

WHO Investment Case 2.0: Technical Report

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Executive summary

Context

For over 70 years, WHO has been the cornerstone of the global health system, and has played a key role in improving global health and wellbeing over that period. The system has become much more complex over time and the COVID-19 pandemic has taken the health challenges facing the world to a new level. These factors highlight the necessity for an effective and well-resourced WHO.

WHO is addressing these challenges through an integrated set of programs based on a common platform, and is renewing itself through the Transformation Program, to ensure that it remains fit-for-purpose for the decade ahead. Central to these efforts are three strategic shifts which WHO is undertaking: stepping up leadership; driving health impact in every country; and focusing global public goods on impact.

In addressing the challenges, WHO is constrained by a funding base providing little certainty looking forward. In the 2020–21 biennium, only 11% of its funding is provided by Assessed Contributions, which are the main source of sustainable funding.

Methods

This report sets out to determine the economic and social return to investing in WHO now. We do this in three steps. First, by estimating the global benefits likely to arise from over 100 interventions in which WHO will be involved, with country and other partners, over the decade from 2022–31.

Second, by estimating the share of those benefits attributable to WHO, having regard to the powerful platform of tools which WHO brings to such interventions and to the strategic shifts that it is currently undertaking. Analysis of both the influencing tools/strategic shifts and of WHO's global health plans leads to an average attribution rate across all the interventions of about 8%.

Finally, we calculate a benefit-cost ratio (BCR) as the ratio of the net present value (NPV) of the attributable benefits to total expenditure by WHO over the decade.

Key findings

The central conclusion of this report is a lower bound BCR of at least 35 (35.0–44.3 across two attribution rate scenarios) for investment in WHO at present. This finding is based on an estimated NPV of US\$1.16–US\$1.46 trillion of the benefits attributable to WHO from programs implemented over 2022–31, at a 3% discount rate. On the same basis, the NPV of expected expenditure by WHO over the ten years is US\$33 billion.

These estimates are lower bound ones because, although we have studied over 100 interventions, these do not cover the full range of WHO's activities, nor have we captured the full range of benefits from them. Obvious examples of other activities whose benefits could not be quantified here, primarily because of the lack of suitable data, are the prequalification program for medicines, many of the public health programs, WHO's response to non-COVID emergencies and the fostering of global capability in digital health. We are also acutely conscious that one of the major benefits of WHO's activities – the reduction in health financial risk and poverty – cannot be quantified by the methods used here.

Thus many other aspects of WHO's work generate significant benefits, although they cannot be estimated at this time, and there are also important benefits from the interventions studied that we have not been able to include. A fully inclusive estimate of the BCR for investment in WHO would be much higher, but a BCR of 35 is a very high return by any standard.

Implications

If WHO is to meet the needs of the global community, it must be able to invest in building its own capability and in partnering with others in shared programs. This has been well documented in many WHO publications. Such investment requires the sustained outlay of funds over a period of years. This is very difficult for WHO, whose funds are largely committed on a year-to-year basis.

If WHO is to reap the very high returns available to it, there needs to be a significant reshaping of its funding base towards more sustainable forms of funding. This could be achieved through a shift in the structure of funding towards higher assessed contributions by Member States. The high returns to investment in WHO shown here suggest that such a change would be well rewarded, both to individual countries and globally.

In the longer term, if an increase in the overall quantum of funding is required, this finding of high returns could support the development of a replenishment funding model for the organization.

1 Introduction: WHO as an investment in human wellbeing

Good health is a vital component of human wellbeing, and enables individuals and communities to build satisfying and productive lives. The value of this improvement in global health over the past century or more is not in dispute, and economists have increasingly recognized its importance relative to other factors.

For example, Nordhaus (1999) estimated that for the United States ‘the economic value of increases in longevity in the last hundred years is about as large as the value of measured growth in non-health goods and services’ (p18). That is, for this dominant economy in the 20th century, the value of increased longevity is comparable to the value of all other factors affecting wellbeing. In a new approach to growth accounting, Arrow et al. (2012) estimate that ‘the value of health capital [is] more than twice as large as all other forms of capital combined’ for five countries (USA, China, Brazil, India and Venezuela) (p351).

The funds that have been provided to WHO by Member States and other contributors since its foundation are clearly investment in an economic sense. They are funds that have been diverted from current consumption to build continuing assets, firstly in the knowledge, skills and capability of the organization, and through WHO, to build the health and human capital of the global community.

The global commitment to the Sustainable Development Goals (SDGs) and the COVID-19 pandemic have both highlighted the centrality of WHO to global public health. This centrality is reinforced by the evident fact that the pandemic has made achieving many of the key SDGs by 2030 more difficult. Indeed, the role of WHO is probably now as critical to the health and development of global populations, especially in low- and middle-income countries (LMICs), as at any other time since it was established in 1948.

This study sets out to understand the returns to investing in WHO itself. What economic and social return can be expected over the next decade to funds invested in WHO now?

Estimating the return to investing in WHO has two components: estimating the benefits created by the projects and programs which WHO leads or facilitates, and assessing the proportion of those benefits that can be rightly attributed to WHO. These benefits attributable to WHO can then be compared to the funds invested in WHO to calculate the benefit-cost ratio (BCR) for that investment.

The body of this report is in five further sections. In Section 2, we introduce the concept of the public value which WHO creates in the global health system through its wide range of programs and activities. The 109 interventions (plus WHO’s pandemic programs) being studied empirically in this report are outlined, and it is noted how these interventions are related to WHO’s goals to create better outcomes at the country level through the ‘Triple Billion’ framework and through the three strategic shifts which are underway.

The WHO has defined these three strategic shifts as being: to step up leadership, to drive health impact in every country, and to focus global public goods on impact as central to its strategy. In this section, we identify and define seven key implementation tools which the WHO commonly uses in helping to generate improved outcomes in Member States, within the framework by provided by the three strategic shifts. All sections of the organization contribute, in one way or another, to these influencing tools, and they help to shape outcomes in all areas.

In Section 3, we consider the public value likely to be generated over the next decade through the 109 interventions plus the pandemic programs being studied here, as data and studies are available to allow that value to be quantified through a viable empirical methodology. Eight such studies are listed, through which we derive an estimate of the global public value generated by the interventions over the next decade. It is important to note that the interventions studied take place only over 2022–31 and the costs are incurred over that period, but the benefits generated by these interventions may extend well beyond this period.

In Section 4, we turn to the critical question of attribution, which is the share of these public benefits that can be rightly attributed to WHO. This question is approached through a detailed analysis of the use by WHO of the influencing tools, within the strategic shifts framework, for each group of interventions. The product of the public value estimate and the attribution rate gives, for each intervention area, the value attributable to WHO.

As noted earlier, WHO undertakes a much wider range of activities than those covered by the 109 interventions plus pandemic programs discussed in Section 3, and also uses the common platform of influencing tools in many of these activities. Six such activities are discussed in Section 5, where the failure to measure the equity and financial risk benefits of WHO activities is also discussed.

Finally, our conclusions about the return to investment in WHO and the implications for WHO’s funding strategy are summarized in Section 6.

2 The foundation of the investment case: creating value in global health

2.1 Creating public value

Ever since it was established in 1948, WHO has been the cornerstone of the global health system. That system has weathered many storms over the past 70 years, but has facilitated major improvements in global health. Average global life expectancy at birth has increased from 47 years in 1950–55 to 72 years in 2015–20 (UN data), an increase of 25 years or 54% over this time.

Many factors have shaped this remarkable improvement in human wellbeing and longevity, which are without precedent in human history. These include rising economic prosperity, rapidly growing medical knowledge, and more effective systems and institutions to apply that medical knowledge to the whole population. Even so, the pivotal role of WHO has been one crucial factor in achieving these outcomes.

WHO is a public sector agency, dedicated to creating and enhancing public goods, and enabling them to be shared equitably within and across States. It exists and operates because its founders and funders believed that it can provide benefits to many communities substantially in excess of the cost of its activities. By analogy with the private sector, in 1995 Mark Moore introduced the concept of public value – the value of the benefits created by public agents for their clients – to describe and seek ways of measuring these benefits (Moore, 1997). A substantial literature has developed on public value, including a follow-up study by Moore (2013) and an extensive review of this literature by Faulkner and Kaufman (2018).

Our approach to estimating the returns to investing in WHO will make use of this concept of public value and the dimensions of public value identified in the literature. These returns will arise from the incremental public value created by WHO in conjunction with a wide range of partners, both national and international.

At the same time, the quality of the contributions and of the leadership provided by WHO will be important in determining the level of benefits created by the activities of the partners. The public value literature (e.g. Faulkner and Kaufman, 2018) highlights the fact that trust and legitimacy, service quality and efficiency are critical if a public organization is to create strong public value for its clients. This certainly applies to WHO.

2.2 The diversity of programs and the transformation of WHO

Over the decades the global health system has changed rapidly, as health challenges, technologies, economic conditions and the needs of Member States have all evolved. This has meant that WHO has had to reinvent itself regularly, to ensure that it remains fit for purpose.

The last decade or so has perhaps seen the greatest change. For example, there has been: an explosion of medical knowledge and of various digital and communications technologies; continued and perhaps increased health inequality around the world; and commitments by the world community to the Sustainable Development Goals (SDGs), to which health is central.

The global health system has also become much more complex, with a sharp increase in the number of participants in the multilateral system. Many of these participants, both government and NGO, contribute highly valuable funding and expertise. But they also contribute to the growing complexity. In addition, the COVID-19 pandemic has been the most disruptive health event in a century.

In recent years, WHO has found it necessary to reshape itself, to ensure that it is fit for purpose in the coming decade. This investment case is underpinned by more than a decade of reform and modernization of WHO, which has sought to align the governance, financing and administration of the organisation at all levels, ensure that priorities are set transparently and from country-level up, and secure a results-based orientation.

The Thirteenth General Programme of Work (GPW 13) (WHO, 2019a), which defined WHO's strategy for the five-year period 2019–2023, represents a new emphasis on measurable impacts. For the first time, a comprehensive results framework has been developed which tracks the joint efforts of the WHO Secretariat, Member States and partners to measure progress towards the GPW 13 targets and the Secretariat's contribution to their achievement.

The WHO transformation, which was launched in 2017, is designed to equip the organisation better to achieve ambitious goals with a clear focus on outcomes. Its initial phases included development of the GPW 13 and re-design of the organisation's key processes and operating model. The implementation phase of the transformation began in 2020 and is ongoing.

For this analysis, a key concept is that of the influencing tools, which we have defined to be the ways in which WHO works to bring about real change, and hence to create public value in Member States. These are placed in the framework provided by the key strategic shifts which WHO management is pursuing. Given adequate funding and an ongoing transformation program based on the three shifts, WHO can develop further its main influencing tools and use them to drive change towards the 'Triple Billion' targets, and to strengthen data and delivery for impact.

These influencing tools, which are discussed further in Section 2.3, are also central to our analysis of attribution rates.

2.3 The diversity of WHO activities: interventions studied and the Triple Billion program

Table 1 below summarises the 109 interventions, plus the activities of WHO in relation to pandemic prevention, control and management, for which data and studies are available to permit estimates to be assembled of the future global benefit. These are referred to as the 109+ interventions. The ages and country coverage of these interventions are shown in Column 2 of the table. These 109+ interventions are also classified (Column 3) in terms of the Triple Billion targets and provided as outcomes of GPW13, to show how integral they are to WHO's program of work. This document also provides a much more detailed classification of outcomes under these three targets.

Table 1: Interventions studied, coverage in available studies and links to General Program of Work (GPW 13) outcomes

Interventions (number)	Coverage in available studies	Links to GPW 13 outcomes ¹
Pandemics (multiple interventions) > Direct/prevent/control disease outbreaks > Best practice pandemic management	Author's analysis; LMIC countries	2
Family planning (11)	Women of childbearing age in 74 LMICs	1
Maternal and newborn health > Women of childbearing age (22) > Adolescent women (22)	Women of childbearing age in 74 LMICs Adolescent women in 40 countries	1
Child health (6)	Children 0–5 years in 74 LMICs	1, 3
Malaria > Pregnant women and young children (5)	In 74 LMICs	1, 3
HIV/AIDS > Pregnant women, mothers and children (4) > Adolescent males and females (9)	In 74 LMICs In 40 LMICs	
Cervical cancer (1)	Vaccination for 12-year-old girls in 75 LMICs	1
Alcohol dependency > Adolescent males and females (2)	In 40 LMICs	3
Epilepsy (2)	In 40 LMICs	1
Child marriage (6)	In 31 LMICs, with high incidence of CM	1,3
Depression > Persons 15 years plus (6) > Adolescents 10–19 years (6)	In 36 countries with 80% of disease burden In 40 LMICs	1, 3
Anxiety (3) > Persons 15 years plus (3) > Adolescents 10–19 years (3)	In 36 countries with 80% of disease burden In 40 LMICs	1, 3
Sodium control (4)	20 countries with highest NCD burden	1, 3
Tobacco use (4)	20 countries with highest NCD burden	1, 3
Drug treatments – cardiovascular disease (6)	20 countries with highest NCD burden	1, 3
Immunisation > Vaccines for 9 diseases (9) > Vaccines for 14 pathogens (14)	Women and children in 194 countries In 194 countries	1, 2
Road safety (8)	In 76 LMIC countries	3
Total interventions studied (excluding double counting): 109 plus the pandemic measures (109+)²		

Notes:

- The Triple Billion targets into which the GPW13 outcomes are classified are as follows:
 - One billion more people benefitting from universal health coverage.
 - One billion more people better protected from health emergencies.
 - One billion more people enjoying better health and wellbeing.
- The pandemic measures are not readily enumerated in terms of individual interventions, so in the text this total is referred to as 109+.

2.4 Influencing tools and better health outcomes

By virtue of its founding Constitution (WHO, 2006), the WHO is in a prime position in the global health system to mandate global health outcomes. But the tools by which it achieves its objectives are focused on persuasion, leadership, negotiation, convening and coordination of partners, who are often other key players in the global health system, through which global health policy plans and strategies are agreed and formulated. Much of its power emanates from the generation and dissemination of technical knowledge in the form of best practice standards and guidelines. It is at the centre of technical knowledge in health interventions, pharmaceuticals and treatment processes, health costs and much more. It has a team of over 8,000 professionals, which include the world's leading public health experts, including doctors, epidemiologists, scientists and managers. This gives its health strategies, guidelines and regulations primacy in the global health system. Member States rely on them. If they weren't available from the WHO, then the countries would need to develop them.

In almost all areas across the WHO, it uses the same influencing tools and processes to achieve the relevant health outcomes. In some areas, it has been appropriate for the WHO to establish formal arrangements between its Member States, such as in the case of the policies and programs to control tobacco, or in pandemic management, where the International Health Regulations (IHR) prevail. But in general, it is the same collection of soft power tools and processes that are used to succeed in the global health system.

Certainly, this is assisted by its six regional offices, 150 country offices and various other offices around the world. The six regional offices are located in Africa, the Americas, Europe, South East Asia, Eastern Mediterranean, and the Western Pacific. WHO works closely with Member States to provide planning, implementing and monitoring of health programs. More than half of WHO staff work in country offices.

The WHO has outlined in its GPW13 how it intends to advance its underlying strategic priorities by employing three strategic shifts: stepping up leadership at all levels, driving impact in every country, and focusing global public goods on impact (2019a, p33). While these are forward looking concepts, they provide a framework within which our own influencing tools can be considered. The influencing tools are based on the past activities of the WHO in developing its powerful and influential policy positions. We have grouped the more detailed influencing tools as sub categories under the headings provided by the strategic shifts.

To demonstrate this commonality of approach across disease areas, for which we have provided benefit estimates, we have analysed the common tools used to influence health outcomes achieved in each of the area. These common influencing tools framed within the overarching strategic shifts are discussed below.

2.4.1 Stepping up leadership

The WHO advocates for health at the highest political level, negotiates multinational treaties and other high-level agreements to achieve its strategic health objectives. This requires not only leadership, but also skills in convening and coordination

Leadership

The WHO is the initiator of myriad initiatives, strategies, policies, guidelines and regulations, which are often developed in partnership with individual countries and other key actors in the health system.

For most of the disease areas we have analysed, the leadership role of the WHO has a long history. The place of the WHO in leading policy developments is well established. WHO's primary role in the control of tobacco consumption dates back at least to 1995 when the World Health Assembly (WHA), requested that the WHO Director General examine the feasibility of developing an international instrument or an international convention on tobacco control. For mental health, the WHO agenda was established by a meeting of WHO and leading country experts in 1999, and for reproductive, maternal, newborn and child health (RMNCH), the WHO Safe Motherhood Initiative to reduce maternal mortality dated from 1987.

The WHO takes the initiative to develop global plans to address health conditions such the Decade for Action in Road Safety or the Mental Health Action Plan, and publishes policies and guidelines. Each of these leadership actions depends on the convening and normative powers of the WHO.

Nonetheless, the WHO does have the power to establish treaties between Member States, such as the Framework Convention on Tobacco Control (FCTC) (WHO, 2003) where signatories give assurance to ratify, accept or approve it, and legally binding regulations such as the International Health Regulations (IHR) are designed to prevent the international spread of infectious diseases. The IHR define the rights and obligations of countries to report public health events and establish procedures for them to follow in upholding global public health security.

Convening and coordination

The leadership initiative to begin the process of formulating high level health policy requires the WHO Secretariat to convene meetings of Member States or other partners and stakeholders, whether formal as in the case of the WHA, or less formal specialist expert committees, or summits and conventions of partners and other stakeholders, to seek international agreement on the formulation of global health strategy plans and the implementation of health programs. Formal declarations from such meetings were often the required support for WHO to develop a global strategic plan for the relevant area.

2.4.2 Driving public health impact in every country

An important part of its role is to articulate ethical and evidence-based options, and provide technical and other support at the country level. WHO has two powerful influencing tools to pursue its objectives at the country level; it has a well-developed regional and country office network and a strong capacity to engage critical actors at the regional and country level in valuable partnerships.

Country office network

In terms of influencing health outcomes, the country/regional office network is essential in transforming the head office advisories into on-the-ground action. This powerful global presence differentiates the WHO from other global partners. The influence of guidelines, fact sheets and other policies emanating from WHO head office could be so easily lost without country office engagement. The role played by country offices can be significant. As an example, in response to COVID-19, almost all country offices reported an expanded role. In terms of coordination, in addition to providing guidance and key documents, such as situation reports to governments and UN agencies, 111 country offices coordinated cooperation between governments and other partners, led procurement, logistic and supply chain mechanisms, communicating to the public, and provided support for duty of care of UN personnel (WHO, 2021a, p28). Moreover, the engagement is two-way, as the offices provide feedback to head office about reactions and concerns from the countries themselves.

Partnerships

Essential to the effective outcomes of these meetings, conventions and summits is the WHO's work with the appropriate partners and other stakeholders. In addition to Member States, the WHO Secretariat works with many different partners. A number are fellow members of the UN system, such as UNICEF, FAO, UNFPA and UNAIDS. There are other important actors in the global health system, such as the Global Fund, GAVI (the Vaccine Alliance) and the Bill and Melinda Gates Foundation, with resources of a similar order of magnitude to the WHO itself. While the WHO received \$10.3 billion for the three years 2018 to 2020, the Global Fund raised \$12.8 billion for the same period. GAVI, which the WHO helped establish, received a total of \$5.1 billion for the same three years, and the Bill and Melinda Gates Foundation provided support for global health over the period totaling \$4.5 billion. The Partnership for Maternal, Newborn and Child Health (PMNCH) was established by WHO and other stakeholders, with WHO providing the secretariat, to advocate for changes in policy, financing and services for women, children and adolescents. It now has over 1000 partners.

Other partners are teams of experts whose contributions range from providing policy input, such as in mental health policy, to those who act as 'boots on the ground', such as the Global Outbreak Alert and Response Network (GOARN) of over 250 technical institutions and networks globally that respond to acute public health events.

2.4.3 Focusing global public goods on impact

WHO's normative, data research and innovation activities drive its creation of public goods which include the formulation of authoritative health guidelines, strategies and interventions used by countries to substitute for their own 'in-house' development. In some instances, these advisories become country health regulations. The basis for this authoritative work is not only the data assembled by the WHO, but the knowledge base provided by its teams of health experts.

Knowledge base

The WHO knowledge base is one of its most powerful influencing tools. The WHO acts as a global clearing house for health advice, policy development, health data, guidelines, and fact sheets on which most of the world depends for independent factual advice and analysis on all disease areas. Some of the WHO's knowledge is original work of its own expert staff, but the remainder is represented by global knowledge that is collected, analysed and disseminated by WHO staff. The WHO Health Observatory contains one of the most complete health data bases in the world. A good example of the expert service provided by WHO to Member States is the prequalification of medicines, which provides Member States with advice on the suitability and price of medicines, saving countries establishing their own regulatory systems.

Formulation of guidelines, strategies and interventions

Arising from this knowledge base, WHO's advice is the leading advice to all its Member States about the best treatment methods, and best medicines to use. WHO provides assistance and planning tools to estimate the complex resource costs for their delivery. For many low-income Member States, without this advice, the level of care would be far lower than that provided. Many lives are saved and morbidity avoided as a result of this advice. The guidelines are subject to a formal approval process by the WHO Guidelines Committee. For instance, guidelines are approved to cover clinical advice to midwives on managing complications in pregnancy and recommendations on antenatal care for a positive pregnancy experience.

Perhaps just as importantly, WHO's expertise and convening powers combine to produce the most authoritative global health strategies and action plans. These cover areas such as mental health, road safety, non-communicable diseases (NCDs), obesity and good diet. They are comprehensive and establish responsibilities across the global health system for the WHO Secretariat, Member States, and international partners and other stakeholders.

Regulation

As discussed above, the use of formal regulation by the WHO is relatively limited. The FCTC and the IHR are important exceptions.

3 Estimating the public value created by the interventions

3.1 The overall approach to empirical assessment

As indicated in Section 2.3 and Table 1 above, to derive an estimate of the public value likely to be created over the next decade by activities in which WHO will play a leading role, we undertake empirical analysis of the WHO's pandemic activities plus 109 other interventions. The central question here is what global public benefit is likely to be created by the implementation of these interventions over the next decade from 2021, namely the period of 2022–31.

In this section, we will adapt the analysis of six published papers – items (ii) to (vii) in Box 1 below – and report on two analyses undertaken for this study items (i) and (viii) in Box 1. In each of these analyses, the objective is what public benefits WHO and its partners can achieve over the next decade.

Box 1: Eight studies reporting the results of multi-country modelling of multiple interventions to improve population health

- (i) An analysis of the benefits of pandemic prevention and control and of best practice pandemic management (in this report)
- (ii) Advancing social and economic development by investing in women's and children's health: a new Global Investment Framework (Stenberg et al., 2014, *The Lancet*)
- (iii) Building the foundations for sustainable development: a case for global investment in the capabilities of adolescents (Sheehan et al., 2017, *The Lancet*)
- (iv) Evaluating the employment benefits of education and targeted interventions to reduce child marriage (Rasmussen et al., 2019, *Journal of Adolescent Health*)
- (v) Scaling-up treatment of depression and anxiety: a global return on investment analysis (Chisholm et al., 2016, *Lancet Psychiatry*)
- (vi) Investing in non-communicable diseases: an estimation of the return on investment for prevention and treatment services (Bertram et al., 2018, *The Lancet*)
- (vii) Reduced road traffic injuries for young people: a preliminary investment analysis (Symons et al., 2019, *Journal of Adolescent Health*)
- (viii) An analysis of the benefits of vaccination programs under the IA30 program (benefit analysis from this report, based on the health outcomes from Carter et al., 2021, SSRN)

To be appropriate for an investment case, these estimates of public value generated must be realistic estimates of benefits that are achievable, rather than benefits generated if optimum goals were achieved. As some of the studies are based on the scale-up of interventions to achieve targets such as the SDGs, we adjust the estimates in these cases by an achievement rate.

In almost all the areas in which WHO participates in interventions, it will do so in conjunction with many other partners – governments, other agencies and NGOs, providers of required technology, knowledge and skills, and in some cases funding partners. A critical part of this project was to analyse the contribution that WHO makes to the activity, and hence the share of the public benefits that can be attributed to WHO. The resulting attribution rate is not the same as WHO's share of total project expenditure, for WHO's role is typically quite different from that of its funding partners. The issues surrounding attribution rates are discussed in some detail in Section 4.

The share of returns attributable to WHO will likely vary across WHO's spheres of activity, depending on the nature of WHO's activities in a given area, and the skills, expertise and communications capability that WHO brings to that area, relative to that of other parties involved in that area. Each of the areas will be the subject of detailed analysis, to determine a preferred range of attribution factors.

3.2 Net public benefits attributable to WHO

3.2.1 Pandemic management

We know that the number of zoonotic diseases – diseases in animals that can affect humans – is very high in the animal kingdom, and that the crossover into humans is occurring at an increasing rate (IPBES, 2020). So there are two challenges: pandemic management, that is limiting the spread of disease through the human community for each case of an infection by a zoonotic disease; and pandemic risk reduction, reducing the number of zoonotic diseases that get passed to humans. The first of these is discussed in this section. The second challenge is a separate issue, as noted above (for further information on this issue see IPBES, 2020).

The task of reducing the risks of future pandemics, in the context of rising pandemic risk, is a vital one, in which WHO must play, and is playing, a leading role. One example of such a role was the agreement in May 2018 for the FAO, WHO and OIE (World Organisation for Animal Health) to step up joint action to combat health threats associated with interactions

between humans, animals and the environment. The World Bank has been active in this area, in conjunction with WHO, under its One Health program, which seeks, in conjunction with agencies such as WHO, to strengthen public health systems at the human-animal-environment. On 21 May 2021, the establishment of a new international panel, to advise FAO, WHO, OIE and UNEP on the emergence and spread of new zoonotic diseases, was announced (WHO, 2021b).

While recognizing the vital importance of concerted action to reduce the risk of future pandemics, and the centrality of WHO to this action, the potential value of WHO's programs in this regard have not been assessed here. Insufficient information is currently available on preferred programs, institutional arrangements, and likely costs and benefits for reliable estimates to be made.

Modelling of pandemic management

In assessing the future economic value of improved pandemic management of another pandemic, two prior estimates are required. One is the likely cost of another pandemic and the second is the probability of its occurrence.

For the future cost of another pandemic, we use an estimate of the economic and social cost of the COVID 19 pandemic as a benchmark. Our estimate is \$11.7 trillion, comprising gross domestic product (GDP) forgone of \$10 trillion for the three years 2020–22 based on an average of World Bank and OECD estimates, and costs of \$1.7 trillion arising from workforce deaths. We acknowledge that this estimate is conservative. The economic costs of GDP forgone are likely to extend beyond the end of 2022 and include losses due to reduced innovation, training and labour force productivity. However, the size of these are uncertain and, in the context of the large initial losses, relatively small. The estimate of workforce deaths is based on relatively limited deaths by age and sex due to COVID. In valuing deaths, we follow Stenberg et al. (2014) which uses estimates based on human capital models of the impact of death on labour force numbers and ratio of GDP per capita used to provide an estimate of the social value of lives lost. This approach is preferred to more speculative approaches based on adopting the value of a statistical life method, which would generate a higher value.

With respect to the probability of the occurrence of another pandemic in the next decade, there is an established literature suggesting that:

The risk of pandemics is increasing rapidly, with more than five new diseases emerging in people every year, any one of which has the potential to spread and become pandemic. The risk of a pandemic is driven by exponentially increasing anthropogenic changes. (IPBES, 2020, p2)

This ongoing, and indeed increasing, pandemic risk reflects many factors shaping the interactions between animals and humans, such as encroaching urbanization, climate change driving new interactions between species, and various practices, such as wet markets. There has been an increasing number of papers modelling the factors behind the emergence of epidemic infectious diseases, some with a view to improving our understanding of the mechanisms underlying their emergence (Allen et al., 2017; Brierley et al., 2016). Others have sought to determine the factors that affect a country's prospective vulnerability to a pandemic risk exposure (Grima et al., 2020).

There have been few estimates of what the probability is, given these trends, of another pandemic comparable to COVID-19 over the next decade. On the basis of long-run statistical analysis and recent estimates of the rate of increase in disease emergence from zoonotic reservoirs, Marani et al. (2021) estimate that the yearly probability of occurrence of extreme epidemics can increase up to threefold in the coming decades.

One estimate is from Metabiota, a data analytics firm which provides risk advice to the insurance industry. They have estimated that there is a 2.5% to 3.3% annual risk of a COVID-sized pandemic event. In other words, there is a 22–28% chance of such a pandemic in the next decade (Smithan and Glassman, 2021; Marani et al., 2021).

In our modelling, we assume that the probability of another pandemic comparable to COVID-19 over the next decade is 25%, and hence the estimated probability-adjusted cost of a future equivalent pandemic would be 25% of that estimated for COVID-19. The preliminary results of this work are outlined below.

In relation to pandemic management, for a given number of diseases transmitted to animals, we use a three-way distinction:

- i. Stopping a new zoonotic disease outcome from becoming a pandemic.
- ii. Controlling and managing a pandemic once it has become established.
- iii. Developing and distributing vaccines and other treatment to protect against the disease.

These are discussed below.

i. Detect, prevent and control disease outbreaks before they become pandemics

Here we refer to a range of programs, to which WHO is central, to put systems in place for early detection of emerging infections, to monitor them closely when they do occur, to control them in their early stages, and to provide early warning to the international community. If these are well developed and comprehensive, and make use of emerging digital and other technologies, such programs could stop the new disease from developing into a global pandemic, and hence avoid virtually all of the costs incurred with COVID-19.

Given the complexity of the global environment, the vagaries of individual countries and the continued emergence of zoonotic diseases, it is not likely that even the best systems will be fully effective.

With the application of well-developed and comprehensive practices, the outbreak could be confined to just one country or region representing say 10% of the cost of COVID 19 as outlined above.

If this was achieved, about 90% of the global cost incurred by world economies would have been avoided, representing some \$10 trillion in benefits over three years. Applying the decadal probability to future pandemic events of 25%, the probability adjusted benefit is \$2.5 trillion. Given WHO's prime role in monitoring, defining, coordinating and managing such a plan for detection and prevention, an attribution rate of 15% can be supported, giving a benefit attributed to WHO of \$375 billion if the 90% saving were achieved (see Table 2).

ii. Best practice management policies given an established pandemic

If a pandemic becomes established, the next stage is the public health programs to control the incidence and spread of the disease. These measures – such as social distancing, mask wearing, lockdowns, closing international borders and so on – have been at the heart of the current response, and have been applied very differently across countries. Another set of measures have focused on detection, testing, infection tracing and quarantine of infected population. Testing is one of the most important tools in the fight to slow and reduce the spread and impact of the virus.

This variation provides a means of estimating the impact of these policies in the current pandemic. We use various techniques, including econometric modelling of the relationship between testing and deaths, and between deaths and GDP loss, to identify a set of best practice or exemplar countries. By comparing the cost of COVID-19 in these countries relative to other countries in the first four or five quarters of the pandemic, we estimate the potential benefits (that is, the proportion of the costs that could be avoided) by the application of such best practice across a sample of 57 countries for which there is adequate data. Exemplar countries have been those with high testing rates, low cases and deaths per million, and modest economic losses. Empirical analysis based on the COVID-19 pandemic suggests that at least 30% of these costs can be avoided by following best practice management.

In addition, estimates were made of the economic and social cost of lives lost (registered deaths) from COVID discussed briefly above, and the proportion of that cost to be avoided by using the policies employed by the exemplar countries. The evidence suggested that best practice policies could eliminate more than 90% of these losses, the benefits of doing so exceeding \$1.7 billion in net present value (NPV) terms.

Overall, best practice management policies were estimated to yield benefits of \$3.0 trillion in year one and \$4.7 trillion over a three-year period. On an equivalent probability-adjusted basis (25%), this would be benefits of \$750 billion and \$1.2 trillion, respectively.

Table 2: Value of WHO pandemic activities

	Total economic and social impact of pandemic policies, \$ trillion		Adjusted for 25% probability of another pandemic, \$ trillion	Benefit attributable to WHO, \$billion ¹	
Preparedness and detection	Year one	4.5	1.125	Year one	169
	Three years	10.0	2.5	Three years	375
Best practice management	Year one	3.0	0.75	Year one	150
	Three years	4.7	1.2	Three years	240

Note:

1. Using attribution rates of 15% and 20% for the two components respectively (see Section 4).

This analysis needs to be dovetailed to (i) above, as both cannot occur at the same time. If a pandemic is largely contained, the benefits from effectively managing it will not be realized. We report the results of applying a 50% probability of a pandemic proceeding in spite of the application of strong detection, prevention and control practices under (i) above. That is, we weight the two components in Table 2 equally.

WHO also needs to take a key role in developing, promulgating and assisting countries to implement these systems, and hence would have a relatively high attribution rate (say 20%) in the case of best practice management. The probability-adjusted level of savings attributable to the activities of WHO is then \$120 billion ($\$1.2 \text{ trillion} \times 0.5 \times 20\%$). The benefits to WHO of successful preparedness outlined in (i) above of \$375 billion would be similarly reduced by 50% to \$188 billion. Together, the value of benefits generated by WHO on a probability-adjusted basis would equal \$308 billion.

iii. Vaccines and medical treatments

In the case of COVID-19, there was a remarkably quick development of effective vaccines, far more rapidly than in previous historical experience. These started to be used in the fifth quarter of the pandemic (March quarter of 2021), but at the end of that quarter only 4.4% of the global population had had one dose and 1.7% had had two doses. By the end of the June quarter, these numbers had grown to 10.9% and 23.4%, respectively. It is also notable that the uptake of vaccines has been highly unequal around the whole world.

It would be unrealistic to say that WHO could do anything major to speed the development of vaccines for the next outbreaks relative to the COVID-19 outbreak, although over the next ten years changes in science and technology might well change the situation here. But where WHO can and should play a role is in increasing equity in access to vaccines. This critical issue is not addressed further in this report.

3.2.2 Reproductive, maternal, newborn and child health (RMNCH)

Paper (ii) in Box 1 studies the health impacts, and their costs and economic and social benefits, for 50 interventions directed at children aged <5 and mothers, in 74 countries over the period 2013–35 (Stenberg et al., 2014). The 74 countries studied account for about 95% of all maternal and child deaths. The health impacts of the interventions were modelled using the UN/WHO OneHealth tool (WHO, 2021c), and the economic and social benefits of these impacts were assessed using models developed by authors of the paper. If the interventions programs run to 2035 and the benefits are included out to 2050, the BCR at 3% is very high (38.7). While the costs of health interventions are largely borne in the year of intervention, the benefits from averting death or disability for a mother or a child extend well into the future.

Three scenarios were run in the paper for the coverage of the policy variables: a base case, a medium case and a high case. In the high case, country coverage rates for the 50 interventions modelled adjust to follow the best performer in each area, and reach an average across all interventions of 88% by 2035. For many interventions, the coverage rate is at or near 100% by 2035.

Our objective here is to draw from this paper some estimates of the benefits and costs of implementing this program over a later but shorter period, namely 2022–31, for the high case relative to the low or base case. Relevant issues here are as follows:

- Between 2013 and 2019, the underlying health situation of mothers and <5 children has improved a good deal, but this may have been partly offset by the COVID-19 events of 2020 and 2021. One limitation of our current analysis is that it assumes that these factors are broadly offsetting and that 2021 can be used as the base for the new analysis.
- The paper (and unpublished data available to the authors of this study) reports the costs of the interventions by year from 2013 to 2035, when the interventions cease, and also the estimated benefits by year to 2050. The costs are low in the early years as the program scales up, but by year 5 are above the long-term average, as the costs of building infrastructure and health systems build up quickly, before declining in the later years. To avoid the distorting effects on costs for the first decade, we estimate these costs as a pro-rata share (10/23) of the NPV of total costs over 2013–35, having regard to these competing factors.
- The annual flow of benefits builds up over time, as the benefits arising from successive cohorts of women and children are added into the annual figure. For example, the benefits total for 2050 includes those for all women and children treated over each year 2013–35. If we estimate the benefits arising from interventions in the first decade as a pro-rata share of benefits, as we did for costs, this will understate the true benefits, as first decade benefits will be a greater share than this of total benefits to 2050. Nevertheless, we adopt this approach, recognizing this underestimation of the benefits resulting from the improved health and welfare of women and children assisted in the first decade.
- The numerical values, for both costs and benefits, will have changed significantly over those used in the 2013 analysis. To adjust these values, we update the benefits by the change in the global GDP deflator over 2013–21 (19.8%) and the costs by the GDP deflator plus 2% per annum over that period (36.4%).

This RMNCH study (Stenberg et al., 2014) is a goal-driven one, that is it studies a program in which, in the high case, the 50 interventions in the 74 countries are scaled up to 88% on average and, for many, to close to 100%. While this is an appropriate setting for many analytical purposes, it is not appropriate for an investment case, where estimates should relate not to what could be achieved if goals are met, but what is likely to be achieved by programs in the real world. Here we again adopt a conservative approach, assuming an achievement rate of 70%, which means that only 70% of the target benefits are achieved for the given cost outlay.

It is important to note that this is not the same as the medium case studied, where on average the interventions are scaled up to an average of 60% by 2035. Here we adopted the aggressive scaling up of the interventions, but allow for the fact that not all the benefits of such a targeted approach may be realized.

While WHO has long been heavily involved in RMNCH programs, both on the technical and policy side and through assisting with their implementation in-country, many other parties play crucial roles. The most important of these are the governments and their health agencies that implement the programs, and the parties, whether governments or others, that fund them. These considerations relate to the attribution issues taken up in Section 4. The full results for these interventions are provided in Table 8 in Section 4.3.

3.2.3 Adolescent health

For the health component of adolescent wellbeing, paper (iii) in Box 1 looks at adolescents (persons 10–19 years) in 40 countries which contain about 95% of all adolescents in developing countries. Sixty-six health interventions were modelled using the OneHealth tool, while human papillomavirus (HPV) was modelled separately, and the estimation of benefits followed a similar approach to that used for the RMNCH (paper (ii)). It examines two scenarios, a base case in which coverage rates remain fixed at their 2015 level, and the other in which they increase to a high level (over 80% in most countries) by 2030. Costs are here indexed by GDP per worker, rather than being held fixed in real terms in the RMNCH study.

Here our objective is to approximate the results of the first ten years of the RMNCH study (that is 2015–24), but shifted forward six years to 2022–31. This raises two main issues: truncating the study to the first ten years, and shifting the cost and benefit assessment forward six years. As the health interventions and the modelling of health outcomes and economic and social benefits are similar for adolescents as for the RMNCH study, we adopt the same pro-rata approach here also. With the target level to which the interventions are scaled up (over 80%), we also use a 70% achievement rate.

The main issue in using the results of paper (iii) here is the extent of overlap with paper (ii), and the need to avoid double counting. Both papers make use of the OneHealth Tool (OHT) and substantially overlap in modelling maternal, newborn and reproductive health. But in other areas, paper (iii) is more extensive, as it covers adolescent boys as well as girls; includes a more extensive set of interventions for HIV/AIDS; includes interventions for tuberculosis and selected NCDs; and undertakes separate modelling for a HPV vaccination program. For this analysis, we include 50% of the benefits arising from the OHT modelling in paper (iii) (excluding 50% as involving double counting), plus those arising from the modelling of the HPV program. For the full results see Table 8 in Section 4.3.

3.2.4 Child marriage

The estimate of benefits arising from reducing child marriage (CM) are sourced from paper (iv) in Box 1 (Rasmussen et al., 2019). The interventions which give rise to the estimated benefits are of two kinds. One set is aimed directly at reducing CM, while the other seeks to keep girls at school, which in turn reduces CM. The CM interventions include economic incentives to remain unmarried, and social and cultural programs to persuade families, communities and the girls themselves of the benefits of delaying marriage. By delaying marriage, these interventions help keep girls at school. The education interventions range from greater access to schools (including girl-friendly schools), to improved teaching quality and economic incentives to remain in school. These interventions seek to improve education outcomes by reducing the dropout rate and extending the time in education to at least secondary school completion.

These improved education outcomes provide the girls with greater and more productive employment opportunities, not only because the additional years of schooling are linked to higher earnings, but in addition the completion of secondary education is associated with a higher probability of obtaining employment in the formal sector. The lower early marriage rates arising from the education interventions also result in delayed first pregnancy, with consequential benefits for mother and child, in particular, reduced rates of mortality. These benefits were not included in the estimates reported in this paper.

Two main models were used to undertake the cost-benefit analysis. One generated education costs and other education outcomes; and second, a benefits model which forecast economic benefits from employment, GDP levels and productivity gains. The modelling compared two scenarios, a continuation of existing conditions described as ‘base scenario’, and an ‘intervention scenario’ which included the interventions discussed above. For the ‘base scenario’, the cost and outcomes model projected base education costs, as well as CM prevalence and education enrolments. The intervention scenario

estimated the impact of the interventions on this base scenario from 2020. The benefit-cost ratios are calculated on the basis that the annual cost of the interventions increases progressively to 2030, thereafter remaining constant to 2050. The benefits are modelled to include productivity and employment gains until retirement for each age cohort.

For 31 lower-income countries (LICs) and LMICs, the total benefits were estimated to be \$902 billion in NPV terms discounted at 3% per annum, adjusted for price movement to 2020 to \$1018 billion. The unweighted average benefit-cost ratio was 7.4.

The elimination of child marriage is one of the SDGs and forms an integral part of the WHO's first pillar, One Billion More People Enjoying Better Health and Well-Being, which includes improvements to child and adolescent health. Preventing child marriage is one of the objectives of the UN Global Strategy for Women's, Children's and Adolescents' Health (2016–2030). While clearly important for the WHO's objectives in child and adolescent health, especially through the impact of child marriage on maternal and infant mortality, the principal UN agency with responsibility for achieving the SDG child marriage objectives is the UNFPA. In considering the value of WHO advocacy to reducing child marriage, an attribution factor of 3–5% would seem reasonable. See Table 8 in Section 4 for the final estimates of benefits attributable to WHO.

3.2.5 Depression and anxiety

Paper (v) in Box 1 reports an analysis of the returns to investment in treatments for anxiety and depression in the 36 largest countries of the world, over the period 2016–2030 (Chisholm et al., 2016). These countries account for 80% of both global population and of the global burden of depression and anxiety disorders. They focus on treatment rather than prevention, as the evidence on prevention strategies was not regarded as sufficiently robust. There has been growing awareness of the burden of mental illness around the world, and the massive economic and social costs that it imposes on society. The authors estimate that the global economic cost of depression and anxiety, due to lost productivity alone, is about US\$1.15 trillion per annum.

Again, we draw on this study to estimate the benefits of applying these interventions in 2021, for the decade 2022–31. For several reasons, the issues raised for the RMNCH study are less problematic here. There is unlikely to have been a major improvement in mental health since 2016, and indeed it may have deteriorated over that time as a result of COVID-19. Costs for treatment of depression and anxiety are fairly stable over the span of the intervention, although there is some allowance for shared program and health system costs. The benefits studied are more immediate than in the previous two cases, primarily arising from increasing productivity. We therefore again estimate costs and benefits for the 2022–31 period on a pro-rata basis, and with the adjustment of both cost and benefit data for inflation rates over 2016–21 as previously described.

Global coverage of treatments for depression and anxiety is very low in most countries, and varies greatly across countries. Treatment rates for depression were estimated in the paper to range from 7–28% across country groupings by income, and from 5–20% for anxiety. This leaves large treatment gaps in almost all countries, ranging from 72–93% across country groupings for depression and 80–95% for anxiety. Paper (v) models different, but fairly modest, increases in coverage rates over the period to 2030, having regard to the low coverage at the present time.

For this reason, we use an achievement rate of 100% for our analysis. The results are also summarised in Table 8 in Section 4.

3.2.6 Cardiovascular disease

For some decades, global health policy has focused on communicable diseases, and great progress has been achieved in this area. For the past decade or more, the importance of the epidemiological transition to non-communicable diseases (NCDs), in virtually all countries, has become more widely understood. WHO has been active in this area, as evidenced by the 2018 strategic response to NCDs (WHO, 2018b). This will inevitably be a key area of WHO's work over the next decade.

Paper (vi) in Box 1 undertook an analysis of initiatives over 2015–30 to reduce the incidence of cardiovascular disease (CVD), by prevention and treatment, in 20 countries (Bertram et al., 2018). The countries studied covered all income groups and accounted for 70% of the global burden of CVD. Fourteen interventions were modelled in the study, across the categories of sodium reduction, control of tobacco use and pharmaceutical interventions.

The SDG goal 3.4 is for a 30% reduction in premature mortality from NCDs by 2030. The coverage of the 14 interventions modelled are scaled up linearly from 2015 to 2030, to a level broadly consistent with the achievement of SDG 3.4 by 2030. As in the previous studies, the health impacts are modelled using the OneHealth tool, with other models used for the benefit assessment. The target level of scale-up consistent with the SDG 3.4 goal was estimated using this tool.

As for papers (ii) and (iii), the adjustment of costs and benefits to 2022–31 were done on a pro-rata basis. Although this exercise involved scaling up the interventions to a target consistent with the SDG goal for 2030, in the light of the global focus on CVD and the relative simplicity and availability of the 14 interventions, we used an achievement factor of 80%. Overall results are provided in Table 8 in Section 4.

3.2.7 Non-COVID vaccines

WHO has been a leader in promoting global immunization programmes since its constitution, starting with the 1950 mass tuberculosis immunization with the bacille Calmette-Guerin (BCG) vaccine to protect children from tuberculosis (WHO, 2008). WHO and its partners such as UNICEF and Gavi created the Expanded Programme on Immunization (EPI), provided lifesaving vaccines to hundreds of millions of children around the world. The immunisation programme has had a profound impact on global public health, with a presence in virtually every country in the world. WHO staff have supported governments and health professionals to identify national health priorities, and to deliver vaccines where they are needed. Its success is measured in millions of lives saved each year. Through vaccination, smallpox has been eradicated and polio is on the verge of being defeated. Immunization benefits our world in saving lives and protecting peoples' health, improving countries' productivity and resilience, and helping ensure a safer, healthier world.

Several studies assessing the health impact and economic benefits of vaccination have been recently conducted (such as, Ozawa et al., 2016; Li et al., 2021; Sim et al., 2020; Toor et al., 2021; Watts et al., 2021) for ten pathogens. For example, Toor et al. (2021) estimates that over the period 2000–2030, vaccination programmes would save 97 million lives across 112 countries. In terms of economic benefits, Sim et al. (2021) use the cost-of-illness approach and estimate that for 94 LMICs vaccinations against ten pathogens averted US\$828.5 billion of costs over the period 2022–31. When taking into account the cost of vaccination programmes, these investments are estimated to have a BCR of 19.8.

With the *Immunization Agenda 2030: A Global Strategy to Leave No One Behind* (IA2030) (WHO, 2020a), WHO has endorsed an ambitious global strategy that envisions a world where everyone, everywhere, at every age fully benefits from vaccines for good health and wellbeing. The study conducted by Carter et al. (2021) is based on the aspirational coverage target for IA2030 to estimate deaths averted due to vaccination against 14 pathogens from 2022–31 in all 194 WHO Member States.

Carter et al. (2021) estimates that 51.0 million (95% CI: 48.5–53.7) deaths are expected to be averted due to vaccinations administered between 2022–31 inclusive. The largest proportion of deaths is attributed to measles and hepatitis B accounting for 18.8 million (16.7–21.1) and 14 million (13.6–14.4) of total deaths averted respectively. In terms of the World Bank income group, it is noted that the expected number of deaths averted is highest in LMICs (approximately 49% or 24.8 million), and then in LICs (26% or 13 million), considering that LICs account for 10% of the total world population. According to WHO country group, 45% (23 million) deaths are expected to be averted in the AFRO region, in comparison to 4% (1.9 million) in the EURO region (Carter et al., 2021).

For this investment case, we are using the data provided by Carter et al. (2021) on the health benefits arising from this immunisation program to estimate the economic and social benefits arising from these improved outcomes, and hence to determine the benefits from this program that can be attributed to WHO. As this analysis uses current year data, no adjustment in inflation rates is required and we use an achievement rate of 80%. But data availability requires some other variations to the methodology used for other interventions. The preliminary results provided in Table 8 in Section 4 refer to the benefits on the deaths and disability avoided over 2022–31 from the immunisation program, with the benefits truncated at 2050. No allowance is made in this case for costs.

3.2.8 Youth road safety

The WHO is an international leader in the implementation of global road safety policies. The 2018 WHO *Global Status Report on Road Safety* (2018a) provided the definitive account of global road safety performance and offered a baseline, accountability and inspiration for action. This led to the adoption in September 2020 of the UN 74th General Assembly resolution A/RES/74/299 of the Second Decade for Action for Road Safety for the period 2012–2030 (UNGA, 2020). This resolution included the ambitious target of reducing the number of road traffic deaths and injuries by at least 50% by 2030. In 2018, the WHO, in collaboration with other partners, developed a 'Global Plan for the Decade of Action', the key driving document to delivering results for the major driving force in road safety improvements, the Decade of Action for Road Safety. This plan was formally launched by the WHO in October 2021 (WHO and UNRC, 2021).

WHO works across sectors with Member States, as well as national and international partners and stakeholders, to support road safety evaluation, implementation and planning. As the lead agency for road safety in the United Nations (WHO, 2021d), WHO plays a key role in guiding global efforts by continuing to advocate for road safety at the highest political levels, compiling and disseminating good practice in prevention, data collection, trauma care, and raising awareness of road safety. The leadership of the WHO has provided the guidance and strategy to implement interventions to address the Decade of Action for Road Safety agenda.

Paper (vii) in Box 1 reports on the construction of a detailed model to estimate the costs and benefits of a set of road safety interventions for adolescents in 75 LMICs (Symons et al., 2019). This model has been updated and extended in later work, supported by the FIA Foundation and including a capability to achieve a nominated road safety target, in terms of reduced deaths and morbidity, at least cost. This version of the model, which is used here, employs an optimal cost minimisation approach to most effectively choose the road safety interventions to achieve a given road safety target.

This model has been used to study the costs and benefits of eight interventions in 75 countries to reduce death and disability for young people (persons aged 10–24 years) over the next decade. The net benefit of this investment in the optimal set of interventions is \$1,690 billion. The vast majority of this net benefit would rightfully accrue to the many governments and other agencies which will finance this investment. However, as outlined above, the WHO has played a critical role in the development of the policies and the definition of intervention programs through its initiative in bringing together the other UN agencies to draft the WHO Global Status Report on Road Safety (2018a), and now the launch of the Decade for Action for Road Safety plan. As with our analysis of similar programs, we have allowed for a success probability of 80% of completing the full program by 2030. See Table 8 in Section 4 for details.

4 The attribution analysis

4.1 Common use of influencing tools within the strategic shift framework

In Section 2.3, we suggested that the WHO uses a common set of influencing tools under the overall *strategic shift* headings to achieve most of its global health objectives. In that section, we identified and provided an outline of the use of those tools. In this section, we present in Table 3 a summary of an analysis using the tools applied to a number of selected disease areas. The disease areas selected cover most of the areas for which we have been able to provide benefit estimates: NCDs; mental health; pandemic management; reproductive, maternal, newborn child and adolescent health (RMNCH+A), and road safety. It also includes one broad area, obesity, which while not explicitly included in our estimates, is nonetheless related to our analysis of NCDs.

Table 3 summarises a detailed analysis of WHO global plans, position statements, budgetary documents and website content, which was used to review the use of the influencing tools under the *strategic shift* headings and permit an allocation of policy actions to the various *strategic shifts* and influencing tools.

A review of the use of the *strategic shift* framework and influencing tools presented in Table 3 supports, in our view, the proposition that the WHO makes use of a common set of tools to address the disease areas for which it chooses to develop global plans, guidelines and other supporting material under the headings of the Three Pillars.

In brief, from our analysis presented in Table 3, the common activities under each of the influencing tools are shown in Table 4.

The benefits that we have estimated reflect total health system outcomes for only a proportion of the WHO activities. We have not been able to estimate WHO's full value due to absence of data and modelling limitations. However, based on this analysis, demonstrating a common approach employed across the disease areas analysed, including one other from outside the group estimated, we would expect the benefits estimated to be broadly transferrable across the total disease areas addressed by the WHO. The additional benefits attributable to the WHO depend of course on the resources allocated to the use of the influencing tools by the WHO, and ultimately, the value of the health outcomes generated by the proposed intervention programs in each of these additional areas.

Table 3: Using the strategic shift framework and influencing tools, examples of their use by WHO across selected disease areas

WHO strategic shifts and influencing tools	NCDs, smoking	Mental health	Pandemic management	RMNCH+A	Road safety	Obesity
Stepping up leadership						
Leadership	1995 WHO Director General framed Convention on Tobacco Control.	1999 WHO mental health agenda established by WHO and leading country experts.	WHO Constitution, gives it responsibility for ‘management of the global regime for the control of the international spread of disease’ (IHR 3rd edn, WHO, 2016a).	1987 WHO Safe Motherhood Initiative following Alma-Ata Declaration of 1978 to reduce maternal mortality. 2005 PMNCH established.	2003 WHO Consultation to Develop Areas of Collaboration with Road Traffic Injury Advocacy Organizations. UN Resolution to reduce road deaths and injuries by 2030 following WHO <i>Global Status Report Road Safety 2018</i> .	2002 WHO <i>World Health Report: Reducing Risks, Promoting Healthy Life</i> . Member States requested the WHO Director General to develop a global strategy on diet, physical activity and health.
Convening and coordination	Framework adopted by WHA 2003 and in force by 2005. Ongoing Conference of Parties to shape treaty implementation.	WHO Mental Health Action Plan 2013–2030 (2021e). Mental Health Gap Action Programme (mhGAP). WHO Special Initiative for the Mental Health, covering the 5-year period 2019–2023.	From 1951 to 2005 regulations covering ‘quarantinable diseases’. 2005 WHO IHR adopted by WHA after consultation with Member States, international organizations and other relevant partners, IHR regularly updated. 2018 convened Global Preparedness Monitoring Board with World Bank.	Convening interested partners formed PMNCH. Other initiatives include WHO (2014) ‘Health for world’s adolescents’, and <i>School-based Violence Prevention: A Practical Handbook</i> (2019d), including interpersonal violence.	2011 WHO and UN coordinated regular monitoring, within the framework of the United Nations Road Safety Collaboration, of global progress towards meeting the targets identified in the plan of action.	DG led broad consultation process including consultations with Member States, UN agencies, other intergovernmental bodies, civil society and the private sector. Also reference group of independent international experts.

WHO strategic shifts and influencing tools	NCDs, smoking	Mental health	Pandemic management	RMNCH+A	Road safety	Obesity
Driving public health impact in every country						
Partnerships	182 parties to Convention. 58 parties to Protocol. International experts, agencies and TFI regional advisors.	2013–2030 Plan adopted by Member States. Plan defines roles and WHO assists countries and international partners to implement.	GOARN network of over 250 technical institutions and networks globally that respond to acute public health events. Access to COVID-19 Tools (ACT) Accelerator, is a global collaboration to accelerate development, production, and equitable access to COVID-19 tests, treatments, and vaccines.	PMNCH representing 1000 partner organisations. Global Strategy for Women's, Children's and Adolescents' Health (2016–2030).	2003 Road Traffic Injury Advocacy Organization. 2004 United Nations Road Safety Collaboration. 2017 Bloomberg Philanthropies and US Centers for Disease Control and Prevention.	FAO and UNICEF, and other partners, including the World Bank, United Nations Economic and Social Council (ECOSOC), ILO, UNESCO, WTO, regional development banks.
Country office network	WHO country offices assist countries to implement FCTC in legislation and adopt MPOWER interventions.	WHO offices work with countries to raise awareness and supports them to undertake policy and law reform.	WHO Cluster Lead Agency with over 900 partners at country level. WHO country offices work closely with partners. Country offices support completion of SPARs responses, monitor local outbreaks and provide operational guidance.	With WHO and partners, 10 countries are part of Quality, Equity, Dignity: the Network to improve quality of care for MNCH.	22 countries have amended their road safety laws, bringing them in line with best practice. 123 have road traffic laws that meet best practice for one or more key risk factors.	Helping Member States update national guidelines, establish surveillance systems and engage with industry.

WHO strategic shifts and influencing tools	NCDs, smoking	Mental health	Pandemic management	RMNCH+A	Road safety	Obesity
Focusing global public goods on impact						
Regulation	Pursuant to FCTC. Monitoring of tobacco use by countries.		IHR is legally binding framework for pandemic management.		114 countries are carrying out systematic assessments or star ratings of existing roads (iRAP).	International norms and standards, particularly those drawn up by the Codex Alimentarius Commission.
Knowledge base	Fact sheets, tool kits, quit guides and online counselling. WHO manuals and handbooks.	The World Mental Health (WMH) Survey Initiative. Mental Health and Neurology Atlas (WHO, 2021f) and the Global Dementia Observatory (GDO). WHO facilitates development of mental health research community. EQUIP: Ensuring Quality in Psychological Support to develop and disseminate resources to support mental health interventions.	2018 WHO provided a new State Parties Self-Assessment Annual Reporting Tool – SPAR to monitor preparedness capacities of Member States. WHO R&D Blueprint a global strategy and preparedness plan for R&D (WHO, 2016b). WHO Collaborating Centres. Open to improve response. WHO Hub for Pandemic and Epidemic Intelligence (WHO, 2021g).	Fact sheets on MNCH and adolescent health. Other project include monitoring across the life course, MNCAAH (includes ageing) data portal.	WHO databases on cause of deaths, effect of legislation. Online database of road safety information. 2009, 2015 and 2018 WHO global status reports on road safety.	Building on own knowledge base, WHO, with FAO, UNESCO, UNICEF, UN. University, research institutes support research in priority areas.
Establish standards and provide guidelines	MPOWER for effective interventions: M for monitoring tobacco use; P protecting people from tobacco smoke; O quitting tobacco; W warning the dangers of smoking; E enforcing tobacco advertising, promotion and sponsorship bans, and R raising taxes.	Fact sheets, videos, intervention manuals for depression. Mindbank online platform for policies, strategies and laws.	Disease Commodity Packages (DCPs for infectious diseases).	Global Strategy for Women's, Children's and Adolescents' Health (2016–2030) (UN supported by WHO and others). PMNCH 2021–2025 Strategy.	2011 Global Plan for the Decade of Action for Road Safety 2011–2020. 2017 Save Lives technical package of road safety interventions. 2021 Decade of Action for Road Safety for 2021–2030.	Updating regional and national guidelines. Identifying and disseminating evidence-based interventions. Providing technical support.

Table 4: Common strategies employed for each influencing tool

Influencing tool	Common strategies
Stepping up leadership	
Leadership	Initial awareness raising report Consultation with partners WHA request for global plan WHA resolution adoption International treaty
Convening and coordination	Meetings with partners Meetings with highly credentialed technical experts Involvement of Member States in extensive consultation Global Plan launched with high level partner buy-in
Driving public health impact in every country	
Country office network	Assisting in implementation and adoption of WHO plans and strategies by Member States Helping Member States update, revise national guidelines, regulations and legislation Assisting in raising awareness and establishing country monitoring and surveillance systems Assisting in country level health planning processes
Partnerships	Formation of partnerships with other UN agencies, development banks, international private and philanthropic bodies Involvement of Member States
Focusing global public goods on impact	
Knowledge base	High quality WHO staff expertise WHO Collaborating Centres Constant knowledge renewal through regular contact with world experts WHO Health Observatory Collection of data from Member States
Establishing standards, providing guidelines	Developing intervention frameworks Providing formally approved WHO guidelines and standards Issuing fact sheets Online reference material Global health strategies and action plans
Regulation	International treaties and agreements

4.2 Methods for estimating WHO attribution to total estimated health value

We have used two methods for estimating the proportion of the total value of the estimated health benefits attributable to WHO. The first is to utilise the detailed analysis of the use of influencing tools for each disease area as discussed above. This provides a qualitative analysis of the actions taken and the overall level of involvement of the WHO, in developing the policies and interventions, and their implementation at country level, through the use of the influencing tools.

The second is to utilise, where they are available, the global health action plans which allocate responsibilities for the objectives of the plan to the key actors involved. These are generally the WHO Secretariat, Member States and other parties, including relevant UN agencies and other international partners. This has the advantage of providing a complete perspective of the plan's achievement, and thus to those parties most responsible for meeting each of the plan's objectives. Where the plans are available, we have used the second approach in preference to the first. Plans are available covering NCDs, mental health and road safety.

4.2.1 Global plan methodology

The global plans generally set out the objectives to be achieved by the activities to be undertaken by each of the parties. From a description of each activity, it is possible to make an approximate assessment of the importance of the relative contributions of the parties. Moreover, it is clear that some of the objectives are significantly more important than others. They can be weighted with a score out of 100, reflecting their relative importance.

Presuming an alignment between the interventions advocated in the plans and those which are modelled to estimate future benefits, the plans provide a device for weighting the contributions of the WHO, Member States and other parties to the generation of those benefits. Accordingly, a scoring was undertaken of each relevant plan. These were for mental health, NCDs and road safety, using an upper and lower bound. The scores are summarised in Tables 5 to 6 below. A summary of the plans and detailed scoring is provided in Appendix A.

Mental health

Table 5 shows the results of the analysis for mental health. VISES scored the contribution of WHO to the Plan's objectives as being 7.2% lower bound with 14% upper bound. The lower bound for Member States was 75.5% (upper 83.3%). International partners were scored at a similar level upper 10.5% (lower 9.5%). Objective 2 which was about the provision of care, was given the highest weighting in both upper and lower variations.

A feature of the analysis is the ability to test variation in the perceived importance of the objectives, as well as the importance of the contribution by each party to the objective, with the two results 14% and 7.2% being considered upper and lower bounds.

Table 5: Comprehensive Mental Health Action Plan 2013–2030, roles of Member States, WHO and international partners, weighted

Objectives	Member States	WHO	International partners
1. To strengthen effective leadership and governance for mental health <i>Weight</i> Upper 15% Lower 5%	Upper 60% Lower 35%	Upper 30% Lower 50%	Upper 10% Lower 15%
2. To provide comprehensive, integrated and responsive mental health and social care services in community-based settings <i>Weight</i> Upper 65% Lower 85%	Upper 80% Lower 85%	Upper 10% Lower 5%	Upper 10% Lower 10%
3. To implement strategies for promotion and prevention in mental health <i>Weight</i> Upper 10% Lower 5%	Upper 80% Lower 90%	Upper 10% Lower 5%	Upper 10% Lower 5%
4. To strengthen information systems, evidence and research for mental health <i>Weight</i> Upper 10% Lower 5%	Upper 65% Lower 95%	Upper 20% Lower 3%	Upper 15% Lower 2%
Total 100%	Upper 75.5% Lower 83.3%	Upper 14% Lower 7.2%	Upper 10.5% Lower 9.5%

Source: WHO (2021e) and VISES estimates.

Non-communicable diseases (NCDs)

For NCDs, the upper bound for WHO's contribution to the objectives was scored as 16.5% of the total, with Member States 70.3% and international partners 13.3% (Table 6). The objectives were more equally weighted in comparison to the mental health plan with WHO's highest role in objectives 1 (advocacy) and 6 (monitoring), 50% and 30%, respectively. Overall, the upper bound score for WHO was 16.5% with the lower bound 9.0%. Most of the difference was the result of a higher role being accorded to the Member States in achieving the Plan's objectives.

Table 6: NCD Global Action Plan 2013–2020, roles of Member States, WHO and international partners

Objectives	Member States	WHO	International partners
1. Advocate for NCDs <i>Weight 5%</i>	Upper 40% Lower 60%	Upper 50% Lower 30%	Upper 10% Lower 10%
2. Strengthen capacity to respond NCDs <i>Weight 30%</i>	Upper 70% Lower 80%	Upper 10% Lower 5%	Upper 20% Lower 15%
3. Reduce risk factors <i>Weight 25%</i>	Upper 74% Lower 85%	Upper 25% Lower 15%	Upper 1%
4. Strengthen health systems including UHC <i>Weight 25%</i>	Upper 75% Lower 85%	Upper 5% Lower 2%	Upper 20% Lower 13%
5. Support R&D <i>Weight 5%</i>	Upper 60% Lower 65%	Upper 10% Lower 5%	Upper 30% Lower 30%
6. Monitor trends and determinants of NCDs <i>Weight 10%</i>	Upper 70% Lower 85%	Upper 30% Lower 15%	
Total 100%	Upper 70.3% Lower 81.3%	Upper 16.5% Lower 9.0%	Upper 13.3% Lower 9.8%

Road safety

The road safety plan did not have individual objectives, but it provided good descriptions of the respective roles of the parties (see Appendix A). Again, without a WHO staffer, we assessed the WHO contribution at 7.5%. The role was small compared with its designated role in both the NCD and mental health plans. It provided advice and guidance, and data collection, but its role appeared to be subject to a greater role of the UN itself than in the other plans. In this plan, the funders are a separately designated party (Table 7). As a result, we ranked their contribution highly (50%) at a cost to presumed contribution of Member States (30%), which was low compared with the other plans. A lower bound is also presented which gave greater emphasis to the role played by Member States which increased to 40%. Other parties were reduced, including WHO, which was lowered to 5%.

Table 7: Global Plan Decade of Action for Road Safety 2021–2030, roles of Member States, WHO and international partners

	Member States	Academia, civil society and youth	Private sector	Funders	UN (WHO)
Upper	30%	2.5%	10%	50%	7.5%
Lower	40%	5%	10%	40%	5%

Non-COVID vaccines

In the Immunization Agenda 2030: A Global Strategy to Leave No One Behind (IA2030) (WHO, 2020a), WHO has endorsed an ambitious global strategy that envisions a world where everyone, everywhere, at every age fully benefits from vaccines for good health and wellbeing. In pursuing this agenda, WHO is working with a wide range of partners – including GAVI, UNICEF and national and regional governments – in a manner consistent with other global plans discussed above. On the basis of this strategy and our previous analysis, we use a single attribution rate of 7.5% for this area.

4.2.2 Influencing roles methodology

For the health areas for which plans are not available (pandemic management and RMNCH+A), we have made an assessment of attribution factors for the WHO based on the analysis of its involvement in the relevant health outcomes through the use of its influencing tools.

Pandemic management

Our analysis of WHO's role in pandemic management, summarised in Table 2, has indicated its primary role in global pandemic management. This is specifically supported by the WHO's Constitution giving it direct responsibility for the 'international spread of disease', and it has a long history in establishing regulations for the control of quarantinable diseases. In 2005, the legally binding International Health Regulations (IHR) were adopted by all Member States and other partner organisations. The WHO has established wide and effective partnerships, such as the GOARN network to assist it in pandemic management, and recently the ACT-Accelerator to provide more equitable access to COVID vaccines and other treatments. It has established monitoring processes for all Member States, and its country network works closely with Member States on monitoring outbreaks. Overall, we assessed its attribution score at 20% with a lower bound of 15%.

RMNCH and adolescents

The WHO has played a prominent role in maternal health dating back to at least 1987, with the Safe Motherhood Initiative, following the 1978 Alma-Ata Declaration. In 2005, WHO, along with a range of partners, established the PMNCH to act as an advocate for child and maternal health. More recently, this was extended to include adolescent health. Defining the role of the WHO is made more complex by the roles played by other UN agencies, such as UNICEF and UNFPA. A global strategy plan was launched by the UN Secretary General in 2016, the Global Strategy for Women's, Children's and Adolescents' Health (2016–2030), in which the WHO and a number of other UN agencies and the World Bank were involved.

Nonetheless, the WHO, partly through the PMNCH, has been active in providing guidelines, fact sheets and other advice to Member States and working with other country partners, such as the Network for Improving Quality of Care for Maternal, Newborn and Child Health (QoC Network) from the Quality Equity Dignity campaign.

On the basis of this analysis, we have assessed the attribution score as 10%, with a 7.5% lower bound.

4.3 Summary of net benefits attributable to WHO

Table 8 below provides a summary of the results for the 109+ interventions considered above, the seven which use a common methodology plus our analysis of pandemic management. Line one provides the results emerging from the models for the global value of the benefits created in each area, expressed as an NPV at a discount rate of 3% per annum. The total figure over the 109 interventions (excluding pandemic management) is US\$15.9 trillion.

Given the estimate of the global value of benefits, two critical variables influence the calculation of the net benefits attributable to WHO. The first is the achievement rate: the extent to which it is reasonable to assume that the target level of outcomes in the studies used as a basis for these estimates can be achieved. For an investment case, it is not appropriate to use high, target levels of interventions and outcomes, which may not be achievable in practice. In the RMNCH and adolescent health studies, for example, the scale-up of the interventions was geared to achieving the SDG targets, and we have assumed an achievement rate of only 70%. By comparison, the scale-up targets in the depression and anxiety study were relatively modest, and we use a 100% completion rate. There is also a strong global track record for the delivery of vaccines, and here we use an achievement rate of 90%. The weighted average achievement rate used across the seven areas is 76.5%. After applying the achievement rate for each area, but including pandemic management, the estimated achieved net benefits across the eight areas is also \$15.9 trillion

Table 8 also pulls together the attribution rates arising from the foregoing analysis, using a lower and higher case for each area. The weighted average attribution rates are 7.3% (lower) and 9.2% (higher), giving a NPV of benefits attributable to WHO of \$1,155 billion to \$1,460 billion. Both of these are NPVs at a 3% discount rate.

Table 8: Summary of net benefits attributable to WHO, 109+ interventions, NPV at 3% discount rate, US\$ billion

	Pandemics	RMNCH	Adolescent health	Depression and anxiety	Child marriage	Vaccines	CVD	Road accidents	Total
Net benefits from 2022–31 interventions (after inflation and costs, incl. cost of capital)		9,700	757	392	702	1800	866	1,690	15,907
Achievement rate		70%	70%	100%	80%	90%	80%	80%	76.5% ¹
Net achieved benefits	3,700 ²	6,790	530	392	562	1,620	693	1,352	15,880
Attribution rate to WHO (low)	16.6% ³	7.5%	7.5%	7.5%	3.0%	7.5%	9.0%	5.0%	7.3% ⁴
Net benefits attributable to WHO (low)	308	509	40	29	17	122	62	68	1,155
Attribution rate to WHO (high)		10%	10%	14%	5%	7.5%	16.5%	7.5%	9.2% ⁴
Net benefits attributable to WHO (high)	308	679	53	55	28	122	114	101	1,460

Notes:

1. Implied average across the last seven interventions.
2. Total (net) of preparedness/detection and best practice management.
3. Weighted average attribution rates for the two components.
4. Implied average across all interventions.

Source: VISES analysis.

5 Value creation in other areas of WHO: some examples

5.1 Reduced poverty and financial risk

One of the three pillars of WHO's *Thirteenth General Programme of Work 2019–23* (2019a) is the achievement of an additional one billion people benefitting from universal health coverage (UHC) by 2023. This level of coverage by 2023, and further progress thereafter, is critical to achieving SDG indicator 3.8.1 (*Coverage of essential health services*) by 2030. While the achievement of the 2023 goal has been hindered by the COVID-19 pandemic, achieving increased UHC remains a central goal of the work of WHO.

As brought out by the well-known UHC cube derived from WHO's pioneering 2010 report (WHO, 2010), UHC is about both equity for a given level of resources (equal access to a given volume of health care, both the coverage of individuals who have access and the extent of the services to which they have access), and about increased resourcing to allow even those with the lowest level of access to have a reasonable level of care. A WHO Technical Note of 2019 (WHO, 2019b) found that in 2015, over half of the global population did not have access to all of seven identified essential health services.

The three steps which might contribute to increasing health coverage are:

- extension of financial coverage for services to those not already covered;
- extension of the range of services covered; and
- reduction in cost sharing or fees for those partly covered for essential services.

Achieving progress towards UHC on any or all of these dimensions will have benefits of two different types: first, the improved health and welfare of the population arising from increased coverage on health interventions; and second, the improved distribution of health outcomes (e.g. for the bottom quintile) and the avoidance of poverty induced by catastrophic health costs.

The extent of inequities in access to health services across income groups, both within and between countries, is well known. On financial risk, an analysis by Wagstaff et al. (2018) of 133 countries, found that in 2010, 11.7% of the population in the countries studied, or 808 million people, incurred catastrophic health spending.

The first type of benefit – that arising from increased investment in health interventions targeted at need – has been addressed in Section 3.5, and assesses the benefits from a range of initiatives to increase the coverage of health services. But important benefits also accrue from improvements in the distribution of health outcomes.

The technique of extended cost-effectiveness analysis (ECEA) was developed to address health policy assessment, with specific reference to the financial and distributional benefits (see for example, Verguet et al., 2015, 2016, 2021; Verguet and Jamison, 2017). This approach has been used to assess these benefits for particular interventions in various countries (for a review see Verguet and Jamison, 2017), but to our knowledge no multi-country study of a move to UHC has yet been undertaken.

It is not likely to be possible to undertake such a study for the current project. There is now a wide range of ECEA applications to specific interventions in LMICs, and of the use of these techniques to UHC policies in individual countries. This body of work is a reminder that there are major benefits from WHO's efforts to improve the global distribution of health outcomes, and that these benefits should not be dismissed.

5.2 Programs for better public health

In 2019, the WHO adopted a new strategy with new priorities and targets 'to promote health, keep the world safe, serve the vulnerable' (WHO, 2020b, p139). These were set out in the Thirteenth General Program of Work (GPW13), which measured progress in improving the health of people at three target areas to be achieved by 2023 (WHO, 2019a, 2020c). The triple billion targets included one for healthier populations or 1 billion more people enjoying better health and wellbeing.

The health of populations is determined by a broad range of factors, which reflect environmental, behavioural and social/health issues. These can cover risk factors such as clean air, safe water, sanitation, road accidents, tobacco and alcohol use, obesity, domestic violence, child nutrition and child development, trans fat and mental health. A WHO report (2020d) also indicates that progress towards the 1 billion target for healthier populations has been uneven, especially in low income countries, where some indicators to improved health were getting worse, and greater attention to issues such as water and sanitation, air quality, tobacco use and obesity was needed in some countries.

To achieve better health for populations, the WHO seeks to address the social, physical and economic conditions that impact upon health by compiling and disseminating evidence on what works to improve conditions that impact on health.

Notable initiatives have addressed road safety to reduce accidents, tobacco control to moderate the harmful effects of tobacco, and healthy diets to tackle the growing problem of obesity, worldwide.

The Safety and Mobility (SAM) Unit promotes sustainable solutions to the safety and mobility challenges to modern life, including road traffic injuries, drowning and falls. The WHO estimates that approximately 1.3 million people die each year as a result of road traffic crashes, which cost most countries 3% of their GDP and are the leading cause of death for children and young adults aged 5–29 years (WHO, 2021h). In 2020, the UN General Assembly adopted the a global plan and declared the Decade of Action for Road Safety 2021–2030, setting a target to halve the global number of deaths and injuries from road traffic crashes by 2030 (UNGA, 2020).

The WHO Framework Convention on Tobacco Control (FCTC) (WHO, 2003) is the first global public health treaty, which came into force in 2005 and has 182 parties to the convention. The WHO FCTC was developed in response to the global tobacco epidemic, which has devastating health, social, economic and environmental consequences. The WHO estimates that tobacco kills more than 8 million people each year, with more than 7 million of those deaths the result of direct tobacco use, and around 1.2 million the result of non-smokers being exposed to second-hand smoke (WHO, 2021i).

WHO also adopted the Global Strategy on Diet, Physical Activity and Health (GSDPAH) in 2004 to promote and protect health through healthy eating and physical activity to counter the growing burden of non-communicable diseases (NCDs) and hence obesity, which is a major factor in contributing to NCDs. Worldwide obesity has nearly tripled since 1975, with 1.9 billion adults being overweight and 650 million obese in 2016 (WHO, 2021j). The United Nations Decade of Action on Nutrition 2016–2025 is a commitment by United Nations Member States to undertake 10 years of sustained and coherent implementation of policies, programs and increased investments to eliminate malnutrition globally (United Nations, n.d.).

Measuring the economic benefits of such a wide range of risk factors and health determinants is a daunting objective for a study of this scale. We examined three areas, the potential economic gains from reducing their impact on health which could yield very sizeable gains, and where, as outlined above, the WHO had shown global and effective leadership. These were road accidents, tobacco control and obesity. While tobacco control and obesity had received serious attention in the literature, there were no studies we could find that undertook a global benefit-cost analysis that would provide us with the necessary data to attribute WHO influence to changing disease outcomes.

5.3 Non-COVID emergencies

Early detection, risk assessment, information-sharing and rapid response are essential to avoid illness, injury, death and economic losses on a large scale.

WHO's approach to health emergencies seeks to ensure that:

- populations affected by health emergencies have access to essential life-saving health services and public health interventions;
- all countries are equipped to mitigate risk from high-threat infectious hazards;
- all countries assess and address critical gaps in preparedness for health emergencies, including in core capacities under the International Health Regulations (WHO, 2016a) and in capacities for all-hazard health emergency risk management;
- national health emergency programmes are supported by a well-resourced and efficient WHO Health Emergencies Programme (WHO, 2019a, p24); and
- outbreaks of epidemic-prone diseases, such as, meningitis, yellow fever, viral haemorrhagic fevers, measles and cholera, disproportionately affect the poorest and most vulnerable populations in society, and can also lead to social, economic and political disruption, are dealt with.

WHO has developed global strategies to address cholera and yellow fever, and more recently one to defeat meningitis by 2030. These three diseases adversely affect 66 Member States as shown in the Table 9.

Table 9: Member States at risk for yellow fever, cholera and meningitis, 2018

	Number of Member States
Yellow fever (high-risk Member States)	39
Cholera (affected Member States)	47
Meningitis (Member States at high epidemic risk)	26
At risk for yellow fever, cholera or meningitis	66

Source: WHO (2020e, p40).

Other initiatives the WHO intend to implement include:

- developing country capabilities for the prevention, detection and control of cholera, viral haemorrhagic fevers, meningitis and yellow fever, including strengthening coordination to build surveillance and laboratory capacity, and scaled-up capabilities to ensure that frontline health workers are protected and able to implement infection prevention and control best practices;
- produce normative products, including outbreak investigation guidance, to shorten the time to confirmation and response for all epidemic-prone diseases; and
- scale up the implementation of strategies for epidemic-prone diseases, including the adoption of new and enabling technologies. (WHO, 2021k, p76)

According to the EM-DAT (2021), a health endemic database which records the number of and other data about endemic events, the number of those affected and those who died of cholera has been the most numerous of endemic events since 2000, and has caused the largest number of deaths by some margin (Table 10). Viral haemorrhagic fevers such as dengue and yellow fever are high up the list by frequency of event and numbers affected.

Table 10: Disease types of endemic events by number, death and number affected since 2000

Since 2000	Number of events	Deaths	Number affected
Cholera	273	40,521	1,938,178
Dengue fever	96	5,509	3,892,629
Meningococcal disease	59	14,299	173,677
Measles	32	8,660	277,909
Acute respiratory syndrome (SARS)	29	774	48,352
Acute watery diarrhoea	26	2,363	47,557
Meningitis	24	4,036	277,909
Ebola	22	14,484	88,695
Yellow fever	22	1,722	2,531
Typhoid	10	562	44,366

Source: EM-DAT (2021); VISES analysis.

Of the diseases that are the subject of WHO global strategies, cholera is the most frequent and has the highest deaths (EM-DAT, 2021). It is a product of poor sanitation and unsafe drinking water, and is a particular risk in fragile states and humanitarian settings (Legros, 2018). In contrast to yellow fever, a vaccine has only recently been developed and its cost effectiveness depends on well-targeted campaigns. Its effectiveness over time is still to be confirmed.

Many of the cases are located in Africa, and the region has been the focus of cost of illness and economic burden studies (Hsiao et al., 2018). A study of cholera in 44 countries in Africa by Mogasale et al. (2021) estimated the economic burden being between \$1,006 million and \$2,406 million. The main component of the burden is productivity loss (over 85%). Mogasale and colleagues (2021) suggest that reducing this burden through vaccines and improved WASH programs are worthwhile, and support the WHO strategy to end cholera by 2030.

The restricted availability of the cholera vaccine means that it is frequently used only in emergencies. A study of the yellow river vaccine in Nigeria which compared the cost of delivery through a broad eradication program with its emergency use, demonstrated not only the lower cost of the former but greatly reduced morbidity and mortality (Monath and Nasidi, 1993).

While these studies do not provide the detail to allow us to calculate future benefits which we are able to attribute to the WHO for these programs, the evidence suggests that WHO strategies are an important aspect of their success.

5.4 Reducing pandemic risk

The second of the two issues distinguished above – programs to curtail the growth and spread of the transmission of zoonotic diseases to humans – is also a key issue, in which WHO is taking, and should take, a key role. Subject to a further review of the literature and a better understanding of the programs, this could be integrated into the modelling above, as it involves a reduction in the probability of another pandemic in the next 25 years, on unchanged policies, to say 20% or 15%. This issue has not been analysed in this study, but it is clearly a vital area for WHO, and for the world, going forward.

5.5 Defining the benefits of WHO's role in digital health

5.5.1 WHO's role in digital health

Digital health forms an important part of WHO's work program. It is integral to the execution of its fourth pillar concerned with strengthening country capacity in data and innovation. The WHO intends to:

... enhance the development of a digital health solutions clearinghouse, and fast track the releases of standards and specifications for an international trusted network of health chatbots using artificial intelligence, interoperability frameworks and other digital technologies. (WHO, 2021k, p106)

Digital health technologies provide support for the acceleration of progress toward healthier societies and close inequality gaps, as well as facilitating the generation of big data to advance research, diagnostics, disease prevention and personalized health services.

WHO has developed a digital health strategy, the Global Strategy on Digital Health 2020–2025. The overall aim of the strategy is to support countries to harness the enormous potential of digital technologies to maximize health outcomes. It will promote global collaboration and advance the transfer of knowledge on digital health through capacity building. This global collaboration will include the creation of a global digital health community – the digital health network of networks – a global, inclusive, multisectoral collaborative that will enable the sharing of best practices and lessons learned with Member States. Its purpose is to strengthen health systems through the application of digital health technologies for consumers, health professionals, health care providers and industry towards empowering patients and achieving the vision of health for all (WHO, 2021l, p11).

The role of the WHO as a normative institution is to give guidance and orientation to the public policy makers in Member States for their populations and health care providers, the health care industry and manufacturers, investors and procurement authorities when it comes to digitalization in health care.

5.5.2 Benefits from digital health

The benefits of digital health are very substantial, but widely dispersed. This makes them difficult to identify and perhaps challenging to aggregate at the global level.

Digital health can 'save lives, improve health and wellbeing and support a sustainable health system that delivers safe, high quality and effective health services' (Australia Digital Health Agency, 2019).

Some of these benefits include:

- preventing adverse drug events, reducing medical errors;
- sustaining a more efficient health system;
- improving healthcare availability and patient experience; and
- providing greater access to healthcare for people living in rural and remote areas.

The benefits then include safer and lower cost health delivery. There are numerous small-scale studies which attempt to estimate the cost of individual projects. Wang et al. (2003) provides a study of the financial effects of electronic medical record systems in ambulatory primary care settings. Other studies include Joshi et al. (2021), on an Indian digital program for training community health workers and Sung et al. (2018) on the benefits and costs of digital consulting in clinics.

A formal literature review of such studies could yield the required evidence to assemble the cost and benefits of individual projects across a range of digital health benefits, which when scaled up could provide an estimate of total benefits, a proportion of which could be attributed to the WHO. This however would be a large and time-consuming study outside the scope of this project.

5.6 Prequalification programme

The WHO Prequalification Programme has a long development period dating back at least to the 1984 WHA at which the Director General was asked to organise a meeting of experts to discuss the rational use of medicines. Following the meeting, a Revised Drug Strategy was adopted in 1986. The prequalification process began in 1987 with the procurement of childhood vaccines which remain a high proportion of drugs prequalified.

While there was initial opposition from the US, the role of the WHO has been guided by this Strategy in the period since (Wirtz et al., 2017). The WHO has published a series of guidelines on developing national drug policies and good prescribing practices ultimately leading to the formal establishment of the WHO Prequalification Programme set up in 2001, as a service to facilitate access to medicines that meet unified standards of quality, safety and efficacy initially for HIV/AIDS, malaria and tuberculosis (WHO, 2021m).

The Lancet Commission on Essential Medicines Policies (Wirtz et al., 2017) recommends the expansion the WHO Prequalification Programme to maintain a focus on new essential medicines, such as those that pose special challenges to regulators and newly developed essential medicines.

Individual countries national regulatory authorities struggle to regulate existing and new products (Roth et al., 2018). WHO has supported most LMICs in developing their regulatory capabilities and implementing national medicine policies including the formulation of an essential medicine list (Roth et al., 2018; Wirtz et al., 2017). However, in the face of weak national regulatory systems, many countries rely on WHO to verify specific medicines as meeting international quality standards. One third of the world's population lacks timely access to quality assured medicines (Roth et al., 2018) and the WHO Prequalification Programme both ensures protection against substandard medicines, as well as reduced cost.

The Independent External Review of the Prequalification Programme (WHO, 2019b) focused on the cost savings of medicines purchased as a result of the Prequalification Programme. Total estimated sales of prequalification enabled sales were estimated to be at least \$3.15 billion. This estimate was of procurements by large donors and procurers, but excluded LMIC national markets and private markets. Very little benefit of prequalification was expected in private markets. Of the total, \$2,143 million are vaccines, \$1,031 million medicines and the remainder (\$341 million) diagnostics.

The benefit analysis is based on a comparison of drug prices before and after prequalification. This is estimated to total \$1,074 million or about a 23% reduction in drug prices. The magnitude of the price reduction is illustrated by a 36% decline in the price of the top three HIV medicines. After factoring up for the market share, the estimated savings are \$312 million representing about one third of the total estimated savings.

The estimates do not include lives saved from the process by reducing adverse drug events from medicine quality failures. There is only limited data from LMICs, however data provided by Mission for Essential Drugs and Supplies (MEDS), a collective medicine procurement agency of faith-based health organisations in Kenya, illustrates the improved quality of medicines arising from a strict quality assurance policy, operating its own medicine quality control laboratory, which is prequalified by WHO. The quality rate of its own medicines improved from a failure rate of about 13% to negligible levels, between 1997 and 2013. The failure rate of external producers submitted to MEDS, fell from over 35% to about 5% over the same period (Wirtz et al., 2017). There is no estimate of the impact on lives saved. But such a reduction, if widely experienced, could result in substantially greater benefits for the Prequalification Programme.

Based on the single benefit of the price drop arising from the Prequalification Programme, the benefits are estimated to be \$1074 million. Since the price reduction is the outcome of the WHO activities. The vast majority of these benefits could be claimed by WHO. This analysis is, in our view, not sufficiently complete to be included in our overall analysis summarised in Table 8 above.

6 The return to investing in WHO

6.1 The lower bound return on investment in WHO

Table 11 pulls together the estimates provided above of the public benefits attributable to WHO in relation to selected activities over 2022–31. The estimates are expressed in NPV terms (at a discount rate of 3%), for both a lower and a higher rate of attribution to WHO, as discussed above. In total across all areas, the net benefits are estimated at \$1,155 billion to \$1,460 billion. To be on the conservative side, given the high level of uncertainty in this analysis, we treat the lower estimate as the preferred case for this study. The lower estimate corresponds to an average attribution rate of 7.3% over the 109+ interventions studied. That is, of the achieved net global benefits of \$15.9 trillion identified in this analysis, 7.3% or \$1,126 billion are ascribed to WHO. If the higher set of attribution rates were used (average of 9.2%), the net benefits attributed to WHO is \$1,460 billion.

Table 11: Estimates of the public benefits attributable to WHO from the 109+ interventions, US\$ billion

Activity	Public benefits attributable to WHO, 2022–31, US\$ billions	
	Low attribution rate	High attribution rate
Pandemic management	308	308
RMNCH	509	679
Adolescent health ¹	40	53
Child marriage	17	28
Depression and anxiety	29	55
Cardiovascular disease	62	114
Immunisation	122	122
Road accidents for adolescents	68	101
Total	1,155	1,460

Note:

1. Excludes double counting of interventions with RMNCH.

The central cost case for the investment analysis starts from the latest proposed programme budget for WHO for the 2022–23 biennium, which already incorporates some allowance for strengthening WHO's activities. In calculating the base case cost for the investment case, and having regard to the intensifying pressures on WHO to support activities around the world, we allow biennial budgets to increase by 10% in real terms per biennium after the 2022–23 biennium. This is approximately equal to an increase of 5% per annum. The total level of funding available to WHO over 2022–31 is then calculated as the net present value (NPV) of this funding stream at a discount rate of 3% per annum. On this basis, the NPV of future funding over the decade is US\$33 billion.

With an NPV of the investment cost of \$33 billion, the implied BCRs for the benefit estimates in Table 11 are 35.0–44.3. In a fuller analysis, the uncertainties around this central result should be explored, for varying investment cost levels, for different achievement and attribution rates, and for variation in other key variables, but that is not possible here. We conclude that the lower bound estimate of the BCR for this level of investment is at least 35.

We stress that this is a lower bound estimate because, while the full cost of investment in WHO is included in the denominator, only a proportion of the relevant activities of WHO have been included in the benefits calculation in the numerator. These exclusions include the six important matters covered in Section 5 above. We also note that, in some of the areas studied quantitatively, only a proportion of the population affected by the interventions has been covered in the studies we rely on. For example, for road safety interventions we have drawn on a study covering only young people (aged 10–24 years), while the interventions would in fact impact on the whole population.

6.2 The nature of WHO's funding

If WHO is to meet the needs of the global community, it must be able to invest in building its own capability and in partnering with others in shared programs. This has been well documented in many WHO publications. Such investment requires the sustained outlay of funds over a period of years.

This study has been undertaken on the assumption that funds will be made available to WHO on a regular and predictable basis, so that WHO can itself undertake the long-term investment programs to build its own capability and to work with partners to achieve important health outcomes. Funding that is uncertain from year to year or which must be spent on priorities determined by the funding agency cannot properly support such programs.

At the present time, WHO is constrained, in addressing the many challenges that it faces, by a funding base providing little certainty looking forward. In the 2020–21 biennium, only 11% of its funding is provided by Assessed Contributions, which are the main source of sustainable funding.

If WHO is to reap the very high returns available to it, there needs to be a significant reshaping of its funding base towards more sustainable forms of funding. This could be achieved through a shift in the structure of funding towards higher contributions by Member States. The high returns to investment in WHO shown here suggest that such a change would be well rewarded at the country level.

In the longer term, if an increase in the overall quantum of funding is required, this finding of high returns could support the development of a replenishment funding model for the organization.

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Appendix A: Roles of Member States, WHO and International Partners

Table A1: Roles of Member States, WHO and International Partners in implementing the Comprehensive Mental Health Action Plan 2013–2030

Objectives	Member States	WHO	International Partners
1. To strengthen effective leadership and governance for mental health.	<p>Develop, implement and monitor policies and laws for protection of human rights.</p> <p>Plan and allocate appropriate resource for different sectors.</p> <p>Collaborate with stakeholders through formal structures/mechanisms.</p> <p>Empowering people with mental disorders/disabilities and their organisations to have authority to influence policy.</p>	<p>Compile knowledge and best practices for – and build capacity in – the development, multi-sectoral implementation and evaluation of policies, plans and laws relevant to mental health.</p> <p>Offer technical support to countries in multisectoral resource planning, budgeting and expenditure tracking for mental health.</p> <p>Assist in stakeholder collaboration through provision of best practices and tools.</p> <p>Strengthen and empower those with disorders/disabilities at international, regional and national levels within WHO's own structures and provide support to design technical tools for capacity-building, rights and mental health tools.</p>	<p>Mainstream mental health interventions into health, poverty reduction, development policies, strategies and interventions.</p> <p>Include those with mental disorders/disabilities in development and poverty reduction strategies.</p> <p>Explicitly include mental health within general and priority health policies, plans and research agenda and partnerships (e.g. Global Health Workforce Alliance).</p> <p>Support exchange of strategies and policies.</p> <p>Support creation and strengthening of those with mental disorders/disabilities and their families and carers, and their integration into other sectors.</p>
Weight			
WHO: 15%	WHO: 60%	WHO: 30%	WHO: 10%
VICES: 5%	VICES: 35%	VICES: 50%	VICES: 15%

Objectives	Member States	WHO	International Partners
2. To provide comprehensive, integrated and responsive mental health and social care services in community-based settings.	<p>Shift the locus of care away from long-stay mental hospitals towards non-specialized health settings with increasing coverage of evidence-based interventions.</p> <p>Integrate and coordinate prevention, promotion, rehabilitation, care into general health and social services.</p> <p>Work with national emergency committees in humanitarian emergencies.</p> <p>Build knowledge and skills of health workers to deliver evidence-based, culturally appropriate and human rights-oriented mental health and social care services.</p> <p>Address disparities.</p>	<p>Provide guidance and evidence-based practices for deinstitutionalization and service reorganization, and technical support for expanding treatment and support, prevention and mental health promotion.</p> <p>Collate and disseminate evidence and best practices for the integration and multisectoral coordination of care.</p> <p>Provide technical advice and guidance for policy related to mental health issues in humanitarian emergencies.</p> <p>Support countries in the formulation of a human resource strategy.</p> <p>Address disparities.</p>	<p>Use funds received for direct service delivery.</p> <p>Assist the training of health workers.</p> <p>Support coordinated efforts to implement mental health programmes in humanitarian emergencies, including training and capacity building.</p>
Weight WHO: 65% VISES: 85%	WHO: 80% VISES: 85%	WHO: 10% VISES: 5%	WHO: 10% VISES: 10%
3. To implement strategies for promotion and prevention in mental health.	<p>Lead and coordinate mental health promotion and prevention strategies.</p> <p>Develop and implement strategies for suicide prevention.</p>	<p>Provide technical support for evidence-based cost-effective strategies.</p> <p>Provide technical support to strengthen suicide prevention programmes.</p>	<p>Advocacy to raise awareness of the magnitude of burden of disease of mental illness and availability of effective interventions.</p> <p>Advocate the rights of those with mental disorder/disability to disability benefits and housing and livelihood programmes.</p> <p>Ensure those with mental disability/disorder are included in wider disability community.</p> <p>Introduce actions to combat stigmatization and discrimination.</p> <p>Partner in developing relevant programmes.</p>
Weight WHO: 10% VISES: 5%	WHO: 80% VISES: 90%	WHO: 10% VISES: 5%	DC: 10% VISES: 5%

Objectives	Member States	WHO	International Partners
4. To strengthen information systems, evidence and research for mental health.	Integrate mental health into information systems. Improve research capacity and academic collaboration on national priorities for research in mental health.	Develop a core set of mental health indicators and provide guidance, training and technical support on the development of surveillance/information systems. Engage relevant stakeholders in the development and promotion of a global mental health research agenda, facilitate global networks for research collaboration, and carry out culturally validated research.	Provide support to Member States to set up surveillance/information systems. Support research aimed at filling the gaps in knowledge.
Weight WHO: 10% VISES: 5%	WHO: 65% VISES: 95%	WHO: 20% VISES: 3%	WHO: 15% VISES: 2%
Total: 100%	WHO: 5.5% VISES: 83.3%	WHO: 14% VISES: 7.2%	WHO: 10.5% VISES: 9.5%

Source: WHO (2021e), Comprehensive Mental Health Action Plan 2013–30; VISES estimates.

Table A2: Roles of Member States, WHO and International Partners in implementing NCD Global Action Plan 2013–2020

Objectives	Member States	WHO	International Partners
1. Advocate for NCDs	Generate disseminate evidence effectiveness of treating NCDs. NCDs as part of development agenda. Forge partnerships.	Coordinate collaborate with Member States and other UN agencies. Offer technical assistance to NCD awareness raising. Provide policy advice. Disseminate best practices.	Promote public health as part of development agenda. Strengthen national system partnerships. Support coordinating role of WHO.
Weight 5%	40%	50%	10%
2. Strengthen capacity to respond NCDs	Lead responsibility for prevention and control of NCDs. Enhance governance of NCDs in health planning. Mobilise resources by, for example, strengthening UHC and NCD disease programs. Conduct needs assessment. Develop plan and budget. Strengthen multi sectoral action. Strengthen workforce. Forge partnerships.	Leading and convening UN system. Technical support for evidence based and suitable options for Member States. Policy guidance and dialogue to address gaps. Generate knowledge (e.g. technical tools, DSS and info products on cost effective interventions). Strengthen WHO capacity (e.g. One WHO and assist Member States).	Strengthen national system cooperation. Promote national capacity building. Improve quality of aid. Support national NCD plans.
Weight 30%	70%	10%	20%
3. Reduce risk factors	30% reduction in prevalence of tobacco use. Implement fully FCTC. 30% reduction salt use. 25% reduction in blood pressure. Address national food policies. Monitoring and evaluation programs. Implement global strategy on diet physical activity and health.	Leading and convening FCTC. Technical cooperation on tobacco, diet, physical activity. Provide policy advice (toolkits) reduce risk factors. Norms and standards – support Conference of Parties on FCTC. Through guidelines and protocols. Knowledge generation: policies on interventions.	Strengthen national system cooperation.
Weight 25%	74%	25%	1%

Objectives	Member States	WHO	International Partners
4. Strengthen health systems including UHC	Leadership and financing for sustainable and equitable health. Expand quality services coverage. Human resource development including: > Capability development > Compensation > Training. Improve equitable access.	Technical cooperation and support for countries. Norms and standards: > Interventions for early detection > Use affordable ICTs. Disseminate evidence and best practice.	Financing to advance universal coverage. Support strengthening of health systems. Help improve access.
Weight 25%	75%	5%	20%
5. Support R&D	Increase investment in R&D Strengthen innovations and scientific evidence base.	Engage WHO collaborating centres. Promote use of ICT.	Promote investment in innovation and research. Facilitate translation of R&D.
Weight 5%	60%	10%	30%
6. Monitor trends and determinants of NCDs	Monitoring legislation collecting health statistics and registration of vital stats and disease registries. Establish and maintain disease surveillance systems. Improve technical capabilities. Dissemination and use of results.	Technical cooperation includes: > Surveillance systems > Targets and indicators > Set standards and monitor global trends > Provide guidance. Convene reps of states to review and evaluate progress.	
Weight 10%	70%	30%	30%
Total 100%	70.3%	16.5%	13.3%

Source: WHO 2013, Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013–2020; VISES estimates.

Table A3: Roles of Member States, WHO and International Partners in implementing the Global Plan Decade of Action for Road Safety 2021–2030

Member States	Academia, civil society and youth	Private sector	Funders	UN (WHO)	
<p>Provide a legislative framework for road safety and legal mandate for the work of different agencies.</p> <p>Develop a plan of action with targets and monitoring activity of different actors and ensuring adequate funding to support implementation.</p> <p>Encourage compliance with standards.</p> <p>Coordinate the different activities.</p>	<p>Provide information on road safety (academia).</p> <p>Ensure government accountability by empowering communities.</p> <p>Strive for achievement of road safety related SDGs.</p> <p>Youth should specify their needs – meaningful engagement with young people helps foster greater ownership of road safety issues.</p>	<p>Specify safety levels for vehicle fleets.</p> <p>Require transport drivers to undergo user training.</p> <p>Expect suppliers to perform road safety performance self-monitoring and reporting.</p> <p>Set standards for scheduling and planning procured driving operations and practices to manage driver fatigue, use of lower risk roads and vehicles and improved times for travel.</p> <p>Vehicle manufactures ensure safety features regardless of markets where they are sold. Insurers can offer incentives for safe road use through premium pricing. Mandatory insurance schemes can contribute significantly to post crash response. Development of a road safety index and establishment of road safety bonds.</p>	<p>Provide resources such as seed funding to carry out road safety improvements while stimulating country-wide and longer-term investments by government.</p> <p>Ensuring alignment of priorities between funders and governments, and a pathway for sustainable financing.</p> <p>Ensuring integration of road safety in development activities and provision of road safety are guaranteed as part of support.</p>	<p>WHO in close cooperation with the UN regional commissions but WHO coordinating agency for road safety. Raising awareness, establishing targets; providing policy guidance; data collection; technical capacity building; and convening stakeholders.</p> <p>UN Secretary General’s special envoy will continue to raise awareness. UN Road Safety Collaboration will act as consultative mechanism to facilitate international cooperation and regional coordination.</p> <p>UN Safety Fund continue to strengthen governments’ capacity to implement road safety improvements through high-impact initiatives.</p> <p>UN Resident Coordinators coordinate UN country teams and host governments in relation to the plan. Specialized agencies such as UN Habitat, Un Environment Program, UNICEF, UN Special Envoy for Youth ensure safe and sustainable mobility are reflected in development priorities and agendas reiterating cross-cutting implications of road safety.</p>	
Scores	30%	3%	12%	50%	5%

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