

**Prevention and Control of  
Noncommunicable Diseases in the  
Federation of Bosnia  
and Herzegovina,  
Bosnia and Herzegovina**

**The case for investment**





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## Abstract

This report is the result of a project to develop an investment case for interventions aimed at the prevention and control of noncommunicable diseases (NCDs) in the Federation of Bosnia and Herzegovina, Bosnia and Herzegovina (hereinafter “the Federation of Bosnia and Herzegovina” or “the entity”). It considers the current NCD health and economic burdens along with current risk levels, the healthcare institutional context, potential barriers to change, as well as current NCD policies.

Noncommunicable diseases such as cancer, cardiovascular disease, diabetes and chronic respiratory disease (or chronic obstructive pulmonary disease) pose a significant threat to health and economic development in the Federation of Bosnia and Herzegovina. Already, NCDs are collectively the leading killers in the entity and their total economic toll is roughly 8% of its gross domestic product. An ageing population, high levels of tobacco consumption, poor diet, excess weight, hypertension, and air pollution are among the drivers of NCDs there. Although some positive efforts to reduce risks and improve NCD diagnosis and care have taken place, these are insufficient to address this burden comprehensively.

Research for this report examined the costs and benefits of five intervention packages which could play a role in addressing the NCD burden in the Federation of Bosnia and Herzegovina. While all could yield important benefits, two in particular – reducing salt consumption and tobacco control – would lead in the next 15 years to economic growth which far outpaced the size of the investment in the measures themselves. Together, the two packages would likely save more than 14,500 lives over the next 15 years.

This report, drafted by United Health Futures, draws on inputs from a United Nations Development Programme Institutional Context Analysis which examined the institutional, governmental, and stakeholder arrangements as well as relationships relevant to managing, preventing and controlling NCDs in the Federation of Bosnia and Herzegovina. The methodology for the analysis is provided in Appendix A. In addition, a team from United Health Futures provided an extensive economic analysis which, for this report, looked in depth at the economic costs which NCDs pose for the Federation of Bosnia and Herzegovina, as well as determining the return on investment of several potential interventions to lessen this burden. The methodology for the economic analysis can be found in Appendix B.

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## Main findings

### NCD INVESTMENT CASE – FEDERATION OF BOSNIA AND HERZEGOVINA

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#### Burden

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## NCDs cost the economy 2 billion BAM annually

**The current economic cost of NCDs to the Federation of Bosnia and Herzegovina is 2 billion BAM per year, equivalent to 8% of its annual gross domestic product (GDP).** Premature morbidity and mortality due to NCDs limit the Federation of Bosnia and Herzegovina's socioeconomic development by reducing productivity and inflating the costs of health and social care. In 2021, the entity and cantonal health systems spent an estimated 477 million BAM on the four major NCDs (cancer, cardiovascular diseases, diabetes and chronic respiratory diseases), representing over 20% of total healthcare expenditure.

## 59%

**59% of deaths are attributable to NCDs.** A large and rising proportion of these deaths occur prematurely, meaning before the age of 70.

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#### Investment benefit

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**By acting now, the Government of the Federation of Bosnia and Herzegovina can reduce the burden of NCDs.** The investment case findings demonstrate that investing in proven policy and clinical packages would, over the next 15 years:

## 1 billion BAM

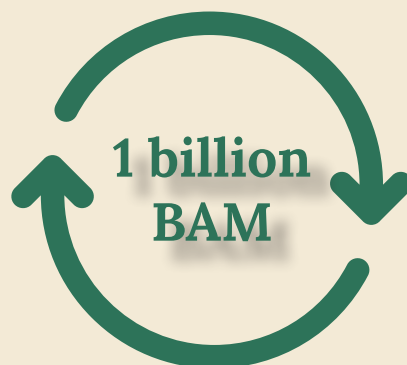
**Provide significant economic benefits (1.03 billion BAM) over a 15-year period.** The return on investment for most interventions is positive, and the highest for interventions on salt reduction (1:54), followed by tobacco (1:6), alcohol (1:5), and physical activity (1:1.5). The clinical interventions package had an ROI below 1 due to high costs of medical treatment, however these interventions are an integral part to improving NCD care and provide significant productivity benefits.

## Save 20,000 lives

**Save over 20,000 lives and reduce the incidence of disease.** The clinical intervention and tobacco control packages lead to the highest averted mortality. Moreover, investing in all interventions over 15 years can avert over 27,000 strokes and 21,100 cases of acute ischaemic heart disease.

## Main findings

### NCD INVESTMENT CASE – FEDERATION OF BOSNIA AND HERZEGOVINA



### Return on investment over a 15-year period

Intervention package	Return on investment	Lives saved	Millions of BAM in productivity benefits
Salt reduction	53.6	12,174	577
Alcohol control	5.28	862	116
Tobacco	6.1	2,340	112
Physical activity awareness	1.49	291	16
CVD and diabetes clinical interventions	0.11	5,253	209

## **Executive summary**

### **Responsibility for healthcare in Bosnia and Herzegovina**

The Dayton Peace Agreement of 1995 established Bosnia and Herzegovina as a state with two entities each with a high degree of autonomy: the Federation of Bosnia and Herzegovina and the Republika Srpska. In 2000, the self-governing Brčko District of Bosnia and Herzegovina was also created. The Federation of Bosnia and Herzegovina is further devolved into 10 cantons with their own respective governments.

Health policy decision-making is devolved to the entity/district level. The two entities and the district, accordingly, each have distinct Laws on Health Care and on Health Insurance. In the Federation of Bosnia and Herzegovina, the 10 cantonal governments are responsible for the planning and delivery of health insurance and health services. The Ministry of Health of the Federation has limited direct responsibilities and takes on a coordinating role in setting and implementing health policies in its cantons.

### **A serious health and economic burden**

Noncommunicable diseases (NCDs) are exacting a substantial health and economic toll on the Federation of Bosnia and Herzegovina, Bosnia and Herzegovina (hereinafter “the Federation of Bosnia and Herzegovina” or “the entity”). They are already responsible for a majority of deaths there. In 2021, cardiovascular diseases (CVD), cancer, diabetes and chronic obstructive pulmonary disease (COPD) combined accounted for 59% of total mortality, or 73% of non-COVID mortality.

The healthcare system is struggling with this burden: the proportion of these deaths which are deemed premature – occurring before the age of 70 – is rising while progress on the age-standardised mortality rates for the major NCDs is lagging behind that in the rest of Europe. Accurate, recent prevalence figures are unavailable, but the best estimates are that over 40% of the population suffer from hypertension and 9% from diabetes. In each case, the majority go undiagnosed, let alone treated.

Meanwhile, anticipated demographic changes mean that the burden on the healthcare system will only increase. A projection based on the forecast changes to the age structure of the Federation of Bosnia and Herzegovina suggests that,



without better prevention and management, the number of cancer deaths could double by 2050 and those from CVD and diabetes rise by 2.8 times.

NCDs also impose a marked financial toll on the various healthcare systems of the Federation of Bosnia and Herzegovina as well as on the economy as a whole. Recent estimates suggest that the aggregate direct government costs of care for cancer, CVD, endocrine diseases (mostly diabetes) and COPD come to 477 million BAM, nearly 30% of all public healthcare spending. The indirect costs, largely from the impact of these conditions on the ability of people to work, are more than three times greater, 1.55 billion BAM. The combined economic burden, over 2 billion BAM, is the equivalent of 8% of annual gross domestic product (GDP).

## High levels of NCD risk in lifestyles and the environment

The population of the Federation of Bosnia and Herzegovina experiences levels of several lifestyle-related and environmental risks which, if left unchecked, will drive substantial NCD incidence in the years to come.

**Tobacco consumption:** A 2019 academic survey found that 42% of the adult population consumed tobacco, almost all of whom did so daily. This figure showed little change from the 44% who used tobacco in 2012, a sign of limited progress.

**Poor diet, low physical activity and excess weight:** According to the latest information available (from 2012), only a minority of the population eat fruit (36%) or vegetables (28%) daily. Just 27% engage in adequate levels of physical exercise. As a result, 59% of the population is either overweight or obese.

**Hypertension:** In 2012, 42% of the population had hypertension. Although there have been no recent studies, there have also been no policy initiatives to address this. Thus, it is reasonable to assume that progress has been limited, especially given the high mortality toll from CVDs in general and essential hypertension in particular.

**Air pollution:** In 2019, all but one of the air monitoring stations in the Federation of Bosnia and Herzegovina recorded annual levels of  $PM_{2.5}$ ,  $PM_{10}$ , and nitrogen dioxide above current WHO recommendations. Indeed, Bosnia and Herzegovina as a whole has, by some metrics, the most polluted air in Europe and is estimated to have the highest per capita rate of years of life lost on the continent from excess  $PM_{2.5}$  levels.

## **Weaknesses in the health system undermine the effectiveness of the response to NCDs**

Although the healthcare system in the Federation of Bosnia and Herzegovina aims to be universal, in practice only 87% of residents are insured. This lack of universal engagement with the health system in practice impedes case finding, which likely helps explain the divergence between the number of people under treatment for given NCDs and the best estimates of their prevalence.

A focus within the system on medical interventions leaves limited resources available for prevention. Under 10% of the target population, for example, receive breast or cervical cancer screening. Money for innovation is also highly limited: even the NCD Action Plan required foreign funding.

Funding of care in general is also limited, with outlay per person lower than in every EU country and Serbia. This lack of financial resources exacerbates both the difficulty in finding funding for preventative measures and the ongoing lack of human resources for health.

Finally, the highly fragmented nature of the health system, with governance shared by the entity and its 10 cantons, results in uneven access to care across the entity as well as the inefficient use of resources. It also impedes health policy planning and reform beyond the cantonal level.

## **A lack of understanding of NCD risks makes any response harder**

In 2012, only 15% of residents surveyed in the Federation of Bosnia and Herzegovina thought that their behaviour could increase the probability of heart diseases; 13% said the same of high blood pressure; and just 7% for cancer. Although no general studies have occurred since, what is available suggests little improvement.

## The entity has taken initial, but limited, steps toward addressing the NCD burden overall

Current efforts that address NCDs as a group fall into several categories:

**Formal policies and plans:** Several policies of the Federation of Bosnia and Herzegovina are relevant to NCD prevention and management, but the core one is the National Action Plan for the Prevention and Control of NCDs 2019-2025. It encompasses various goals along four axes: Management; Health promotion and disease prevention; Health care; and Research, monitoring, and evaluation. The goals listed under these axes, however, are general and ones specific to the entity are lacking. Moreover, little capacity exists to monitor how effective any program might be.

**Improvements to primary health care:** Since 2008, the Ministry of Health has engaged in various efforts to improve the ability of primary health care facilities to diagnose and manage NCDs. The two most prominent of these are: the development of 75 community mental healthcare centres; and the roll out of the program for cardiovascular risk assessment and management (CVRAM) which by 2019 had given 70% of the population access to standardised, evidence-based, preventative CVD services through primary health care. The CVRAM programme wound up in 2019, so its long-term impact remains unclear.

## Policies to address specific NCD risks, where they exist, tend to be weak and poorly enforced

**Tobacco control:** The Federation of Bosnia and Herzegovina greatly improved its tobacco control regime with new legislation in 2022. Nevertheless, the law still falls short of WHO recommendations in key respects: it allows designated smoking areas in airports, healthcare facilities, and dining establishments; permits advertising at point of sale; and does not require graphic warnings on packaging. Smoking cessation assistance has highly limited availability in the entity. Meanwhile, smoking bans are inadequately enforced and around a third of cigarettes sold are from illicit sources.

**Reduction of harmful alcohol consumption:** Limited regulation, including some low taxes at the state Bosnia and Herzegovina level, apply in this area. On the other hand, little data exist on the extent to which alcohol consumption poses a widespread health risk within the Federation of Bosnia and Herzegovina.

***Sodium, fat, and sugar reduction in diets:*** The entity does not appear to have any regulations aimed at salt, fat, or sugar reduction. Sodium consumption is not monitored. On diet in general, the main government initiatives have been multi-stakeholder ones to improve the quality of food for children and in schools. These are positive but narrowly focused.

***Physical activity:*** There is no evidence of the implementation of policies to improve levels of physical activity.

***Air quality:*** Efforts on air quality so far appear to be restricted to increasing the number of monitoring stations.

## **Several cost-effective intervention packages exist to reduce the NCD burden in the entity, with sodium control and enhanced tobacco control displaying high cost-benefit ratios**

Research conducted for this report examined the potential benefit of implementing five packages of interventions, made up of WHO “best buys” – programmes which have been shown to be cost-effective in numerous cases. Four of the packages concerned population health measures – tobacco control, improved awareness of the benefits of physical activity, reduction in harmful alcohol consumption, and reduction in sodium consumption – and one was made up of clinical interventions related to diagnosis and control of CVD and diabetes.

All saved lives. The policy interventions also reduced NCD incidence, which had the attendant result of increasing economic output by maintaining workforce health. The sodium and tobacco control packages yielded the highest ratio of benefits to cost: one BAM’s investment in the sodium-related measures yield more than 53 BAM in greater economic growth over 15 years, and the equivalent figure for tobacco control was more than 6. The other population health packages also had benefits greater than costs over the same period.

The clinical intervention package cost more than the benefits it yielded in terms of enhanced economic output. Healthcare officials should nevertheless consider the elements of the package given the improvement in the quality of life they can bring to those with CVD and diabetes.

## Abbreviations

<b>BMI</b>	Body mass index
<b>COPD</b>	Chronic obstructive pulmonary disease
<b>CVD</b>	Cardiovascular disease
<b>CVRAM</b>	Cardiovascular risk assessment and management program
<b>DZ</b>	Dom Zdravljas (primary health care facilities)
<b>EU</b>	European Union
<b>FBiH</b>	Federation of Bosnia and Herzegovina, an entity of Bosnia and Herzegovina
<b>FCTC</b>	WHO Framework Convention on Tobacco Control
<b>GDP</b>	Gross domestic product
<b>HIF</b>	Health Insurance Fund
<b>ICA</b>	Institutional Context Analysis
<b>ICD</b>	International Classification of Diseases
<b>NCD</b>	Noncommunicable diseases
<b>PPP</b>	Purchasing power parity
<b>ROI</b>	Return on investment
<b>SDC</b>	Swiss Agency for Development and Cooperation
<b>SDR</b>	Standardized mortality rates
<b>STEPS</b>	STEPwise approach to NCD risk factor surveillance
<b>UHF</b>	United Health Futures
<b>UNDP</b>	United Nations Development Programme
<b>UNICEF</b>	United Nations Children's Fund
<b>VAT</b>	Value added tax
<b>WHO</b>	World Health Organization

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# Overview of the noncommunicable disease burden in the Federation of Bosnia and Herzegovina, Bosnia and Herzegovina

## Responsibility for healthcare in Bosnia and Herzegovina

The Dayton Peace Agreement of 1995 established Bosnia and Herzegovina as a state with two entities each with a high degree of autonomy: the Federation of Bosnia and Herzegovina and the Republika Srpska. In 2000, the self-governing Brčko District of Bosnia and Herzegovina was also created. The Federation of Bosnia and Herzegovina is further devolved into 10 cantons with their own respective governments.

Health policy decision-making is devolved to the entity/district level. The two entities and the district, accordingly, each have distinct Laws on Health Care and on Health Insurance. In the Federation of Bosnia and Herzegovina, the 10 cantonal governments are responsible for the planning and delivery of health insurance and health services. The Ministry of Health of the Federation has limited direct responsibilities and takes on a coordinating role in setting and implementing health policies in its cantons.

## The health burden

Noncommunicable diseases (NCDs) collectively are the dominant health challenge in the Federation of Bosnia and Herzegovina, Bosnia and Herzegovina (hereinafter the Federation of Bosnia and Herzegovina). In 2017, the four leading ones – cardiovascular disease (CVD), cancer, diabetes, and chronic obstructive pulmonary disease (COPD) – were responsible for over two thirds of total mortality there.<sup>1</sup> Although that figure decreased by 2021, to 59%, this is not a sign of progress. In that year, COVID-19 was responsible for roughly 20% of mortality in the Federation of Bosnia and Herzegovina. Of non-COVID deaths, the four main NCDs accounted for 73% of total mortality in the entity. The two leading killers among NCDs are CVD and cancer, respectively responsible for 39% and 16% of all deaths in the Federation of Bosnia and Herzegovina in 2021.<sup>2</sup>

Worrying signs suggest that the situation may get worse. In particular, premature mortality for CVDs and cancers is a rough but useful measure of the proportion of these conditions which are considered preventable through timely diagnosis and management. (It is a percentage calculated by taking the number of people in a year aged 30 to 70 who die from a given NCD and dividing that by the total deaths from the same condition for all age groups during the same period). For both CVDs and cancers in the Federation of Bosnia and Herzegovina, rates of premature mortality remained stable from 2010 to 2017.<sup>3</sup> By 2021, however, the figures had

1 Federation of Bosnia and Herzegovina, "Akcioni plan za prevenciju i kontrolu hroničnih nezaraznih bolesti," 2019-2025

2 Institute for Statistics of The Federation of Bosnia and Herzegovina, Statistical Yearbook 2021, 2021; Data provided directly by Ministry of Health, The Federation of Bosnia and Herzegovina; UHF Calculations based on these data.

3 Federation of Bosnia and Herzegovina, "Akcioni plan za prevenciju i kontrolu hroničnih nezaraznih bolesti," 2019-2025

risen significantly. For men, 50% of cancer fatalities were premature (compared to 29% in 2017) and 32% for CVD (compared to 16%). For women, the equivalent figures for cancer were 49% (compared to 14% in 2017) and 14% for CVD (compared to 8%).<sup>4</sup>

This discussion has focused on mortality because, in the Federation of Bosnia and Herzegovina, data on the incidence and prevalence of NCDs is less robust. Rather than using registries, which have not yet been established in the entity, official figures draw on the number of patients with a given condition registered in primary health care facilities called *Dom Zdravljias* (DZs). Health officials assume that this approach understates the overall numbers.<sup>5</sup>

That said, the data do reveal a widespread problem with hypertension which, despite the cardiovascular risk assessment and management program (CVRAM) discussed later in this document, remains largely unaddressed. In the entity, hypertension – which straddles the line between an NCD in its own right and a risk factor for other CVDs – is by far the most common risk for NCDs. In 2021, 10.7% of the population were registered at DZs with high blood pressure, a slight decrease from the 12% reported in 2017.<sup>6, 7</sup> This is unlikely to reflect the reality within the population: a 2012 government health survey found that 42% of those living in the Federation of Bosnia and Herzegovina had hypertension (systolic pressure greater than 140 mmHg and diastolic pressure greater than 90 mmHg).<sup>8</sup> There is no sign of the necessary, substantial shifts in behaviour since that year that would lead to such a dramatic drop in hypertension rates. This higher figure also explains why hypertension on its own is one of the largest contributors to mortality in the entity.<sup>9</sup> The accompanying chart gives the 2021 aggregate figures from all DZs for several other leading NCDs.<sup>10</sup>

	ICD 10 CODE	Sex	Prevalence per 100,000
<b>Diabetes Type 2</b>	E11	Male	2,918.5
		Female	3,413.0
<b>IHD</b>	I20-I25	Male	1,444.5
		Female	1,284.8
<b>Acute myocardial infarction</b>	I21-I22	Male	308.1
		Female	214.4
<b>Stroke</b>	I60-I64	Male	300.3
		Female	287.1
<b>Cancer</b>	C00-C97	Male	776.7
		Female	899.1

4 Data provided directly by Ministry of Health, Federation of Bosnia and Herzegovina; UHF calculations based on these data

5 Federation of Bosnia and Herzegovina, "Akcion plan za prevenciju i kontrolu hroničnih nezaraznih bolesti," 2019-2025

6 Data provided directly by Ministry of Health, Federation of Bosnia and Herzegovina

7 Federation of Bosnia and Herzegovina, "Akcion plan za prevenciju i kontrolu hroničnih nezaraznih bolesti," 2019-2025

8 Ministry of Health, Federation of Bosnia and Herzegovina, Survey of the Health Status of the Population in 2012, 2014

9 Institute for Public Health of the Federation of Bosnia and Herzegovina, Health Status of the Population 2020, 2022

10 Data provided directly by Ministry of Health, Federation of Bosnia and Herzegovina



Similarly to the prevalence of hypertension, some of these numbers may indicate an issue with case finding rather than serve as an accurate reflection of the prevalence of NCDs in the Federation of Bosnia and Herzegovina. The figures above indicate, for example, that only between 3% and 4% of the population are being seen for type II diabetes at clinics in the Federation of Bosnia and Herzegovina, which typically accounts for more than 90% of the cases of diabetes in a given population. The above-noted 2012 health survey, however, found that 9.6% of the Federation of Bosnia and Herzegovina's adult population had been diagnosed with some form of diabetes during their lives, and 21.7% had blood sugar levels greater than 6.0 mmol/l – a sign of either already having the condition or possibly developing it in future.<sup>11</sup> More recently, for Bosnia and Herzegovina as a whole, the International Diabetes Federation – in its highly respected atlas – estimates that 12.2% of adults had diabetes in 2021.<sup>12</sup> These figures seem more likely to be accurate than ones derived solely from the numbers under treatment.

Similarly, the International Agency for Research on Cancer estimates – based on registry figures from the Republika Srpska, Bosnia and Herzegovina – that the five-year prevalence of cancer in Bosnia and Herzegovina as a whole is 1,045 per 100,000.<sup>13</sup> In short, while data for treatment in DZs is useful for understanding the current burden of NCDs on the health system, it probably understates the true prevalence of NCDs and their risk factors.

The current NCD burden is also liable to grow substantially unless levels of behavioural and environmental risks diminish. Indeed, even if they stay the same, the situation is likely to deteriorate because the demographic changes expected in the entity will have a huge influence on the crude rates of incidence – the actual number of people with which a health system has to cope – and mortality.

Here, two important contextual developments are a play: a shrinking population and an ageing one. The most likely projection from the Institute for Statistics of the Federation of Bosnia and Herzegovina estimates that the number of people living in the entity will drop by around 30% between 2020 and 2050. Even with a more hopeful variant, in which no emigration occurs, the population will still decline by nearly 12%. The likely variant may even be overly hopeful, as it includes a rise in the birth rate per woman from 1.29 in 2020 to 1.37 in 2030 and 1.44 by 2050, which may be difficult to achieve even with supportive policies.<sup>14, 15</sup>

At the same time as it is shrinking, the population is also ageing rapidly, due to both a low birth rate and the emigration of younger residents. Under the more likely variant, the median age in the Federation of Bosnia and Herzegovina will rise from around 42 in 2020 to just

11 Ministry of Health, Federation of Bosnia and Herzegovina, Survey of the Health Status of the Population in 2012, 2014

12 WHO, NCD Country Profile: Bosnia and Herzegovina, 2018; International Diabetes Federation, Atlas, 2021

13 International Agency for Research on Cancer, "Estimated number of [5-year] prevalent cases in 2020, all cancers, both sexes, all ages," Cancer Today Database, Settings for Countries: Southern Europe, accessed 26 April 2023

14 Institute for Statistics of the Federation of Bosnia and Herzegovina, Population Projections, 2020

15 Krešić, "In Bosnia, Populist Natalty Policies Are Doomed to Fail," blog post, 9 April 2021

over 56 by 2050. In the same period, the percentage of those aged 65 or over will more than double from 16% to 37%.<sup>16</sup>

Although a smaller population means, all things being equal, fewer cases of NCDs, age is a risk factor for many of these conditions. Of these two factors, an analysis of the Federation of Bosnia and Herzegovina's figures shows that age is likely to dominate. If one takes the 2020 age-specific mortality figures for diabetes, cancer, and CVD and applies them to the projected numbers in each age group by 2050, it yields an estimate that demographics alone will be responsible for more than doubling the number of annual cancer deaths by the latter year, and nearly tripling deaths from CVD and diabetes.<sup>17</sup> Put another way, unless urgent steps are taken to address NCD risk factors and their management, demographic changes are likely to put tremendous pressure on the health system.

## The economic burden

As part of the research for this report, a team working with the Bosnia and Herzegovina country office and health officials in the Federation of Bosnia and Herzegovina analysed the direct and indirect costs of noncommunicable diseases in the entity. For the methodology, see Appendix B.

### Direct costs

This estimate of the direct economic costs of NCDs draws only on government and compulsory insurance healthcare expenditure. It does not include private out-of-pocket healthcare expenditure – around a third of all healthcare spending in the entity – costs to third-party insurers, or non-healthcare costs such as transport.

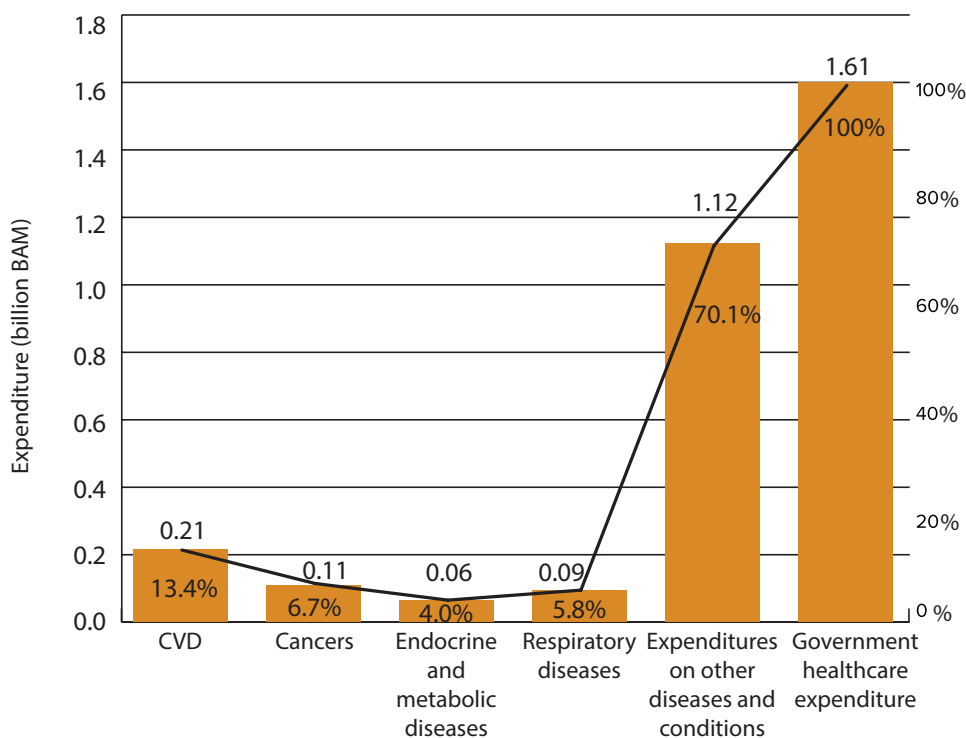
According to the Health Insurance and Reinsurance Institute of the Federation of Bosnia and Herzegovina, total healthcare expenditure within the entity was 2,386.7 million BAM in 2021. Government and compulsory insurance health expenditure was 1,595.1 million BAM, or 66.8% of the total.

Bosnia and Herzegovina's health accounts provide the approximate share of government and compulsory health expenditure for each NCD group (CVDs, diabetes, cancer and chronic respiratory diseases) across the country. Assuming that these figures are broadly accurate for the Federation of Bosnia and Herzegovina, annual estimated spending on the four main groups of NCDs in 2021 was 477 million BAM: 213.8 million BAM (13.4% of government and compulsory health expenditure) on CVD; 106.9 million BAM (6.7%) on cancer, 92.5 million BAM (5.8%) on chronic respiratory diseases; and 63.8 million BAM (4.0%) on endocrine and metabolic diseases (mainly diabetes) (**Fig. 1**).

16 UHF Calculations based on data in Institute for Statistics of the Federation of Bosnia and Herzegovina, Population Projections, 2020

17 UHF Calculations based on data provided by Ministry of Health of The Federation of Bosnia and Herzegovina; Institute for Statistics of the Federation of Bosnia and Herzegovina, Population Projections, 2020

**Fig.1. Government healthcare expenditure in the Federation of Bosnia and Herzegovina in billions of BAM, 2021**



It is worth noting that such spending can, by definition, occur only in cases where the disease has been diagnosed. The large number of undiagnosed cases do not receive any care.

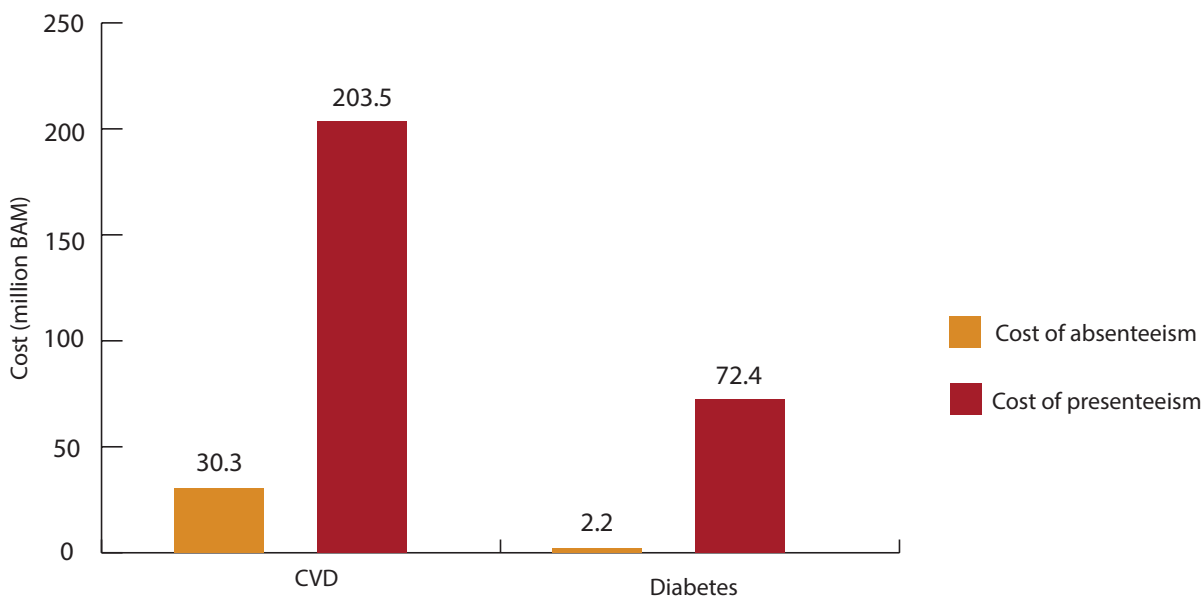
### Indirect costs

Indirect economic losses due to NCDs in the Federation of Bosnia and Herzegovina were calculated – using the human capital method – as the total of those from reduced labour force participation due to increased absenteeism and presenteeism, as well as losses from premature death.

**Figure 2** shows the labour force participation results for 2021 for CVD and diabetes. No relevant data were available for chronic respiratory diseases or cancer.

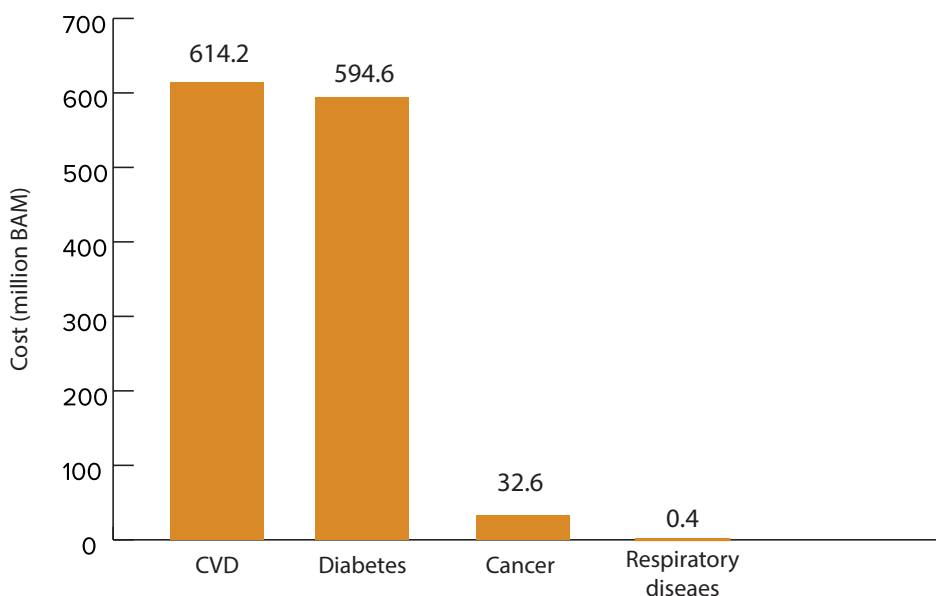
For CVD, the estimated cost of absenteeism was 30,298,941 BAM, and for presenteeism 203,457,422 BAM. The equivalent projections for diabetes were 2,158,703 BAM and 72,399,569 BAM respectively.

**Fig. 2. Costs of absenteeism and presenteeism for CVD and diabetes in millions of BAM, 2021**



Under the human capital approach, the costs of premature death are calculated by determining the proportion of the years of life lost within the working population (labour force participation rate multiplied by the age-specific employment rate) from each of the four main NCDs in 2021. This number is then multiplied by the GDP per working person. When aggregated for all four conditions, the estimate for the total cost of premature death came to 1.2 billion BAM (**Fig. 3**). Due to their higher mortality rates, CVD and cancer are associated with higher costs (614.2 million BAM and 594.6 million BAM, respectively) for premature mortality compared to diabetes and respiratory diseases.

**Fig. 3. Costs of premature death due to four NCDs in millions of BAM, 2021**



## Total economic burden

**Table 1** summarises the total direct and indirect costs of NCDs in the Federation of Bosnia and Herzegovina, a sum which came to just over 2 billion BAM in 2021. This represents about 8% of the entity’s GDP that year. The actual total is almost certainly higher, as key information to determine the total costs of NCDs was unavailable. For example, there were no data to estimate absenteeism or presenteeism for cancer or chronic respiratory diseases; only government healthcare spending could be included in direct costs; and figures for other costs – such as disability pensions or lost productivity by family carers for those with NCDs – were impossible to calculate.

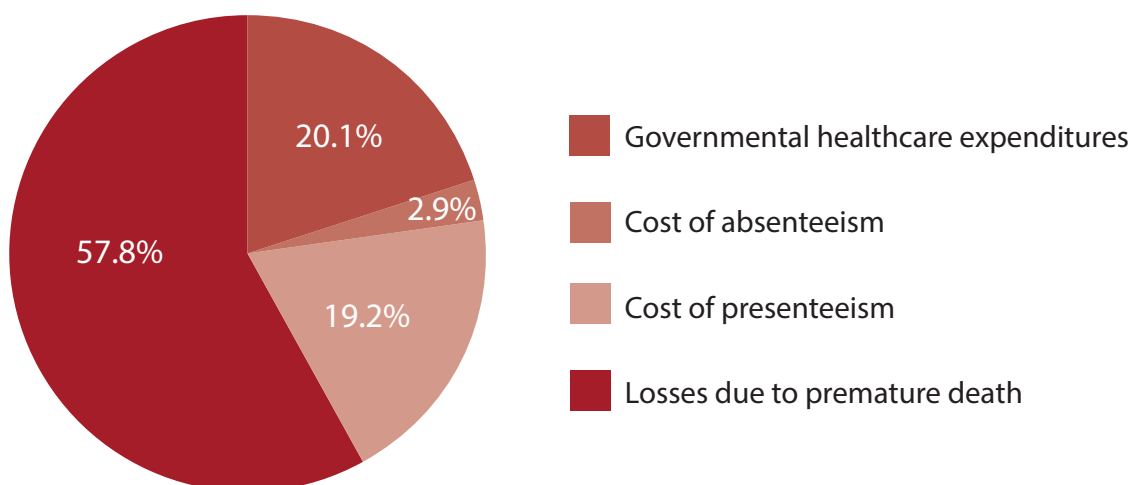
**Table 1. Economic burden of NCDs in the Federation of Bosnia and Herzegovina in millions of BAM, 2021**

Cost	Cardiovascular Diseases	Cancer	Endocrine and metabolic diseases (mainly diabetes)	Chronic respiratory diseases	Total
Direct costs					
Health care					
Government expenditure	213.8	106.9	63.8	92.5	476.9
Indirect costs					
Absenteeism	30.3	NA	2.2	NA	32.5
Presenteeism	203.5	NA	72.4	NA	275.9
Premature deaths	614.2	594.6	32.6	0.41	1 241.8
Total indirect costs	847.9	594.6	107.1	0.41	1 550.1
Total	1 061.7	701.5	170.9	92.9	2 027.1

NA: not available

**Figure 4** shows the structure of the economic burden of NCDs in the Federation of Bosnia and Herzegovina in 2021. The direct costs of NCDs (government healthcare expenditure) represented only 20.1%—just the tip of the iceberg of the total economic burden. The aggregate indirect costs are nearly four times more, suggesting that the lack of direct investment in NCD prevention and control is exacting a substantial economic, and human, toll within the entity.

**Fig. 4. Structure of the economic burden of NCDs in the Federation of Bosnia and Herzegovina, 2021**



## The prevalence of selected leading NCD risk factors

The extent of NCD-related risks in the Federation of Bosnia and Herzegovina is difficult to report precisely because the last major government survey, the Study on the State of Health of the Adult Population in the Federation of Bosnia and Herzegovina, took place over a decade ago, in 2012. Here we present what is available.

### Tobacco consumption

The 2012 survey found that 44% of the adult population were regular smokers, with significantly more men (56%) than women (32%) in this group.<sup>18</sup> An extensive survey by academic researchers in 2019 found that 42% of the population in the Federation of Bosnia and Herzegovina consumed tobacco – almost always as cigarettes – and nearly all of this group (40% of the population) did so daily. The research did not break down the entity sample by gender, but for Bosnia and Herzegovina as a whole, it reported that 48% of adult males smoked, compared to 34% of women. If these figures hold true in the Federation of Bosnia and Herzegovina, it implies that any progress against tobacco in recent years has occurred among men, with women even becoming slightly more likely to take up smoking.<sup>19</sup>

Surveys of specific groups by the Institute of Public Health paint an equally worrying picture. In 2019, it found that 24% of school children used some tobacco product with cigarettes and hookah pipes having almost equal popularity. Even more surprising, 35% of healthcare professionals smoke tobacco, four-fifths of whom do so daily. Very few show any interest in quitting.<sup>20</sup>

<sup>18</sup> Ministry of Health, Federation of Bosnia and Herzegovina, Survey of the Health Status of the Population in 2012, 2014

<sup>19</sup> Mičić et al., “Tobacco consumption in 2019,” 2020

<sup>20</sup> Institute for Public Health of the Federation of Bosnia and Herzegovina, Health Status of the Population 2020, 2022

Exposure to second hand smoke also remains a common health risk. The 2019 research found that just 37% of adults had completely smoke-free workplaces, while for 32% smoking was either permitted everywhere where they worked or there was no policy. Meanwhile, second hand exposure is ubiquitous when socialising: in the entity, 92% – including 91% of non-smokers – report experiencing second hand smoke inside bars and nightclubs, and 94.0% – with equal proportions of smokers and non-smokers – say the same of restaurants.<sup>21</sup>

## Alcohol consumption

Bosnia and Herzegovina as a whole has alcohol consumption below the European average. Within the Federation of Bosnia and Herzegovina, the 2012 adult health population survey found that 29% had consumed some alcohol within the last twelve months. Only one in nine, however, did so daily.<sup>22</sup>

## Physical inactivity, improper nutrition, and excess body mass

According to the 2012 health population study, few adults in the Federation of Bosnia and Herzegovina have healthy diets, with only 28% eating vegetables daily, and 36% fruit.<sup>23</sup> The Institute of Public Health calls the situation “disastrous.”<sup>24</sup> Meanwhile, just 27% engage in what is defined as adequate levels of physical activity (more than one session per week of at least 30 minutes of physical exercise leading to a mild increase in breathing rate or sweating). In addition to, and perhaps because of, the low levels of physical activity and fruit or vegetable intake, 21% of adults were found to be obese in 2012 (Body Mass Index (BMI)>30) and a further 38% overweight (BMI>25). Moreover, of children aged 5 to 10 years, 31% were overweight or obese in 2012, highlighting the importance of promoting healthy behaviours amongst young children.<sup>25, 26</sup>

## Hypertension

As noted earlier, in 2012, 42% of the adult population in the Federation of Bosnia and Herzegovina had systolic pressure greater than 140 mmHg and diastolic pressure greater than 90 mmHg. The continuing high death rate in the entity from essential hypertension – the fourth biggest killer among individual International Classification of Disease (ICD) disease codes – suggests that an insufficient proportion of these cases are being properly managed.

21 Mičić et al., “Tobacco consumption in 2019,” 2020

22 Ministry of Health, Federation of Bosnia and Herzegovina, Survey of the Health Status of the Population in 2012, 2014

23 *ibid.*

24 Institute for Public Health of the Federation of Bosnia and Herzegovina, Health Status of the Population 2020, 2022

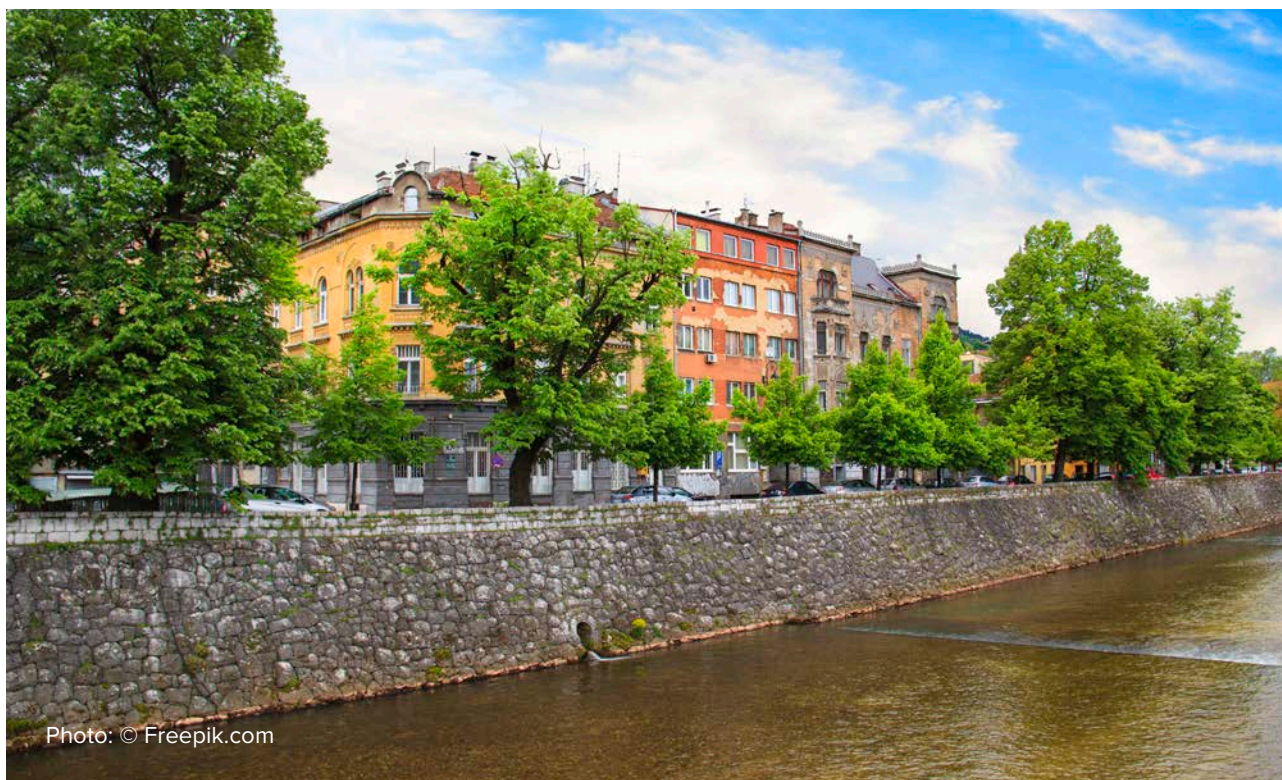
25 Ministry of Health, Federation of Bosnia and Herzegovina, Survey of the Health Status of the Population in 2012, 2014

26 Institute for Public Health of the Federation of Bosnia and Herzegovina, Health Status of the Population 2020, 2022

## Air pollution

The Federation of Bosnia and Herzegovina has a substantial air quality problem according to data from its monitoring stations. For the smallest particulate matter  $PM_{2.5}$ , the WHO-recommended safe mean annual limit was set at  $5\mu\text{g}/\text{m}^3$  in 2020. In the entity in 2019, all the monitoring stations reported significantly higher figures for this pollutant, with year-long averages between  $32.5\mu\text{g}/\text{m}^3$  and  $42.8\mu\text{g}/\text{m}^3$ , or between 6 to 9 times greater than the WHO recommendation. The WHO recommendation for  $PM_{10}$  is a limit of  $15\mu\text{g}/\text{m}^3$  on average. Of the eight stations providing data on this form of particulate matter, two – Herzegovina-Neretva Canton and Jajce – came in under the WHO safe maximum. However overall, the average mean annual concentration for all eight stations was  $43.8\mu\text{g}/\text{m}^3$ , nearly triple the WHO figure. Seven stations monitor for nitrogen dioxide ( $\text{NO}_2$ ). Of these, only the Gorazde station met the WHO recommended annual mean limit of  $10\mu\text{g}/\text{m}^3$ . The average figure across the entity was  $22.3\mu\text{g}/\text{m}^3$ , or more than twice the current WHO recommended annual mean maximum.<sup>27</sup>

The problem of air pollution is similar in Bosnia and Herzegovina's entities and district, and each affects the other depending on, literally, how the wind blows. To put these numbers into perspective, according to European Environment Agency estimates, Bosnia and Herzegovina as a whole had the highest number of years of life lost in Europe from  $PM_{2.5}$  – 2,379 per 100,000 – in 2022.<sup>28</sup>



27 World Health Organization, Ambient (outdoor) air quality database, by country and city, Excel version, 2022

28 European Environment Agency, "Health impacts of air pollution," 2023



## Challenges to better NCD care within the health system

In face of its substantial NCD challenge, the health system in the Federation of Bosnia and Herzegovina is not matching the progress of those across the WHO European Region – the comparator used by the entity’s Institute for Public Health.

**Table 2. Standardised mortality rates (SDR) for selected NCDs, all age groups, per 100,000 inhabitants 2014 and 2020**

	Federation of Bosnia and Herzegovina		WHO European Region <sup>29</sup>	
	2014 <sup>30</sup>	2020 <sup>31</sup>	2014	2019
Cardiovascular diseases	361	332	311	271
Malignant neoplasms	160	163	152	142
Diabetes	44	40	13	14

Between 2014 and 2020, age-standardised mortality rates for cancer and diabetes remained relatively unchanged in the Federation of Bosnia and Herzegovina and that for CVD declined slightly. These figures were not only higher than those for the WHO European Region, the mortality rates for CVD and cancer have been decreasing at a much greater, and steadier, rate in Europe.

Beyond the data, patients commonly experience long waiting times for NCD care. These exist for CVD management across secondary care.<sup>32</sup> Other chronic diseases are also affected. For example, a 2015 study found that the median time for treatment of chronic myeloid leukaemia in the Federation of Bosnia and Herzegovina, was 14 months.<sup>33</sup> In 2022, the waiting time for an MRI scan in relatively well-resourced Sarajevo and Tuzla was a year.<sup>34</sup> These delays can be deadly for conditions where survival often depends on timely intervention and informed management.

Those considering NCD-reducing interventions therefore need to be aware of potential barriers arising from structural and funding difficulties in the provision of healthcare in the Federation of Bosnia and Herzegovina. This report is too limited to give a detailed overview of the health system, but the following are ongoing issues relevant to NCDs.

29 Data from World Health Organization Europe, European Health for All database <https://gateway.euro.who.int/en/datasets/european-health-for-all-database/> accessed 22 March 2023

30 Federation of Bosnia and Herzegovina, "Akcion plan za prevenciju i kontrolu hroničnih nezaraznih bolesti," 2019-2025

31 Institute for Public Health of the Federation of Bosnia and Herzegovina, Health Status of the Population 2020, 2022

32 European Observatory on Health Systems, Bosnia and Herzegovina, 2022

33 Kurtovic-Kozaric et al., "The reality of cancer treatment in a developing country," British Journal of Haematology, 2015

34 "Long waiting Time for radiological Diagnostics in medical Institutions in BiH?" Sarajevo Times, 31 May 2022

## A lack of universal coverage may impede case finding

Under the Law on Health Protection and the Law on Health Insurance in the Federation of Bosnia and Herzegovina, everyone has the right to healthcare and to health insurance.<sup>35</sup> As noted earlier, delivery of care is spread across different levels of government. Each of the entity's 10 cantons is responsible for health policy within its jurisdiction, as well as for implementing local healthcare regulations, organising healthcare services (including primary healthcare), and overseeing its own cantonal health insurance fund (HIF).<sup>36</sup> The Federation's Ministry of Health is responsible for: entity-wide health policy; public healthcare services and the Public Health Institute; certain secondary and tertiary healthcare facilities; and the Federal Health Insurance and Reinsurance Fund, Federal Public Health Institute, and Federal Blood Transfusion Institute.<sup>37, 38</sup>

Despite these structural arrangements, and that membership in the HIF of one's canton is mandatory, coverage is not universal in practice. Of the total population of the Federation of Bosnia and Herzegovina, 87% are insured.<sup>39</sup> (The uninsured were temporarily given free, complete coverage as an emergency measure during the COVID pandemic, but research for the European Commission indicates that this declaration had limited effect.<sup>40</sup>) A 2015 study suggests that those who are uninsured may either be trying to avoid paying the required premiums or – especially for those eligible for free insurance, such as the unemployed and pensioners – have not gone through the necessary enrolment process for various reasons of their own.<sup>41</sup>

A lack of insurance cover, at the very least, suggests low patient engagement with the health system. This, all things being equal, can greatly impede NCD case finding within the population – an issue consistent with the differences between the number of registered patients being treated for diabetes or hypertension and the likely population prevalence. The authorities do try to address this issue when it comes to certain NCDs. Officially, even the uninsured have the right to free treatment for mental illness, cancer, and diabetes.<sup>42</sup> Not all NCDs are covered – hypertension is a notable exception – and it is unclear how many uninsured avail themselves of this access. Moreover, someone uninsured feeling ill may not be aware that they are likely to have one of these conditions, so may not attend until it has reached a later, more difficult to treat, stage.

35 Federation of Bosnia and Herzegovina, Zakon o Zdravstvenoj Zaštiti [Law on Health Protection], 2010; Zakon o Zdravstvenom Osiguranju Federacije BiH [Law on Health Insurance], 1997 with amendments to 2022

36 European Committee of the Regions, "Division of Powers: Bosnia and Herzegovina - Public Health," web site accessed 26 April 2023, <https://portal.cor.europa.eu/divisionpowers/Pages/Bosnia-Herzegovina-Public-health.aspx>

37 European Committee of the Regions, "Division of Powers: Bosnia and Herzegovina - Public Health," web site accessed 26 April 2023, <https://portal.cor.europa.eu/divisionpowers/Pages/Bosnia-Herzegovina-Public-health.aspx>

38 Martić and Đukić, "Health care systems in BiH," 2018

39 European Observatory on Health Systems, Bosnia and Herzegovina, 2022

40 European Social Policy Network, "Bosnia and Herzegovina: healthcare response to COVID-19," 2021

41 Martić and Đukić, "Health care systems in BiH," 2018

42 Federation of Bosnia and Herzegovina, Odluka o Utvrđivanju Osnovnog Paketa Zdravstvenih Prava [Decision on the Maximum Amounts of User Charges for Services Provided under the Basic Package of Health Rights], 2009

## Medical interventions dominate care and NCD prevention receives limited attention

The healthcare available in the Federation of Bosnia and Herzegovina is not necessarily well-suited to providing an effective response to the NCD burden. Despite efforts to strengthen primary health care, which is especially valuable in ongoing NCD management, hospital care continues to dominate the health system.<sup>43</sup>

Moreover, little consideration is given to preventative measures. This begins with spending. In Bosnia and Herzegovina as a whole in 2020, under PPP\$ 11 per capita went toward prevention.<sup>44</sup> Nor do preventative interventions see substantial use: in 2021, only 8.6% of women in the entity aged 20 to 69 were screened for cervical cancer and 5.2% of women aged 40 to 69 for breast cancer.<sup>45</sup> Among women, breast cancer was the most common form of the disease in the entity in 2020 and the second biggest cause of cancer deaths.<sup>46</sup> Given that prevention-related programmes can be much less expensive than treatment costs, an approach focused largely on medical interventions – because prevention does not seem as pressing – represents a false economy.

## Low absolute level of resources within the system

Relative to GDP, healthcare spending in the Federation of Bosnia and Herzegovina is below that in the European Union, but not dramatically so. The public spending on health in the entity in 2021 came to 6.3% of GDP.<sup>47</sup> In 2020, the aggregate figure for the EU as a whole was 8%, but the average of the individual member states was 7.1%. Total spending, which also includes out-of-pocket expenses, represented 9.5% of GDP in the Federation of Bosnia and Herzegovina in 2021, next to 10.9% in the EU overall in 2020, while the member state average was 9.2%.<sup>48</sup> In other words, healthcare makes up a share of the entity's economy roughly consistent with that in the rest of Europe.

The economy, however, is very small compared to much of the rest of the continent in absolute and per capita terms, making the actual outlay smaller as well. In US\$ per capita, the Federation of Bosnia and Herzegovina's total current healthcare expenditure in 2021 (US\$637) lagged behind the most recent available figures for every EU country, as well as that of Serbia. Among the entity's neighbours, only North Macedonia and Albania spent less

43 European Observatory on Health Systems, Bosnia and Herzegovina, 2022

44 UHF calculations based on data from World Health Organization, Global Health Expenditure Database, <https://apps.who.int/nha/database/ViewData/Indicators/en>

45 UHF Calculations based on data in Institute for Public Health of the Federation of Bosnia and Herzegovina, Health Statistics Annual 2021, 2022; Institute for Statistics of the Federation of Bosnia and Herzegovina, Population Projections, 2020

46 Institute for Public Health of the Federation of Bosnia and Herzegovina, Health Status of the Population 2020, 2022

47 Calculations based on data provided by Federation of Bosnia and Herzegovina government sources

48 Data from World Health Organization, Global Health Expenditure Database, <https://apps.who.int/nha/database/ViewData/Indicators/en>, Eurostat Data Browser, <https://ec.europa.eu/eurostat/databrowser/>, Eurostat, "Healthcare Expenditure Statistics," web page accessed 25 April 2023, [updated 2022], [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Healthcare\\_expenditure\\_statistics#Overview\\_of\\_healthcare\\_financing.2C\\_functions\\_and\\_providers](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Healthcare_expenditure_statistics#Overview_of_healthcare_financing.2C_functions_and_providers)

per capita. In PPP terms, the Federation of Bosnia and Herzegovina's per capita spending (PPP\$743) falls behind even these.<sup>49</sup>

In short, financial resources in the system are highly limited – more so than in most of Europe. In practice, this constraint often makes new investment difficult. The lack of investable resources poses a particular challenge for new efforts to deal with NCDs. Even financing the NCD Action Plan, much of which focuses on prevention and health promotion, has had to depend on official development assistance from the World Bank, EU, and Global Fund.<sup>50</sup> In 2020, external funding of health systems in Bosnia and Herzegovina as a whole represented more than 10% of the amount directly contributed from the coffers of all levels of government collectively.<sup>51</sup>

The limited funding within the system also has an impact on human resources for health. The Federation of Bosnia and Herzegovina faces a chronic shortage of medical professionals exacerbated by the ongoing emigration – especially of the best qualified clinicians – to countries where they can get better pay.<sup>52, 53</sup>

## Multiple healthcare systems impede comprehensive approaches

The population of the Federation of Bosnia and Herzegovina is just under 2.2m people. It is served by 11 Ministries of Health (10 cantonal and one federal), and 11 health insurance funds.<sup>54</sup> The centralisation or decentralisation of healthcare governance is a political choice, with many different arrangements selected worldwide. The WHO does not argue for any given form of governance as the single best approach. Each has its strengths, but can also display weaknesses.

In the Federation of Bosnia and Herzegovina, one such challenge is inequality of access between the cantons. Although there are secondary and tertiary institutions run at the entity level, the primary and secondary health care offerings vary in quality and number. Moreover, a substantial degree of overlap, and therefore inefficiency, exists. The entity, for example, has 18 hospitals, but most have only a small number of beds. Those in one canton may not always be able to receive care at a hospital owned by another as this would involve a transfer of funds between their HIFs – a pronounced difficulty in a still hospital-dominated system.<sup>55</sup>

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49 Data from World Health Organization, Global Health Expenditure Database, <https://apps.who.int/nha/database/ViewData/Indicators/en>, Eurostat Data Browser, <https://ec.europa.eu/eurostat/databrowser/>, Eurostat, "Healthcare Expenditure Statistics," web page accessed 25 April 2023, [updated 2022], [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Healthcare\\_expenditure\\_statistics#Overview\\_of\\_healthcare\\_financing.2C\\_functions\\_and\\_providers](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Healthcare_expenditure_statistics#Overview_of_healthcare_financing.2C_functions_and_providers)

50 Data from interviews conducted by UNDP for Institutional Context Analysis

51 Data from World Health Organization, Global Health Expenditure Database, <https://apps.who.int/nha/database/ViewData/Indicators/en>

52 Data from interviews conducted by UNDP for Institutional Context Analysis

53 International Organisation for Migration, Emigration of Health Professionals, 2022

54 Martić and Đukić, "Health care systems in BiH," 2018

55 European Observatory on Health Systems, Bosnia and Herzegovina, 2022

Specifically for NCDs, decentralized and fragmented health governance structures, and the large number of decision-makers they entail, make health policy-making and joint initiatives beyond the cantonal level very challenging. Moreover, the limited cooperation between governments impedes policy reform and implementation. Indeed, a lack of consensus has repeatedly prevented such efforts.<sup>56</sup>

Thus, any new interventions to cut NCD risk, morbidity, or mortality in the Federation of Bosnia and Herzegovina, need to work in the context of a devolved formal healthcare system and the limited availability of funds for upfront investment.

## **Additional barriers to addressing NCDs**

### **Poor understanding of NCD risks**

The 2012 Study on the State of Health of the Adult Population in the Federation of Bosnia and Herzegovina found alarming details about the popular understanding of the link between lifestyle and NCDs. Only around one in seven of those surveyed thought that their behaviour could increase the probability of heart diseases (15%), high blood pressure (13%) or obesity (13%).<sup>57</sup> For cancer, the figure was just 7%. Meanwhile, an analysis of respondents from the Federation of Bosnia and Herzegovina to the European School Survey Project on Alcohol and Other Drugs found that high school students in the entity were less aware of the risks of smoking and drinking than the European average.<sup>58</sup>

No general studies have appeared since 2012, but other research indicates that low knowledge of these risks probably remains a widespread problem. Formally, the entity's primary school curriculum, at various points, requires students to receive instruction on the dangers of alcohol and tobacco use.<sup>59</sup> Nevertheless, a series of interviews with 200 cancer patients in Sarajevo in 2019 found a "lack of public awareness of the consequences of unhealthy lifestyles."<sup>60</sup>

<sup>56</sup> Ibid.

<sup>57</sup> Institute for Public Health of the Federation of Bosnia and Herzegovina, Health Status of the Population 2020, 2022

<sup>58</sup> Pilav et al., "Perception of health risks among adolescents," Public Health, 2015

<sup>59</sup> Data from interviews conducted by UNDP for Institutional Context Analysis

<sup>60</sup> Mlačo, et al., "Lifestyle risk factors and comorbidities of cancer patients," Medicinski Glasnik, 2020

## Political will

A report conducted for the Swiss Agency for Development and Cooperation (SDC) reviewing efforts to improve tobacco legislation in the two entities of Bosnia and Herzegovina, the Federation of Bosnia and Herzegovina and the Republika Srpska, noted that habits of cooperation between stakeholders in the NCD prevention field were underdeveloped, making it hard to build greater political will.<sup>61</sup> Interviewees for this project did not address this matter, so this view may be a minority one. Nevertheless, it suggests that any stakeholder whose interests could be hurt by an NCD-related initiative may be able to use political allies to slow progress.

## Policies for addressing the overall burden of NCDs

### Federation of Bosnia and Herzegovina government policy

The key NCD strategy for the Federation of Bosnia and Herzegovina is its National Action Plan for the Prevention and Control of NCDs 2019-2025. This document is consistent with several other relevant policies and strategies in place at its adoption: the Strategic Plan for the Development of Healthcare 2008-2018; the Strategy for the Prevention, Treatment and Control of Malignant Neoplasms 2012-2020 and the Strategy for the Fight Against Diabetes 2014-2024.

The Action Plan encompasses various measures and initiatives to address NCDs with an underlying emphasis on prevention across all activities. Its four main axes are:

- Management, with a focus on strengthening leadership, capacity, multisectoral action, and partnerships to improve NCD prevention and control;
- Health promotion and disease prevention, especially reducing risk factors for chronic NCDs;
- Health care, with a particular emphasis on strengthening the work of all levels of health care in NCD prevention and control through monitoring of risk factors, such as high blood pressure, obesity, and dyslipidaemia;
- Research, monitoring and evaluation of NCD trends in the entity.

Although each axis has any number of implementing activities, these tend to be general and the indicators of progress lack specifics on what constitutes success. Moreover, even if these existed, it would be difficult to monitor and evaluate progress. Although the cantons provide health information for the annual 'State of Health' report submitted to parliament for budgetary purposes, there is no existing health information system to support preventive services. Data collection methods are also inconsistent across cantons.<sup>62</sup>

61 World Bank, "Implementation Completion and Results Report," 2019; healthForum, "Health Risk Factors Project," 2018; Swiss Agency for Development and Cooperation (SDC), "Reducing Health Risk Factors in Bosnia and Herzegovina," [project description], 2021

62 Data from interviews conducted by UNDP for Institutional Context Analysis

Instead, much of the evidence to support policy interventions for NCDs, as well as to track progress and effectiveness, are inconsistently gathered and focus on epidemiological, rather than risk or intervention data. The last public health survey which measured NCD risk factors took place in 2012.<sup>63</sup> Planning for a STEPS study is ongoing, but interviewees do not expect it to occur because of cost and difficulties in administering surveys across entities. On the other hand, the Global Youth Tobacco Survey has been conducted five times, most recently in 2019.<sup>64</sup>

## Enhanced primary health care services

Since 2008, the Federation of Bosnia and Herzegovina, has had a strategy for the development of primary health care with a focus on developing the practice of family medicine. Among various justifications for the policy's adoption, two leading rationales were: (1) the unsustainable costs of NCD care provided largely by specialists, and (2) international studies which show improved mortality figures for cancer and CVD when largely managed in primary health care.<sup>65</sup>

Thus, efforts to improve primary health care are, inter alia, efforts to create a more efficient system for NCD management. Two notable aspects of primary health care improvement are also particularly relevant to NCDs.

The first is mental healthcare. Already in the post-conflict and transition period, the entity's Ministry of Health began an extensive reform of mental healthcare provision.<sup>66</sup> Since then, it has been at the forefront of community-based mental health programming in south-eastern Europe. It has established 45 centres for case management, treatment, and prevention. Ideally, these rely on multidisciplinary teams, including a psychiatrist, clinical psychologist, medical nurse, occupational therapist, and social worker.<sup>67,68</sup> The primary healthcare strategy seeks to embed these centres within primary healthcare more broadly.<sup>69</sup>

The second major initiative has been the introduction of the programme for cardiovascular risk assessment and management (CVRAM), an important outcome of the "Reducing Health Risk Factors in Bosnia and Herzegovina" project. Its creation was a joint effort of public health and primary health care experts from all three entities/district in Bosnia and Herzegovina with content specifically developed for local needs. Family physicians use the Systematic Coronary Risk Evaluation to identify preventative or therapeutic interventions for those displaying the three main metabolic risks – hypertension, hyperlipidaemia, and type 2 diabetes – and the three leading behavioural risks – tobacco smoking, excess weight, and insufficient physical activity. The package of potential interventions is evidence-based and includes several WHO-recommended "best-buys".

63 Ministry of Health, Federation of Bosnia and Herzegovina, Survey of the Health Status of the Population in 2012, 2014

64 Data from interviews conducted by UNDP for Institutional Context Analysis

65 Ministry of Health, Federation of Bosnia and Herzegovina, Strategija za Razvoj Primarne Zdravstvene Zaštite, 2008

66 Ministry of Health, Federation of Bosnia and Herzegovina, Strategic Plan for Health Care Development, 2008

67 Data from interviews conducted by UNDP for Institutional Context Analysis

68 Ministry of Health, Federation of Bosnia and Herzegovina, Strategija za Razvoj Primarne Zdravstvene Zaštite, 2008

69 *ibid.*

Doctors and nurses trained by the programme can also benefit from eight separate sets of clinical guidelines covering different situations.<sup>70</sup>

By February 2018, 70% of all family medicine professionals in the Federation of Bosnia and Herzegovina had completed the two-day CVRAM course. As a result, in 2019 – when the programme wrapped up – an estimated 70% of the population had access to standardised, evidence-based, preventative CVD/CVRAM services in primary health care and family medicine.<sup>71, 72</sup> It remains to be seen how sustainable the impact will be.

Despite these efforts to strengthen primary health care, the health system remains hospital-dominated.<sup>73</sup> Nevertheless, community-based care has been able to deliver programmes with important implications for NCD prevention and management.

Wider educational efforts have been less successful. Another element of the “Reducing Health Risk Factors in Bosnia and Herzegovina” programme – in this case implemented by the World Bank – aimed to help public health authorities manage major risks such as those related to NCDs, create local coalitions of stakeholders to prioritise NCD risks, and develop action plans to address them. After years of stakeholder disagreement and misunderstanding, as well as frequent personnel changes, the main activity of the project was focused on four cities in Bosnia and Herzegovina, including Zenica and Mostar in the Federation of Bosnia and Herzegovina.

The World Bank judged the outcome as moderately unsatisfactory, having no discernible impact on levels of NCD risk awareness. The Bank did correctly note that there had been progress in building links between various stakeholder groups that could help in future. A report written for the SDC, however, pointed out that the results of the deliberations of stakeholder coalitions under the process were largely aspirational and that cooperation between groups remained “fragile.”<sup>74</sup>

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70 World Health Organization Europe, Tackling noncommunicable diseases, 2018

71 Data from interviews conducted by UNDP for Institutional Context Analysis

72 World Health Organization Europe, Tackling noncommunicable diseases, 2018

73 Data from World Health Organization, Global Health Expenditure Database, <https://apps.who.int/nha/database/ViewData/Indicators/en>

74 World Bank, “Implementation Completion and Results Report,” 2019; healthForum, “Health Risk Factors Project; SDC, “Reducing Health Risk Factors in Bosnia and Herzegovina,” [project description], 2021.



## Current policies and public health interventions for addressing specific NCD risk factors

In addition to the policies and actions in the preceding section which address NCDs in general, the Federation of Bosnia and Herzegovina, has policies focused on specific NCD risks.

### Tobacco control

Tobacco control is weak in the entity, due to inadequate regulation and poor enforcement of the rules which do exist.

The entity is bound by the commitments of the WHO Framework Convention on Tobacco Control (FCTC) through Bosnia and Herzegovina's adherence to the treaty in 2009. The Federation of Bosnia and Herzegovina has taken some steps to put tobacco control in place and a federal-level commission on tobacco control is currently being established to coordinate mechanisms across the entity.<sup>75</sup> Moreover, in 2022 the Federation of Bosnia and Herzegovina updated its legislation with its Law on the Control and Restricted Use of Tobacco and Other Products for Smoking.<sup>76</sup> The new act is far more comprehensive than its predecessor, and "mandates a ban on smoking in most enclosed public places, workplaces and public transport, prohibits tobacco advertising and promotion (outside point of sale), bans the use of additives and flavours in cigarettes, and imposes health warnings on all tobacco products".<sup>77</sup> Nevertheless, as discussed below, its provisions are, in several places, weaker than WHO recommendations.

Tobacco taxation, meanwhile, is the responsibility of the Council of Ministers of Bosnia and Herzegovina and therefore the same across all of Bosnia and Herzegovina. It meets European Union and WHO recommendations, with an aggregate tax levy on the most commonly sold brand of cigarettes that comes to 84%. Half of this, 42% of the total, is an ad valorem excise tax, 27.5% a specific excise tax, and 14.5% VAT.<sup>78</sup>

Another relevant piece of state level legislation covering all of Bosnia and Herzegovina is the Law on the Public Broadcasting System. This act bans advertisements by tobacco companies and programs which in some way encourage the use of tobacco products by anyone, especially children.<sup>79</sup> This state law and the entity one, in its coverage of marketing in other media, broadly align.

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75 Data from interviews conducted by UNDP for Institutional Context Analysis

76 Federation of Bosnia and Herzegovina, The Law on the Control and Restricted Use of Tobacco, Tobacco Products, and Other Smoking Products, [unofficial translation], 2022

77 Campaign for Tobacco Free Kids, "Federation of Bosnia and Herzegovina Approves a Strong Law to Save Lives and Protect Youth from Tobacco," press release, 26 May 2022

78 World Health Organization, Country Profile Bosnia and Herzegovina World Tobacco Report, 2021

79 Office of the High Representative, "Law on the Public Broadcasting System of Bosnia And Herzegovina," 2005

A detailed look at tobacco legislation and its implementation, however, reveals shortcomings. While smoking is banned in many public places, the law continues to allow it in designated smoking areas in airports, specific healthcare facilities, nursing homes, and catering premises such as cafes, bars, and restaurants.<sup>80</sup> Moreover, heated tobacco products are exempt from the indoor smoking ban and tobacco companies are still permitted to advertise tobacco products inside any point of sale. Additionally, restrictions on smoking and illegal tobacco sales in public places are ineffectively enforced<sup>81</sup> – consistent with the high levels of second hand smoke reported earlier. Meanwhile, narghile (hookah) bars are becoming more common. These are often accessible even to those under 18 years of age, undermining the laws banning the sale or gift of tobacco to the young.<sup>82</sup>

Progress on marketing is also uneven. For example, while the new law requires health warnings on packaging to cover 35% of the surface area, these do not need to be graphic, nor is plain packaging required.<sup>83</sup> More generally, the bans on advertising do not include elements encouraged by the WHO. For example, tobacco companies are allowed to publicise their own activities and contribute to smoking prevention media campaigns.

Smoking cessation efforts could also be improved in the entity. Despite training of family doctors in cessation treatment, only a few clinics and facilities in the Federation of Bosnia and Herzegovina routinely offer it.<sup>84, 85</sup>

Finally, even the tax rates consistent with WHO recommendations are undermined by avoidance. A 2021 analysis estimated that nearly a third of all cigarettes consumed in Bosnia and Herzegovina as a whole are illicit, with such sales often taking place openly on the street or in markets. Despite the substantial threat of such trade, Bosnia and Herzegovina has not yet ratified the FCTC Protocol to Eliminate Illicit Trade.<sup>86</sup>

## Reduction of harmful alcohol consumption

The Federation of Bosnia and Herzegovina has various alcohol-related regulations in place, including a ban on sales to those under 18 and restrictions on alcohol advertising and product placements. The entity also places some limits on the physical availability of alcohol, such as laws regulating on-premise sales for special events and to intoxicated persons.<sup>87, 88</sup>

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80 Federation of Bosnia and Herzegovina, The Law on the Control and Restricted Use of Tobacco, Tobacco Products, and Other Smoking Products, [unofficial translation], 2022

81 Mičić et al., “Tobacco consumption in 2019,” 2020

82 Jusufovic, “Hot Topics of Tobacco Control in Bosnia and Herzegovina,” 2018

83 Federation of Bosnia and Herzegovina, The Law on the Control and Restricted Use of Tobacco, Tobacco Products, and Other Smoking Products, [unofficial translation], 2022

84 World Health Organization Europe, Tobacco Control Fact Sheet: Bosnia and Herzegovina, 20

85 Jusufovic, “Hot Topics of Tobacco Control in Bosnia and Herzegovina,” 2018

86 Gligorić et al., “Tobacco tax evasion in Bosnia and Herzegovina,” University of Banja Luka working paper, 2021

87 World Health Organization, “Alcohol fact sheet: Bosnia and Herzegovina,” 2018

88 World Health Organization, NCD Progress Monitor, 2022

In addition to entity-specific rules, the state-level Law on the Public Broadcasting System is also relevant. It requires that television advertising for alcoholic beverages may not be directly targeted at minors or give the impression that consumption: improves physical activity; contributes to social and sexual success; solves personal problems; or has medicinal properties. The state-level Code on Commercial Communications has similar restrictions on advertising in other media.<sup>89</sup>

Excise taxes are also a responsibility of the Bosnia and Herzegovina Council of Ministers. These are between 8 BAM and 15 BAM per litre for liquor, 0.20 BAM per litre of beer, and 0.25 BAM per litre of wine. These are largely income-raising levies rather than aimed at reducing consumption.

### Sodium, fat, and sugar reduction in diets

While some efforts have been made to improve diets in the Federation of Bosnia and Herzegovina, more substantial ones are needed.

Existing salt-specific policies in place at the level of Bosnia and Herzegovina deal entirely with rules on food labelling and on the production and sale of salt as food. They do not cover efforts to reduce its use.<sup>90</sup> According to WHO, sodium consumption is not effectively monitored, with no recent adult risk survey covering salt intake in either the Federation of Bosnia and Herzegovina or in the state of Bosnia and Herzegovina.<sup>91</sup>

There is no indication that the Federation of Bosnia and Herzegovina has any specific policy to reduce sodium consumption; limit saturated fatty acid intake; eliminate industrially produced trans fatty acids; or reduce the impact of marketing of foods and beverages high in saturated fats, trans fatty acids, or free sugars to children.<sup>92, 93</sup> Meanwhile, the Council of Ministers of Bosnia and Herzegovina has not imposed a tax on sugar-sweetened beverages.<sup>94</sup>

Beyond regulation, officials have made efforts to improve the diet of young people. The Federation of Bosnia and Herzegovina's Ministries of Health and of Education, along with the Institute of Public Health and UNICEF, developed an integrated, intersectoral "Eat Healthy, Grow Healthy" programme aimed at improving the health of preschool and school-aged children. It does so by developing local networks of preschool institutions and schools to

89 Bosnia And Herzegovina Ministry Of Human Rights And Refugees, "Eleventh Report [on] the Implementation Of The European Social Charter," 2020

90 For copies of relevant legislation see: [https://extranet.who.int/ncdccs/Data/BIH\\_B25\\_s21\\_bs-pravilnik\\_o\\_oznacavanju\\_hranjivih\\_vrijednosti\\_hrane\\_78-12.pdf](https://extranet.who.int/ncdccs/Data/BIH_B25_s21_bs-pravilnik_o_oznacavanju_hranjivih_vrijednosti_hrane_78-12.pdf); [https://extranet.who.int/ncdccs/Data/BIH\\_B25\\_s21\\_bs-Pravilnik\\_o\\_pru%5beanju\\_informacija\\_poto%5a1a%c4%8dima\\_o\\_hrani\\_68-13.pdf](https://extranet.who.int/ncdccs/Data/BIH_B25_s21_bs-Pravilnik_o_pru%5beanju_informacija_poto%5a1a%c4%8dima_o_hrani_68-13.pdf); [https://extranet.who.int/ncdccs/Data/BIH\\_B25\\_s21\\_hr-pravilnik\\_o\\_sol\\_i\\_za\\_ljudsku\\_ishranu\\_39-09.pdf](https://extranet.who.int/ncdccs/Data/BIH_B25_s21_hr-pravilnik_o_sol_i_za_ljudsku_ishranu_39-09.pdf)

91 World Health Organization, "Has conducted a recent, national adult risk factor survey covering salt/sodium intake," Global Health Observatory Database, <https://www.who.int/data/gho/data/indicators/indicator-details/GHO/has-conducted-a-recent--national-adult-risk-factor-survey-covering-salt-sodium-intake>

92 World Health Organization, NCD Progress Monitor, 2022

93 Global Nutrition Report, "Country Profile: Bosnia and Herzegovina," 2022

94 Ibid.

implement the government's Policy for the Improvement of Early Growth and Development of Children and its Policy for the Improvement of Children's Nutrition. These strategies encourage children, parents, and professional staff to put in practice healthy lifestyles in these institutions. The Ministries of Health and of Education have also signed a Memorandum of Understanding to reformulate foods in schools by, for example, working with food businesses to improve production in ways that increase use of whole grains and reduce salt content.<sup>95, 96</sup>

### Physical activity

Although the NCD Action Plan calls for various programmes related to encouraging greater physical activity, our research was not able to find evidence of their introduction.

### Air quality improvement

One of the many priorities of the Development Strategy of the government of the Federation of Bosnia and Herzegovina is improvement in air quality. The strategy document speaks of numerous essential initiatives to implement, and a general objective to bring air quality standards into line with European Union requirements. To date, however, the most extensive relevant activity seems to be the expansion of the entity's network of air quality monitoring stations.<sup>97</sup>

## The costs and return on investment of five packages to address the NCD burden in the Federation of Bosnia and Herzegovina

The same team which analysed the current economic cost of NCDs in the Federation of Bosnia and Herzegovina, presented above, also studied the potential expense and gains associate with five packages to address this burden. These are sets of interventions identified by WHO globally as its “best buys” – those which have proven themselves cost-effective in a wide range of settings. Of the packages, one is a collection of clinical measures to improve diagnosis and treatment of both CVD and diabetes. The other four are population health interventions to, respectively: improve tobacco control; reduce hazardous alcohol use; encourage physical activity; and reduce sodium consumption. **Table 2** provides the detailed measures within each package.

95 Data from interviews conducted by UNDP for Institutional Context Analysis

96 Aida Filipović Hadžiomerađić and Dragana Stojisavljević, “Initiatives regarding whole grains in Bosnia and Herzegovina,” slide presentation, 24 September 2020

97 “When will the air quality Monitoring Stations Network be operational in FBiH?” Sarajevo Times, 12 November 2022

**Table 3. NCD interventions costed within the OneHealth Tool**

<b>CVD and diabetes-related clinical measures</b>
Screening for risk of CVD/diabetes
Follow-up care for those at low risk of CVD/diabetes (absolute risk: 10-20%)
Treatment for those with very high cholesterol but low absolute risk of CVD/diabetes (< 20%)
Treatment for those with high blood pressure but low absolute risk of CVD/diabetes (< 20%)
Treatment for those with absolute risk of CVD/diabetes 20-30%
Treatment for those with high absolute risk of CVD/diabetes (>30%)
Treatment of new cases of acute myocardial infarction (AMI) with aspirin
Treatment of cases with established ischaemic heart disease (IHD) and post MI
Treatment for those with established cerebrovascular disease and post stroke
Treatment of cases with rheumatic heart disease (with benzathine penicillin)
Standard glycaemic control
Intensive glycaemic control
Retinopathy screening and photocoagulation
Neuropathy screening and preventive foot care
<b>Tobacco control</b>
Monitor tobacco use/prevention policies
Protect people from tobacco smoke
Offer to help quit tobacco use: mCessation
Warn about danger: Warning labels
Warn about danger: Mass media campaign
Enforce bans on tobacco advertising
Enforce youth access restriction
Raise taxes on tobacco
Plain packaging of tobacco products
Offer to help quit tobacco use: Brief intervention
<b>Hazardous alcohol use reduction</b>
Enforce restrictions on availability of retailed alcohol
Enforce restrictions on alcohol advertising
Enforce drunk driving laws (sobriety checkpoints)
Raise taxes on alcoholic beverages
Screening and brief intervention for hazardous and harmful alcohol use

### Encouragement of physical activity

Awareness campaigns to encourage increased physical activity

Brief advice as part of routine care

### Sodium reduction

Sodium surveillance

Harness food industry for product reformulation

Adopt standards: Front of pack sodium labelling

Adopt standards: Strategies to combat misleading marketing

Knowledge of sodium risk: Education and communication

Environment: Salt reduction strategies in community-based eating spaces

## The costs of policies and clinical intervention

The costs of the four policy intervention packages were calculated with the WHO Costing Tool, and those for the clinical package using the OneHealth Tool.<sup>98</sup> For further details of how these tools are applied, see Appendix B. The costs of the intervention packages were estimated for the period 2023–2037. **Table 4** shows the figures for each of the first five years of this period and the five- and 15-year totals.

The combined clinical interventions would be the most expensive, with an annual cost of 82.94 million BAM by 2027. Implementation of this entire package would require 405.81 million BAM during the 5-year scale-up and 1 290.45 million BAM over 15 years. The total outlay required for the tobacco package would be 8.76 million BAM for 5 years and 29.52 million BAM over 15, although the costs of individual interventions within the package vary. Certain policies, such as mass-media campaigns and protecting people from smoking, have large expected costs. Nevertheless, numerous low-cost tobacco policies exist, including package warning labels and bans on tobacco advertising. Raising taxes, meanwhile, can be revenue generating. The alcohol control package would cost an estimated 10.83 million BAM for 5 years, the salt-reduction one 4.56 million BAM, and the physical activity awareness interventions 5.14 million BAM.

<sup>98</sup> World Health Organization, Costing tool – user guide: Scaling up action against noncommunicable diseases: How much will it cost?, 2012.

**Table 4. Estimated costs of policy and clinical interventions in millions of BAM, 2023–2037**

Intervention	2023	2024	2025	2026	2027	Total 2023-2027	Total 2023-2037
<b>Tobacco control package</b>	0.84	2.07	1.90	1.96	1.99	8.76	29.52
<b>Alcohol control package</b>	1.08	2.44	2.35	2.51	2.46	10.83	39.42
<b>Physical activity awareness package</b>	0.03	1.44	1.20	1.22	1.25	5.14	19.48
<b>Salt-reduction package</b>	0.16	1.11	1.07	1.10	1.12	4.56	17.47
<b>Total for all policy interventions</b>	2.11	7.06	6.52	6.79	6.82	29.29	105.89
<b>CVD and diabetes clinical intervention package</b>	79.59	80.24	81.06	81.97	82.94	405.81	1 290.45
<b>Total</b>	81.70	87.29	87.58	88.76	89.77	435.10	1 396.34



## Health benefits

The analysis also considered health benefits, at the population level, likely to arise from the implementation of each of the packages. For the methodology and its limitations, see Appendix B.

All the interventions would significantly reduce the number of lives lost to causes related to CVDs (**Table 5**). Salt-reduction interventions would have the greatest impact on mortality, followed by CVD and diabetes clinical interventions and tobacco-related ones.

**Table 5. Estimated health benefits over 15 years**

Intervention package	Strokes averted	Acute ischaemic heart disease averted	Mortality averted	Healthy life-years gained
<b>CVD and diabetes clinical intervention package</b>	3,511	3,076	5,253	30,695
<b>Tobacco control package</b>	2,846	2,815	2,340	20,705
<b>Alcohol control package</b>	82	0	862	84,999
<b>Physical activity awareness package</b>	94	276	291	6,100
<b>Salt-reduction package</b>	20,847	14,926	12,174	102,947

Each set of interventions would also add healthy life-years. The salt, alcohol, tobacco and clinical intervention packages prevent strokes and cardiovascular events, and thus individuals would avoid disabling states (such as partial paralysis from stroke) that can increase pain and suffering, reduce mobility, and impair speech and thought. Again, salt-reduction brings the largest gains by this measure, followed by alcohol related interventions, the CVD and diabetes clinical ones, and those involving tobacco control. That said, the tobacco figures may be an underestimate (see Appendix B).

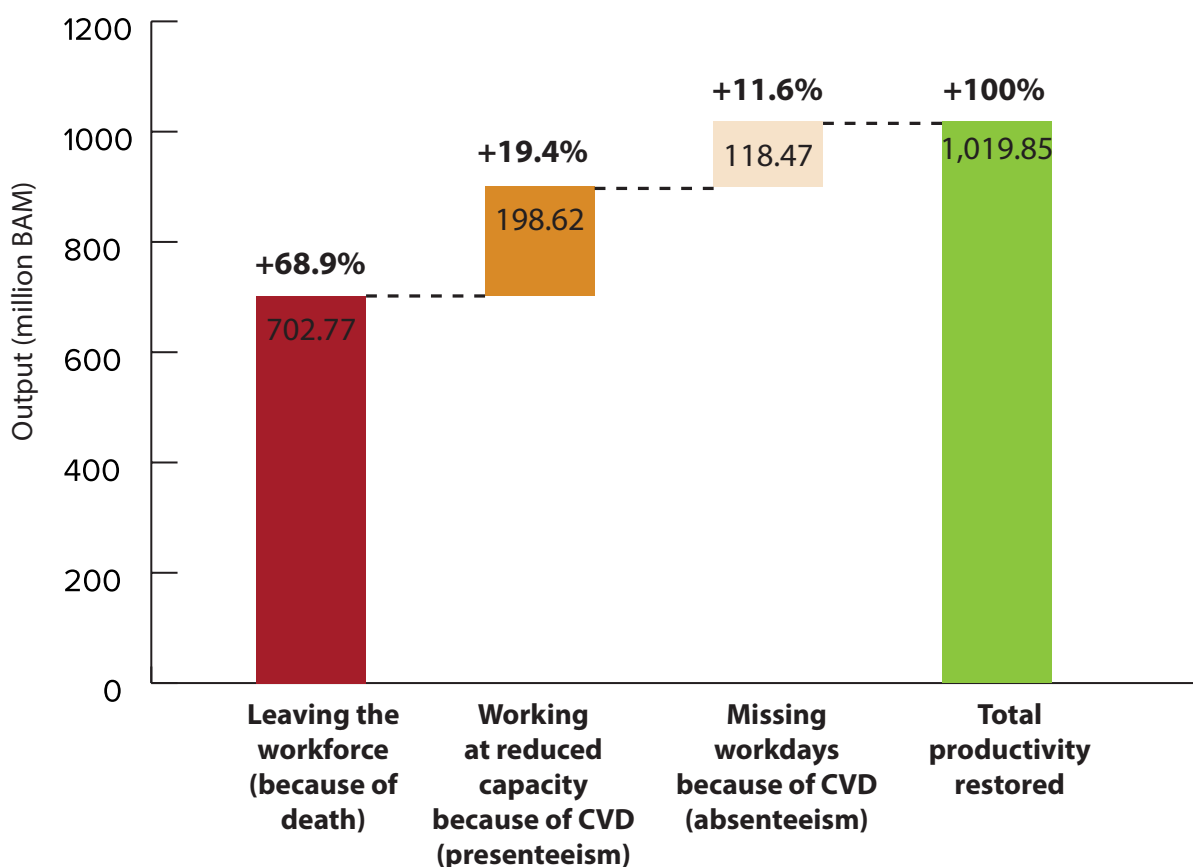
## Economic benefits and return on investment

As discussed earlier in this report, the NCDs included in this analysis reduce the labour workforce and productivity through premature mortality, fewer days of work (absenteeism) and reduced productivity while at work (presenteeism). Accordingly, using the same methodology as that for determining the economic burden of NCDs above, it is possible to calculate the labour productivity gains from the prevention of deaths and disease incidence resulting from implementation of these packages compared to the situation if they were not enacted.

**Figure 5** shows those gains over 15 years.



**Fig. 5. Recovered economic output expected from interventions to prevent tobacco and alcohol use, inadequate physical activity, excess salt, and primary prevention of CVDs over 15 years**



These economic benefit figures, combined with the previously described costs of the packages, allow a cost-benefit analysis. Return on investment and cost-benefit ratios are measures of the efficiency of a healthcare investment, as the magnitude and timing of the gains and required outlay are compared directly. Simply put, the cost-benefit ratio is the discounted (present) value of the benefits of an intervention divided by the discounted (present) value of the investment costs. Such discounting is needed for future costs and benefits because a unit of currency in the future is typically worth less than a unit today due to inflation or, more formally, the time value of money. A ratio of greater than one indicates that an intervention generates more benefits – in this case calculated as the gains to the whole economy from improved productivity – than the investment costs – in this case, for the most part, government outlay. For more details on the cost-benefit analysis methodology, see Appendix B.

Comparison of the costs and benefits of each package shows that all of the population-level risk reduction ones – salt reduction, tobacco control, encouragement of physical activity, and alcohol control – have benefits that exceed the costs of implementation over 15 years, and all but the encouragement of physical activity do so over five years.

**Table 6. Costs, benefits and cost–benefit ratios at 5 and 15 years, by intervention package (millions of BAM)**

Intervention package	5 years			15 years		
	Total cost	Total productivity benefits	Return on investment	Total cost	Total productivity benefits	Return on investment
<b>Tobacco</b>	8.76	8.34	1.01	29.52	112.29	6.10
<b>Alcohol</b>	10.83	14.43	1.66	39.42	116.07	5.28
<b>Physical activity</b>	5.14	1.88	0.41	19.48	16.09	1.49
<b>Salt</b>	4.56	44.99	10.47	17.47	576.68	53.63
<b>CVD and diabetes clinical interventions</b>	405.81	27.03	0.06	1 290.45	209.35	0.11

The salt-reduction package has the highest impact, with 1 BAM of investment expected to yield 10.47 BAM during the first 5 years and 53.63 BAM over 15 years. Tobacco interventions also have a high return on investment over 15 years, with a cost-benefit ratio of 6.1 during that period.

The package of clinical interventions has a cost-benefit ration of less than one over five and 15 years. This is a frequent result in health economics because of the high costs of medical treatment. Lack of return on investment in these calculations does not, however, mean the absence of utility. First of all, these interventions do lead to a higher level of productivity benefits than any other except for salt reduction. Moreover, other benefit metrics than economic output, such as quality of life, may indicate cost-effectiveness. Finally, these clinical interventions are an essential part of making the right to health in the Federation of Bosnia and Herzegovina meaningful for affected individuals.

Overall, then, policy makers in the entity have a variety of intervention packages available that should diminish the NCD burden and yield economic productivity gains greatly in excess of the investment outlay, notably – but not exclusively – sodium and tobacco control measures.

## **Limitations of economic analysis**

As noted throughout this report, the investment case methodology has several limitations. It does not include all NCDs and their risk factors. Nor does it capture all productivity losses associated with NCD morbidity and mortality. Instead, it focuses on the four major NCD categories and workplace productivity losses as these are simpler to estimate.

Moreover, beyond healthcare treatment costs, the investment case model does not estimate other direct costs associated with NCDs such as non-medical costs (e.g., transport to a health provider, foregone wages of carers), retirement benefits, nor does it attempt to include intangible costs such as care provided by relatives and quality of life.

Readers should not interpret this cost-benefit analysis as a budget costing exercise. The estimated costs of the interventions do not take into consideration the current actual expenditure on, nor the potential benefits already arising from, these interventions where they are partially implemented. Moreover, interventions for which evidence of benefits was lacking were excluded from the analysis. On the benefits side, the model does not estimate reductions in direct healthcare costs to treat prevented NCDs.

Combined, these limitations imply that the model is conservative in its estimates and that both the burden of NCDs as well as the benefits of investing in NCD prevention and control are higher than estimated.

## **Conclusions**

This study shows that the current high NCD burden in the Federation of Bosnia and Herzegovina, with its attendant direct and indirect economic costs, will continue to grow without active steps within the health system and by policy makers.

In practice, the major barriers to progress seem to be those related to the low level of resources available for the complex healthcare system in the entity, a lack of focus on NCD prevention, and poor understanding of NCD risks within the population as a whole. On the other hand, recent progress in the creation of an NCD plan, tobacco control laws, and efforts to strengthen primary health care are all indications of the political will to improve.

While all five of the intervention packages would be valuable within the Federation of Bosnia and Herzegovina's current context, two stand out for particular attention because of their relatively low cost, high return, element of public education, and capacity to be implemented without the need to coordinate multiple cantonal health systems: sodium reduction measures and further enhancement of tobacco control.

## Implementation of the salt reduction package

The salt reduction package is the most economically feasible of those studied and averts significant NCD morbidity and mortality. It should be the highest priority for implementation. The package's multi-faceted elements include: introducing surveillance, harnessing industry for reformulation, adopting labelling and marketing standards, integrating health education and communicating tailored messages for each key environment. Government agencies already have some experience improving the health of food offerings in educational institutions and these do not appear to have raised any significant stakeholder opposition.

## Further tobacco control interventions

The momentum from recent strengthening of tobacco legislation provides a launch pad for the more rigorous implementation of existing measures. The tobacco control package recommended within the Investment Case is based on elements of the WHO's MPOWER package: eliminating exposure to second-hand smoke, implementing large graphic health warnings on tobacco packages, mass media campaigns, tobacco advertising bans and raising excise taxes and prices on tobacco products. This package, and resultant population health improvements, also has a high cost-benefit ratio.

## Other possible actions

The research for this study also indicates that the Federation of Bosnia and Herzegovina has yet to implement some of the promising ideas detailed in its National NCD Action Plan and its Development Strategy. Considering problems with air quality and high levels of overweight/obesity, the government should prioritise the parts of those plans which aim to improve air and encourage physical activity.

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## Appendix A: Institutional Context Analysis Methodology

The ICA was based on a desk review of materials, interviews with policymakers across sectors and institutions, and discussions with stakeholders. Members of relevant bodies discussed how NCDs can be prioritised in government policies, the priorities of various sectors and stakeholders, and how these could support a strengthened whole-of-government NCD response in the Federation of Bosnia and Herzegovina. The valuable insights gained from these discussions are incorporated throughout this report and informed its findings and conclusions.

## Appendix B: Economic Analysis Methodology

This section outlines the methods and economic models used in order to calculate the economic burden of NCDs in terms of direct costs and indirect costs (absenteeism, presenteeism and premature death); the cost of interventions (clinical and policy interventions); the economic value of the health impact from those interventions; and their consequent return on investment.

### Calculating the economic burden of noncommunicable disease

A model was developed to calculate the economic burden of NCDs, which provides estimates of the current direct and indirect costs of four of these diseases in the Federation of Bosnia and Herzegovina. Calculations were based on the data provided by national and entity authorities through the WHO Country Office. The data used for the population by age and sex for the period 2021–2036 were modelled in the OneHealth Tool. The details included incidence rates by age and sex for heart attack and stroke and prevalence by age and sex for diabetes, hypertension and chronic respiratory diseases, provided by a local team. Mortality rates by age and sex were applied for each condition. The model provided projections for the numbers of incident and prevalent cases and mortality due to diabetes, CVDs, chronic respiratory diseases and cancer between 2021 and 2036, assuming that current rates would remain constant.<sup>99</sup> These projections were summarised as total incidence, prevalence and mortality for both the entire population and the working-age population, defined as people aged 15–65 years.

The following steps were followed to calculate the economic costs.

- Total Government health expenditure and the share of total health expenditure on NCDs were provided by the WHO Country Office. A lack of local data meant that direct non-health care costs (such as disability payments) were not included in the analysis.
- The annual value (in terms of economic output) of each full-time worker in the Federation of Bosnia and Herzegovina, was calculated from the gross domestic product (GDP) per employed person, defined as the entity's GDP (25.2 billion BAM in 2021, local data) divided by the total employed labour force. Local data on the total labour force aged ≥ 15 years

<sup>99</sup> The model estimates growth in the numbers of prevalent and incident cases and mortality from population growth only and not growth in disease rates.

(881 000, local data), the unemployment rate (16.5%, local data) and the labour force participation rate (47.7%, local data) were used to determine the total employed labour force in the Federation of Bosnia and Herzegovina.

- Data were incorporated on the extent to which NCDs reduce worker productivity. Rates were found in the academic literature,<sup>100, 101</sup> to describe (i) the reduction in labour force participation due to hypertension, stroke, acute myocardial infarction and diabetes; (ii) the reduction in full-time hours worked because of absenteeism; and (iii) the reduction in productivity due to presenteeism.
- The number of people with NCDs working in the Federation of Bosnia and Herzegovina in 2021 was determined from labour force participation, unemployment and mortality rates. The model began with people of working age with NCDs and then subtracted those who chose not to participate in the labour force or were unemployed, then subtracted those who could not participate in the labour force specifically because of their NCD and, finally, subtracted those who had died. The result was the estimated number of active workers with NCDs.
- The final steps were to calculate economic losses from premature deaths from the numbers of workers who had died, from would-be workers who could not participate in the labour force and the costs of absenteeism and presenteeism for surviving active workers with NCDs. The model applied the relevant productivity figures found in the second step to the populations determined in the third step and multiplied this by the GDP per employed person. This calculation resulted in the total indirect costs of each NCD.

## Calculating the costs of policy and clinical intervention packages

The costs of policy intervention were calculated with the WHO Costing Tool.<sup>102</sup> Those of the clinical intervention package were determined using The OneHealth Tool. For each package, the WHO Costing Tool or the OneHealth Tool costed human resources, training, external meetings, mass-media campaigns (such as television and radio time and newspaper advertisements) and miscellaneous equipment necessary to enact the relevant policies and programmes. This necessitated assumptions, made by WHO experts, about the quantity of input required to implement and enforce the given policies. For the clinical package, the OneHealth Tool was also used to identify, quantify and valuing each resource required for all of the interventions and their costs. The WHO Costing Tool or the OneHealth Tool, as appropriate, was then used to estimate the quantity of resources required at entity, regional and district levels for each package. The unit costs for resource items were taken from the WHO-CHOICE database.<sup>103, 104</sup>

100 Andrew Anesetti-Rothermel and Usha Sambamoorthi, "Physical and mental illness burden: disability days among working adults," *Population Health Management*, 2011.

101 Philip Wang et al., "Chronic medical conditions and work performance in the health and work performance questionnaire calibration surveys," *Journal of occupational and environmental medicine*, 2004.

102 World Health Organization, *Costing tool – user guide: Scaling up action against noncommunicable diseases: How much will it cost?*, 2012.

103 Melanie Bertram et al., "Disease control programme support costs: an update of WHO-CHOICE methodology, price databases and quantity assumptions," *Cost Effectiveness and Resource Allocation*, 2017.

104 Karin Stenberg, "Econometric estimation of WHO-CHOICE country-specific costs for inpatient and outpatient health service delivery," *Cost Effectiveness and Resource Allocation*, 2018.

## Calculating benefits and return on investment

Analysis of the returns on investment are based on an Excel® model developed in 2015 by WHO and the UNDP and based in turn on the OneHealth Tool and the WHO Costing Tool.

In order to determine the overall impact of the set of interventions on GDP, the productivity measures were assessed in the following steps.

- The amount by which NCDs reduce worker productivity was incorporated, as noted for the model on the economic burden of NCDs. As the interventions reduce the projected incidence of ischaemic heart disease and stroke, there is an associated increase in the number of healthy life-years of the population. Inclusion of the increase in healthy life-years, the GDP per employed person and reductions in the rates of absenteeism and presenteeism allows determination of the increase in GDP attributable to the value of avoided absenteeism and presenteeism.
- The increase in labour force participation due to avoided deaths was calculated from the labour force participation rate in the Federation of Bosnia and Herzegovina, Bosnia and Herzegovina, and the projected number of deaths avoided. Avoided mortality was monetized by multiplying by the GDP per worker, as outlined above.
- The return on investment was calculated for the interventions listed in Table 2 of the main text of this report. These were selected from the available data to ensure sufficient data for calculating the costs and health effects.
- The projected economic gains from implementing interventions that are considered cost-effective were therefore the value of avoided presenteeism, the value of avoided absenteeism, and the value of avoided mortality. The impact of an intervention, measured as the total increase in GDP, was calculated by combining the three types of gain.
- The return on investment for the Federation of Bosnia and Herzegovina, Bosnia and Herzegovina, was arrived at by comparing the impact (increase in GDP) of the interventions with the total cost of setting up and implementing the interventions. It was calculated with the net present value approach to future costs and economic gains, with 3% discounting.



