the Central Europe, Eastern Europe, and Central Asia region in the first decade of the 21st century but declined thereafter (Figure 13a and Figure 13b).

For males, age-standardized smoking prevalence was almost 50% in the Southeast Asia, East Asia, and Oceania region, with the next highest levels in the Central Europe, Eastern Europe, and Central Asia region (39.5%), and the lowest observed in the Sub-Saharan Africa region (17.5%) and Latin America and Caribbean region (17.1%).

For females, age-standardized smoking prevalence was highest in the High-Income region (17.6%) and Central Europe, Eastern Europe, and Central Asia region (15.5%) and lowest in the Sub-Saharan Africa region (2.9%).

For males, the five countries with highest prevalence were Timor-Leste (64.6%), Kiribati (63.8%), Federated States of Micronesia (62.2%), Indonesia (58.3%) and Armenia (55.3%) . The five with the lowest prevalence were Peru (7.3%), Nigeria (7.4%), Sao Tome and Principe (7.8%), United States Virgin Islands (8.3%) and Guinea Bissau (8.5%).

For females, the five countries with the highest prevalence were Greenland (42.3%), Nauru (40.3%), Serbia (37.8%), Federated States of Micronesia (36.4%) and Kiribati (35.1%).). Those with the lowest prevalence were Eritrea (0.7%), Egypt (1.1%), Morocco (1.1%), Guinea Bissau (1.1%) and Nigeria (1.2%).

In all countries except Sweden and Ireland, the age-standardised prevalence of tobacco smoking was higher in males than females.
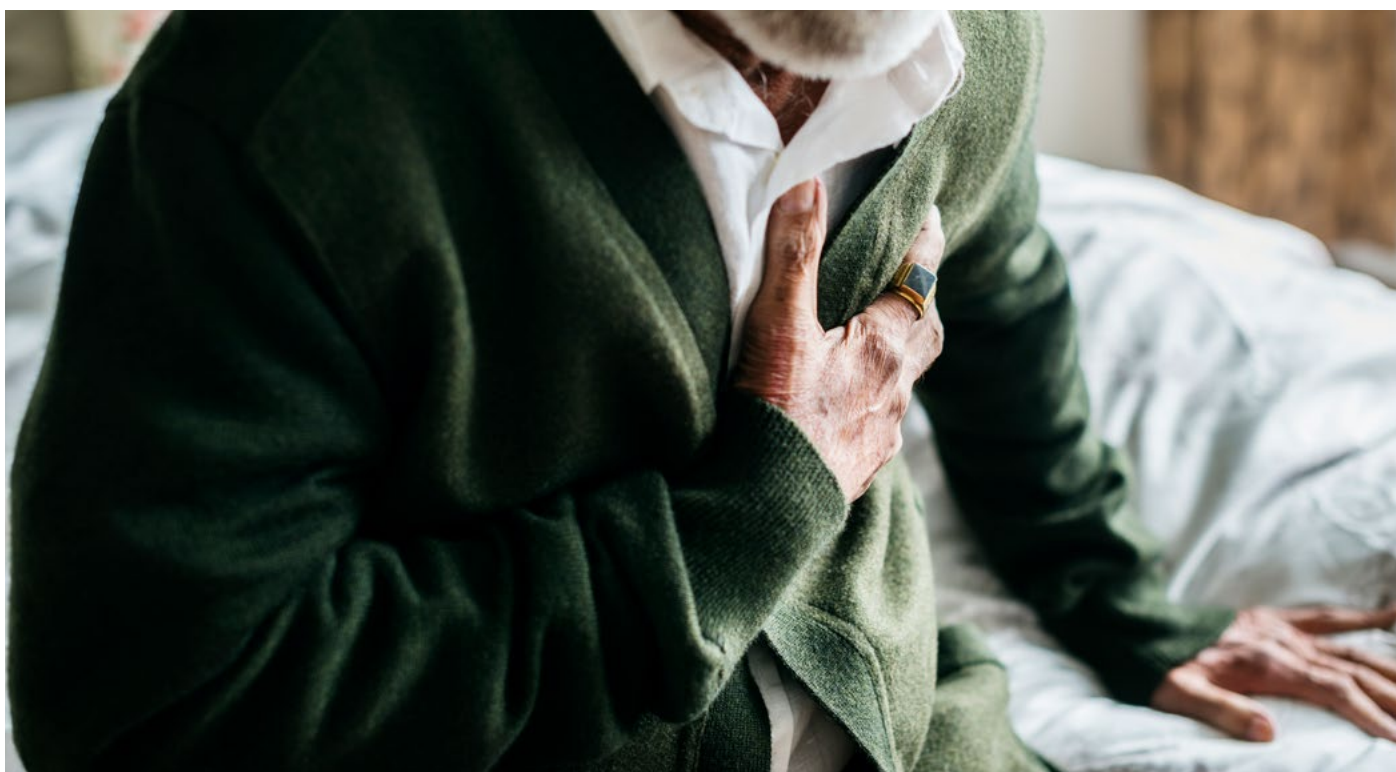
22

Figure 13a - National age-standardised smoking prevalence (%) for individuals aged 15 and above, by sex, 2019. Countries and territories without data are shown in grey.
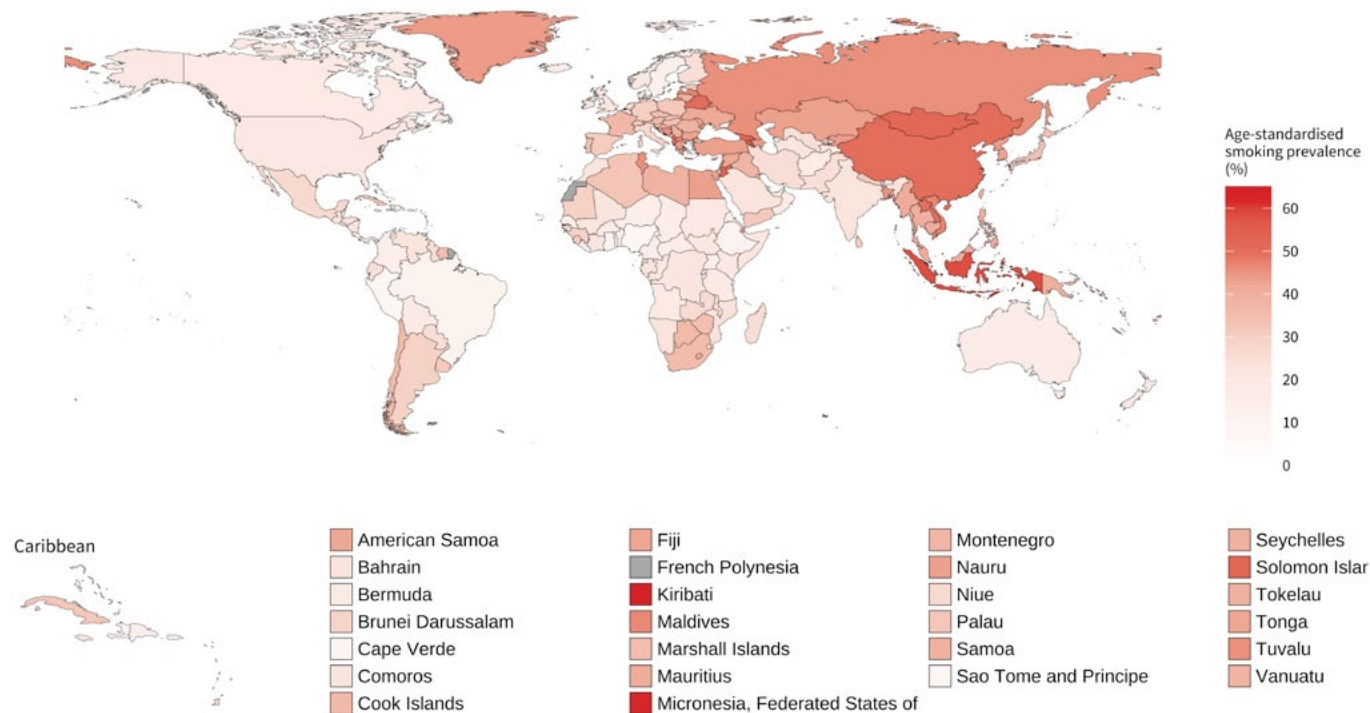
Male

Female
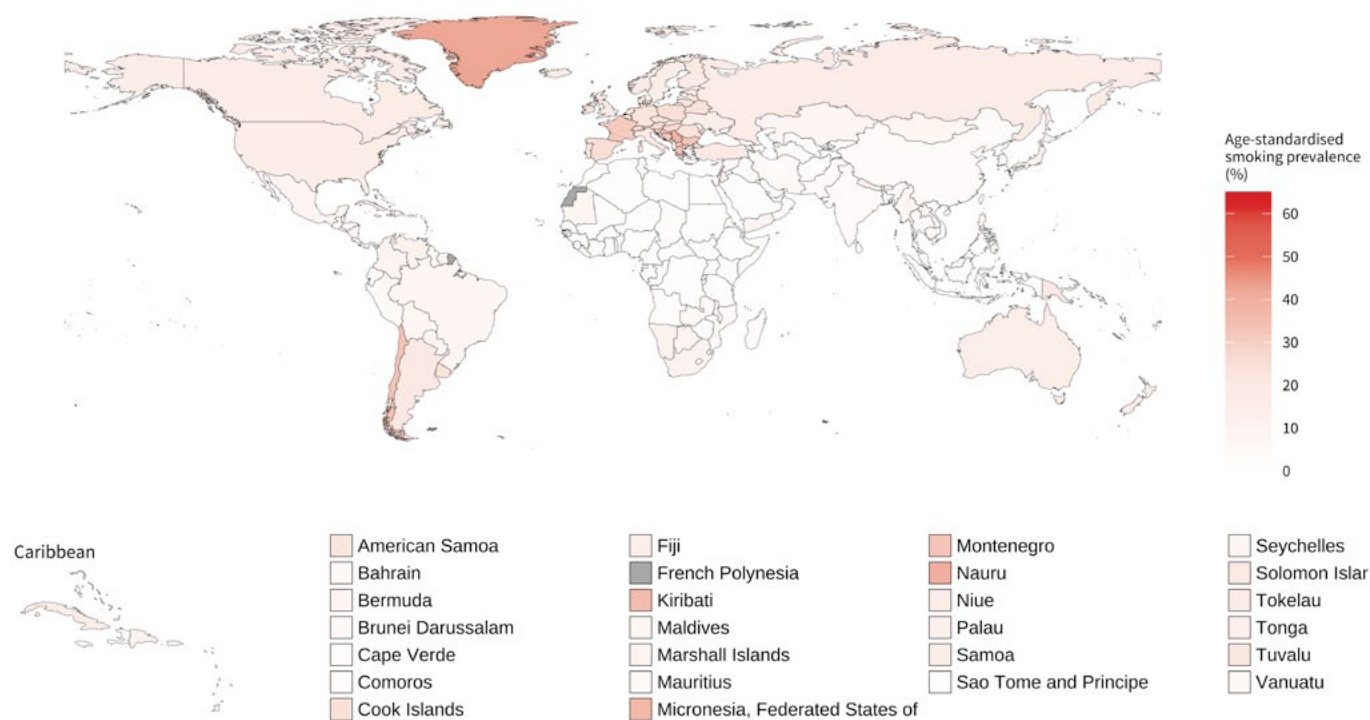
Figure 13b - Regional trends in age-standardised smoking prevalence (%) for individuals aged 15 and above from 1990 to 2019, by sex.

24
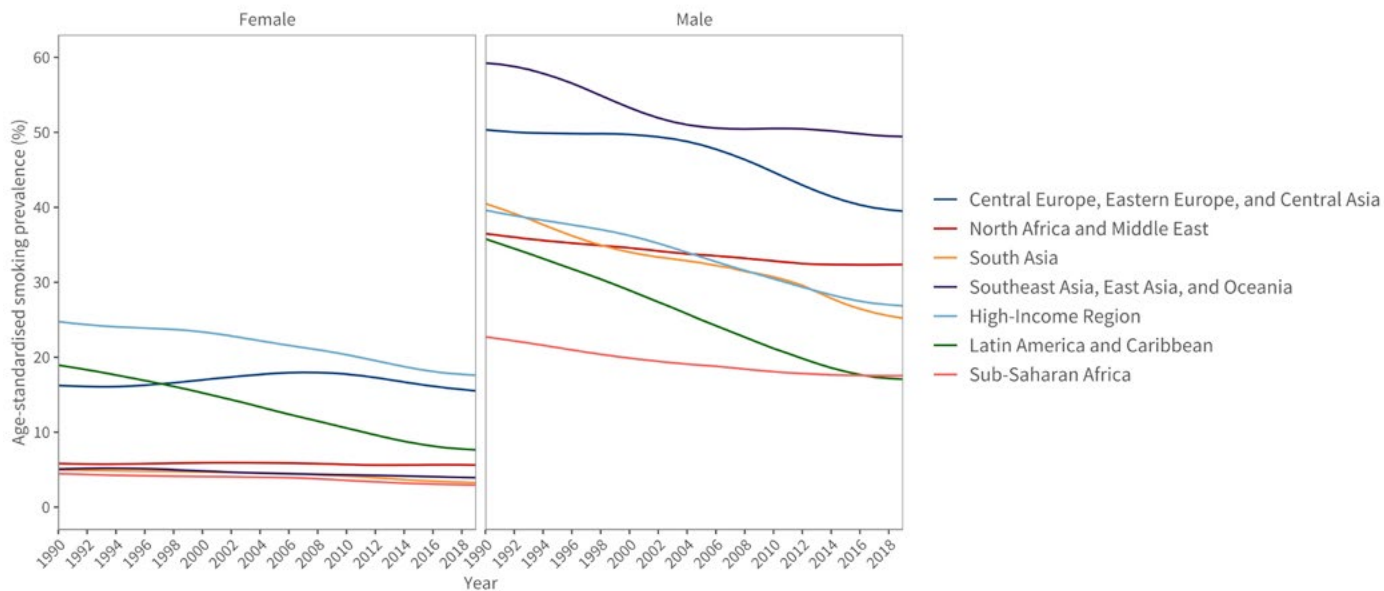
Policy resources: Resources to monitor progress and support the implementation of the WHO Framework Convention on Tobacco Control (WHO FCTC) allow for the sharing of lessons learned and for identifying barriers to policy implementation. The FCTC was the first treaty negotiated under the auspices of WHO and entered into force in 2005. To date, 182 states are party to the Convention, covering 90% of the world's population. Parties are legally bound to the FCTC's provisions, which include measures relating to the pricing and taxing of tobacco products, packaging and labelling, protection of exposure to tobacco smoke in indoor spaces and restriction of tobacco advertising and promotion. The WHF Roadmap for Reducing Cardiovascular Mortality Through Tobacco Control provides further guidance on how the cardiovascular community can support policy implementation and tackle roadblocks.

In all countries except Sweden and Ireland, the age-standardised prevalence of tobacco smoking was higher in males than females.

OBESITY

**Measure:** Age-standardised prevalence of obesity for adults aged 20 years and older (Body Mass Index (BMI) >= 30 kg/m2)

Data: NCD Risk Factor Collaboration, 2016

Obesity prevalence exceeded 20% in women in almost two-thirds of countries worldwide and exceeded the same level for men in 43% of countries (Figure 14). The prevalence was lowest in Vietnam (1.7% in men and 2.7% in women) but reached upward of 55% in men and 60% in women in both American Samoa and Nauru.

Regionally, obesity prevalence was highest in women in the North Africa and Middle East region and the Latin America and Caribbean region, where prevalence was more than 25% in over 85% and 96% of countries, respectively. Obesity prevalence in men was more than 25% in about half of countries in both the High-Income region and North Africa and Middle East region. Obesity prevalence was lower in South Asia where the rates in men ranged from 2% in Bangladesh to 6% in Pakistan and in women ranged from 5% in Bangladesh to 12% in Pakistan.

From 1975 to 2016, age-standardised obesity prevalence increased in all countries worldwide and by as much as 33 percentage points in women and 36 percentage points in men in Tuvalu. However, rates of increase varied substantially across countries and regions. In the Latin America and Caribbean region, all countries experienced at least a 13 percentage points rise in obesity prevalence in women and at least a 9 percentage points rise in men. By contrast, in South Asia, obesity prevalence in all countries increased by less than 7 percentage points in men and 12 percentage points in women.

Policy initiatives: The Joint Position Paper on Obesity and Cardiovascular Disease by the World Heart Federation and World Obesity Federation highlights the direct and indirect links between obesity/being overweight and CVD and includes recommendations for national cardiovascular societies and clinicians to reduce the risk of obesity-related CVD and mortality. The WHO "best buys" provide several recommendations to improve nutrition, which include measures to tackle obesity. These include taxation on sugar-sweetened beverages, subsidies to increase fruit and vegetable intake, and reducing portion and package sizes.

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Figure 14 - National age-standardised prevalence of obesity (%) for individuals aged 20 years and above, by sex, 2016. Countries and territories without data are shown in grey.

Men

Age-standardised obesity prevalence (%)

American Samoa	Fiji	Montenegro	Seychelles
Bahrain	French Polynesia	Nauru	Solomon Islar
Bermuda	Kiribati	Niue	Tokelau
Brunei Darussalam	Maldives	Palau	Tonga
Cape Verde	Marshall Islands	Samoa	Tuvalu
Comoros	Mauritius	Sao Tome and Principe	Vanuatu
Cook Islands	Micronesia, Federated States of		

Caribbean

27

Women

Age-standardised obesity prevalence (%)

American Samoa	Fiji	Montenegro	Seychelles
Bahrain	French Polynesia	Nauru	Solomon Islar
Bermuda	Kiribati	Niue	Tokelau
Brunei Darussalam	Maldives	Palau	Tonga
Cape Verde	Marshall Islands	Samoa	Tuvalu
Comoros	Mauritius	Sao Tome and Principe	Vanuatu
Cook Islands	Micronesia, Federated States of		

Caribbean

RAISED BLOOD PRESSURE

Measure: Age-standardised prevalence of raised blood pressure for adults aged 18 years and older (SBP ≥ 140 mmHg or DBP ≥ 90 mmHg). This definition does not include people who have hypertension but whose blood pressure is controlled by taking medication (i.e., taking anti-hypertensive medications and whose blood pressure is <140/90 mmhg)

Data: NCD Risk Factor Collaboration, 2015

Age-standardised prevalence of raised blood pressure was lowest in South Korea (14% in men and 8% in women) and highest in women in Niger (36%) and in men in Croatia (38%) (Figure 15).

Raised blood pressure prevalence exceeded 20% in both men and women in all countries in the Central Europe, Eastern Europe, and Central Asia region, the South Asia region, and the Sub-Saharan Africa region, and in men in the North Africa and Middle East region. Prevalence was lowest in the High-Income region, where rates ranged from South Korea's levels (see above) to 30% and 20% in men and women respectively in Portugal. Raised blood pressure prevalence was less than 20% for women in all countries and for men in 21% of countries in the High-Income region. Raised blood pressure prevalence was above 22% for men and women in all countries in Sub-Saharan Africa.
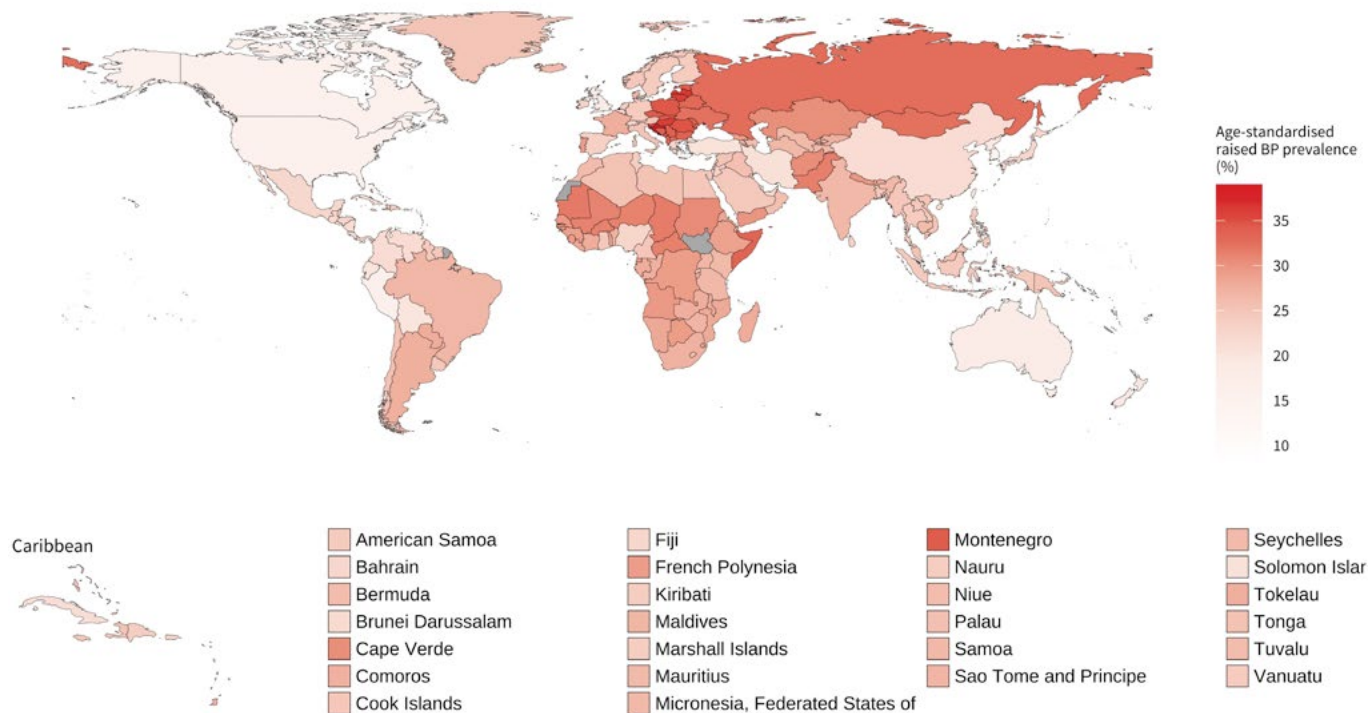
From 1975 to 2015, age-standardised prevalence of raised blood pressure decreased globally by 6 percentage points in women and 5 percentage points in men. In the High-Income region, rates declined in women by as much as 26 percentage points in Singapore, and in men by as much as 23 percentage points in New Zealand. Conversely, rates increased for many countries in the world's poorest regions. For example, in all South Asian countries, raised blood pressure prevalence increased by more than 2 percentage points in both men and women. Despite global reductions in prevalence, the estimated total number of adults with raised blood pressure increased from 594 million in 1975 to 1.13 billion in 2015 due to population increase and aging.

Policy Recommendations: The WHO HEARTS supports Ministries of Health to strengthen CVD management in primary health care settings. It includes six modules that cover, among other topics, implementation of tools for improving CVD risk assessment, the management of hypertension and diabetes, and access to essential medicines and technologies for tackling CVDs in primary care.
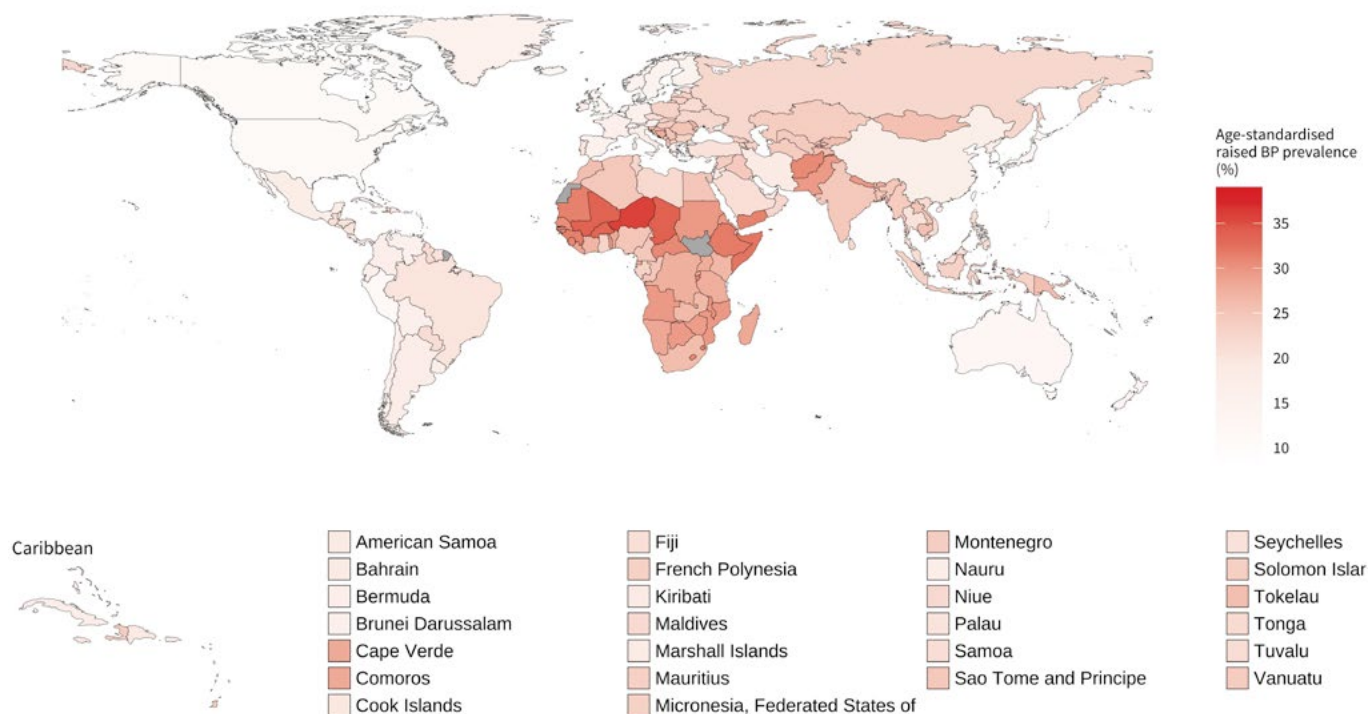
For a broader policy perspective, the WHF Roadmap on Hypertension provides a framework which countries can use to assess factors that influence hypertension prevention and care to help inform national strategies to tackle it.

Figure 15 – National age-standardised prevalence of raised blood pressure (%) for individuals aged 18 years and above, by sex, 2015. Countries and territories without data are shown in grey.

Men

Age-standardised raised BP prevalence (%)

American Samoa	Fiji
Bahrain	French Polynesia
Bermuda	Kiribati
Brunei Darussalam	Maldives
Cape Verde	Marshall Islands
Comoros	Mauritius
Cook Islands	Micronesia, Federated States of

Montenegro / Nauru / Niue / Palau / Samoa / Sao Tome and Principe

Seychelles / Solomon Islar / Tokelau / Tonga / Tuvalu / Vanuatu

Caribbean

29

Women

Age-standardised raised BP prevalence (%)

American Samoa	Fiji
Bahrain	French Polynesia
Bermuda	Kiribati
Brunei Darussalam	Maldives
Cape Verde	Marshall Islands
Comoros	Mauritius
Cook Islands	Micronesia, Federated States of

Montenegro / Nauru / Niue / Palau / Samoa / Sao Tome and Principe

Seychelles / Solomon Islar / Tokelau / Tonga / Tuvalu / Vanuatu

Caribbean

DIABETES

Measure: Age-standardised prevalence of diabetes for adults aged 18 years and older (fasting>=7.00 mmol/L or history of diagnosis with diabetes or or use of insulin or oral hypoglycaemic drugs)

Data: NCD Risk Factor Collaboration, 2014

In China and India alone, there were over 420 million adults living with diabetes in 2014, accounting respectively for 24% and 15% of all cases globally. The prevalence was lowest in men in Burundi (4%) and in women in Switzerland (3%), and highest in American Samoa (31% in men and 33% in women).

Diabetes prevalence was high in many countries of the Southeast Asia, East Asia, and Oceania region, but there were large differences between countries within the region. Prevalence ranged from 5% in men in Timor-Leste and in women in Vietnam to 31% in men and 33% in women in American Samoa. Diabetes prevalence was lower in the Sub-Saharan Africa region, where rates in both men and women ranged from 4% in Burundi to 10% in Gabon in men and 13% in women in South Africa.

From 1980 to 2014, the age-standardised prevalence of diabetes increased globally by 5% in men and 3% in women. Increases were seen in most countries worldwide and remained unchanged in only a few, mostly High-Income, countries. The largest increases were in Tokelau (18% increase in women and 19% increase in men).

Policy initiatives: The WHO Global Diabetes Compact is a multi-stakeholder mechanism to drive action to improve diabetes prevention and care. By bringing together WHO member states, people living with diabetes, academia and the private sector, the Compact seeks to improve knowledge and develop collaborations that will improve integration of diabetes prevention and management in primary health care, advance research and improve access to diabetes diagnostics, medicines, and health products, among other goals.

The WHF Roadmap for CVD and Diabetes provides stakeholders a range of solutions and best practices to improving CVD prevention, diagnosis and management in people living with diabetes.
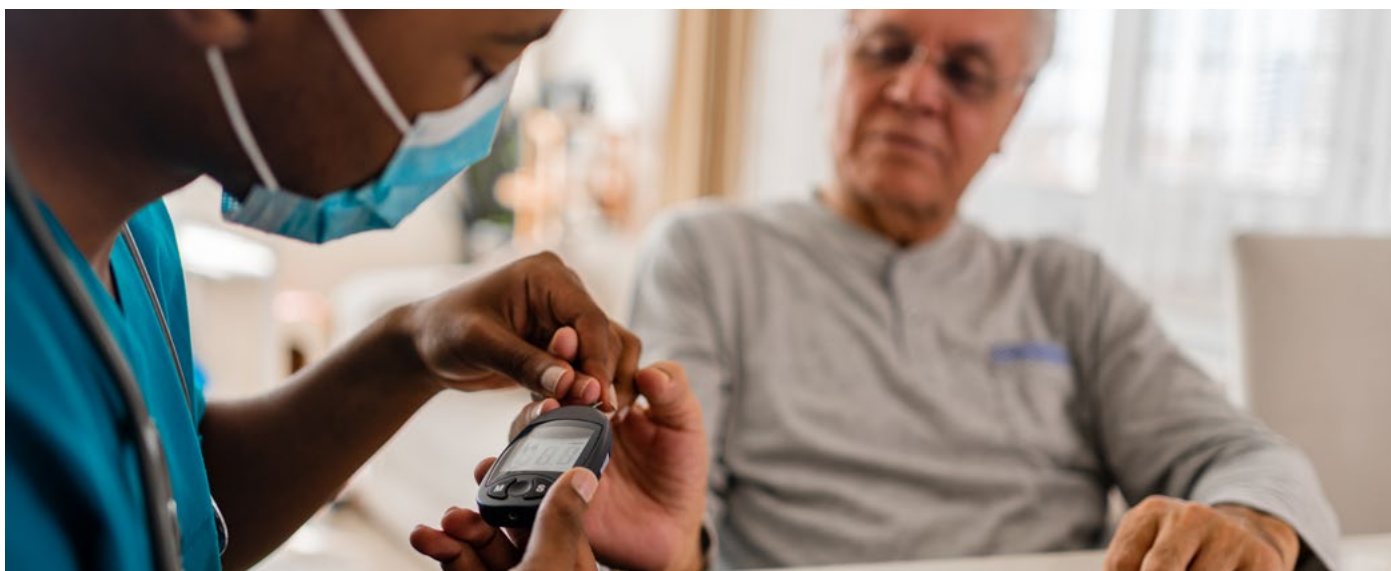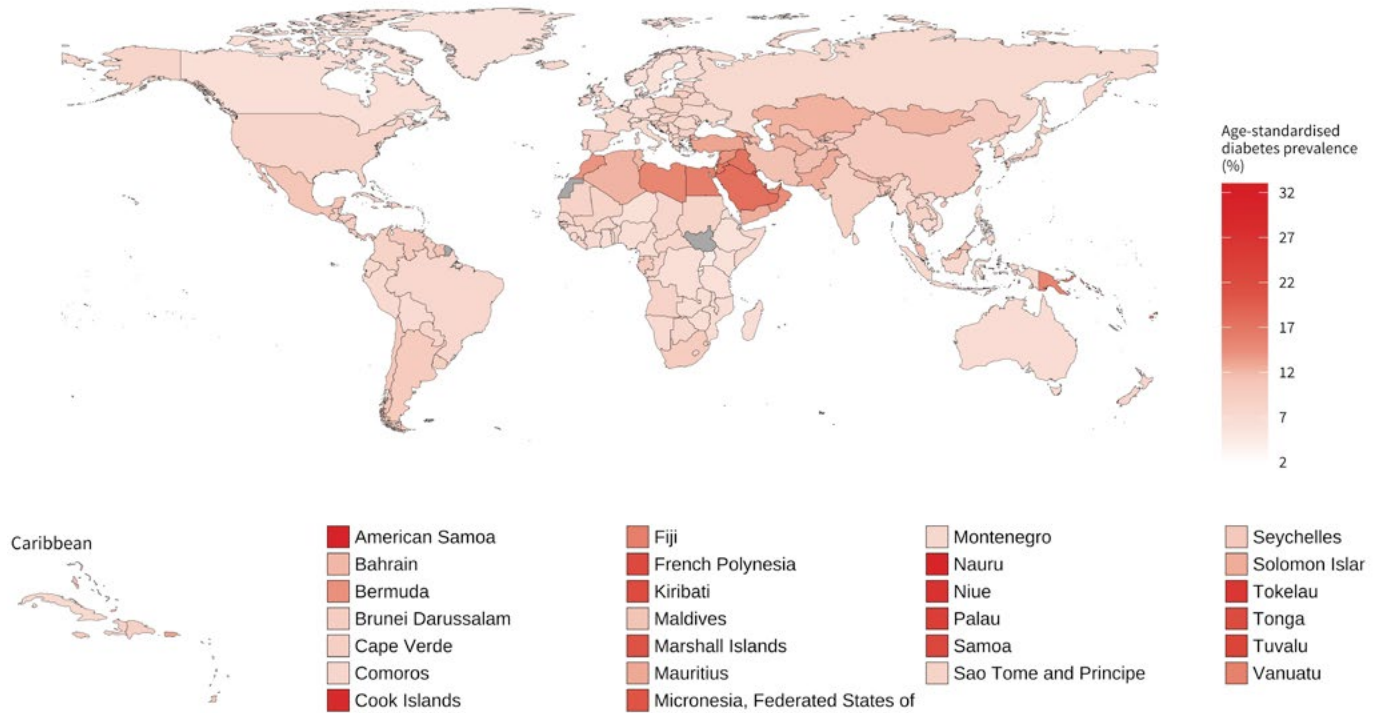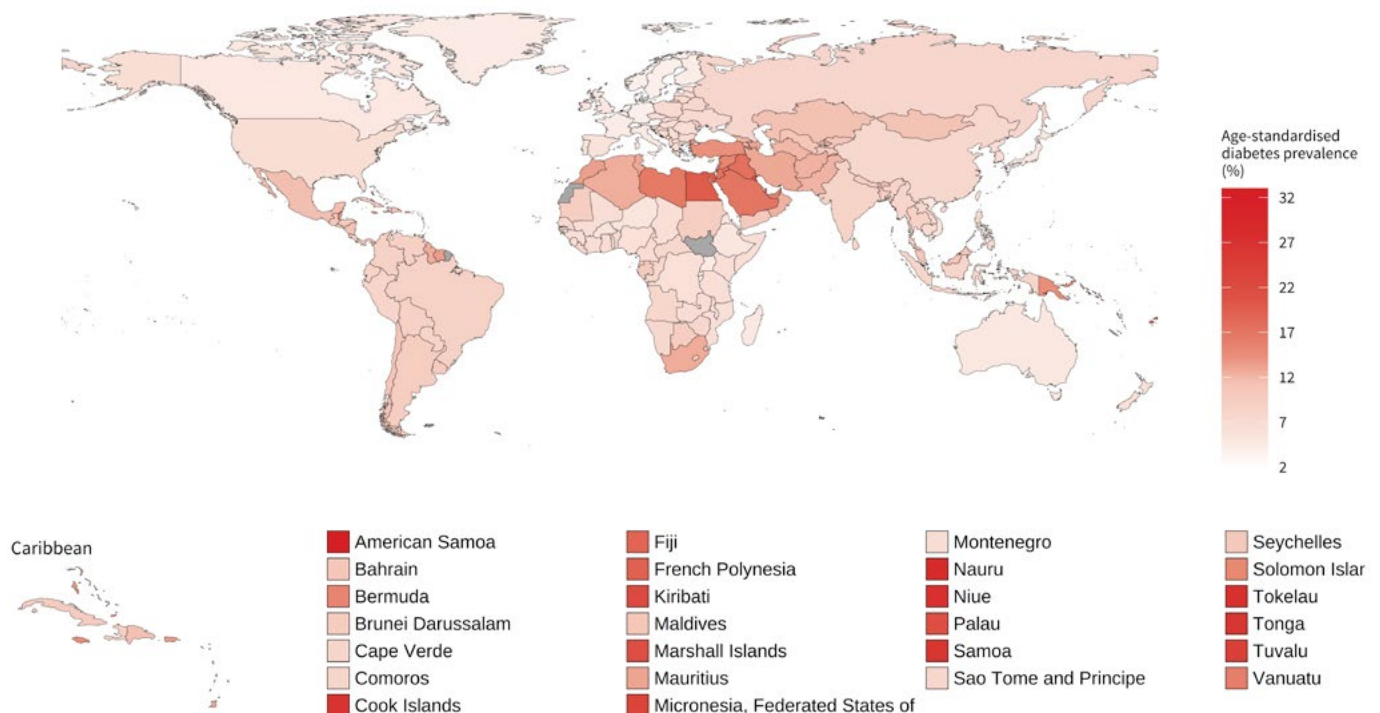
30

Figure 16 – National age-standardised prevalence of diabetes (%) for individuals aged 18 years and above, by sex, 2014. Countries and territories without data are shown in grey.

Men

Women

LIPIDS

Measure: Age-standardised mean non-high-density lipoprotein (non-HDL) cholesterol (mmol/L) for adults aged 18 years and older

Data: NCD Risk Factor Collaboration, 2018

Mean non-HDL ranged from 2.4 mmol/L in men and 2.6 in women in Lesotho to 4.2 mmol/L in both men and women in Malaysia and women in Tokelau in 2018.

Mean non-HDL levels were higher than 3 mmol/L in both men and women in all countries of the Central Europe, Eastern Europe, and Central Asia and Southeast Asia, East Asia and Oceania regions. Levels were lower in the Sub-Saharan Africa region, where mean non-HDL ranged from lows in Lesotho (see above) to 3.2 mmol/L in men and 3.4 mmol/L in women in Ghana.

There was significant variability in levels and trends across regions. Non-optimal cholesterol was previously a distinct feature of High-Income countries in north-western Europe, North America, and Australasia, whereas the highest cholesterol-related risk was now observed in middle-income countries in East and Southeast Asia, as well as some countries in Southeast Asia and central Latin America.[19]

From 1980 to 2018, levels of non-HDL improved markedly in the High-Income region with declines as large as 1.7 mmol/L in men and women in Belgium. In contrast, mean non-HDL increased in both men and women in all countries in the South Asia region and most countries in the Sub-Saharan Africa region. Some of the largest increases were by as much as 0.8 mmol/L in both women in Cambodia and in men in Tokelau.
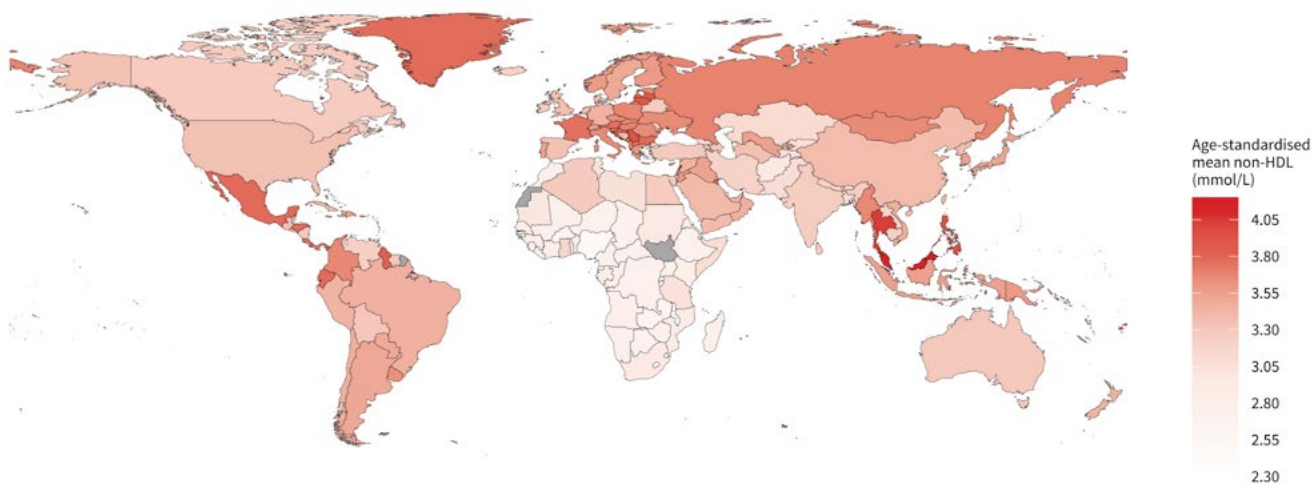
Not only did High-Income countries benefit from decreasing non-HDL cholesterol levels, but they also had higher mean HDL cholesterol than low- and middle-income countries.

Policy initiatives: The WHF Roadmap for Cholesterol provides a conceptual framework for the development of national policies and health systems approaches, so that potential roadblocks to cholesterol management and atherosclerotic CVD prevention can be overcome. These include better promotion of primordial prevention, available and affordable testing, improved risk stratification in care settings and wider availability of cholesterol-lowering therapies. A forthcoming Global Coalition for Circulator Health Position Paper on Universal Health Coverage (to be published in Spring 2023) will provide recommendations on essential circulatory health interventions that should be included in packages of basic health interventions in primary care. These are an essential component of improving detection and management of cholesterol and other CVD risk factors.

[19]NCD Risk Factor Collaboration (NCD-RisC). Repositioning of the global epicentre of non-optimal cholesterol. Nature 582, 73–77 (2020). https://doi.org/10.1038/s41586-020-2338-1

Figure 17 – National age-standardised mean non-HDL cholesterol (mmol/L) for individuals aged 18 years and above, by sex, 2018. Countries and territories without data are shown in grey.

Men

Caribbean

Age-standardised mean non-HDL (mmol/L)

4.05
3.80
3.55
3.30
3.05
2.80
2.55
2.30

American Samoa	Fiji	Montenegro	Seychelles
Bahrain	French Polynesia	Nauru	Solomon Islar
Bermuda	Kiribati	Niue	Tokelau
Brunei Darussalam	Maldives	Palau	Tonga
Cape Verde	Marshall Islands	Samoa	Tuvalu
Comoros	Mauritius	Sao Tome and Principe	Vanuatu
Cook Islands	Micronesia, Federated States of		

33

Women

Caribbean

Age-standardised mean non-HDL (mmol/L)

4.05
3.80
3.55
3.30
3.05
2.80
2.55
2.30

American Samoa	Fiji	Montenegro	Seychelles
Bahrain	French Polynesia	Nauru	Solomon Islar
Bermuda	Kiribati	Niue	Tokelau
Brunei Darussalam	Maldives	Palau	Tonga
Cape Verde	Marshall Islands	Samoa	Tuvalu
Comoros	Mauritius	Sao Tome and Principe	Vanuatu
Cook Islands	Micronesia, Federated States of		

AMBIENT AIR POLLUTION

Measure: Population weighted average of particulate matter PM2.5, µg/m³

Data: Global Burden of Diseases, 2019

Trends in ambient air pollution show little decline over time, with the South Asia region having both the highest level of ambient particulate pollution in 2019 (5.9 times higher than in the High-Income region) and an increasing trend.

Globally, ambient particulate matter pollution ranged from 5.6 mg/m³ in Finland to 83.1 mg/m³ micrograms per cubic meter in India (Figure 18). Countries with the highest levels of ambient

particulate matter pollution are in the South Asia region (mean particulate matter = 66.2 mg/m³) followed by the North Africa and Middle East region (mean particulate matter = 44.0 mg/m³) and Sub-Saharan Africa region (mean particulate matter = 39.5 mg/m³). Countries with the lowest levels are in the High-Income region (mean particulate matter = 11.2 mg/m³) followed by the Southeast Asia, East Asia, and Oceania region (mean particulate matter = 15.2 mg/m³).

34

Figure 18a – National ambient fine particulate matter concentration (PM2.5) (µg/m³), 2019. Countries and territories without data are shown in grey.

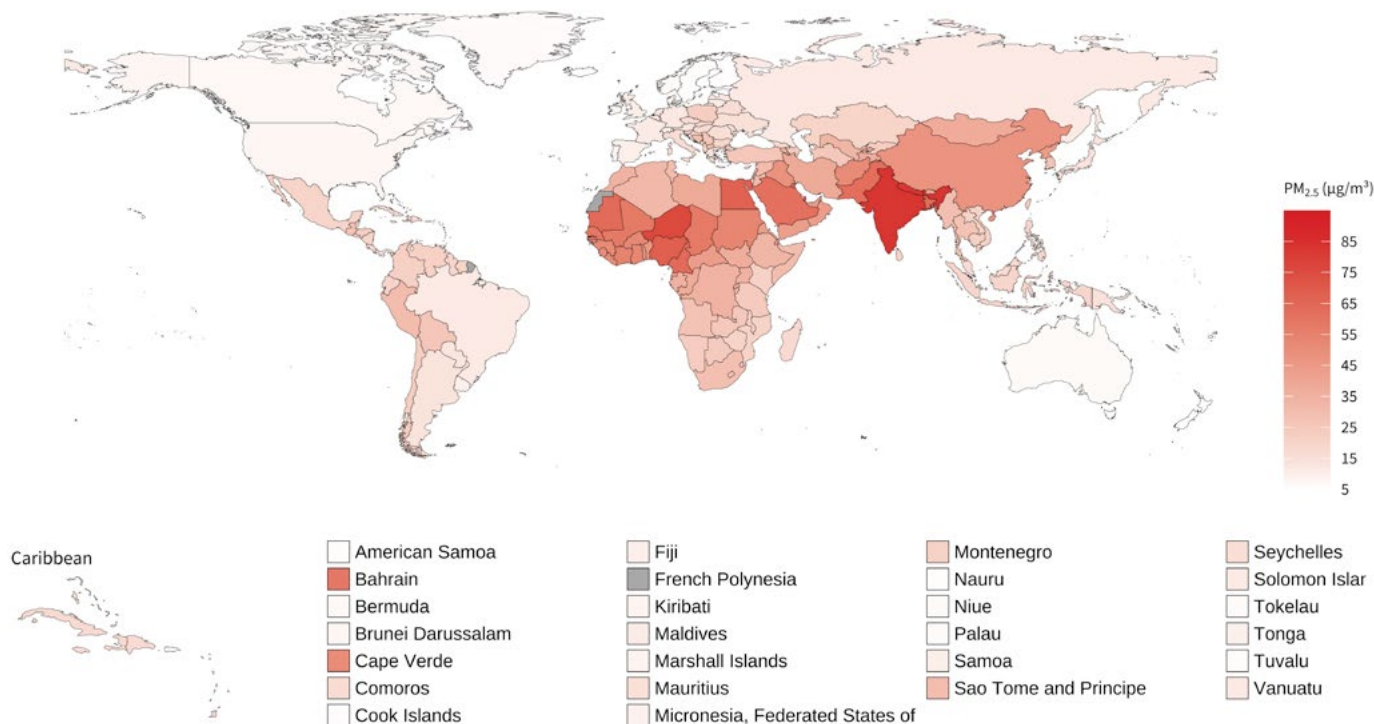**Figure 18b - Regional trends in ambient fine particulate matter concentration (%)(PM2.5) (µg/m³) from 1990 to 2019.**
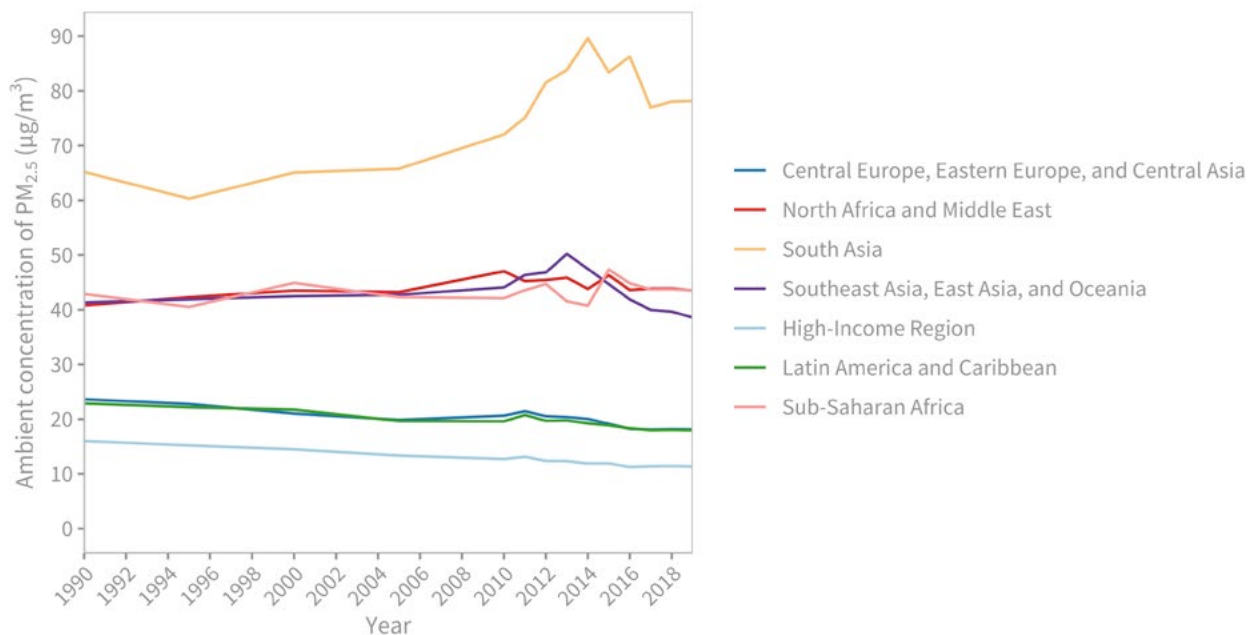
Policy Recommendations: WHF's air policy brief, <u>Clean Air, Smart Cities, Healthy Hearts</u> identifies a range of actions that stakeholders at all levels can take to act on air pollution. Scientific societies can play a role by raising awareness of air pollution among health professionals and the public, and highlighting what can be done to protect people at risk from air pollution exposures. Policies such as implementing low emissions zones, improving public transport and infrastructure for walking and cycling, and penalties for excessive production of air pollution waste, can all help mitigate the health impacts of ambient air pollution.

COMPARATIVE LEVELS OF RISK FACTORS BY COUNTRY AND REGION

For each of the previously reported cardiovascular risk factors, we ordered countries from the highest to the lowest level. In the Appendix, we can see the quintile into which each country falls for each risk factor. This can help policymakers and stakeholders identify the risk factors that are particularly high in their context and define priorities for action (Appendix Figure 2).

Central Europe, Eastern Europe and Central Asia

In the Central Europe, Eastern Europe, and Central Asia region, most countries have high levels of sodium intake, raised blood pressure and non-HDL cholesterol in men, and high levels of sodium intake and tobacco smoking in women. Within the region, countries in Central and Eastern Europe generally have higher levels of risk factors overall than countries in Central Asia.

High-Income

In the High-Income region, most countries are characterised by high-levels of behavioural risk factors, namely high levels of sodium and alcohol consumption, high levels of tobacco smoking, and low physical activity. They also have high levels of non-HDL cholesterol in both sexes, and high obesity levels in men.

Latin America and Caribbean

The Latin America and Caribbean region is more heterogeneous compared to other regions, though low physical activity is a significant risk factor across many countries of the region. Generally, Caribbean countries have higher risk factor levels than other countries in the region.

North Africa and Middle East

The North Africa and Middle East region is characterised by high levels of metabolic risk factors, especially diabetes and obesity. Air pollution and physical activity are also significant risk factors in this region. In general, Middle Eastern countries have higher risk factor levels than those in North Africa.

South Asia

Air pollution levels are high in all countries in South Asia. Sodium intake, raised blood pressure and diabetes are also high in both sexes.

Southeast Asia, East Asia and Oceania

In the Southeast Asia, East Asia and Oceania region, countries in Oceania have high levels of diabetes, obesity, tobacco smoking, and low levels of physical activity. They also have some of the highest levels of non-HDL cholesterol in women. All countries in Southeast Asia and East Asia have high levels of sodium intake and non-HDL cholesterol.

Sub-Saharan Africa

In the Sub-Saharan Africa region, most countries have higher levels of raised blood pressure. Air pollution levels are also high across the region, and particularly in countries in the Sahel. Generally, countries in southern Sub-Saharan Africa have the highest risk factor levels in the region.

THE WHF POLICY INDEX

What it is	What it does	How it is calculated	Why we need it
An analysis of the level to which national governments have implemented eight policies that are critical for CVD health. **Note:** *The analysis does not correlate to CVD mortality. For example, a country with a high policy score (i.e., it has implemented a number/all the policies to mitigate CVDs) will not necessarily have a low CVD death rate.*	It combines data[20] on whether the following policies/measures have been implemented: 1) National tobacco control programmes 2) Action plan for CVDs 3) Operational Unit in Ministry of Health with responsibility for NCDs 4) Guidelines for the management of CVDs 5) Action plan to reduce physical inactivity 6) Action plan to reduce unhealthy diet related to NCDs 7) Action plan to reduce the harmful use of alcohol 8) Availability of CVD drugs (e.g., ACE inhibitors, aspirin, and Beta blockers) in the public health sector.	For each policy implemented, a score of 1 is assigned. The Index is calculated by adding up each country's overall score, ranging from 0 (none of the policies are implemented) to 8 (all the polices are implemented). The source of data for each country is the WHO Global Health Observatory	To help policymakers and stakeholders identify policy gaps in tackling CVDs.

Globally, 106 countries (64% of 166 countries with available information), have implemented at least 7 of the 8 policies outlined above.

The largest proportion of countries with the maximum score (8) were in the South Asia region (80%), the Central Europe, Eastern Europe, and Central Asia region (68%), and the High-Income (62%) region.

The Sub-Saharan Africa region had the highest proportion of countries (16%) with a score of 2 or below and the lowest proportion (13%) of countries with the maximum score. The only other regions with countries scoring 1 or 2 were the Latin America and Caribbean region, and the Southeast Asia, East Asia, and Oceania region (Figure 20).

[20]All data taken from the WHO Global Health Observatory.

Figure 20 – Number of key policies implemented to address cardiovascular diseases, by region (% of countries).
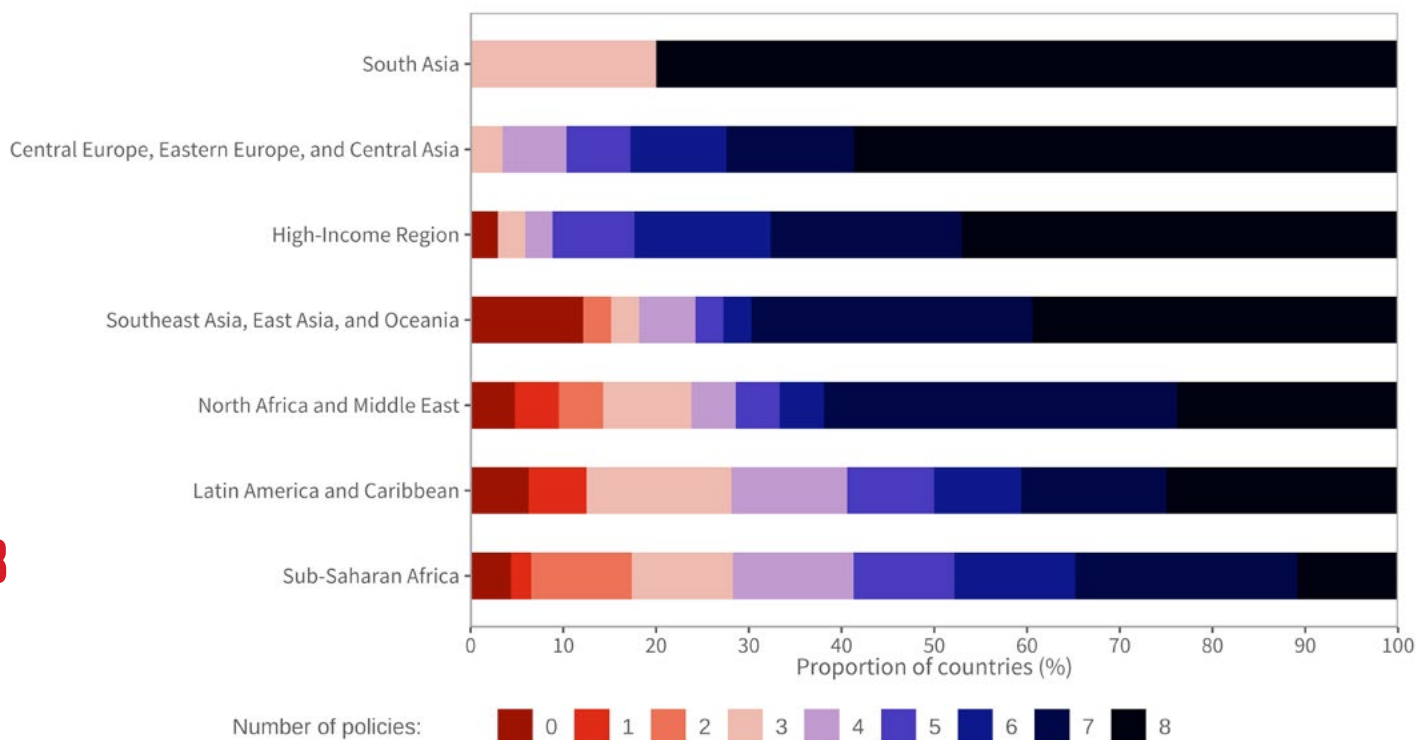
38

Globally, national tobacco control programmes were the most implemented policy[21] (implemented in 91% of countries), followed by guidelines/protocols/standards for the management of CVDs (86%), and policy/strategy/action plan to reduce unhealthy diet related to NCDs (85%). Existence of an action plan to reduce the harmful use of alcohol had the lowest level of implementation globally (70%).

Over 50% of countries in the Sub-Saharan Africa region do not have a CVD plan, an NCD Unit or availability of CVD drugs in the public sectors. Existence of an action plan to reduce the harmful use of alcohol was lowest in the North Africa and Middle East region. The Latin America and Caribbean region had the lowest implementation of action plans to reduce physical inactivity and to reduce unhealthy diet related to NCDs.

Country-level information on policies implemented is included in the Appendix Figure 3.

[21]For national tobacco control programmes, the last year for which data was available was 2018.

KEY FINDINGS

CVD mortality

- CVDs are the leading cause of mortality and amount to about a third of all global deaths.

- The estimated number of deaths due to CVDs globally increased from around 12.1 million in 1990 (equally distributed between males and females) to 18.6 million (9.6 million males and 8.9 million females) in 2019.

- While the number of deaths due to CVDs over the last 30 years has increased globally—in large part due to an ageing and growing population—the age-standardised death rate has declined by one third, from 354.5 deaths per 100,000 people in 1990 to 239.9 deaths per 100,000 people in 2019. This decline has slowed in recent years and is beginning to stall in some regions.

- The decline in death rates for CVDs has been much faster in High-Income countries (HICs) compared to low- and middle-income countries (LMICs), where more than 80% of CVD deaths occur globally. The world is far from achieving the equitable distribution of prevention, diagnosis, and treatment of CVDs.

- In 2019, for females, no region, other than Latin America and the Caribbean, had registered a decline in the CVD death rate to the level registered in the High-Income region in 1990.

- The highest levels of age-standardised CVD death rates occur in the Central Europe, Eastern Europe, and Central Asia region and the North-Africa and Middle East region.

- Ischaemic heart disease is the leading cause of CVD mortality in all regions except for females in Sub-Saharan Africa and for both males and females in South Asia (where stroke is the main cause).

- In most regions, age-standardised CVD death rates are higher in males than in females; however, in a large proportion of West African countries, females are at a higher risk of dying due to CVD than males.

- There is a correlation between lower expenditure on health as a percentage of GDP and higher CVD mortality. In addition, the higher the proportion of out-of-pocket expenditure for health, the higher the CVD mortality.

CVD risk factors

- Raised blood pressure is the leading CVD risk factor globally and contributed to about 10.8 million deaths in 2021.

- Most CVD risk factors, including physical inactivity, alcohol consumption, tobacco smoking, raised blood pressure, and diabetes are higher in males in comparison to females. Obesity is the only risk factor that is higher in females.

- The distribution of CVD risk factors varies markedly by region. For example, countries in the Sub-Saharan Africa region are among those with the highest prevalence of raised blood pressure, while countries in the Southeast Asia, East Asia and Oceania region have among the highest sodium consumption and prevalence of diabetes. Countries in South Asia are among those with the highest levels of ambient air pollution.

- The distribution of CVD risk factors varies by sex. For example, for males the prevalence of smoking is highest in the Southeast Asia, East Asia, and Oceania region while for females it is highest in the High-Income region. The North Africa and Middle East region had the highest prevalence of obesity for females and the Southeast Asia, East Asia, and Oceania had the highest for males. Non-HDL levels are highest in the Central Europe, Eastern Europe and Central Asia region for males and females.

WHF Policy Index

- The WHF Policy Index showed that the lowest implementation of key policies for improving CVD health is in the Sub-Saharan Africa region, where over 50% of the countries do not have availability of CVD drugs in public health facilities, a CVD National Plan or an NCD Unit.

- Globally, 106 countries (64% of 166 countries with available information), have implemented at least 7 of the 8 policies.

- The largest proportion of countries with the maximum score (8) were in the South Asia region (80%), the Central Europe, Eastern Europe, and Central Asia region (68%), and the High-Income (62%) region.

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KEY RECOMMENDATIONS

All countries and stakeholders must urgently unite to accelerate efforts on improving CVD health and get progress back on track so that Sustainable Development Goal 3.4 of reducing by one-third premature mortality from NCDs can be achieved. This goal aligns with the World Heart Federation's (WHF) World Heart Vision 2030.

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To help promote action at every level against CVDs, WHF recommends the following, which are complementary to other key recommendations included in recent policy briefs and reports:

1. Countries and other relevant stakeholders should continue efforts to improve data for CVDs and their risk factors, particularly in LMICs where data gaps exist. This will help to understand why certain populations are at higher risk for certain CVDs.

2. Countries should ensure that their health expenditure as a percentage of GDP is *at least* 5%, in line with recommendations from the World Health Organization.

3. Countries should implement policies to combat CVDs, guided by the burden of disease and predominant risk factors, and ensure that their implementation is adequately resourced and monitored for progress.

4. As a matter of urgency, countries should prioritise coverage of interventions for the prevention and management of CVDs in Universal Health Coverage (UHC) benefit packages to help minimize out-of-pocket expenditure.

5. Lessons-learned in improving CVD prevention, management and improved access to care and therapies need to be implemented across all regions to address inequities and the uneven progress in CVD mortality declines.

APPENDIX – SUPPLEMENTARY FIGURES

Figure 1: Regional classification (based on the Global Burden of Disease super regions)
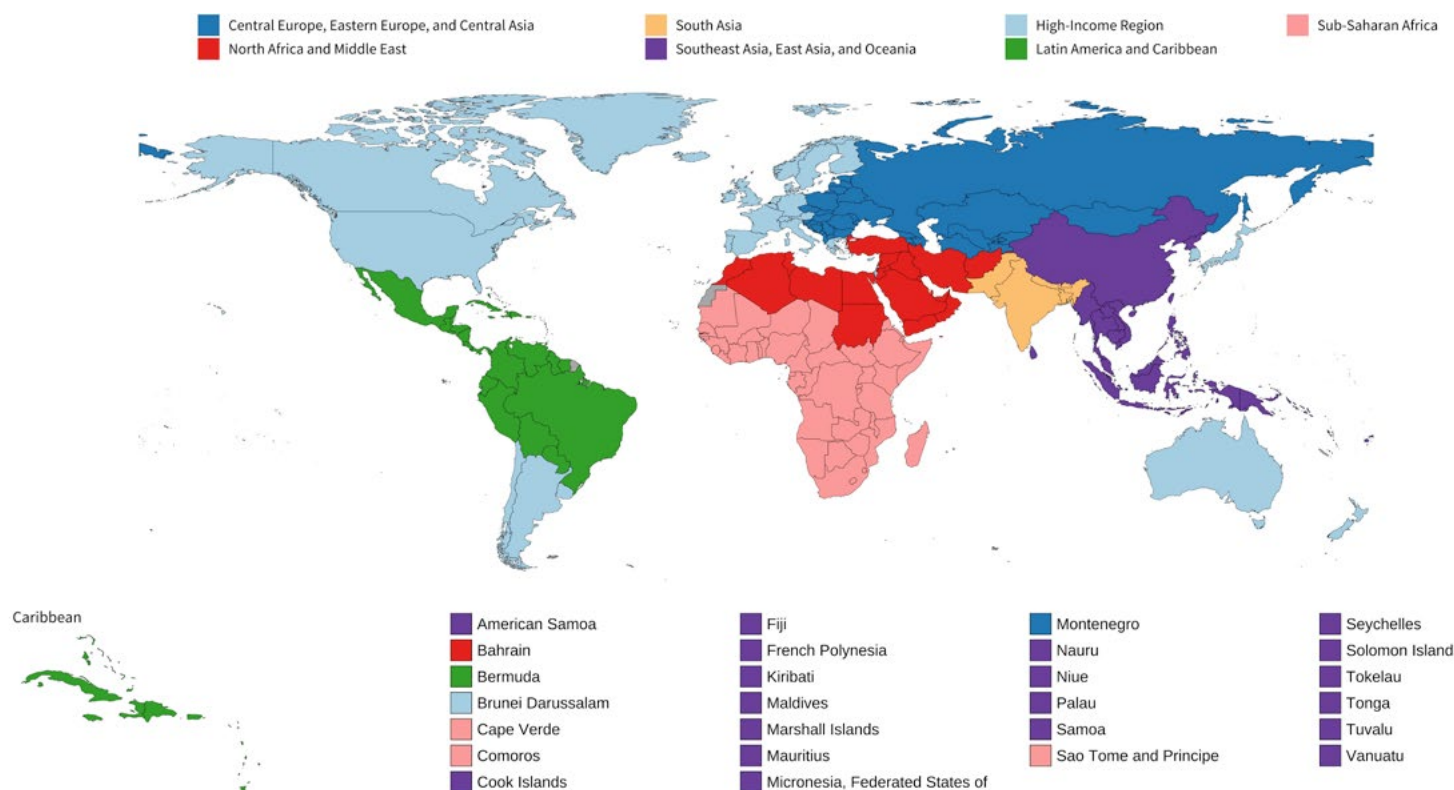
Figure 2: Comparative levels of risk factors by country and region

The figures display the global quintile into which each country falls for each risk factor presented in the Report. This can help policymakers and stakeholders identify the risk factors that are particularly high in their context and define priorities for action.

Risk Factors are labelled in the same order in which they appear in the Report:

RF1 – Physical activity

RF2 – Sodium intake

RF3 – Alcohol consumption

RF4 – Tobacco smoking

RF5 – Obesity

RF6 – Raised Blood Pressure

RF7 – Diabetes

RF8 – Lipids

RF9 – Ambient air pollution

Central Europe, Eastern Europe and Central Asia

High-Income

42

Latin America and the Caribbean

North Africa and Middle East

43

South Asia

Female / Male heatmap for South Asia showing Nepal, India, Pakistan, Bhutan, Bangladesh across RF1–RF9. Legend: Q1 (lowest levels), Q2, Q3, Q4, Q5 (highest levels).

Southeast Asia, East Asia and Oceania

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Female / Male heatmap for Southeast Asia, East Asia and Oceania showing French Polynesia, Micronesia (Federated States of), Tokelau, Tonga, Cook Islands, Papua New Guinea, Niue, Tuvalu, Samoa, Solomon Islands, Fiji, Kiribati, American Samoa, Vanuatu, Marshall Islands, Palau, Nauru, Maldives, Mauritius, Myanmar, Malaysia, Lao People's Democratic Republic, Thailand, Indonesia, Philippines, Seychelles, Cambodia, China, Democratic People's Republic of Korea, Sri Lanka, Timor-Leste, Viet Nam, Taiwan (Province of China) across RF1–RF9. Legend: Q1 (lowest levels), Q2, Q3, Q4, Q5 (highest levels), NA.

Sub-Saharan Africa

Figure 3: Policy Implementation by country and region

Policy implementation per country

Policies are labelled in the same order in which they appear in the report:

P1 - National tobacco control programmes
P2 - Action plan for CVDs
P3 - Operational Unit in Ministry of Health with responsibility for NCDs
P4 - Guidelines for the management of CVDs
P5 - Action plan to reduce physical inactivity
P6 - Action plan to reduce unhealthy diet related to NCDs
P7 - Action plan to reduce the harmful use of alcohol
P8 - Availability of CVD drugs (e.g., ACE inhibitors, aspirin, and Beta blockers) in the public health sector.

Central Europe, Eastern Europe and Central Asia

High-Income

Latin America and the Caribbean

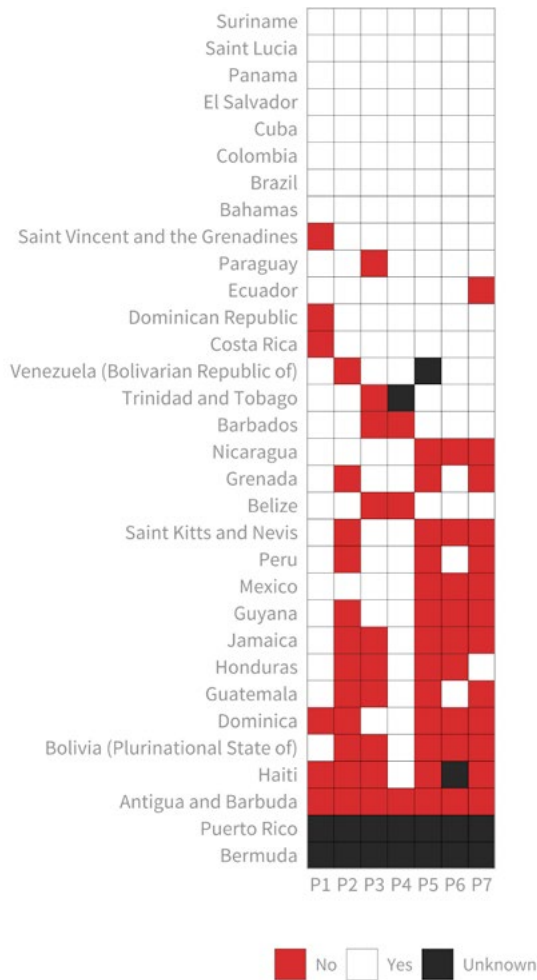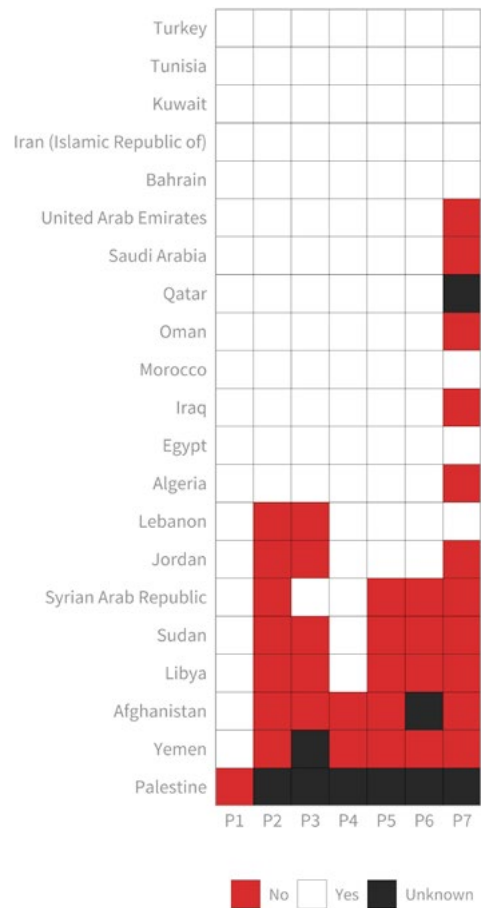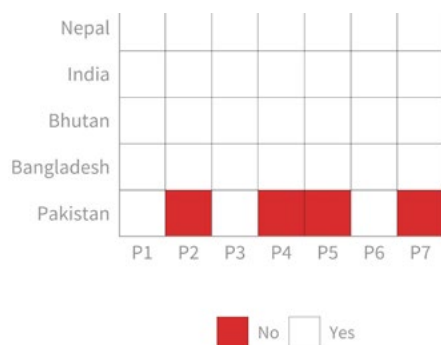|	P1	P2	P3	P4	P5	P6	P7
Suriname							
Saint Lucia							
Panama							
El Salvador							
Cuba							
Colombia							
Brazil							
Bahamas							
Saint Vincent and the Grenadines	No						
Paraguay			No				
Ecuador							No
Dominican Republic							
Costa Rica							
Venezuela (Bolivarian Republic of)			No	Unknown			
Trinidad and Tobago			No	Unknown			
Barbados			No				
Nicaragua		No			No	No	
Grenada		No				No	
Belize		No				No	
Saint Kitts and Nevis		No			No	No	
Peru		No			No	No	
Mexico		No				No	
Guyana		No			No	No	
Jamaica		No	No		No	No	
Honduras		No			No	No	
Guatemala		No			No	No	
Dominica		No			No	No	
Bolivia (Plurinational State of)		No			No	No	
Haiti	No	No	No	No	No	Unknown	No
Antigua and Barbuda	No	No	No	No	No	No	No
Puerto Rico	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Bermuda	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown

■ No ☐ Yes ■ Unknown

North Africa and Middle East

	P1	P2	P3	P4	P5	P6	P7
Turkey							
Tunisia							
Kuwait							
Iran (Islamic Republic of)							
Bahrain							
United Arab Emirates							No
Saudi Arabia							No
Qatar						Unknown	No
Oman							No
Morocco							
Iraq							No
Egypt							
Algeria						No	
Lebanon		No	No				
Jordan		No				No	No
Syrian Arab Republic		No			No	No	No
Sudan		No	No	No	No	No	No
Libya		No	No		No	No	No
Afghanistan		No	No	No	Unknown	No	No
Yemen		No	Unknown	No	No	No	No
Palestine	No	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown

■ No ☐ Yes ■ Unknown

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South Asia

	P1	P2	P3	P4	P5	P6	P7
Nepal							
India							
Bhutan							
Bangladesh							
Pakistan		No		No	No		No

■ No ☐ Yes

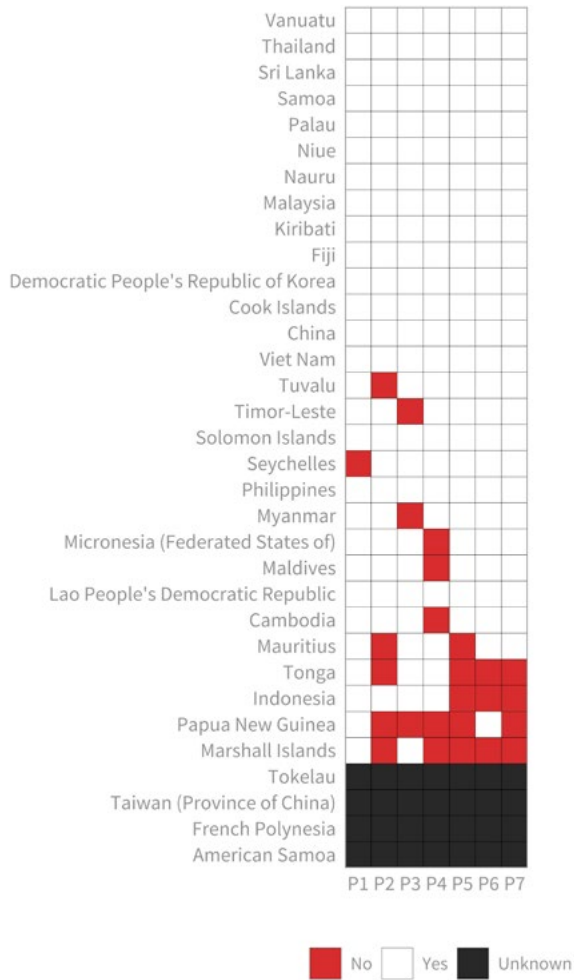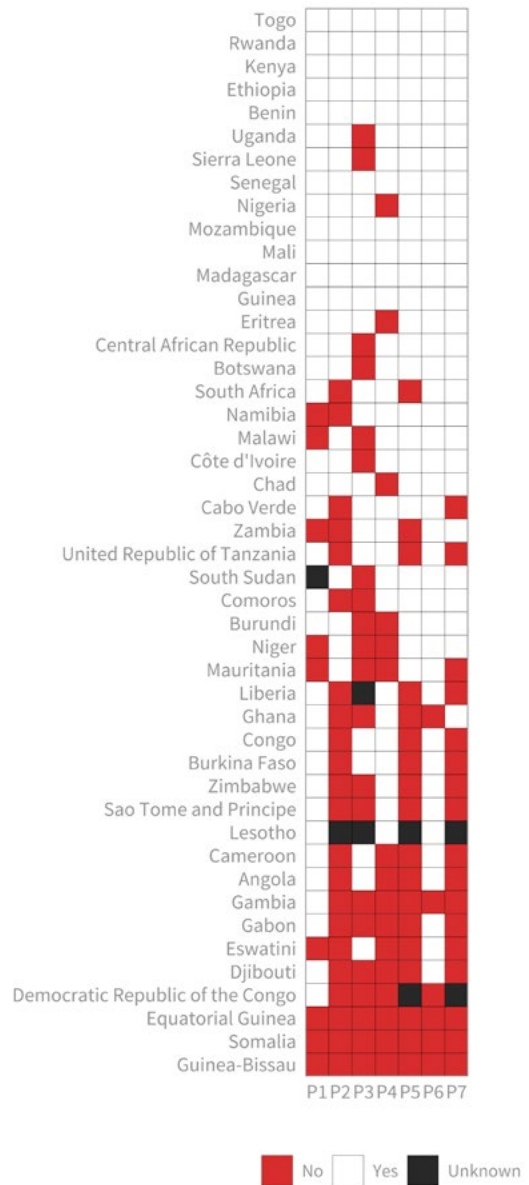## Southeast Asia, East Asia and Oceania

Sub-Saharan Africa

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