WHO Discussion Paper (version dated 8 June 2022)

Draft Updated Appendix 3 of the WHO Global NCD action plan 2013-2030

MANDATE

1. Paragraph 3(a) of decision WHA72(11) requested the Director-General to, inter alia:

> "to propose updates to the appendices of WHO's Global Action Plan for the Prevention and Control of NCDs 2013-2020 and WHO's comprehensive mental health action plan 2013–2020, as appropriate, in consultation with Member States and taking into account the views of other stakeholders, ensuring that the action plans remain based on scientific evidence for the achievement of previous commitments for the prevention and control of noncommunicable diseases, including Sustainable Development Goal target 3.4 (by 2030, reduce by one third premature mortality from noncommunicable diseases through prevention and treatment and promote mental health and well-being) and other related goals and targets"[1]

This WHO Discussion paper is prepared pursuant to this decision.

BACKGROUND

2. In line with paragraph 3(a) of decision WHA72(11), the WHO Secretariat is updating the 2017 version of the Appendix 3 of the WHO Global NCD Action Plan 2013-2020, now extended until 2030, considering new scientific evidence as well as new WHO recommendations, since the 2017 update.

3. The WHO Global NCD Action Plan contains five appendices. Appendix 3 consists of a menu of policy options to support the implementation of the 6 objectives of the WHO Global NCD Action Plan. It outlines a list of policy options and cost-effective interventions, Member States should prioritize in order to prevent and control NCDs. The last revision of the Appendix 3 of the WHO Global NCD Action Plan[2] was endorsed by the World Health Assembly in 2017 (decision WHA70.11). That endorsement by WHA70, in May 2017, enabled the WHO Secretariat to include an updated Appendix 3 in the report of the UN Secretary-General to the United Nations General Assembly on NCDs of December 2017 (see paragraphs 10, 15, Table 3, Table 5, 53, 55, 59 and 60 of A/72/662).

[1] World Health Assembly 74 (2019) Follow-up to the political declaration of the third high-level meeting of the General Assembly on the prevention and control of non-communicable diseases. WHA72(11). https://apps.who.int/gb/ebwha/pdf_files/WHA72/A72(11)-en.pdf.

[2] World Health Organization (2017). Tackling NCDs: 'best buys' and other recommended interventions for the prevention and control of noncommunicable diseases. World Health Organization. https://apps.who.int/iris/handle/10665/259232.

4. The 2017 update of Appendix 3 contained 88 recommendations including 16 interventions which were classified as "very cost-effective and affordable interventions for all Member States"[3] (previously referred to as the "best buys"), as well as other cost-effective interventions (previously referred to as "good buys")[4].

5. The main reasons for updating Appendix 3 are:

- To take into consideration the emergence of new evidence of cost-effectiveness and/or new WHO recommendations since the adoption of the WHO Global NCD Action Plan 2013-2020,
- To assist countries selecting a combination of these interventions to define locally tailored packages of interventions to accelerate ongoing national NCD responses.

6. This updated version of the Appendix 3, will complement a number of technical products that WHO secretariat is developing along with the NCD Implementation Roadmap for the WHO Global NCD Action Plan [5] including the WHO menu of cost-effectiveness intervention for mental health[6], the recommended interventions to address the health impact of air pollution[7,8] and the menu of cost-effective interventions for oral health[9] that are being developed.

PROCESS FOLLOWED BY THE SECRETARIAT TO UPDATE APPENDIX 3

7. The WHO secretariat used the WHO-CHOICE methodology for updating appendix 3 which was endorsed at the World Health Assembly in May 2016[10]. This is to retain consistency and familiarity with existing Appendix 3 and previously agreed methods and global strategies. This update is accompanied by a technical annex providing more information on the methodology used to identify and analyse interventions, and includes assumptions used in the WHO-CHOICE economic modelling and describing updates from the 2017 update. Detailed information on the evidence and assumptions underlying the interventions are provided in separate technical briefs by disease and risk factor area.

8. The Secretariat identified a revised list of 81 interventions (excluding overarching/enabling actions). These include:

- 31 interventions which have been unchanged from the 2017 update and for which key parameters were updated and cost-effectiveness estimates were generated,

[3] Generate an extra year of healthy life for a cost that falls below the average annual income or GDP per person

[4] WHO (2017). Tackling NCDs: 'best buys' and other recommended interventions for the prevention and control of noncommunicable diseases. World Health Organization. https://apps.who.int/iris/handle/10665/259232.

[5] WHO (2022). Draft implementation road map 2023–2030 for the global action plan for the prevention and control of noncommunicable diseases 2013–2030. Annex 1. Document A75/10 Add.8. World Health Organization. https://apps.who.int/gb/ebwha/pdf_files/WHA75/A75_10Add8-en.pdf

[6] WHO (2021) WHO menu of cost-effective interventions for mental health. Geneva: World Health Organization. https://www.who.int/publications/i/item/9789240031081.

[7] Compendium of WHO and other UN guidance on health and the environment: https://www.who.int/tools/compendium-on-health-and-environment

[8] WHO (2021) WHO global air quality guidelines: particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide. Geneva: World Health Organization. https://www.who.int/publications/i/item/9789240034228

[9] https://apps.who.int/gb/ebwha/pdf_files/WHA74/A74_R5-en.pdf

[10] http://apps.who.int/gb/ebwha/pdf_files/WHA69/A69_1Rev1-en.pdf

- 9 interventions from the 2017 update which have been revised to reflect updates in WHO policy or scientific evidence,
- 7 interventions included in the 2017 update that had no analysis carried out at the time and for which cost-effectiveness analysis was performed for the 2022 update,
- 10 new interventions from new WHO guidance and tools, and
- 24 interventions that are considered priorities but have no cost-effectiveness analysis.

Two interventions were deleted because they were either no longer relevant, or were incorporated into another intervention.

The cost effectiveness analysis of the intervention on "Taxation on sugar-sweetened beverages as part of comprehensive fiscal policies to promote healthy diets" is currently being updated and will be presented in the next round of consultations on 25th July.

9. The list of interventions is not exhaustive but is intended to provide information and guidance on effectiveness and cost-effectiveness of population-based and individual interventions based on current evidence, and to act as the basis for future work to develop and expand the evidence base.

10. It is acknowledged that there are inherent challenges in identifying a core list of interventions whilst being comprehensive enough to meet the needs of Member States. The limitations of considering cost-effectiveness in isolation are recognised. It is recommended that additional criteria reflecting national values are used when determining the list of interventions to be adopted by the Member States[11].

KEY CHANGES AND PROPOSED UPDATED APPENDIX 3

11. The key changes compared to the 2017 update include:

- Changes in the definition of interventions and inclusion of new interventions to align with new WHO policy and guidance. For example dietary interventions moved from an approach focusing on the health impact and cost of salt intake only to interventions assessing the health outcomes and cost of interventions addressing multiple nutrients such as fibres, vegetables, and salt. Similarly interventions for chronic respiratory diseases (asthma and chronic obstructive pulmonary disease) now distinguish between acute and long-term patient management to be in line with WHO PEN guidance.
- Changes to the modelling of interventions. This includes changes such as the inclusion of a different population in need or adding new health outcomes due to additional evidence on impact being available. For example, for cardiovascular diseases, the use of new risk charts and threshold leads to different populations in need and drug therapies.
- The inclusion and use of country-level data for 62 low -and middle-income countries compared to regional data for 20 low, middle and high-income countries in the 2017 update.

12. Annex 1 outlines the proposed structure and content of the updated Appendix 3. This includes:

- A proposed preamble text to the Appendix 3

[11] WHO (2021) Principles of health benefit packages. https://www.who.int/publications/i/item/9789240020689

- The updated list of interventions for the main Appendix 3, and
- An annotated outline of the proposed technical Annex, which includes more details about the scope and methodological aspects of the economic analysis, with summary tables presenting costs, health impacts and cost-effectiveness ratios for all interventions. Results of the cost-effectiveness analysis are presented for 3 income categories: low-income countries, lower-middle income countries and high-income countries.

TIMELINE AND NEXT STEPS

13. As per the approach shared with Members States, the timeframe and next steps for finalising the updated Appendix 3 is as follows:

Dates	**Activity**
June 1st to 26 June 2022	The Secretariat will publish a first draft WHO Discussion Paper containing a proposed updated Appendix 3 for a web-based consultation; including available results from completed CHOICE analyses
20 June 2022	The Secretariat will convene a first informal consultation with Member States and UN organizations
24 June 2022	The Secretariat will convene a first informal consultation with non-State actors (nongovernmental organizations, private sector entities, philanthropic foundations, and academic institutions).
25 July to 21 August 2022	The Secretariat will publish a second draft WHO Discussion Paper containing a proposed updated Appendix 3 for a web-based consultation; including updated results on CHOICE analyses.
16 September 2022	The Secretariat will convene a second informal consultation with Member States and UN organizations
19 September 2022	The Secretariat will convene a second informal consultation with non-State actors

Annex 1. Proposed updated Appendix 3 of the Global Action Plan for the prevention and control of noncommunicable diseases 2013-2030

What is appendix 3

Provided at the request of Member States, Appendix 3 is a menu of policy options and cost-effective interventions for prevention and control of major noncommunicable diseases. The purpose is to assist Member States in implementing, as appropriate, for national context, (without prejudice to the sovereign rights of nations to determine taxation among other policies), actions to achieve the nine voluntary global targets for NCD prevention and control through the six objectives of the WHO Global NCD Action Plan 2013-2030. The list of interventions is not exhaustive but is intended to provide information and guidance on effectiveness and cost-effectiveness of population-based and individual interventions based on current evidence, and to act as the basis for future work to develop and expand the evidence base.

Why update appendix 3

The main reasons for updating Appendix 3 are firstly to take into consideration the emergence of new evidence of cost-effectiveness or new WHO recommendations since the adoption of the Global Action Plan for the prevention and control of noncommunicable diseases 2013 and the Global Action Plan 2013-2030, and secondly, to refine the existing formulation of some interventions based on lessons learnt from the use of the previous two versions. The area of Appendix 3 where this is most relevant is under Objective 3 (risk factors) and Objective 4 (health systems). All of the “very cost-effective and affordable interventions for all Member States” interventions in the original Appendices were listed under Objectives 3 and 4. In line with paragraph 3(a) of decision WHA72(11), the Secretariat has updated the 2017 update of Appendix 3 to ensure that “the action plans remain based on scientific evidence for the achievement of previous commitments for the prevention and control of noncommunicable diseases, including Sustainable Development Goal target 3.4 (by 2030, reduce by one third premature mortality from noncommunicable diseases through prevention and treatment and promote mental health and well-being) and other related goals and targets”.

What has changed?

The menu of options listed for Objectives 1 (raising the priority of NCDs), 2 (strengthening leadership & governance), 5 (research) and 6 (monitoring & evaluation) are process-related recommendations and have not changed.

Within Objectives 3 (risk factors) and 4 (health systems), in the 2022 updated Appendix 3, there are a now a total of 81 interventions and 21 overarching/enabling actions, representing an expansion from the original list of 88. This increase is due to the availability of scientific evidence as proposed by WHO technical units or expert groups since the adoption of the WHO Global NCD Action Plan 2013-2020.

In the 2017 appendix there were 16 interventions considered with a cost-effectiveness ratio ≤I$100 per DALY averted in low -and middle-income countries (previously referred to as the “best buys”) and 20

interventions with a cost-effectiveness ratio >I$[12]100/DALY and (previously referred to as “good buys”). In addition 36 interventions without CEA but are part of WHO guidance were also provided. In the 2022 update, results are presented as a menu of cost-effective interventions for non-communicable diseases without explicit reference to a cost-effectiveness threshold. In the current update, the cost-effectiveness was examined for 57 interventions. In addition, 24 interventions without cost-effectiveness analysis but are part of WHO guidance are also provided.

Interventions	Overarching/enabling actions	Interventions with WHO-CHOICE analysis	Interventions without WHO-CHOICE analysis
Objective 3			
Tobacco	3	7	2
Harmful use of alcohol	4	5	6
Healthy diet	1	6	5
Physical inactivity	5	2	5
Objective 4			
Cardio-vascular diseases	8	13	3
Diabetes		6	
Chronic respiratory diseases		4	3
Cancer		14	
Total	21	57	24

Technical annex

The update of appendix 3 is accompanied by a technical annex. This annex provides more detailed information about the methodology used to identify and analyse interventions, and includes the assumptions used in the WHO-CHOICE economic modelling. The technical Annex also presents more detailed economic analyses for each intervention, and includes summary tables with costs, health impacts and banded cost-effectiveness ratios for all interventions presented separately for 3 income categories: low income countries, lower-middle income countries and high-income countries.

How to use this information

The economic analyses in the technical annex, upon which this list is based, give an assessment of cost-effectiveness ratio, based on the health impact and the economic cost of the intervention. These economic results present a set of parameters for consideration by Member States, but it must be emphasised that such global analyses should be accompanied by analyses further tailored to the local context. Other tools, such as the One Health Tool (https://www.avenirhealth.org/software-onehealth.php) are available to help individual countries cost specific interventions in their national context.

[12] The international dollar is a hypothetical unit of currency that has the same purchasing power parity that the U.S. dollar had in the United States at a given point in time.

When considering interventions for prevention and control of any disease, including non-communicable diseases, emphasis should be given to both economic and non-economic criteria, as both will affect the implementation and impact of interventions. Non-economic implementation considerations such as acceptability, sustainability, scalability, equity, ethics[13] are essential in preparing to achieve the targets of the global action plan and should be considered before the decision to implement the interventions in Appendix 3.

[13] WHO (2021) Principles of health benefit packages. https://www.who.int/publications/i/item/9789240020689

Objective 1: To raise the priority accorded to the prevention and control of noncommunicable diseases in global, regional and national agendas and internationally agreed development goals, through strengthened international cooperation and advocacy

Overarching/enabling actions

- Raise public and political awareness, understanding and practice about prevention and control of NCDs
- Integrate NCDs into the social and development agenda and poverty alleviation strategies
- Strengthen international cooperation for resource mobilization, capacity-building, health workforce training and exchange of information on lessons learnt and best practices
- Engage and mobilize civil society and the private sector as appropriate and strengthen international cooperation to support implementation of the action plan at global, regional and national levels
- Implement other policy options in objective 1

Objective 2: To strengthen national capacity, leadership, governance, multisectoral action and partnerships to accelerate country response for the prevention and control of noncommunicable diseases

Overarching/enabling actions

- Prioritize and increase, as needed, budgetary allocations for prevention and control of NCDs without prejudice to the sovereign right of nations to determine taxation and other policies
- Assess national capacity for prevention and control of NCDs
- Develop and implement a national multisectoral policy and plan for the prevention of control of NCDs through multi-stakeholder engagement
- Implement other policy options in objective 2 to strengthen national capacity including human and institutional capacity, leadership, governance, multisectoral action and partnerships for prevention and control of noncommunicable diseases

Objective 3: To reduce modifiable risk factors for noncommunicable diseases and underlying social determinants through creation of health-promoting environments

Tobacco use

Overarching/enabling actions

For the Parties to the WHO Framework Convention on Tobacco Control (WHO FCTC):

- Strengthen the effective implementation of the WHO FCTC and its guidelines, as well as the Protocol to Eliminate Illicit Trade in Tobacco Products, if applicable
- Establish and operationalize national mechanisms for coordination of the WHO FCTC implementation as part of national strategy with specific mandate, responsibilities and resources

For the Member States that are not Parties to the WHO FCTC:

- Consider implementing the measures set out in the WHO FCTC and its guidelines, as well as the Protocol to Eliminate Illicit Trade in Tobacco Products, if applicable, as the foundational instruments in global tobacco control

Specific interventions with WHO-CHOICE analysis

N°	Intervention	Non-financial considerations
T1	Increase excise taxes and prices on tobacco products	
T2	Implement plain/standardized packaging and/or large graphic health warnings on all tobacco packages	Requires capacity for implementing and enforcing regulations and legislation
T3	Enact and enforce comprehensive bans on tobacco advertising, promotion and sponsorship	
T4	Eliminate exposure to second-hand tobacco smoke in all indoor workplaces, public places, public transport	
T5	Implement effective mass media campaigns that educate the public about the harms of smoking/tobacco use and second hand smoke	
T6	Provision of cost-covered effective population-wide support (including brief advice, national toll-free quit line services and mCessation) for tobacco cessation to all tobacco users.	Requires sufficient, trained providers and a better functioning health system
T7	Provision of cost-covered effective pharmacological interventions to all tobacco users who want to quit.	

Other interventions from WHO guidance (without WHO-CHOICE analysis)

N°	Intervention
T8	Establish a tracking and tracing system to support the elimination of illicit trade in tobacco products
T9	Ban cross-border tobacco advertising, promotion and sponsorship, including through modern means of communication

Harmful use of alcohol

Overarching/enabling actions

- Implement the WHO Global strategy to reduce harmful use of alcohol through multisectoral actions in the recommended target areas[14]
- Implement the action plan on alcohol to support and complement policy measures and interventions implemented at the national level in the 10 areas recommended of the global strategy[15]
- Strengthen leadership and increase commitment and capacity to address the harmful use of alcohol
- Increase awareness and strengthen the knowledge base on the magnitude and nature of problems caused by harmful use of alcohol by awareness programmes, operational research, improved monitoring and surveillance systems

Specific interventions with WHO-CHOICE analysis

N°	Intervention	Non-financial considerations
A1	Increase excise taxes on alcoholic beverages	Levying taxes should be combined with other price measures, such as bans on discounts or promotions
A2	Enact and enforce bans or comprehensive restrictions on exposure to alcohol advertising (across multiple types of media)	Requires capacity and infrastructure for implementing and enforcing regulations and legislation
A3	Enact and enforce restrictions on the physical availability of retailed alcohol (via reduced hours of sale)	
A4	Enact and enforce drink-driving laws and blood alcohol concentration limits via sobriety checkpoints	
A5	Provide brief psychosocial intervention for persons with hazardous and harmful alcohol use	Requires trained providers at all levels of health care

Other interventions from WHO guidance (without WHO-CHOICE analysis)

N°	Intervention
A6	Carry out regular reviews of prices in relation to level of inflation and income
A7	Establish minimum prices for alcohol where applicable
A8	Enact and enforce an appropriate minimum age for purchase or consumption of alcoholic beverages and reduce density of retail outlets
A9	Restrict or ban promotions of alcoholic beverages in connection with sponsorships and activities targeting young people
A10	Provide prevention, treatment and care for alcohol use disorders and comorbid conditions in health and social services
A11	Provide consumer information about, and label, alcoholic beverages to indicate, the harm related to alcohol

[14] http://www.who.int/substance_abuse/publications/global_strategy_reduce_harmful_use_alcohol/en/

[15] https://apps.who.int/gb/ebwha/pdf_files/EB150/B150_7Add1-en.pdf

Unhealthy diet

Overarching/enabling actions

- Implement the WHO Global Strategy on Diet, Physical Activity and Health[16]

Specific interventions with WHO-CHOICE analysis

N°	Intervention	Non-financial considerations
H1	Reformulation policies for healthier food and beverage products	Requires multisectoral actions with relevant ministries and support by civil society. Regulatory capacity along with multisectoral action is needed.
H2	Front-of-pack labelling as part of comprehensive nutrition labelling policies	
H3	Public food procurement and service policies for healthy diets	
H4	Behaviour change communication and mass media campaign for healthy diets	
H5	Protection, promotion and support of optimal breastfeeding practices	
H6	Taxation on sugar-sweetened beverages as part of comprehensive fiscal policies to promote healthy diets	

Other interventions from WHO guidance (without WHO-CHOICE analysis)

N°	Intervention
H7	Implement WHO's set of recommendations on the marketing of foods and non-alcoholic beverages to children
H8	Subsidies on healthy foods and beverages (e.g. fruits and vegetables) as part of comprehensive fiscal policies for healthy diets
H9	Menu labelling in food service to promote healthy diets (e.g. reduce total energy intake (kcal) and/or intake of sugars, sodium and unhealthy fats)
H10	Limiting portion and package size to reduce energy intake and the risk of overweight/obesity
H11	Nutrition education and counselling in different settings (for example, in preschools, schools, workplaces and hospitals) to promote healthy diets

[16] WHO (2014) Global strategy on diet, physical activity and health. Geneva: World Health Organization. https://www.who.int/publications/i/item/9241592222

Physical inactivity

Overarching/enabling actions

- Global action plan on physical activity 2018–2030: more active people for a healthier world [17]
- ACTIVE: a technical package for increasing physical activity[18]
- WHO guidelines on physical activity and sedentary behaviour[19]
- Leadership and whole of government commitment to address physical inactivity using a life course approach
- Strong advocacy to increase awareness and knowledge on the cross cutting benefits of increasing physical activity, operational research and knowledge translation and improved monitoring and surveillance systems

Specific interventions with WHO-CHOICE analysis

N°	Intervention	Non-financial considerations
P1	Provide physical activity assessment, counselling, and behaviour change support as part of routine primary health care services through the use of a brief intervention	Requires capacity, and sufficiently trained staff in primary care
P2	Implement sustained, population wide, best practice communication campaigns to promote physical activity, with links to community-based programmes and environmental improvements to enable and support behaviour change.	Requires multisectoral actions with relevant ministries and support by civil society

Other interventions from WHO guidance (without WHO-CHOICE analysis)

N°	Intervention
P3	Implement urban and transport planning and urban design, at all levels of government, to provide compact neighbourhoods providing mixed-land use and connected networks for walking and cycling and equitable access to safe, quality public open spaces that enable and promote physical activity and active mobility
P4	Implement whole-of-school programmes that include quality physical education, and adequate facilities, equipment and programs supporting active travel to/from school and support physical activity for all children of all abilities during and after school
P5	Improve walking and cycling infrastructure ensuring universal and equitable access to enable and promote safe walking, cycling, other forms of micro mobility (e.g. wheelchairs, scooters and skates) by people of all ages and abilities
P6	Implement multi-component workplace physical activity programmes
P7	Provide and promote physical activity through provision of community-based (grass roots) sport and recreation programmes and conduct free mass participation events to encourage engagement by people of all ages and abilities

[17] https://apps.who.int/iris/bitstream/handle/10665/272722/9789241514187-eng.pdf

[18] https://apps.who.int/iris/handle/10665/275415

[19] https://www.who.int/publications/i/item/9789240015128

Objective 4: To strengthen and orient health systems to address the prevention and control of noncommunicable diseases and the underlying social determinants through people-centred primary health care and universal health coverage

Overarching/enabling actions

- Integrate very cost-effective noncommunicable disease interventions into the basic primary health care package with referral systems to all levels of care to advance the universal health coverage agenda
- Explore viable health financing mechanisms and innovative economic tools supported by evidence
- Scale up early detection and coverage, prioritizing very cost-effective high-impact interventions including cost-effective interventions to address behavioural risk factors
- Train the health workforce and strengthen capacity of health system particularly at primary care level to address the prevention and control of noncommunicable diseases
- Improve the availability of the affordable basic technologies and essential medicines, including generics, required to treat major noncommunicable diseases, in both public and private facilities
- Implement other cost-effective interventions and policy options in objective 4 to strengthen and orient health systems to address noncommunicable diseases and risk factors through people-centred health care and universal health coverage
- Develop and implement a palliative care policy, including access to opioids analgesics for pain relief, together with training for health workers
- Expand the use of digital technologies to increase health service access and efficacy for NCD prevention, and to reduce the costs in health care delivery

Cardiovascular disease

Specific interventions with WHO-CHOICE analysis

N°	Intervention	Non-financial considerations
CV1	Pharmacological treatment of hypertension in adults using either of the following: thiazide and thiazide-like agents; angiotensin-converting enzyme inhibitors (ACE-Is)/angiotensin-receptor blocker (ARBs); calcium channel blockers (CCBs).	Feasible to implement in all settings and aligned to latest WHO guidelines (2021) Simple protocols can be followed by non-physician workers depending on the country context
CV2a	Drug therapy to control CVD risk using a total risk approach and counselling to individuals who have had a heart attack or stroke and to persons with high risk (≥ 20%) of a fatal and non-fatal cardiovascular event in the next 10 years using the updated WHO CVD risk charts	Feasibility and practicality of implementation needs to be assessed and determined. Glucose control not included in this intervention.
CV2b	Drug therapy to control CVD risk using a total risk approach and counselling to individuals who have had a heart attack or stroke and to persons with high risk (≥ 10%) of a fatal and non-fatal cardiovascular event in the next 10 years using the updated WHO CVD risk charts	Feasibility and practicality of implementation needs to be assessed and determined. Glucose control not included in this intervention.
CV3	Treatment of new cases of acute myocardial infarction with either: aspirin, or aspirin and thrombolysis, or aspirin, thrombolysis and clopidogrel, or primary percutaneous coronary interventions (PCI) initially treated in a hospital setting with follow up carried out through primary health care facilities at a 95% coverage rate	Selection of option depends on health system capacity
CV4a	Treatment of acute ischemic stroke with intravenous thrombolytic therapy	Feasibility and practicality of implementation needs to be assessed and determined according to health systems capacity.
CV4b	Treatment of acute ischemic stroke with mechanical thrombectomy within an experienced facility	Feasibility and practicality of implementation needs to be assessed and determined according to health systems capacity. Requires a surgical facility with appropriately trained workforce.
CV5a	Primary prevention of rheumatic fever and rheumatic heart diseases by increasing appropriate treatment of streptococcal pharyngitis at the primary care level	

CV5b	Secondary prevention of rheumatic fever and rheumatic heart disease by developing a register of patients who receive regular prophylactic penicillin	
CV6	Low-dose acetylsalicylic acid within 24 to 48 hours for secondary prevention of ischemic stroke	
CV7	Comprehensive* care of acute stroke patients in stroke units *Comprehensive care includes strategies such as staffing by a specialist stroke multidisciplinary team, access to equipment for monitoring and rehabilitation.	Early multidisciplinary approach to be determined and depending on country context. Composition of rehabilitation workforce as an integral part of multidisciplinary team depends on health system capacity.'

Other interventions from WHO guidance (without WHO-CHOICE analysis)

N°	Intervention
	Treatment of congestive cardiac failure with angiotensin-converting-enzyme inhibitor, beta-blocker and diuretic
	Cardiac rehabilitation post myocardial infarction
	Anticoagulation for medium-and high-risk non-valvular atrial fibrillation and for mitral stenosis with atrial fibrillation

Diabetes

Specific interventions with WHO-CHOICE analysis

N°	Intervention	Non-financial considerations
D1	Foot care to prevent amputation in people with diabetes (including educational programmes, access to appropriate footwear, multidisciplinary clinics)	
D2	Diabetic retinopathy screening for all diabetes patients and laser photocoagulation for prevention of blindness	Requires health staff capacity for retinal assessment and photocoagulation
D3	Glycaemic control for people with diabetes, along with standard home glucose monitoring for people treated with insulin to reduce diabetes complications	
D4	Screening of people with diabetes for proteinuria and treatment with angiotensin-converting enzyme inhibitor for the prevention and delay of renal disease	
D5	Control of blood pressure in people with diabetes	
D6	Statin use in people with diabetes > 40years old	

Chronic respiratory diseases

Specific interventions with WHO-CHOICE analysis

N°	Intervention	Non-financial considerations
CR1	Acute treatment of asthma exacerbations with inhaled bronchodilators and oral steroids	Requires trained providers at all levels of healthcare
CR2	Acute treatment of COPD exacerbations with inhaled bronchodilators and oral steroids	
CR3	Long-term management of asthma with inhaled bronchodilator and low-dose beclometasone	
CR4	Long-term management of COPD with inhaled bronchodilator	

Other interventions from WHO guidance (without WHO-CHOICE analysis)

N°	Intervention
CR5	Influenza vaccination for patients with chronic obstructive pulmonary disease
CR6	Access to improved stoves and cleaner fuels to reduce indoor air pollution
CR7	Cost-effective interventions to prevent occupational lung diseases, for example, from exposure to silica, asbestos

Cancer

Specific interventions with WHO-CHOICE analysis

N°	Intervention	Non-financial considerations
CA1	Vaccination against human papillomavirus (1-2 doses) of 9–14 year old girls	
CA2	Cervical cancer: HPV DNA screening, starting at the age of 30 years with regular screening every 5 to 10 years (using a screen-and-treat approach or screen, triage and treat approach)	
CA3	Cervical cancer: early diagnosis programs linked with timely diagnostic work-up and comprehensive cancer treatment	
CA4	Breast cancer: early diagnosis programs linked with timely diagnostic work-up and comprehensive cancer treatment	
CA5	Breast Cancer: Screening with mammography (once every 2 years for women aged 50-69 years) linked with timely diagnostic work-up and comprehensive breast cancer treatment in setting where mammographic screening programme is recommended	Requires systems for organised, population-based screening
CA6	Colorectal cancer: early diagnosis programs linked with timely diagnostic work-up and comprehensive cancer treatment	
CA7	Basic palliative care for cancer: home-based and hospital care with multi-disciplinary team and access to opiates and essential supportive medicines	Requires access to controlled medicines for pain relief
CA8	Prevention of liver cancer through hepatitis B immunization	
CA9	Oral Cancer: screening in high-risk groups linked with timely diagnostic work-up and comprehensive cancer treatment in setting where significant disease burden and programme is recommended	Requires systems for organised, population-based screening
CA10	Colorectal cancer screening: population-based programme, including through stool-based tests, as appropriate, at age >50 years, linked with timely treatment in settings where screening programme is recommended	Requires systems for organised, population-based screening
CA11	Childhood cancer: early diagnosis programs linked with timely diagnostic work-up and comprehensive cancer treatment, focusing on 6 index cancers of WHO Global Initiative for Childhood Cancer	

CA12	Head and neck cancers including oral cancers: early diagnosis programs linked with timely diagnostic work-up and comprehensive cancer treatment	
CA13	Prostate cancer: early diagnosis programs linked with timely diagnostic work-up and comprehensive cancer treatment	
CA14	Early detection and comprehensive treatment of cancer for those living with HIV	

Objective 5: To promote and support national capacity for high-quality research and development for the prevention and control of noncommunicable diseases

Overarching/enabling actions

- Develop and implement a prioritized national research agenda for noncommunicable diseases
- Prioritize budgetary allocation for research on noncommunicable disease prevention and control
- Strengthen human resources and institutional capacity for research
- Strengthen research capacity through cooperation with foreign and domestic research institutes
- Implement other policy options in objective 5 to promote and support national capacity for high-quality research, development and innovation

Objective 6: To monitor the trends and determinants of noncommunicable diseases and evaluate progress in their prevention and control

Overarching/enabling actions

- Develop national targets and indicators based on global monitoring framework and linked with a multisectoral policy and plan
- Strengthen human resources and institutional capacity for surveillance and monitoring and evaluation
- Establish and or strengthen a comprehensive noncommunicable disease surveillance system, including reliable registration of deaths by cause, cancer registration, periodic data collection on risk factors and monitoring national response
- Integrate noncommunicable disease surveillance and monitoring into national health information systems
- Implement other policy options in objective 6 to monitor trends and determinants of noncommunicable diseases and evaluate progress in their prevention and control

Technical annex to Appendix 3: proposed table of contents

The technical annex will provide further information on the methods used in the development of the 2022 update of the Appendix 3, and highlight the differences compared to the 2017 update. Contents of the Annex will include;

1. Detailed methodological information, including:
    a. The methodological approach and process used to update appendix 3, including selection of interventions
    b. Explanation of Generalized Cost Effectiveness Analysis and WHO-CHOICE methodology
    c. References to the evidence sources and assumptions used in the economic modelling for specific interventions
2. Results of the WHO-CHOICE economic analyses for interventions included in Appendix 3

Detailed information on methods, the evidence and assumptions underlying the interventions by disease and risk factor area are provided in separate technical briefs.

Detailed methodological information

Identification of interventions

The following criteria used for identifying interventions in 2017 were applied for the 2022 update:

– An intervention must have a demonstrated and quantifiable effect size, from at least one published study in a peer reviewed journal;
– An intervention must have a clear link to one of the global NCD targets.

Additional interventions were considered using the same criteria as above. The intervention list for the 2022 updated Appendix 3 comprised (i) interventions which have been unchanged from the 2017 update, (ii) interventions from the 2017 update which have been re-worded or revised to reflect updates in WHO policy or scientific evidence (iii) interventions included in the 2017 update that had no analysis carried out at the time and for which cost-effectiveness analysis was done in the 2022 update, and (iv) new interventions from new WHO guidance and tools (Table 1).

Table 1: List of interventions for 2022 update and comparison with 2017 update

Interventions	Update of original 2017 interventions (i)	Revised 2017 interventions (ii)	2017 intervention with new CEA (iii)	New interventions with CEA (iv)
Objective 3				
Tobacco	6			1
Harmful use of alcohol	5			
Healthy diet	1	4	1	
Physical inactivity	2			
Objective 4				
Cardio-vascular diseases	7	2	2	2
Diabetes	3		1	2
Chronic respiratory diseases		3		1
Cancer	7		3	4
Total	31	9	7	10

CEA: cost-effectiveness analysis

Choice of economic parameters

Economic parameters are listed below:

1. A menu of interventions for NCDs based on WHO-CHOICE methodology (see below) and presented as a ratio of international dollars (I$) per healthy life year gained (HLYg)[20].
    a. Cost-effectiveness ratios are presented in bands, ranging from < I$100/HLYg to >I $50,000/HLYg[21]. The decision to band cost-effectiveness was based on the consensus that the data represent global estimates, therefore banding cost-effectiveness emphasises the relative magnitude of cost-effectiveness rather than a specific amount.
2. Size of health gain: the expected size of population health impact for each intervention was calculated based on total HLY gained per year in a standardized[22] population of 1 million people. HLY gained due to an intervention are calculated over a 100-year time frame and evaluated at 95% coverage.
3. Economic cost of implementation: The total cost required per year to implement each intervention was estimated, based on cost in I$ millions to implement in a standardized population of 1 million people (i.e. I$ per capita)

[20] The HLY is the equivalent of the Disability Adjusted Life Years (DALYs) used in the 2017 update but framed in a positive way. DALYs are averted while HLY are gained.

[21] Cost-effectiveness bands (in I$) are: <100, 100-$500, 500-1,000, 1,000-5,000, 5,000-10,000, 10,000-20,000, 20,000-50,000, >50,000.

[22] Standardized over the total population of the analysed countries per income grouping

Country selection

Economic parameters were assessed for 3 country income-groups: low-income countries, lower-middle income countries and upper-middle income countries and this is different compared to the 2017 update where results were presented for 2 country income groups (low -and lower middle income countries as one group and upper-middle and high income countries as the second group). The current update includes selected low -and middle-income countries (LMICs) only since the results from the updated Appendix 3 are most relevant for these countries. Countries were selected so that a significant proportion of the total population and health burden would be represented.

Sixty-two countries were considered in the analysis and listed below[23]. The list of countries included all low-income countries, the 20 most populous lower-middle-income countries and the 20 most populous upper-middle-income countries. Combined, they represent nearly 80% of the total population and 80% of the global burden of disease. For some type of interventions (e.g. harmful use of alcohol), the analysis was based on a smaller subset of countries.

Table 2: Classification of countries by World Bank income level (2019)

Low-income countries	**Lower middle-income countries**	**Upper middle-income countries[24]**
Afghanistan	Algeria	Argentina
Burkina Faso	Angola	Brazil
Burundi	Bangladesh	China
Central African Republic	Cameroon	Colombia
Chad	Côte d'Ivoire	Dominican Republic
Democratic Republic of the Congo	Egypt	Ecuador
Eritrea	Ghana	Guatemala
Ethiopia	India	Indonesia
Gambia	Kenya	Iran (Islamic Republic of)
Guinea	Morocco	Iraq
Guinea-Bissau	Myanmar	Jordan
Haiti	Nepal	Kazakhstan
Madagascar	Nigeria	Malaysia
Malawi	Pakistan	Mexico
Mali	Philippines	Peru
Mozambique	Sri Lanka	Russian Federation
Niger	Ukraine	South Africa
Rwanda	United Republic of Tanzania	Thailand
Sierra Leone	Uzbekistan	Turkey
Sudan	Viet Nam	
Tajikistan		
Togo		
Uganda		

[23] The 2017 update included 20 countries.
[24] One upper-middle income country was excluded during analysis due to lack of data

WHO-CHOICE: A brief methodological overview

General approach

Value for money and efficiency are fundamental considerations guiding investment in health, and WHO-CHOICE provides a way to measure them. This is true in settings where lack of finance is no longer the greatest barrier to achieving better health outcomes; it is also true in less well-resourced settings, where inefficiency is measured in lives lost and human suffering.

Cost-effectiveness analysis supports priority setting by defining areas of action where the greatest health gains can be achieved.

Generalized cost-effectiveness analysis (WHO-CHOICE) also allows the definition of an optimal set of interventions, taking into account setting-specific factors such as the burden of disease, health system practice, and economic conditions. Tools to facilitate country-level cost-effectiveness analysis of a wide range of health activities are available. In parallel, WHO-CHOICE publishes and disseminates online a knowledge base of regional-level cost-effectiveness information[25].

The use of cost-effectiveness analysis within decision making processes in health is increasingly common globally. However, a series of methodological shortcomings may limit the practical application of cost-effectiveness analysis results.

Two examples of this are methodological differences between studies that limit comparability, and use of the current practice as a comparator, which implicitly assumes current resource use is efficient. Generalized Cost-Effectiveness Analysis (GCEA) was developed to overcome such shortcomings of traditional cost-effectiveness analysis.

The GCEA approach enables both existing and new interventions to be evaluated simultaneously. The comparator used in GCEA is a hypothetical “null” scenario, where the impacts of all currently implemented interventions are removed. Uniquely, this method allows existing and new interventions to be analysed at the same time.

Previous cost-effectiveness analyses have been restricted to assessing the efficiency of adding a single new intervention to the existing set, or replacing one existing intervention with an alternative. Using WHO-CHOICE, the analyst is no longer constrained by what is already being done, and policymakers can revisit and revise past choices if necessary and feasible. They will have a rational basis for deciding to reallocate resources between interventions to achieve social objectives.

[25] World Health Organization Choosing Interventions that are Cost-Effective (WHO-CHOICE) programme: https://www.who.int/teams/health-systems-governance-and-financing/economic-analysis

WHO-CHOICE:

- Uses a standardized method for cost-effectiveness analysis that can be applied to all interventions in different settings
- All interventions are evaluated compared to the “null”, a scenario in which we model the absence of health care interventions
- Impact models are developed using a population based approach, and healthy life years gained due to an intervention are calculated over a 100 year time frame. Health impacts are not discounted.
- Costs for each intervention are developed using an ingredients based economic costing methodology. Costs are expressed in international dollars (I$) to ensure comparability across countries and country income groups. Costs are calculated over a 100 year time frame and discounted at 3% per year.
- All interventions are evaluated at 95% coverage.

Table 3: Summary of WHO-CHOICE economic analyses for interventions for NCD prevention and control

Notes: The tables below list all interventions for which WHO-CHOICE economic analysis is available. In this example, separate tables are provided for each of the four main risk factors and four main diseases covered by Objectives 3 and 4 of the WHO Global NCD Action Plan. The intervention name contains more exact detail about the intervention that was modelled -note that these may differ slightly from the wording of the WHO recommended interventions. This Annex is provided for background scientific information only and should not be used as a specific menu for implementation.

		Low-income			**Lower-middle-income**			**Upper-middle-income**		
N°	**Intervention**	**Banded cost-effectiveness ratio**	**Health impact per** year (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)	**Banded cost-effectiveness ratio**	**Health impact per** year (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)	**Banded cost-effectiveness ratio**	**Health impact per year** (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)
Tobacco use										
T1	Increase excise taxes and prices on tobacco products	<100	1,717	<0.01	<100	2,674	0.01	<100	3,093	0.01
T2	Implement plain/standardized packaging and/or large graphic health warnings on all tobacco packages	<100	1,212	<0.01	<100	2,181	0.01	<100	2,319	0.01
T3	Enact and enforce comprehensive bans on tobacco advertising, promotion and sponsorship	<100	933	<0.01	<100	1,490	0.01	<100	1,535	0.01
T4	Eliminate exposure to second-hand tobacco smoke in all indoor workplaces, public places, public transport	<100	1,475	<0.01	<100	2,845	0.01	<100	3,077	0.02
T5	Implement effective mass media campaigns that educate the public about the harms of smoking/tobacco use and second hand smoke	<100	1,345	0.01	<100	2,516	0.03	<100	2,701	0.10
T6	Provision of cost-covered effective population-wide support (including brief advice, national toll-free quit line services and mCessation) for tobacco cessation to all tobacco users.	<100	1,028	0.02	<100	1,724	0.05	<100	1,800	0.09
T7	Provision of cost-covered effective pharmacological interventions to all tobacco users who want to quit.	<100	1,761	0.08	100 - 500	3,583	0.71	100 - 500	3,924	1.32

		Low-income			Lower-middle-income			Upper-middle-income		
N°	**Intervention**	**Banded cost-effectiveness ratio**	**Health impact per** year (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)	**Banded cost-effectiveness ratio**	**Health impact per** year (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)	**Banded cost-effectiveness ratio**	**Health impact per year** (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)
Harmful use of alcohol										
A1	Increase excise taxes on alcoholic beverages	<100	155	0.01	<100	445	0.02	<100	797	0.04
A2	Enact and enforce bans or comprehensive restrictions on exposure to alcohol advertising (across multiple types of media)	<100	121	<0.01	<100	377	0.01	100 - 500	158	0.03
A3	Enact and enforce restrictions on the physical availability of retailed alcohol (via reduced hours of sale)	<100	132	0.01	<100	383	0.03	100 - 500	190	0.05
A4	Enact and enforce drink-driving laws and blood alcohol concentration limits via sobriety checkpoints	100 - 500	104	0.01	100 - 500	321	0.04	1,000 - 5,000	44	0.11
A5	Provide brief psychosocial intervention for persons with hazardous and harmful alcohol use	<100	244	0.02	100 - 500	647	0.07	100 - 500	691	0.29
Unhealthy diet										
H1	Reformulation policies for healthier food and beverage products	<100	2,449	0.01	<100	4,038	0.02	<100	4,704	0.06
H2	Front-of-pack labelling as part of comprehensive nutrition labelling policies	<100	4,042	<0.01	<100	7,441	0.01	<100	9,069	0.02
H3	Public food procurement and service policies for healthy diets	<100	449	0.01	<100	472	0.02	<100	441	0.04
H4	Behaviour change communication and mass media campaign for healthy diets	<100	1,516	0.01	<100	3,505	0.03	<100	4,734	0.12
H5	Protection, promotion and support of optimal breastfeeding practices	<100	2,052	0.04	<100	3,049	0.13	<100	2,964	0.16

		Low-income			Lower-middle-income			Upper-middle-income		
N°	**Intervention**	**Banded cost-effectiveness ratio**	**Health impact per** year (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)	**Banded cost-effectiveness ratio**	**Health impact per** year (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)	**Banded cost-effectiveness ratio**	**Health impact per year** (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)
H6	Reduce sugar consumption through effective taxation on sugar-sweetened beverages	Results for this intervention are forthcoming and will be included in the second consultation round.								
Physical inactivity										
P1	Brief counselling intervention on physical activity in primary health care	100 - 500	246	0.07	100 - 500	732	0.30	1,000 - 5,000	296	0.90
P2	Physical activity public education and awareness campaign	<100	185	<0.01	<100	617	0.01	100 - 500	162	0.04
Cardiovascular diseases										
CV1	Pharmacological treatment of hypertension in adults using either of the following: thiazide and thiazide-like agents; angiotensin-converting enzyme inhibitors (ACE-Is)/angiotensin-receptor blocker (ARBs); calcium channel blockers (CCBs).	100 - 500	5,281	2.12	500 - 1,000	1,435	0.78	500 - 1,000	3,002	1.97
CV2a	Drug therapy to control CVD risk using a total risk* approach and counselling to individuals who have had a heart attack or stroke and to persons with high risk (≥ 20%) of a fatal and non-fatal cardiovascular event in the next 10 years using the updated WHO CVD risk charts	100 - 500	435	0.21	1,000 - 5,000	274	0.29	500 - 1,000	1,166	0.82
CV2b	Drug therapy to control CVD risk using a total risk* approach and counselling to individuals who have had a heart attack or stroke and to persons with high risk (≥ 10%) of a fatal and non-fatal cardiovascular event in the next 10 years using the updated WHO CVD risk charts	500 - 1,000	2,389	1.24	500 - 1,000	762	0.64	500 - 1,000	2,107	1.79

		Low-income			Lower-middle-income			Upper-middle-income		
N°	**Intervention**	**Banded cost-effectiveness ratio**	**Health impact per** year (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)	**Banded cost-effectiveness ratio**	**Health impact per** year (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)	**Banded cost-effectiveness ratio**	**Health impact per year** (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)
CV3a	Treatment new cases of acute myocardial infarction with aspirin initially treated in a hospital setting with follow up carried out through primary health care facilities at a 95% coverage rate	10,000 - 15,000	7.9	0.08	15,000 - 20,000	2.7	0.04	20,000 - 50,000	3.9	0.08
CV3b	Treatment new cases of acute myocardial infarction with aspirin and thrombolysis initially treated in a hospital setting with follow up carried out through primary health care facilities at a 95% coverage rate	5,000 - 10,000	13.0	0.13	15,000 - 20,000	3.7	0.06	15,000 - 20,000	6.1	0.12
CV3c	Treatment of new cases of acute myocardial infarction with aspirin, thrombolysis and clopidogrel, initially treated in a hospital setting with follow up carried out through primary health care facilities at a 95% coverage rate	5,000 - 10,000	15.4	0.14	15,000 - 20,000	4.2	0.06	15,000 - 20,000	7.2	0.12
CV3d	Treatment of new cases of myocardial infarction with primary percutaneous coronary interventions (PCI), aspirin and clopidogrel, initially treated in a hospital setting with follow up carried out through primary health care facilities at a 95% coverage rate	>50,000	7.8	1.00	>50,000	2.6	0.24	>50,000	3.9	0.56
CV4a	Treatment of acute ischemic stroke with intravenous thrombolytic therapy	5,000 - 10,000	18.3	0.17	10,000 - 15,000	5.3	0.07	15,000 - 20,000	16.9	0.27
CV4b	Treatment of acute ischemic stroke with mechanical thrombectomy within an experienced facility	20,000 - 50,000	8.0	0.40	20,000 - 50,000	2.9	0.10	>50,000	7.6	0.48
CV5a	Primary prevention of rheumatic fever and rheumatic heart diseases by increasing appropriate treatment of streptococcal pharyngitis at the primary care level	100 - 500	3,430.0	0.44	100 - 500	989.0	0.14	100 - 500	622.4	0.28

		Low-income			Lower-middle-income			Upper-middle-income		
N°	**Intervention**	**Banded cost-effectiveness ratio**	**Health impact per** year (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)	**Banded cost-effectiveness ratio**	**Health impact per** year (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)	**Banded cost-effectiveness ratio**	**Health impact per year** (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)
CV5b	Secondary prevention of rheumatic fever and rheumatic heart disease by developing a register of patients who receive regular prophylactic penicillin	<100	722.2	0.03	<100	200.0	0.01	<100	121.9	0.01
CV6	Low-dose acetylsalicylic acid within 24 to 48 hours for secondary prevention of ischemic stroke	20,000 - 50,000	0.8	0.03	10,000 - 15,000	1.2	0.02	>50,000	1.0	0.06
CV7	Comprehensive care of acute stroke patients in stroke units	>50,000	1.6	0.22	>50,000	1.4	0.11	>50,000	1.8	0.39
Diabetes										
D1	Foot care to prevent amputation in people with diabetes (including educational programmes, access to appropriate footwear, multidisciplinary clinics)	100 - 500	80	0.03	1,000 - 5,000	99	0.10	1,000 - 5,000	176	0.20
D2	Diabetic retinopathy screening for all diabetes patients and laser photocoagulation for prevention of blindness	1,000 - 5,000	32	0.04	1,000 - 5,000	48	0.17	1,000 - 5,000	133	0.34
D3	Glycaemic control for people with diabetes, along with standard home glucose monitoring for people treated with insulin to reduce diabetes complications	500 - 1,000	1,091	0.75	1,000 - 5,000	1,996	2.51	1,000 - 5,000	2,784	3.96
D4	Screening of people with diabetes for proteinuria and treatment with angiotensin-converting enzyme inhibitor for the prevention and delay of renal disease	100 - 500	526	0.12	100 - 500	1,012	0.44	500 - 1,000	1,192	0.78
D5	Control of blood pressure in people with diabetes	100 - 500	274	0.04	100 - 500	532	0.17	500 - 1,000	824	0.50
D6	Statin use in people with diabetes > 40years old	<100	515	0.05	100 - 500	1,271	0.22	100 - 500	1,559	0.61

		Low-income			Lower-middle-income			Upper-middle-income		
N°	**Intervention**	**Banded cost-effectiveness ratio**	**Health impact per** year (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)	**Banded cost-effectiveness ratio**	**Health impact per** year (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)	**Banded cost-effectiveness ratio**	**Health impact per year** (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)
Chronic respiratory diseases										
CR1	Acute treatment of asthma exacerbations with inhaled bronchodilators and oral steroids	<100	1,220	0.05	100 - 500	1,051	0.13	500 - 1,000	828	0.43
CR2	Acute treatment of COPD exacerbations with inhaled bronchodilators and oral steroids	<100	183	<0.01	100 - 500	378	0.04	100 - 500	389	0.16
CR3	Long-term management of asthma with inhaled bronchodilator and low-dose beclometasone	<100	1,204	0.10	100 - 500	1,123	0.16	100 - 500	733	0.32
CR4	Long-term management of COPD with inhaled bronchodilator	<100	920	0.03	<100	1,811	0.16	100 - 500	1,723	0.39
Cancer										
CA1	Vaccination against human papillomavirus (1-2 doses) of 9–14 year old girls	<100	2,170	0.04	<100	1,878	0.05	<100	2,524	0.05
CA2	Cervical cancer: HPV DNA screening, starting at the age of 30 years with regular screening every 5 to 10 years (using a screen-and-treat approach or screen, triage and treat approach)	<100	856	0.02	<100	804	0.05	<100	1,431	0.14
CA3	Cervical cancer: early diagnosis programs linked with timely diagnostic work-up and comprehensive cancer treatment	<100	621	0.02	<100	605	0.02	<100	578	0.03
CA4	Breast cancer: early diagnosis programs linked with timely diagnostic work-up and comprehensive cancer treatment	<100	929	0.05	<100	1,405	0.11	100 - 500	2,721	0.30
CA5	Breast Cancer: Screening with mammography (once every 2 years for	100 - 500	990	0.17	100 - 500	1,492	0.39	100 - 500	2,900	0.94

		Low-income			Lower-middle-income			Upper-middle-income		
N°	**Intervention**	**Banded cost-effectiveness ratio**	**Health impact per** year (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)	**Banded cost-effectiveness ratio**	**Health impact per** year (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)	**Banded cost-effectiveness ratio**	**Health impact per year** (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)
	women aged 50-69 years) linked with timely diagnostic work-up and comprehensive breast cancer treatment in setting where mammographic screening programme is recommended									
CA6	Colorectal cancer: early diagnosis programs linked with timely diagnostic work-up and comprehensive cancer treatment	<100	356	0.02	<100	643	0.04	100 - 500	2,877	0.34
CA7	Basic palliative care for cancer: home-based and hospital care with multi-disciplinary team and access to opiates and essential supportive medicines[26]			<0.01			<0.01			0.02
CA8	Prevention of liver cancer through hepatitis B immunization	<100	213	0.01	<100	175	0.01	<100	684	0.01
CA9	Oral Cancer: screening in high-risk groups linked with timely diagnostic work-up and comprehensive cancer treatment in setting where significant disease burden and programme is recommended	1,000 - 5,000	12	0.02	100 - 500	390	0.05	1,000 - 5,000	62	0.11
CA10	Colorectal cancer screening: population-based programme, including through stool-based tests, as appropriate, at age >50 years, linked with timely treatment in settings where screening programme is recommended	100 - 500	1,057	0.42	500 - 1,000	1,623	0.93	500 - 1,000	3,508	1.77
CA11	Childhood cancer: early diagnosis programs linked with timely diagnostic work-up and comprehensive cancer treatment, focusing on 6 index cancers	<100	327	0.02	<100	1,088	0.10	100 - 500	310	0.03

[26] Impact model not available for palliative care

		Low-income			Lower-middle-income			Upper-middle-income		
N°	**Intervention**	**Banded cost-effectiveness ratio**	**Health impact per** year (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)	**Banded cost-effectiveness ratio**	**Health impact per** year (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)	**Banded cost-effectiveness ratio**	**Health impact per year** (HLY gained per 1 million)	**Economic cost per year** (I$ in millions per 1 million)
	of WHO Global Initiative for Childhood Cancer									
CA12	Head and neck cancers including oral cancers: early diagnosis programs linked with timely diagnostic work-up and comprehensive cancer treatment	500 - 1,000	18	0.01	500 - 1,000	102	0.08	1,000 - 5,000	47	0.05
CA13	Prostate cancer: early diagnosis programs linked with timely diagnostic work-up and comprehensive cancer treatment	100 - 500	224	0.03	100 - 500	272	0.05	100 - 500	1,040	0.19
CA14	Early detection and comprehensive treatment of cancer for those living with HIV	<100	247	0.01	<100	84	<0.01	100 - 500	34	<0.01