



**ADVISORY SERVICES AGREEMENT**

**between**

**MINISTRY OF HEALTH OF THE REPUBLIC OF BULGARIA**

**and the**

**INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT**

**Background Paper:  
International Comparisons of Bulgaria's  
Health System Performance**

**May 2015**

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## Nature of this document and acknowledgement

This background document was prepared in the context of the World Bank RAS on health financing.

The document presents – for reference purposes only - a large set of international comparisons which were prepared by Iryna Postolovska (Health Economist, consultant to the World Bank).

The key findings were summarized and incorporated in the core of the report, and illustrated by selected graphs taken from the present document.

By sharing this, the team’s objective is simply to ensure that all the graphs and analyses are available to the Government in case they want to use or refer to them. This is not a formal output.

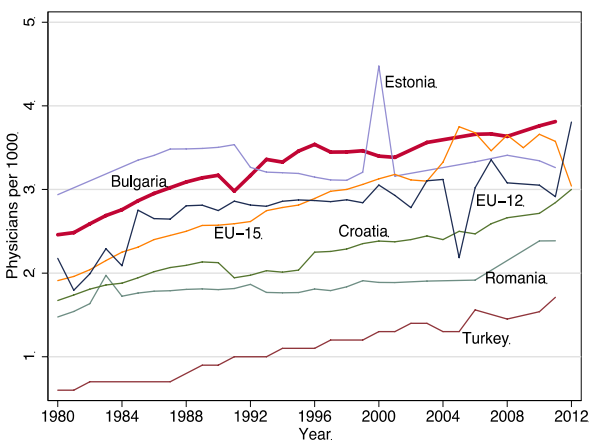
## International comparisons

### 1. Summary analysis of health outcomes, inputs, and expenditures

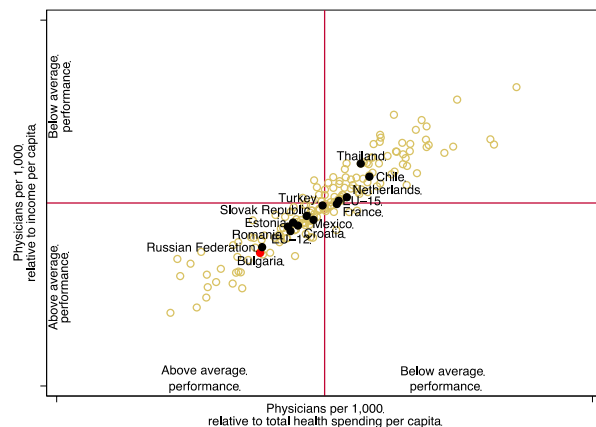
#### Health inputs

Relative to other comparable income and health spending countries, Bulgaria has more physicians per capita. Bulgaria's physician to population ratio increased from 2.5 in 1980 to 3.8 physicians per 1000 population in 2011.<sup>1</sup> The physician to population ratio is comparable to the EU-12 average of 3.8 physicians per 1000 population in 2012 but is higher than the EU-15 average of 3.1 physicians per 1000 population in 2012 (Figure 1). As shown in Figure 2, however, Bulgaria's physician to population ratio is higher than other comparable income and health spending countries and actually higher than the EU averages holding income and health spending constant.

**Figure 1: Physicians per 1000 population: Bulgaria and comparators; 1980-2012**



**Figure 2: Physician Population Ratio Relative to Total Health Spending and Income\***

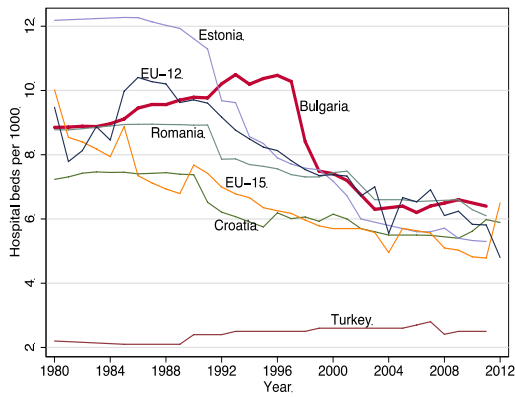


Source: World Development Indicators & WHO, 2014.  
 \* Physicians and GDP per capita data are for latest/earliest available year.

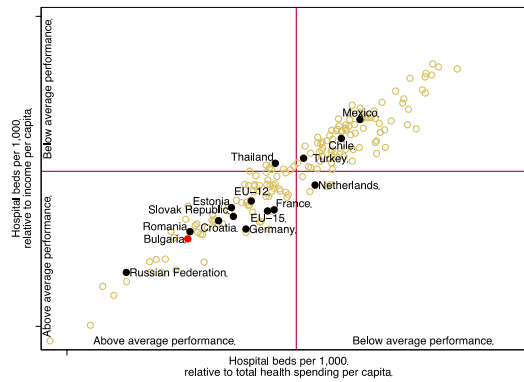
With respect to hospital beds, Bulgaria's hospital beds have decreased from 8.9 in 1980 to 6.4 beds per 1000 population in 2011 (latest year for which data are available). The number of hospital beds per capita, however, steadily increased between 1980 until 1996, reaching a peak of 10.5 beds per capita in 1996. Currently, the hospital beds to population ratio is similar to the EU-15 average of 6.5 beds per 1000 population but is higher than the EU-12 average of 4.8 beds per capita (Figure 3). As shown in Figure 4, however, Bulgaria's hospital bed to population ratio is significantly above the global averages for comparable income and health spending countries and is well above the EU averages holding income and health spending constant.

<sup>1</sup> Data are not available for 2012.

**Figure 3: Hospital beds per 1000 population: Bulgaria and comparators; 1980-2012**



**Figure 4: Hospital Beds to Population Ratio Relative to Total Health Spending and Income\***



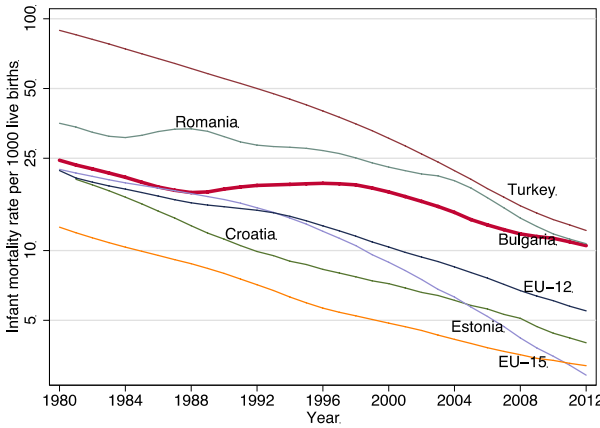
Source: World Development Indicators and WHO NHA, 2014

\*Beds and GDP per capita data are for the latest/earliest available year.

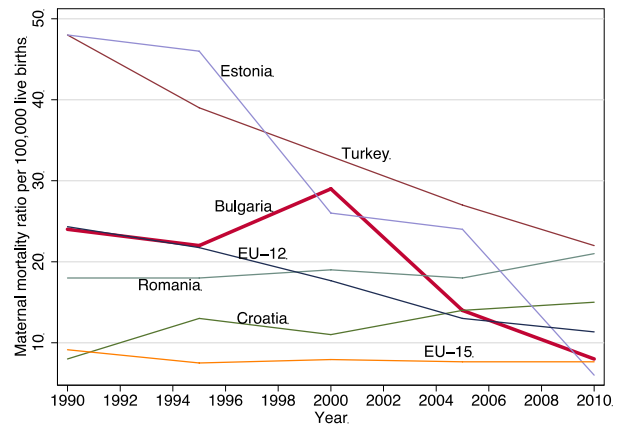
## Health Outcomes

Bulgaria has achieved significant improvements in health outcomes over time but is still falling behind most EU countries on key health indicators. Infant mortality decreased from 24.5 in 1980 to 10.5 per 1,000 live births in 2012 (Figure 5). Infant mortality in Bulgaria is slightly lower relative to other comparable income and health spending countries. Despite the significant reduction, however, Bulgaria’s infant mortality rate is still more than three times higher than the EU-15 average of 3.2 infant deaths per 1000 live births and almost twice as high as the EU-12 average of 5.5 infant deaths per 1000 live births. More significant improvements were achieved in reducing maternal mortality, which fell from 24 deaths per 100,000 live births in 1990 to 8 deaths per 100,000 live births in 2010. The maternal mortality ratio in Bulgaria is low compared to the global averages relative to income and health spending. Bulgaria has surpassed the EU-12 average of 11.3 deaths per 100,000 live births and is approaching the EU-15 average of 7.6 deaths per 100,000 live births (Figure 6).

**Figure 5: Infant mortality rate per 1,000 live births: Bulgaria and comparators; 1980-2012**

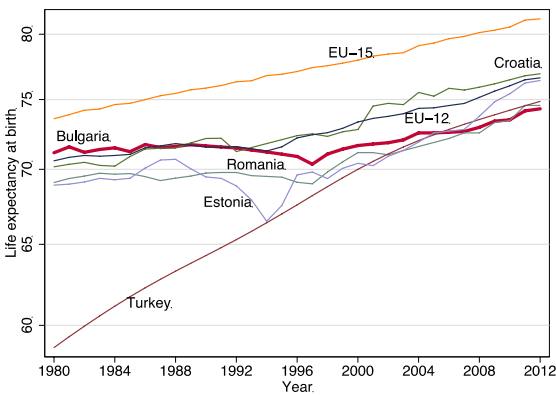


**Figure 6: Maternal mortality ratio per 100,000 live births: Bulgaria and comparators; 1990-2010**

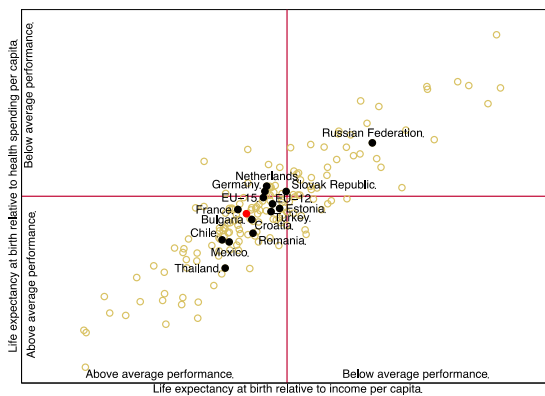


1. Moderate improvements have been achieved in terms of life expectancy. Life expectancy has increased from 71.2 years in 1980 to 74.3 years in 2012. Most of the improvements in life expectancy were achieved after 2000, as life expectancy remained below 71.7 years until 2000. Bulgaria's life expectancy, however, is still significantly lower than the EU-15 average of 81.2 years in 2012 but is similar to the life expectancy in Turkey (74.9 years) and Romania (74.6 years) (Figure 7). In 2012, life expectancy in Bulgaria was above average compared to other similar income and health spending countries (Figure 8). Holding income and health spending constant, Bulgaria does better than comparators, including the EU averages, on all three measures.

**Figure 7: Life expectancy: Bulgaria and comparators; 1980-2012**



**Figure 8: Global Comparisons of Life Expectancy Relative to Income and Spending, 2012**

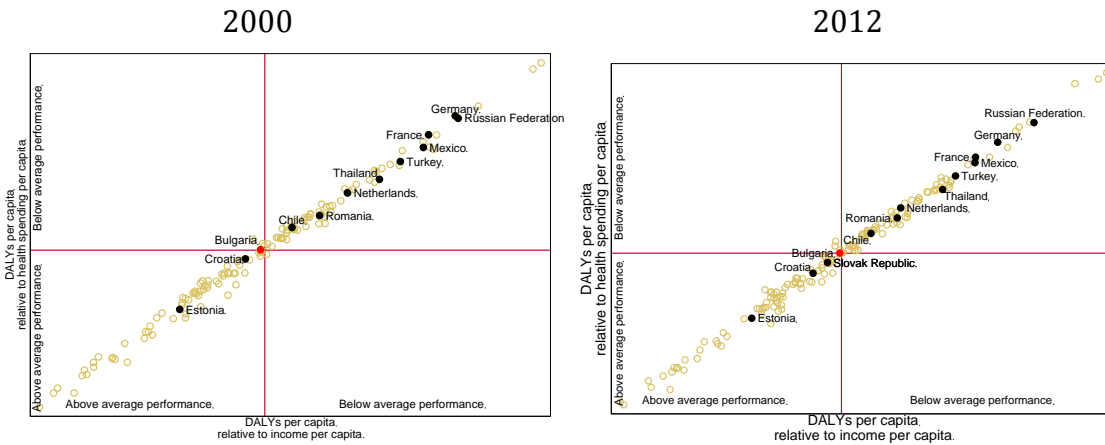


Source: World Development Indicators & WHO, 2014

Figure 9 below shows how well Bulgaria performs in terms of postponing premature death and limiting disability for its income and health spending levels. The relative position of Bulgaria has not changed since 2000, and, in 2012, it performs about average on this measure of health outcomes. While attributing such performance to specific policies or socioeconomic/cultural/institutional factors is not possible, it appears

that Bulgaria's overall health status performance as measured by DALYs is about average compared to countries with similar levels of income and health spending.

Figure 9: DALYs per capita relative to income and spending, 2000 and 2012

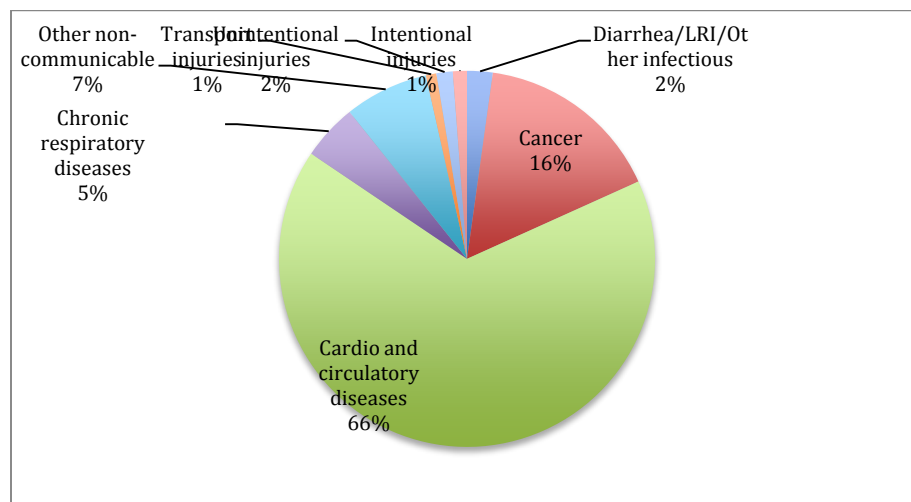


Source: World Development Indicators, WHO NHA, and WHO Global Health Estimates, 2014

Bulgaria has undergone an epidemiological transition. Although infant mortality is still relatively high, non-communicable diseases represent the largest share of the disease burden. According to the most recent Global Burden of Disease Study conducted by the Institute for Health Metrics and Evaluation, in 2010 almost 94 percent of deaths were caused by non-communicable diseases. Cardio and circulatory diseases were the leading cause of death (66 percent of deaths). Injuries (transport, intentional, and unintentional) caused 3.5 percent of deaths, while 2.2 percent of deaths were attributed to diarrhea, LRI, or other infectious diseases (

Figure 10).

Figure 10: Causes of death, Bulgaria, 2010



Source: IHME Global Burden of Disease (2014)

The two main causes of premature death in Bulgaria are ischemic heart disease and stroke, with 24.2 and 19.2 percent of years of life lost (YLLs) being attributed to the respective causes. Compared to 1990, a significantly larger share of YLLs is now attributed to other non-communicable diseases, such as hypertensive heart disease and COPD. A smaller share of YLLs in 2010 is attributed to injuries as compared to 1990 (Figure 11).

Figure 11: Causes of premature death (Years of Life Lost), 1990 and 2010

# YLLs in thousands (% of total)	Rank and disorder 1990	Rank and disorder 2010	# YLLs in thousands (% of total)	% change
511 (23.4%)	1 Ischemic heart disease	1 Ischemic heart disease	465 (24.2%)	-9
433 (19.8%)	2 Stroke	2 Stroke	369 (19.2%)	-16
106 (4.8%)	3 Lower respiratory infections	3 Lung cancer	80 (4.2%)	-2
82 (3.8%)	4 Lung cancer	4 Hypertensive heart disease	80 (4.2%)	54
54 (2.5%)	5 Road injury	5 COPD	62 (3.2%)	34
53 (2.4%)	6 Other cardio & circulatory	6 Other cardio & circulatory	62 (3.2%)	17
55 (2.5%)	7 Hypertensive heart disease	7 Lower respiratory infections	52 (2.7%)	-55
51 (2.3%)	8 Self-harm	8 Colorectal cancer	48 (2.5%)	13
50 (2.3%)	9 Stomach cancer	9 Cirrhosis	43 (2.2%)	-8
47 (2.2%)	10 Cirrhosis	10 Road injury	37 (1.9%)	-31
47 (2.1%)	11 Congenital anomalies	11 Diabetes	36 (1.9%)	-5
46 (2.1%)	12 COPD	12 Self-harm	35 (1.8%)	-36
43 (2.0%)	13 Colorectal cancer	13 Cardiomyopathy	33 (1.7%)	154
38 (1.7%)	14 Diabetes	14 Stomach cancer	31 (1.6%)	-39
30 (1.4%)	15 Breast cancer	15 Breast cancer	29 (1.5%)	-5
23 (1.1%)	16 Rheumatic heart disease	16 Congenital anomalies	20 (1.0%)	-58
21 (1.0%)	17 Falls	17 Pancreatic cancer	20 (1.0%)	14
21 (0.9%)	18 Liver cancer	18 Rheumatic heart disease	18 (1.0%)	-19
20 (0.9%)	19 Preterm birth complications	19 Liver cancer	18 (1.0%)	-11
18 (0.8%)	20 Brain cancer	20 Brain cancer	18 (0.9%)	3
18 (0.8%)	21 Pancreatic cancer	21 Chronic kidney disease	17 (0.9%)	16
16 (0.7%)	22 Leukemia	22 Falls	14 (0.7%)	-36
15 (0.7%)	23 Drowning	23 Cervical cancer	12 (0.6%)	-4
15 (0.7%)	24 Chronic kidney disease	24 Preterm birth complications	12 (0.6%)	-41
15 (0.7%)	25 Interpersonal violence	25 Leukemia	12 (0.6%)	-26
	26 Cardiomyopathy	31 Interpersonal violence		
	27 Cervical cancer	35 Drowning		

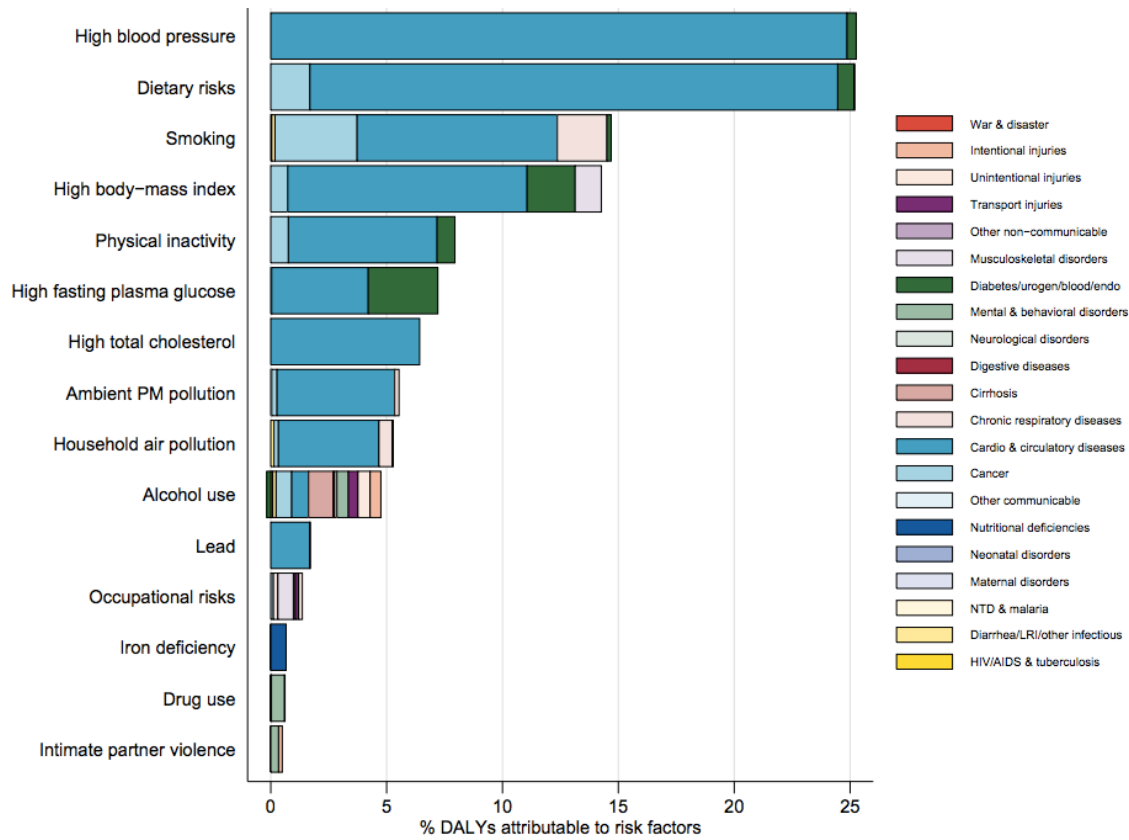
Source: IHME Global Burden of Disease (2014)

Cardio and circulatory diseases also represent the largest share of DALYs. In Bulgaria, almost 37 percent of DALYs can be attributed to cardio and circulatory diseases. This is the highest share among the EU-28 countries. Other main causes of DALYs include cancer (13 percent), musculoskeletal disorders (9.8 percent), injuries (8.3 percent) and mental and behavioral disorders (IHME GBD, 2014).

The majority of DALYs can be attributed to high blood pressure, dietary risks, smoking, and high body mass index (Figure 12). Latest available data indicate that in 2008, 41 percent of the adult population (over the age of 25) in Bulgaria suffered from raised blood pressure (SBP  $\geq$  140 or DBP  $\geq$  90) (WHO Global Health Observatory, 2014).



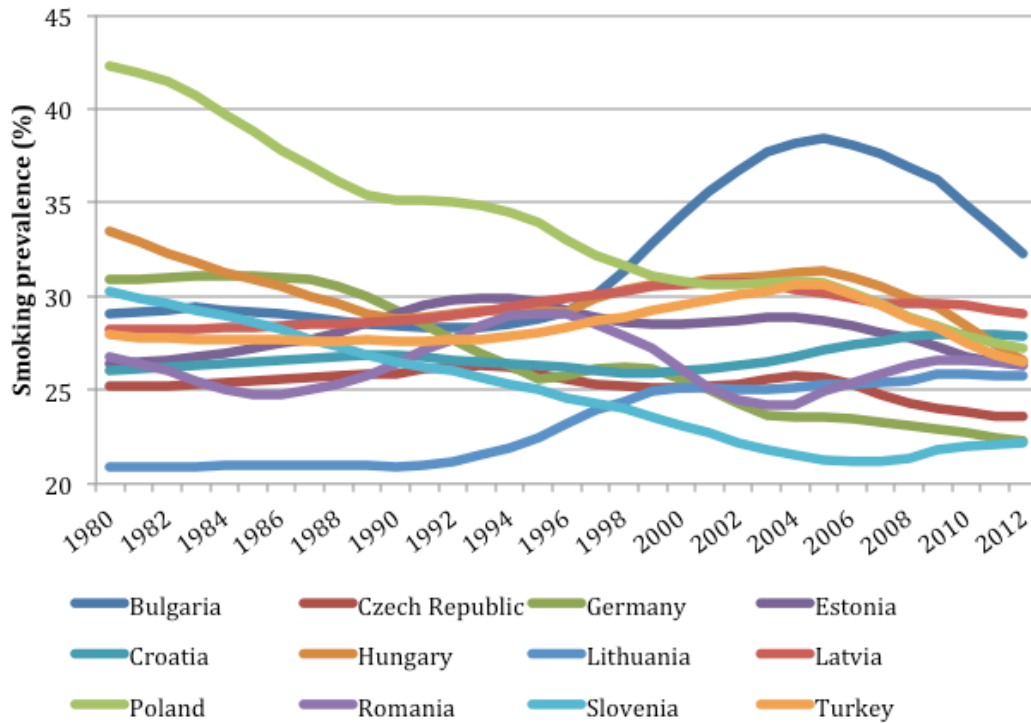
Figure 12: Burden of disease attributable to 15 leading risk factors in 2010, expressed as a percentage of Bulgaria DALYs



Source: IHME Global Burden of Disease (2014)

Smoking, a key risk factor for the described burden of cardiovascular diseases and cancer, continues to be widespread in Bulgaria. Over 32 percent of individuals aged 15 years and over are daily smokers. This is the highest prevalence among EU countries after Greece (38.3 percent). The prevalence of daily smoking reached a peak in 2005, when 38.4 percent of individuals aged 15 or over were daily smokers (Figure 13). Recently, Bulgaria has taken several steps to curb smoking rates. In 2010, tobacco tax rates were increased sharply, and bans on public smoking were implemented in 2012.

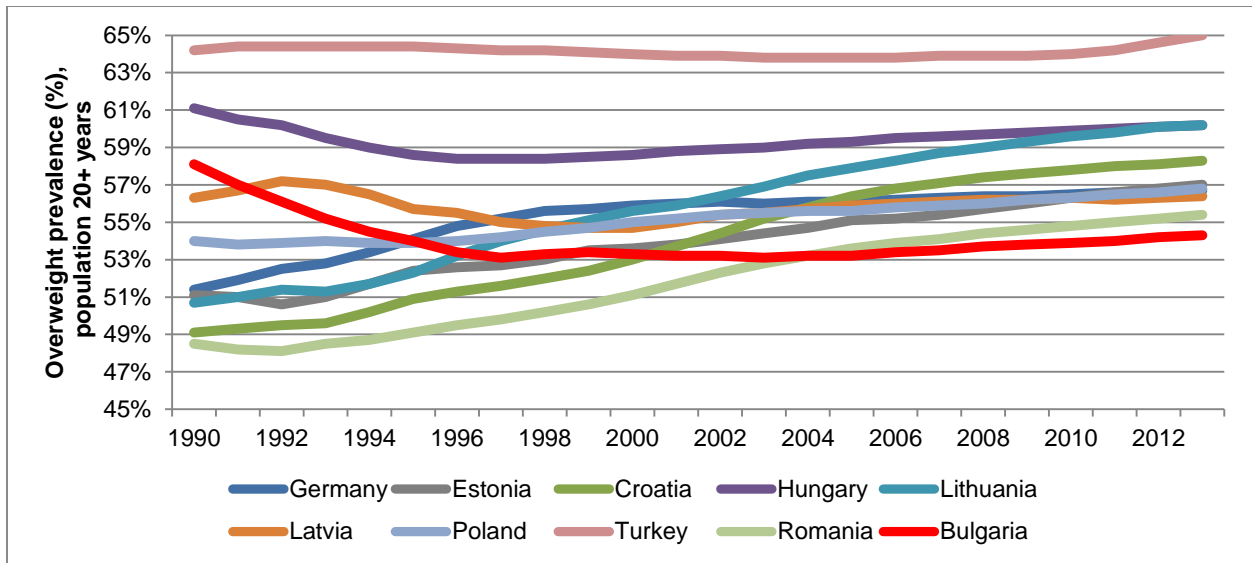
Figure 13: Adult population above the age of 15 smoking daily, 1980-2012



Source: IHME GBD 2014

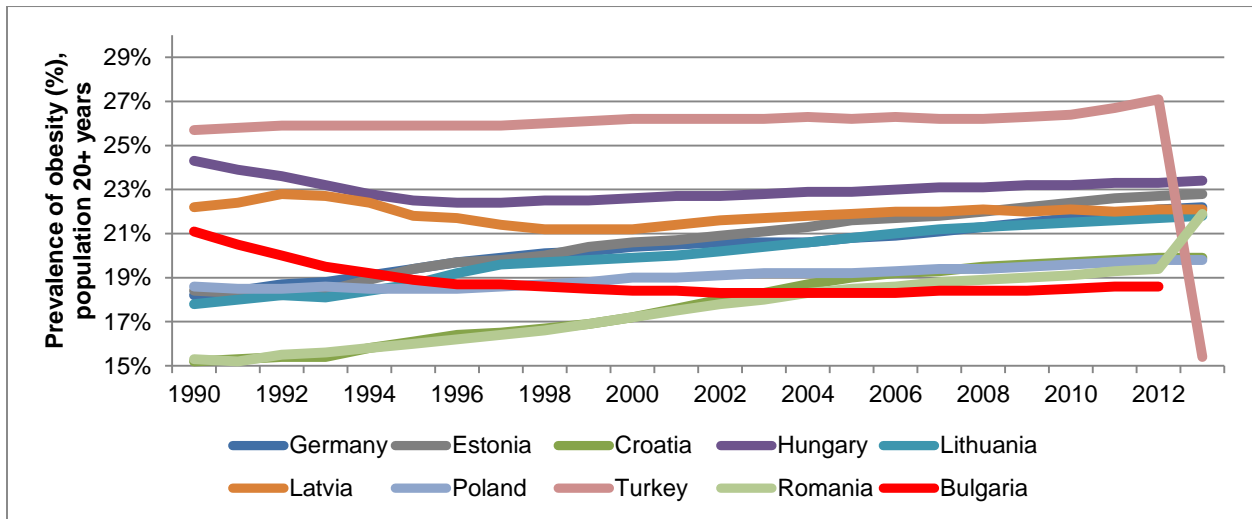
The prevalence of overweight and obesity in Bulgaria is lower than in other comparable countries. Unlike in most other comparator countries, in Bulgaria the share of individuals 20 years or older being overweight has decreased since 1990. The prevalence is now among the lowest, with 54 percent of individuals above the age of 20 being overweight. This is similar to the prevalence in Romania (55 percent), Latvia (55 percent), and Poland (57 percent). The share is significantly higher in Turkey, where 65 percent of adults above the age of 20 are overweight (Figure 14). Similarly, the prevalence of obesity has fallen slightly from 21 percent in 1990 to 18.6 percent in 2012 and is comparable to the obesity prevalence found in Poland (19.8 percent) and Croatia (19.9) (Figure 15).

Figure 14: Overweight prevalence, population 20+ years (%), 1990-2012



Source: IHME GBD 2014

Figure 15: Prevalence of obesity, population 20+years (%), 1990-2012



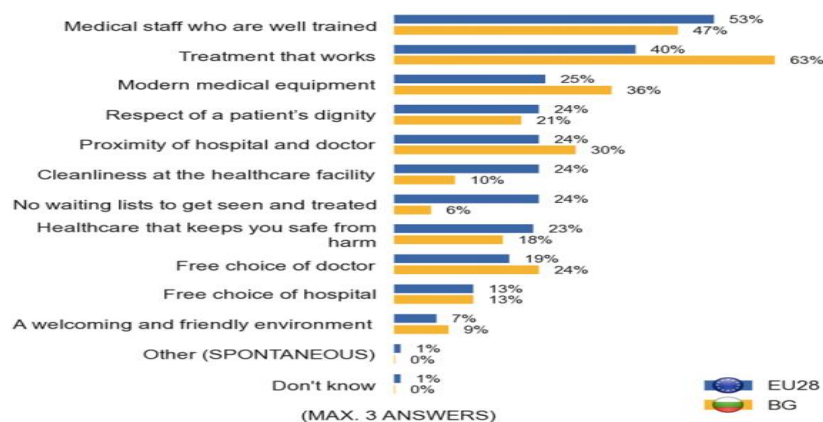
Source: IHME GBD 2014

### Perceptions about the health system

Patient satisfaction remains low. In 2013, only 29 percent rated the overall quality of health care as ‘good’ compared to the EU-28 average of 71 percent. This was the third lowest rate in the EU after Romania (25 percent) and Greece (26 percent) (Eurobarometer, 2014). Seventy-two percent of respondents believed that the quality of healthcare in Bulgaria was worse compared to other EU member states. When asked to list the most important criteria for high quality health care, Bulgarians chose ‘treatment that works’ (63 percent), medical staff who are well trained (47 percent), and modern medical equipment (36 percent) (Figure 16) (Eurobarometer, 2014). Corruption could also factor in the dissatisfaction, as 78 percent of respondents in the 2013 Global Barometer Survey conducted by Transparency International felt that

medical and health services were corrupt or extremely corrupt (Transparency International, 2014).<sup>2</sup> It is important to note, however, that Bulgaria appears to have made some improvements in terms of the quality of care offered. According to the 2013 EuroHealth Consumer Index,<sup>3</sup> Bulgaria ranked 30<sup>th</sup> out of 35 European health care systems, moving up 3 spots since 2012. Bulgaria measured particularly poorly on health outcomes and range of reach and services provided.<sup>4</sup>

Figure 16: Most important criteria when you think of high quality healthcare, % of respondents



Source: Eurobarometer (2014).

Notes: Respondents were asked the following question: “Of the following criteria, which are the three most important criteria when you think of high quality healthcare in (OUR COUNTRY)?” Respondents could choose up to three criteria.

## Health financing

Despite significant increases in health spending between 1995 and 2012, per capita health spending in Bulgaria is still below EU averages. Both total and per capita health spending increased significantly in Bulgaria between 1995 and 2012. Per capita health spending increased from 82 in US dollars and 295 in international dollars (PPP) in 1995 to 566 US dollars and 1139 PPP, respectively, in 2012. Per capita health spending, however, is still significantly lower than the EU-12 and EU-15 averages of 1160 and 4379 US dollars per capita, respectively, in 2012.

The composition of health spending has changed remarkably during the same time period. In 2012, the public share of total health spending represented 51.4 percent compared to almost 74 percent in 1995. As a result, private health spending increased from 26 percent in 1995 to 48.6 percent in 2012, with the OOP share rising from 26 percent to 47.5 percent, respectively.

<sup>2</sup>The share was higher only in the judiciary – 86 percent of respondents believed that the judiciary was corrupt or extremely corrupt. Only 7 percent, however, reported paying a bribe to the medical and health services in the last 12 months (Transparency International, 2014).

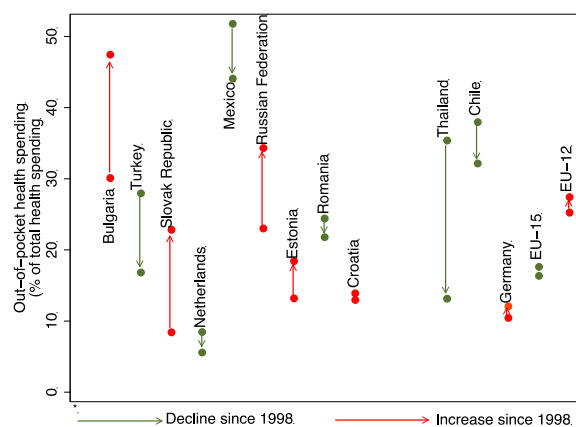
<sup>3</sup> The EuroHealth Consumer Index was established in 2005 and ranks health care systems on 48 indicators, covering six areas that are essential to the health consumer: patients’ rights and information, accessibility of treatment (waiting times), medical outcomes, range and reach of services provided, pharmaceuticals, and prevention.

<sup>4</sup> Range of reach and services provided included equity of healthcare systems, cataract operations per 100,000 age 65+, kidney transplants per million population, inclusion of dental care in public healthcare, informal payments to doctors, long-term care for the elderly, and share of dialysis done outside of clinic.

- ✓ In 2012, total health spending represented 8 percent of GDP up from 5.2 percent in 1995. In terms of global comparisons in 2012, total health spending as a share of GDP and in per capita terms, is above average relative to countries with similar levels of income.
- ✓ Public spending on health as a share of total health spending is below average but slightly above average when measured as a share of GDP (4.1 percent). When measured in per capita terms (in both exchange rates and international dollars), public health spending is about average relative to other comparable income countries.
- ✓ A different picture emerges in regards to private health spending. Private spending as a share of total health spending (48.6), as a share of GDP (3.9 percent) and in per capita exchange rate (\$275) and international dollar terms (\$553) for 2012 is significantly above global averages.

High out-of-pocket payments limit the financial risk protection provided by the system. Out-of-pocket payments account for almost 98 percent of all private health spending. As a share of total health spending (48 percent), as a share of GDP (3.8 percent), and in per capita terms (\$268 in exchange rates and \$540 in PPP), OOP is significantly above global averages. Bulgaria thus does not meet the WHO criterion of financial protection, as OOP is significantly higher than the WHO threshold of 15-20 percent as a share of total health spending. It is important to note that OOP has increased by more than 20 percentage points from 1998 until 2012 (Figure ).

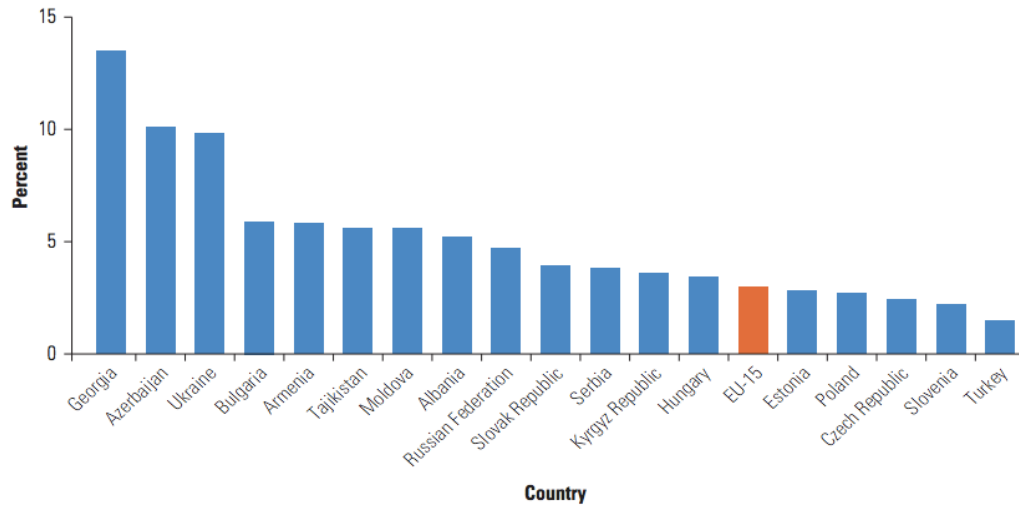
Figure 17: Changes in out-of-pocket share (1998-2012)



Source: World Development Indicators & WHO (2014)

OOP payments represent more than 6 percent of total household spending – almost double the ratio found in EU-15 countries (Figure 18). In 2012, more than 14 percent of respondents in the bottom income quintile indicated that they did not seek health care because it was too expensive. Although the indicator more than halved since 2006, Bulgaria lags behind most other EU countries. The EU average was 4.5 percent in 2012, and the indicator was below 3 percent in Estonia, Germany, Lithuania and Czech Republic (Figure 19).

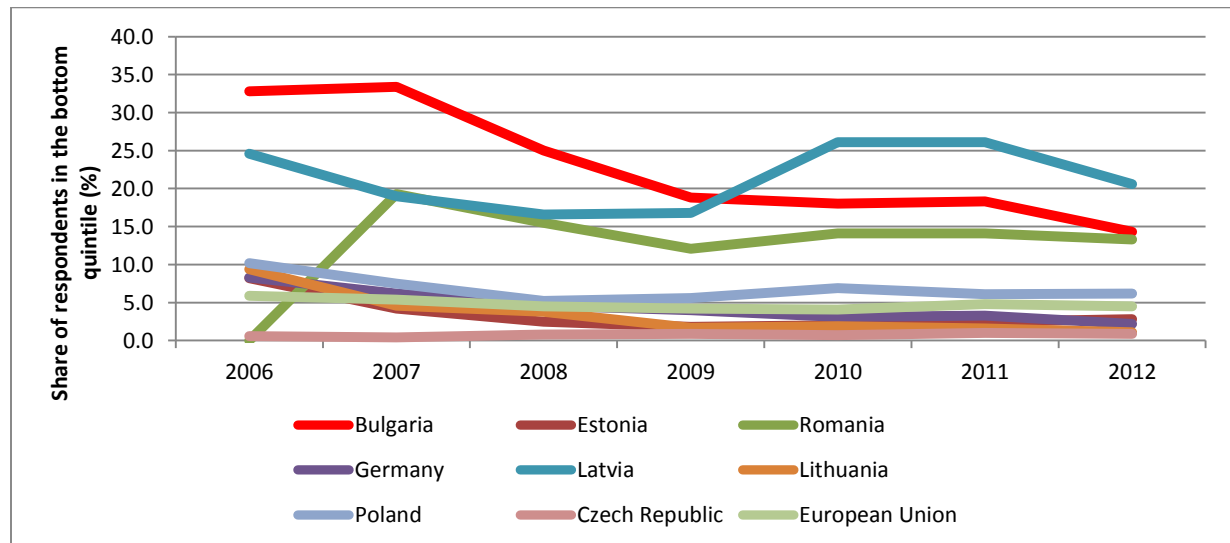
Figure 18: Out-of-pocket payments on health as a percentage of total household spending\*



\*Latest available year

Source: Smith and Nguyen (2013)

Figure 19: Share of respondents in the bottom quintile indicating that they did not seek care because it was too expensive



Source: Eurostat (2014)

Despite the introduction of copayments in 2000, there is evidence that patients continue to incur informal payments. Using results from a nationally representative survey conducted in 2010, Atanasova et al. (2014) find that 13 percent of patients reported informal payments for outpatient visits and 33 percent of patients reported to have paid informally for inpatient care.

## 2. Detailed analysis of health outcomes, inputs, and expenditures

In this document, we present the analysis of Bulgaria's performance on health system indicators. First, we analyze trends in health outcomes and inputs over the period 1980-2012 and trends in health financing over the period 1995-2012, comparing these trends to the EU-12 and EU-15 averages, as well as to the trends in Croatia, Estonia, Romania, and Turkey. Second, we benchmark Bulgaria's performance for the latest year available (generally 2012) against comparable income and health spending countries.

### 2.1. Health outcome, input, and expenditure trends over time

While Bulgaria has seen significant improvements in key health outcomes between 1980-2012, the pace at which these improvements have occurred has been slower than in other EU countries. The infant mortality decreased from 24.5 in 1980 to 10.5 per 1,000 live births in 2012. Despite the significant reduction, however, Bulgaria's infant mortality rate is still more than three times higher than the EU-15 average of 3.2 infant deaths per 1000 live births and almost twice as high as the EU-12 average of 5.5 infant deaths per 1000 live births (Figure 21). Similar progress has been achieved in reducing maternal mortality, which fell from 24 in 1990 to 8 deaths per 100,000 live births in 2010. Bulgaria has surpassed the EU-12 average of 11.3 deaths per 100,000 live births and is approaching the EU-15 average of 7.6 deaths per 100,000 live births (Figure 21)

Figure 20: Infant mortality rate per 1,000 live births: Bulgaria and comparators; 1980-2012

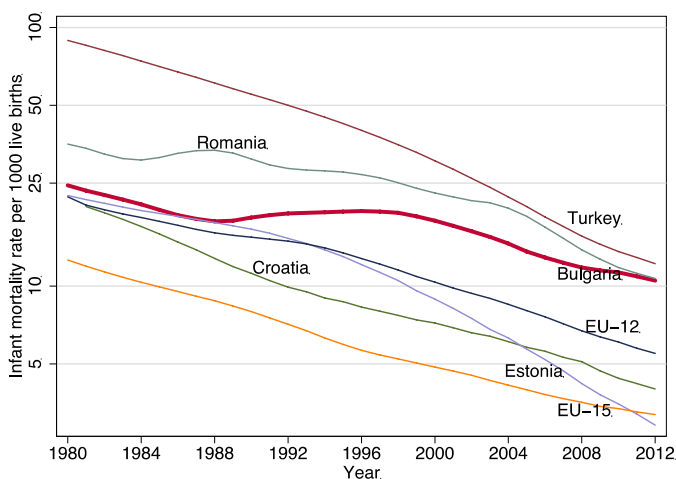
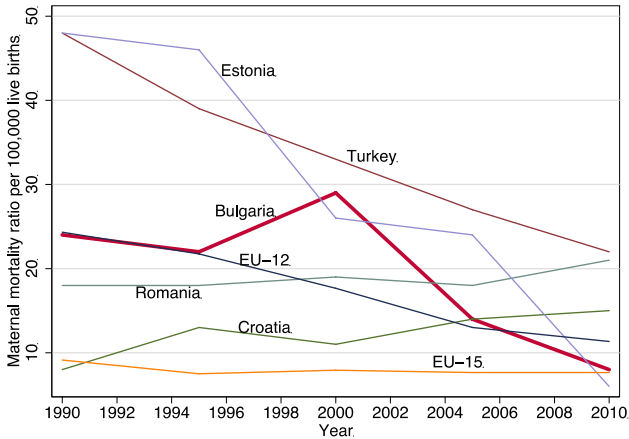
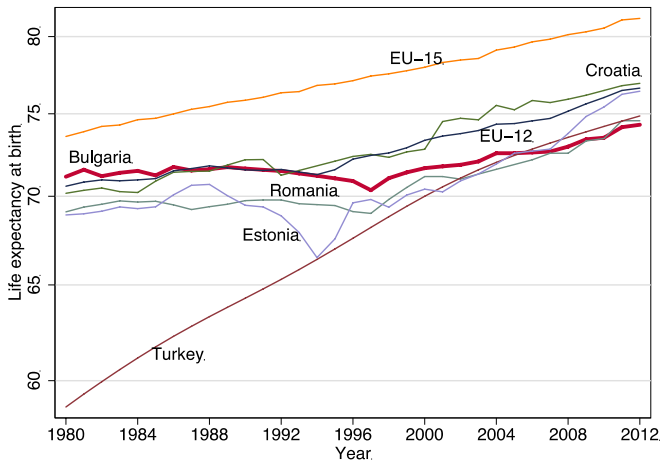


Figure 21: Maternal mortality ratio per 100,000 live births: Bulgaria and comparators; 1990-2010



Moderate improvements have been achieved in terms of life expectancy. Life expectancy has increased from 71.2 years in 1980 to 74.3 years in 2012. Most of the improvements in life expectancy were achieved after 2000, as life expectancy remained below 71.7 years until 2000. Bulgaria’s life expectancy, however, is still significantly lower than the EU-15 average of 81.2 years in 2012 but is similar to the life expectancies in Turkey (74.9 years) and Romania (74.6 years) (Figure 22).

Figure 22: Life expectancy: Bulgaria and comparators; 1980-2012



Source: World Development Indicators & WHO, 2014

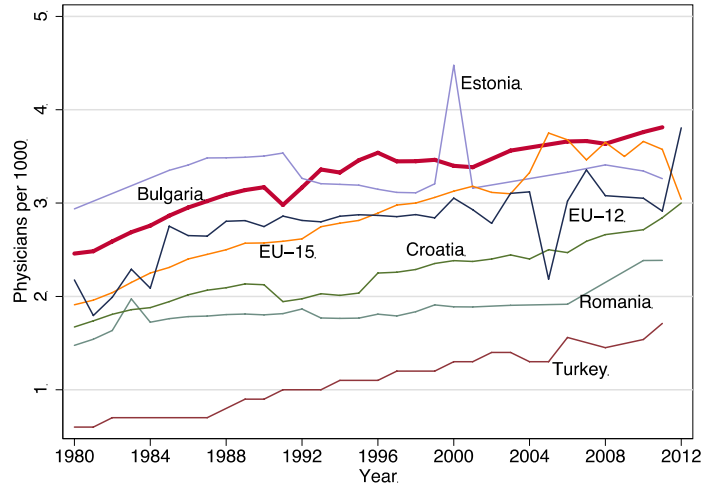
The number of physicians per capita has increased from 2.5 in 1980 to 3.8 physicians per 1000 population in 2011.<sup>5</sup> The physician to population ratio is comparable to the EU-12 average of 3.8 physicians per 1000 population in 2012 but is higher than the EU-15 average of 3.1 physicians per 1000 population in 2012 (Figure 23). Meanwhile, the number of hospital beds per 1000 population has decreased from 8.9 in 1980 to 6.4 beds per 1000 population in 2011 (latest year

<sup>5</sup> Data are not available for 2012.



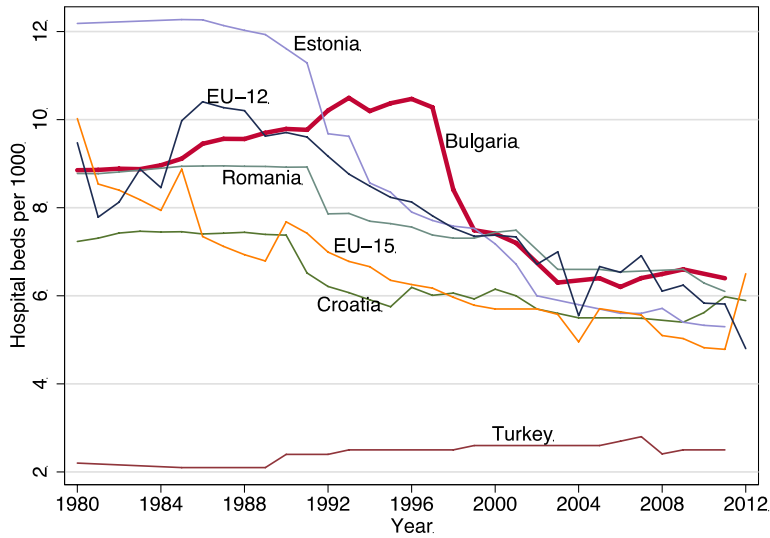
for which data are available). The number of hospital beds per capita, however, steadily increased between 1980 until 1996, reaching a peak of 10.5 beds per capita in 1996. Currently, the hospital beds to population ratio is similar to the EU-15 average of 6.5 beds per 1000 population but is higher than the EU-12 average of 4.8 beds per capita (Figure ).

Figure 23: Physicians per 1000 population: Bulgaria and comparators; 1980-2012



Source: World Development Indicators and WHO NHA, 2014

Figure 24: Hospital beds per 1000 population: Bulgaria and comparators; 1980-2012

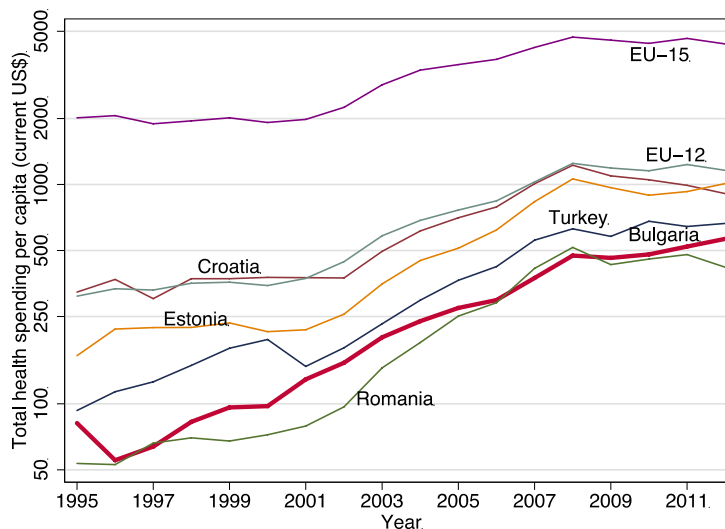


Source: World Development Indicators and WHO NHA, 2014

Both total and per capita health spending increased significantly in Bulgaria between 1995 and 2012. Total health spending as a share of GDP increased from 5.2 percent in 1995 to 8 percent in 2012, while per capita health spending increased from 82 in US dollars and 295 in international dollars (PPP) in 1995 to 566 US dollars and 1139 PPP, respectively, in 2012. Per capita health spending, however, is still

significantly lower than the EU-12 and EU-15 averages of 1160 and 4379 US dollars per capita, respectively, in 2012 (Figure 25).

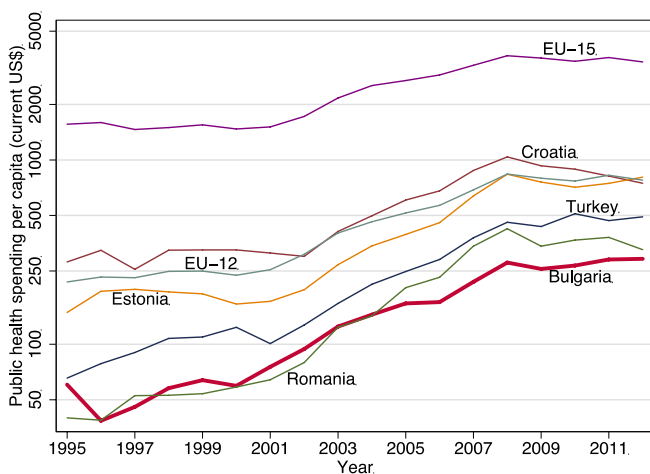
**Figure 25: Total health spending per capita (current US\$): Bulgaria and comparators; 1995-201**



Source: World Development Indicators and WHO NHA, 2014

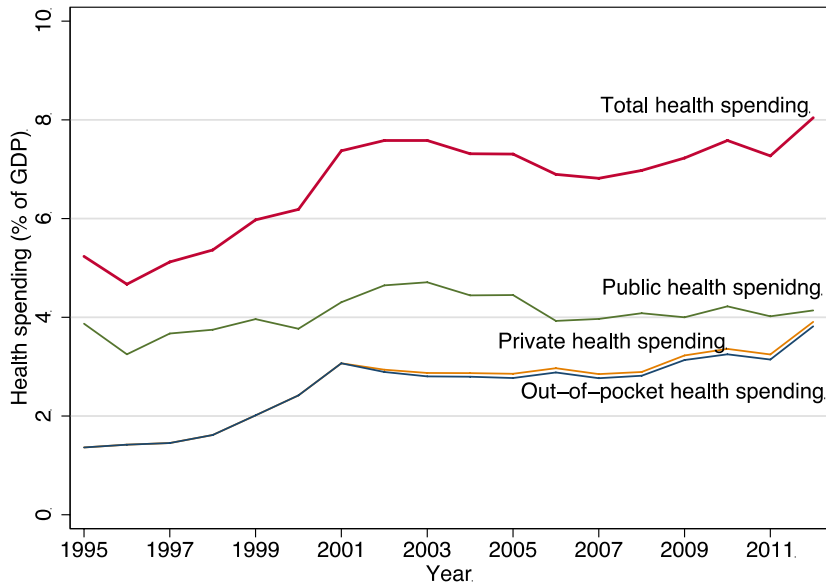
Public health spending per capita in Bulgaria has also increased from 60 US dollars in 1995 to 291 US dollars in 2012, but is still significantly lower than the EU-12 and EU-15 averages of 777 US dollars and 3404 US dollars, respectively, in 2012 (Figure 26). As a share of GDP, public health spending increased from 3.9 percent in 1995 to 4.1 percent in 2012, while private health spending increased from 1.4 percent to 3.9 percent, respectively (Figure 27).

**Figure 26: Public health spending per capita (current US\$): Bulgaria and comparators; 1995-2012**



Source: World Development Indicators and WHO NHA, 2014

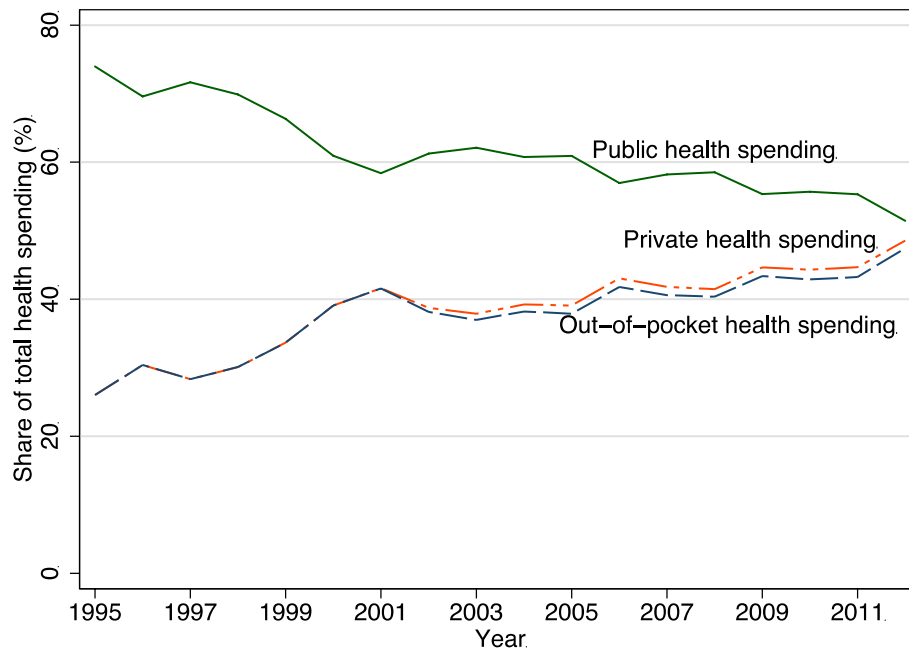
Figure 27: Health spending as a share of GDP, Bulgaria, 1995-2012



Source: World Development Indicators and WHO NHA, 2014

The composition of health spending has changed during the same time period. In 2012, the public share of total health spending represented 51.4 percent compared to almost 74 percent in 1995. As a result, private health spending increased from 26 percent in 1995 to 48.6 percent in 2012, with the OOP share rising from 26 percent to 47.5 percent, respectively.

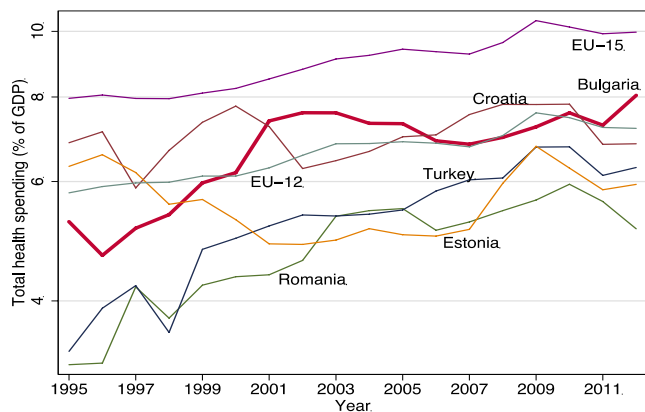
Figure 28: Public, private, and out-of-pocket health spending as a share of total health spending, Bulgaria, 1995-2012



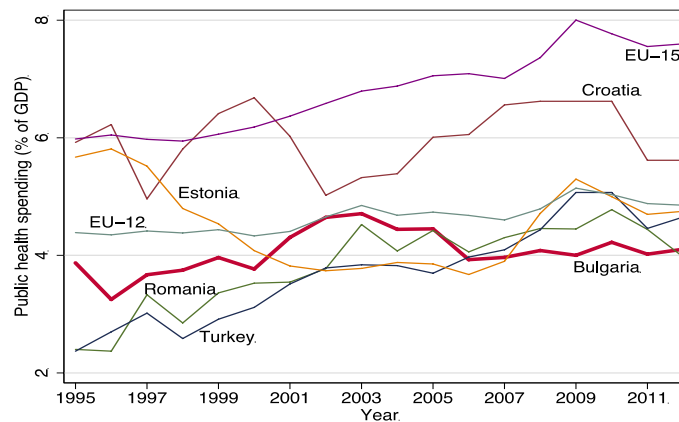
Source: World Development Indicators and WHO NHA, 2014

Figure 29-Figure 35 display trends in health financing for Bulgaria and comparator countries over the period 1995-2012. As a share of GDP, total spending is similar to the EU-12 average, while public health spending is lower than the EU-12 average. Private and out-of-pocket health spending, as shares of GDP, are significantly higher than those observed in the comparator countries. The same is true when private and OOP spending are measured as shares of total health spending. Public health spending, as a share of total health spending, on the other hand is significantly lower than in other comparable countries.

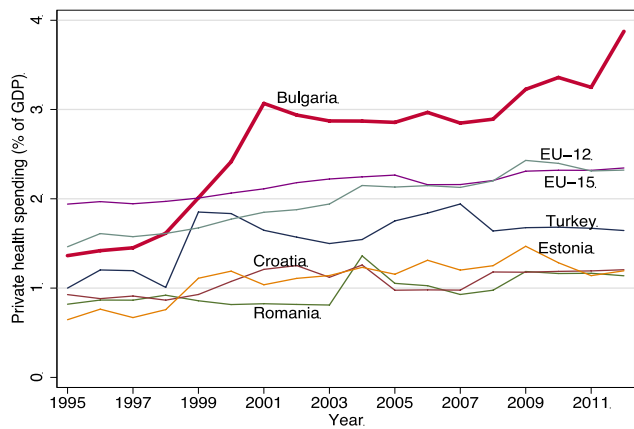
**Figure 29: Total health spending as a share of GDP: Bulgaria and comparators; 1995-2012**



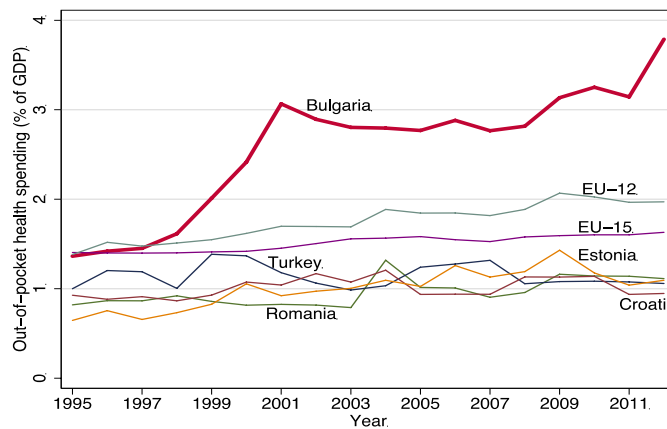
**Figure 30: Public health spending as a share of GDP: Bulgaria and comparators; 1995-2012**



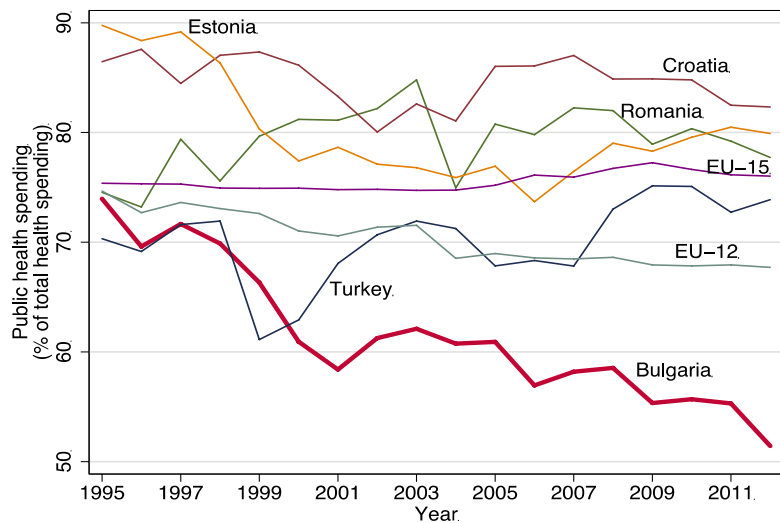
**Figure 31: Private health spending as a share of GDP: Bulgaria and comparators; 1995-2012**



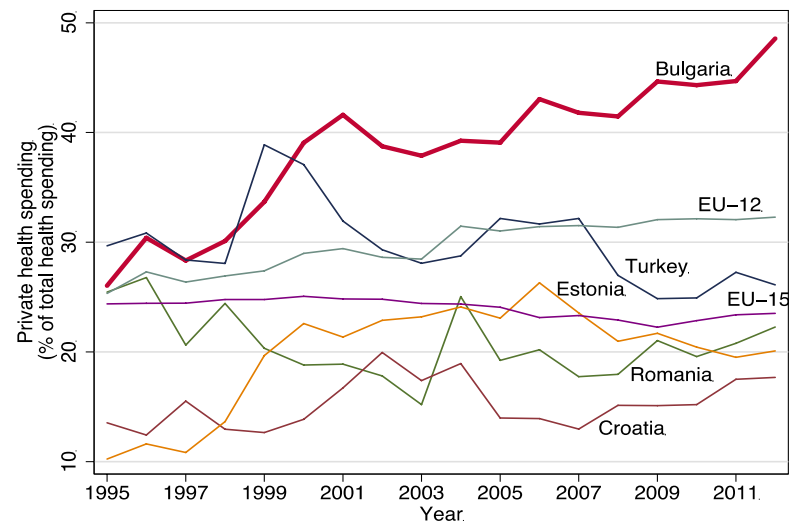
**Figure 32: Out-of-pocket health spending as a share of GDP: Bulgaria and comparators; 1995-2012**



**Figure 33: Public health spending as a share of total health spending: Bulgaria and comparators, 1995-2012**



**Figure 34: Private health spending as a share of total health spending: Bulgaria and comparators, 1995-2012**



**Figure 35: Out-of-pocket health spending as a share of total health spending: Bulgaria and comparators; 1995-2012**

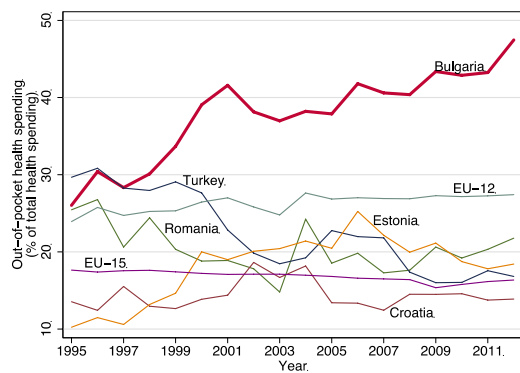


Table 1 displays the nominal elasticities of total, public, and private health spending with respect to GDP for 1995-2012, as well as for the 1999-2012 and 2005-2012 sub-periods. In terms of the relationship between nominal health spending and nominal GDP growth, total health spending over the full 1995-2012 period increased 11.2 percent per year more rapidly than GDP (nominal elasticity of 1.112), public spending increased 4.6 percent more rapidly (1.046) and private spending increased 23.2 percent more rapidly (1.232). Between 2005-2012, total health spending increased 13.5 percent more rapidly than GDP (1.135), public health spending grew 7 percent less rapidly than GDP (0.930), and private spending grew at a significantly higher rate of 40.2 percent (1.402).

Table 2 displays the nominal elasticities of total government revenues and expenditures relative to GDP, as well as public health spending relative to total government expenditures. Government revenues grew 7.2 percent less rapidly than GDP between 1999-2012 and 23 percent less rapidly between 2005-2012. Meanwhile, government expenditures grew 7.1 percent (elasticity of 0.929) less rapidly between 1999-2012 and 3.1 percent (elasticity of 1.031) per year faster between 2005-2012. Public health spending grew 3.6 percent faster than total government expenditures between 1999-2012 (elasticity of 1.036) but over 10 percent less rapidly between 2005-2012 (elasticity of 0.898).

**Table 1: Elasticities of health spending relative to GDP, 1995-2011**

	<b>1995-2012</b>	<b>1999-2012</b>	<b>2005-2012</b>
Total Health Spending	1.112	1.100	1.135
Public Health Spending	1.046	0.970	0.930
Private Health Spending	1.232	1.287	1.402

Source: IMF World Economic Outlook and WHO, 2014

**Table 2: Elasticities of government revenues and expenditures relative to GDP and public health spending relative to government expenditures, 2000-2012\***

	<b>1999-2012</b>	<b>2005-2012</b>
Government revenues relative to GDP	0.928	0.770
Government expenditures relative to GDP	0.929	1.031
Public health spending relative to government expenditures	1.036	0.898

Source: IMF World Economic Outlook and WHO, 2014

\*Data on government revenues and expenditures are only available beginning 1999

## 2.2. Benchmarking Bulgaria's performance against countries with similar levels of income and health spending

Given the lack of appropriate data and methods, it is difficult to perform a rigorous assessment of a health system. For this reason, researchers often rely on global benchmarking of health outcomes, inputs, and health spending to provide an overview of the country's performance relative to countries of comparable income and health spending levels. A global average does not represent the gold standard,

but rather is an easy-to-measure and useful metric for assessing comparative performance. Compared to other income and health spending countries, Bulgaria performs above average on key health outcomes (Figure 36 - Figure 38).

Figure 36: Global Comparisons of Infant Mortality versus Income and Total Health Spending, 2012

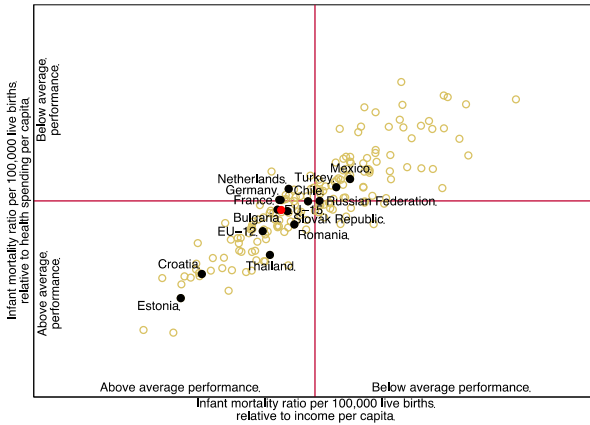


Figure 37: Global Comparisons of Maternal Mortality Relative to Income and Spending, 2010

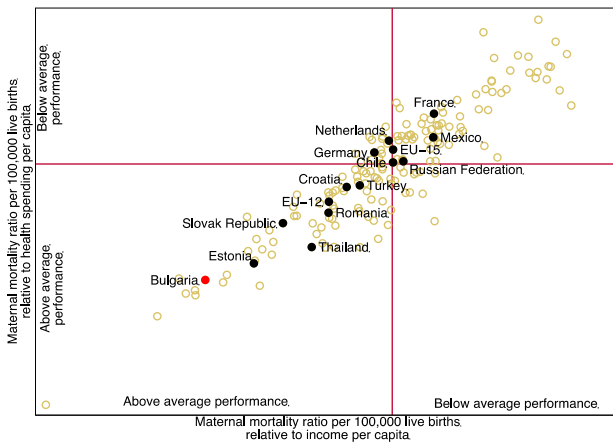
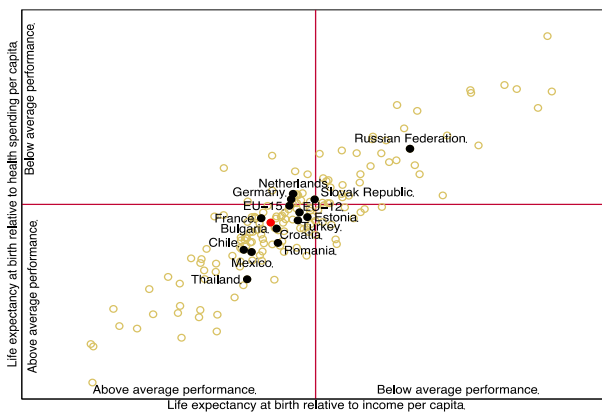


Figure 38: Global Comparisons of Life Expectancy Relative to Income and Spending, 2012

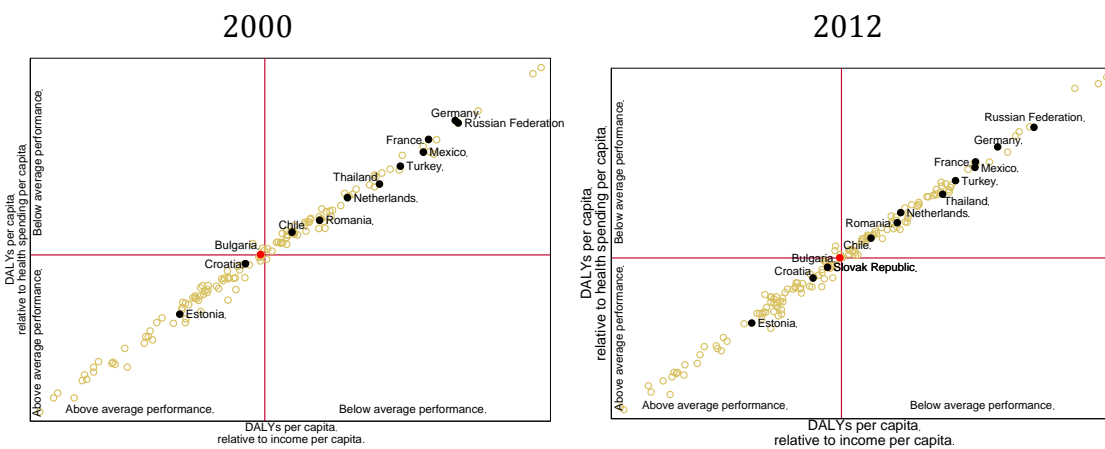




Source: World Development Indicators & WHO, 2014  
 Note: Both axes log scale.

Figure 39 below shows how well Bulgaria performs in terms of postponing premature death and limiting disability for its income and health spending levels. The relative position of Bulgaria has not changed since 2000, and, in 2012, it performs about average on this measure of health outcomes. While attributing such performance to specific policies or socioeconomic/cultural/institutional factors is not possible, it appears that Bulgaria’s overall health status performance as measured by DALYs is about average compared to countries with similar levels of income and health spending.

Figure 39: DALYs Per Capita Relative to Income and Spending, 2000 and 2012



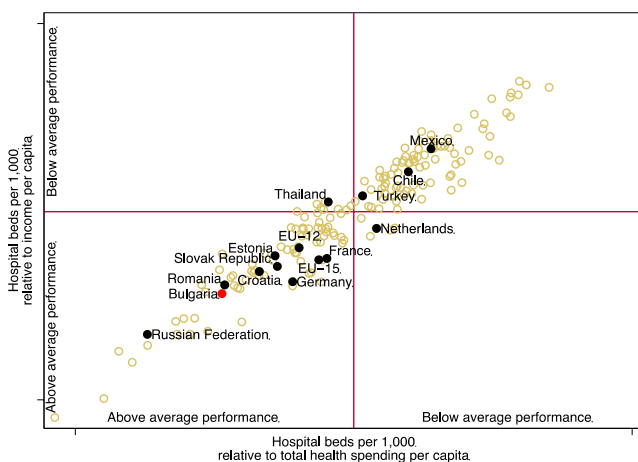
Source: World Development Indicators, WHO NHA, and WHO Global Health Estimates, 2014

Bulgaria’s bed to population ratio and physician to population ratios are 6.4 per 1000 and 3.8 per 1000, respectively.<sup>6</sup> The levels of physical and human inputs are high relative to the EU-12 average of 5.8 hospital beds per 1000 population and 2.9 physicians per 1000 population.

Figure 40 and Figure 41 benchmark Bulgaria’s performance globally with respect to hospital beds and physicians. The figures show that on both measures of inputs Bulgaria performs significantly above average holding income and health spending constant.

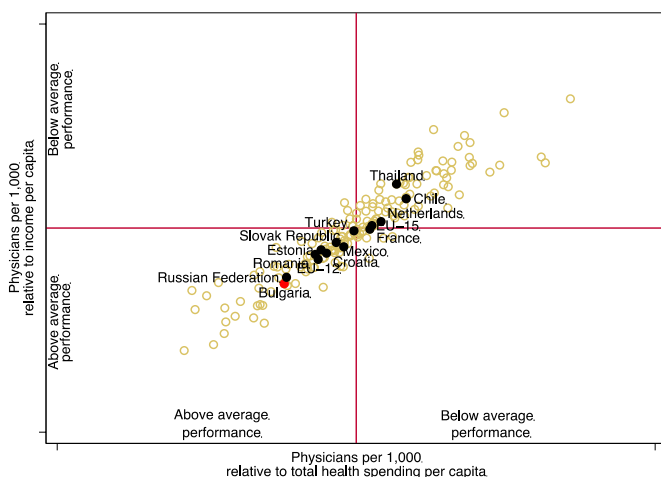
<sup>6</sup> Data are for latest available year (2011).

**Figure 40: Hospital Beds to Population Ratio Relative to Total Health Spending and Income**



Source: World Development Indicators & WHO, 2014.  
 Note: Beds and GDP per capita data are for the latest/earliest available year.

**Figure 41: Physician Population Ratio Relative to Total Health Spending and Income**



Source: World Development Indicators & WHO, 2014.  
 Note: Physicians and GDP per capita data are for latest/earliest available year.

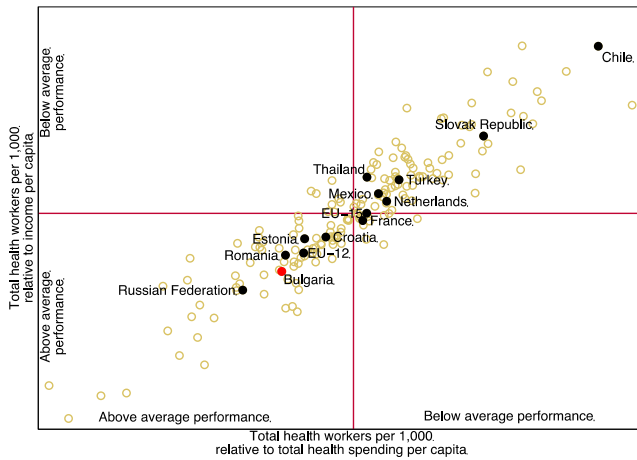
In addition, Bulgaria’s nurse and midwife to population ratio is 4.684 per 1000. As shown in 42 and Figure 43, Bulgaria performs significantly above average in terms of the number of nurses and midwives per population, as well as the total number of health workers (physicians, nurses, and midwives), holding income and health spending constant.

**Figure 42: Nurses and midwives to population ratio relative to total health spending and income**



Source: World Development Indicators & WHO, 2014.  
 Note: Physicians and GDP per capita data are for latest/earliest available year.

**Figure 43: Total health workers to population ratio relative to total health spending and income**



Source: World Development Indicators & WHO, 2014.  
 Note: Data are for latest/earliest available year. Total health workers (a) include physicians, nurses, and midwives.

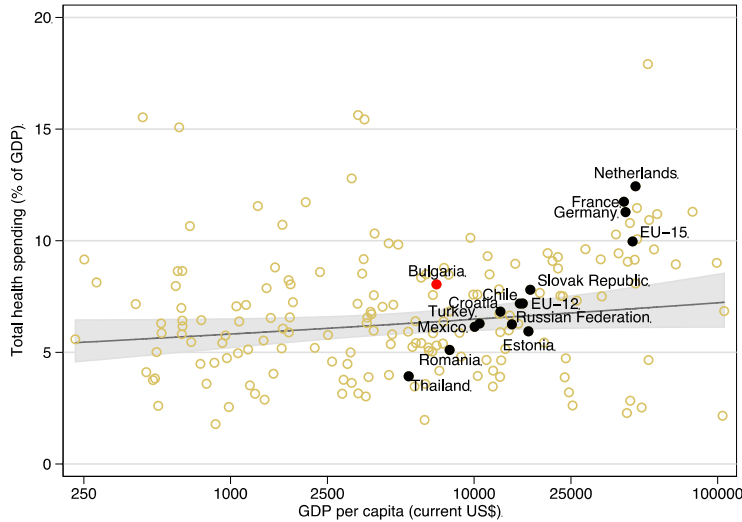
The above comparative analysis suggests that for its health spending and income levels, Bulgaria’s aggregate health outcomes and physical and human inputs are significantly above the global averages. To more fully understand the system’s performance, one must also analyze its financing performance, including the level of financial protection, the system’s fairness and equity, and public satisfaction.

**The analysis below provides a global performance assessment of Bulgaria’s health financing.**

In 2012, total health spending in Bulgaria represented 8 percent of GDP, with Bulgaria spending 566 US dollars per capita or 1139 per capita in international dollars (PPP).

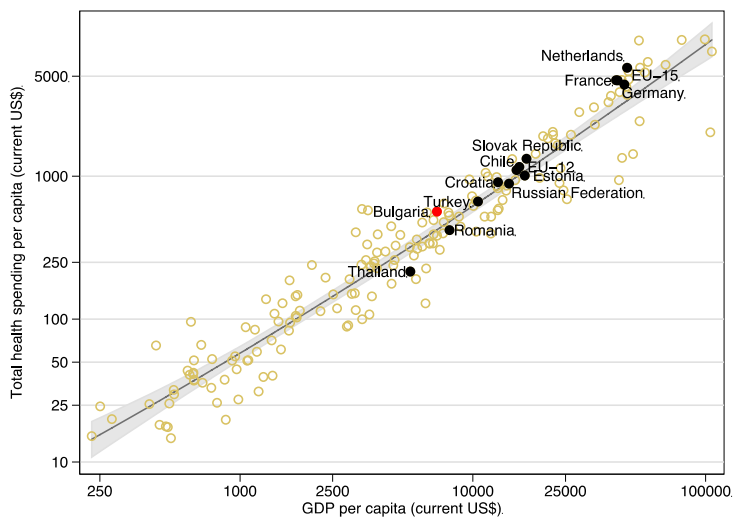
Figure 44 shows Bulgaria’s health spending in 2012 as a share of GDP compared to other comparable income countries, while Figure 45 and figure 46 display per capita spending in both exchange rates and international dollars. A consistent picture emerges for all three measures of total health spending: Bulgaria’s total health spending in 2012 is above average for a country of its income level.

**Figure 44: Total Health Expenditure as a Share of GDP versus Income Per Capita, 2012**



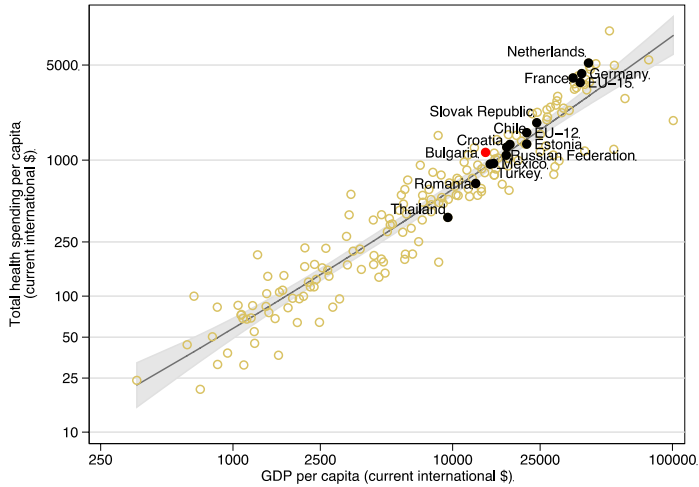
Note: x-axis log scale.

**Figure 45: Total Health Expenditure Per Capita versus Income Per Capita in Current US\$, 2012**



Note: Both axes log scale

**Figure 46: Total health expenditure per capita versus income per capita in current international\$, 2012**

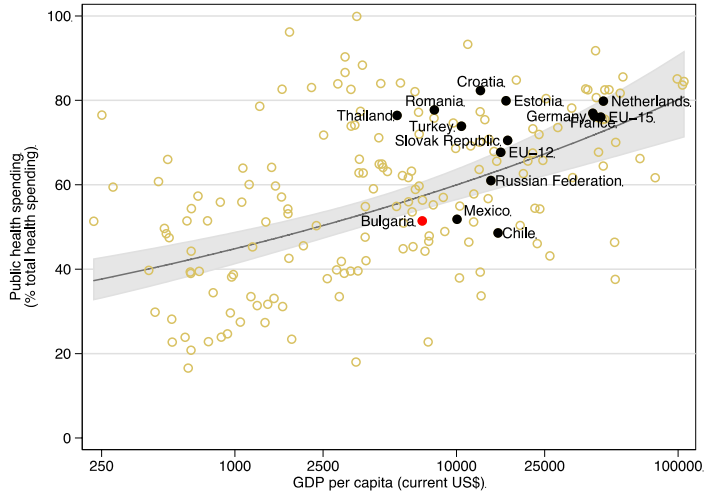


Source: World Development Indicators & WHO, 2014.  
 Note: Both axes log scale.

Public spending on health can also be measured in a number of ways including: as shares of total health spending and GDP, public spending per capita in exchange-rate-based and international dollars, and public spending on health as a share of all public spending. In 2012, public health spending represented 51.4 percent of total health spending. As a share of GDP, this constituted 4.1 percent. In per capita terms, public health spending was 291 in exchange rate based US dollars.

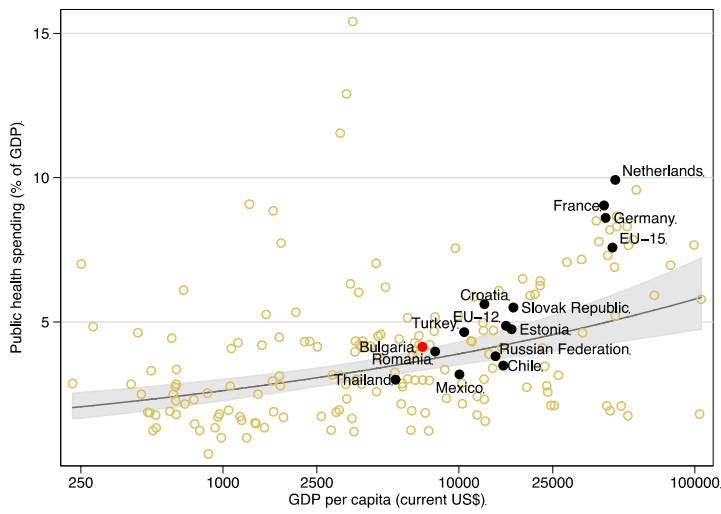
Figure 47- Figure 51 provide global comparisons for 2012. Public health spending as a share of total health spending is below the global average, but is slightly above the global average when measured as a share of GDP. In per capita terms (in both exchange rates and international dollars), public health spending is about average relative to other comparable income countries. Given the average level of public health spending as a share of the total government budget and per capita, as well as the high public health spending to GDP share level, it appears that Bulgaria has already prioritized health within its budget allocations.

**Figure 47: Public health expenditure as a share of total health expenditure and GDP per capita, 2012**



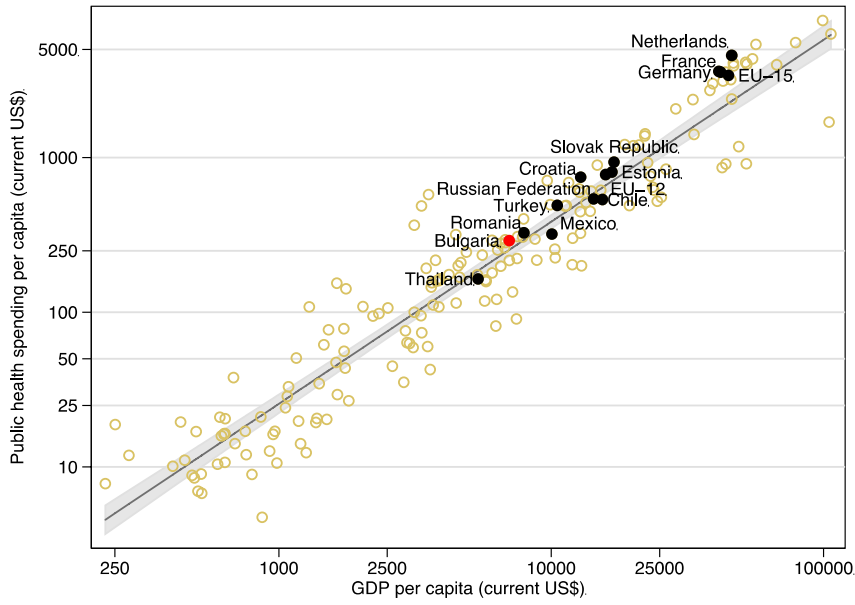
Note: x-axis log scale.

Figure 48: Public health expenditure as a share of GDP versus income per capita, 2012



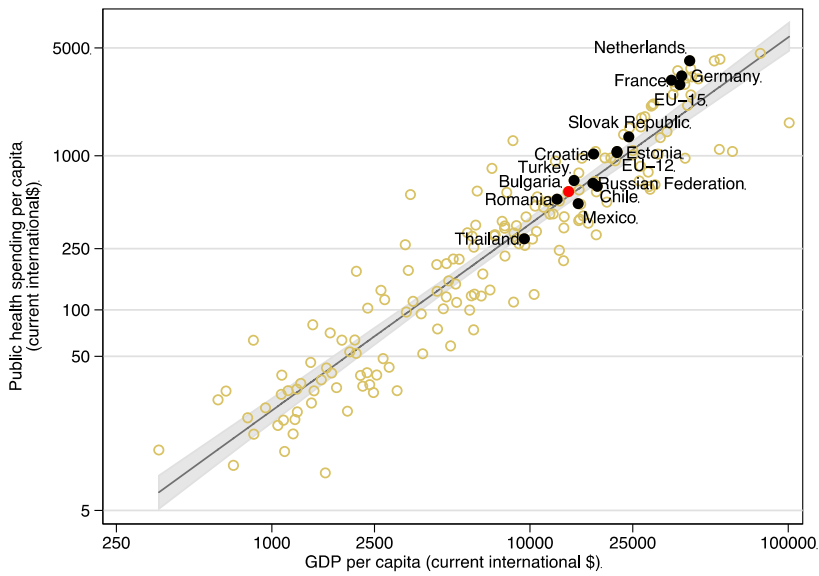
Note: x-axis log scale.

Figure 49: Public Health Expenditure Per Capita versus Income Per Capita in Current US\$, 2012



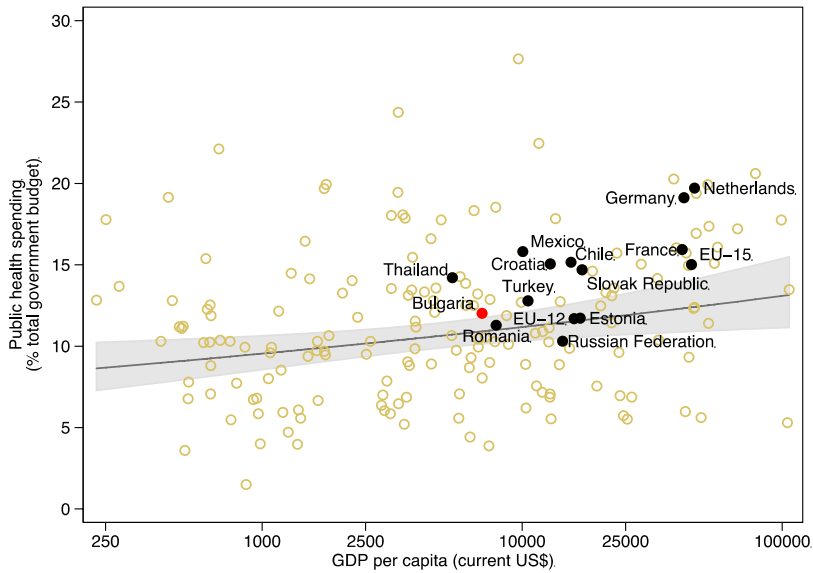
Note: both axes log scale.

Figure 50: Public Health Expenditure Per Capita versus Income Per Capita in Current International \$, 2012



Note: Both axes log scale.

Figure 51: Public Health Expenditure as a Share of Total Government Expenditure versus Income Per Capita, 2012



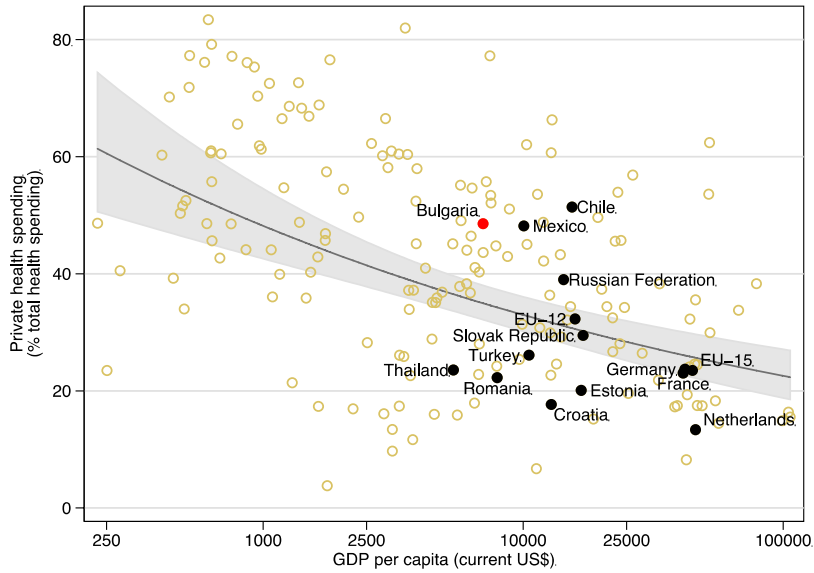
Source: World Development Indicators & WHO, 2014.

It is especially important to examine the levels of private spending given the implications they hold for financial protection and the equity of the system. Out-of-pocket payments, in particular, directly impact the household's financial status and can push households into poverty. Private insurance expenditures, on the other hand, provide some financial protection through the pooling of risks and their redistribution between healthy and sick individuals and households.

In 2012, private health spending in Bulgaria represented 48.6 percent of total health spending and 3.9 percent of GDP. Figure 52-Figure 55 show private spending as shares of total health spending and GDP and in per capita exchange rate-based and international dollar terms for 2012 relative to other comparable income countries. Private spending is significantly above average for all measures for a country of Bulgaria's income level.

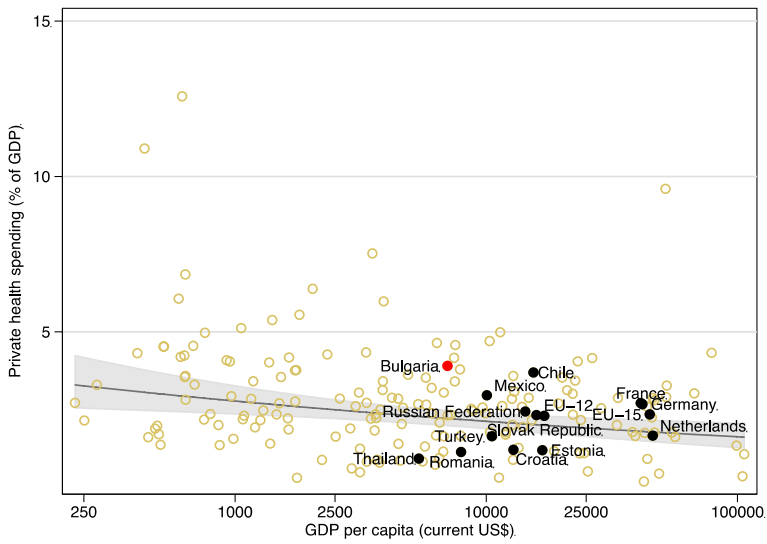


Figure 52: Private Health Spending as a Share of Total Health Expenditure versus Income Per Capita, 2012



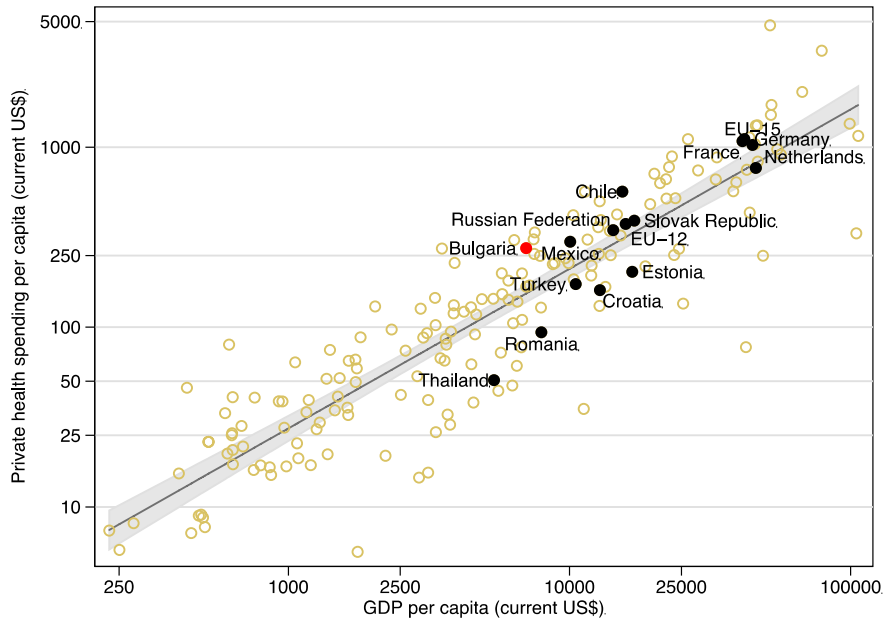
Note: x-axis log scale.

Figure 53: Private Health Spending as a Share of GDP versus Income per Capita, 2012



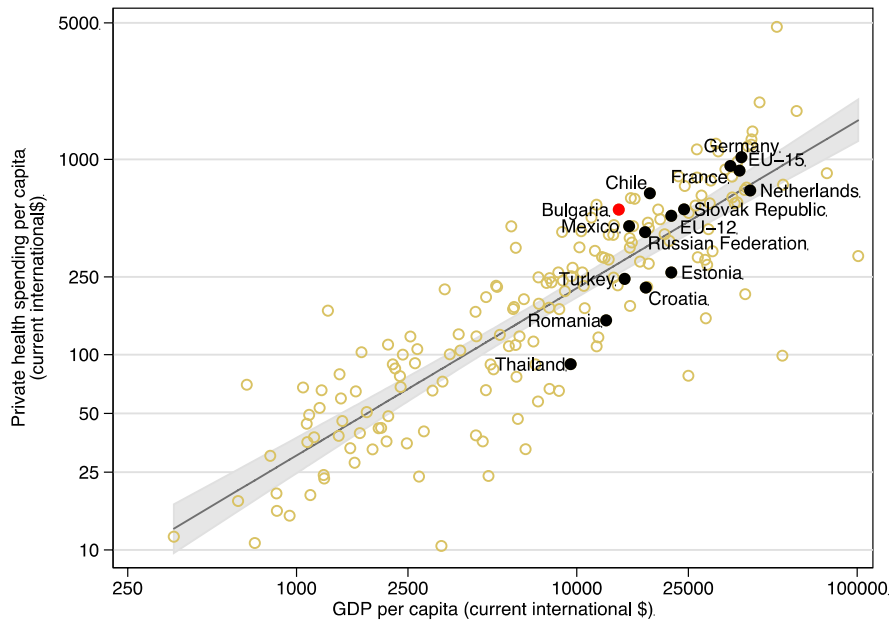
Note: x-axis log scale.

Figure 54: Private Health Expenditure Per Capita versus Income Per Capita in Current US\$, 2012



Note: Both axes log scale.

Figure 55: Private Health Expenditure Per Capita versus Income Per Capita in Current International \$, 2012



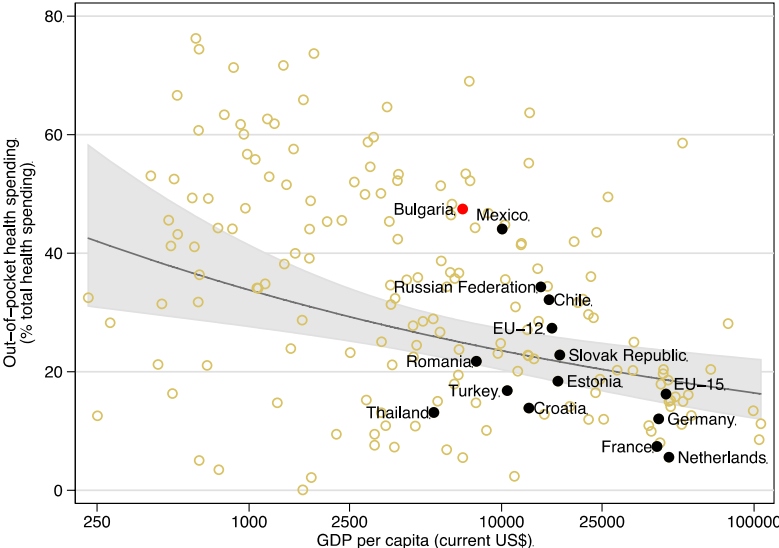
Source: World Development Indicators & WHO, 2010.

Note: Both axes log scale.

As discussed above, out-of-pocket spending is a gross measure of financial protection. WHO has indicated that countries with OOP shares below 15-20 percent of total health spending are able to ensure financial protection to their citizens. While gross percentages and levels of OOP are useful macro indicators of financial protection or lack thereof, to understand the equity of the system, one must look at household-level information and obtain information by income quintile about the share of out-of-pocket health spending as a share of total household income/consumption overall, and the impoverishing effects of out-of-pocket health spending.

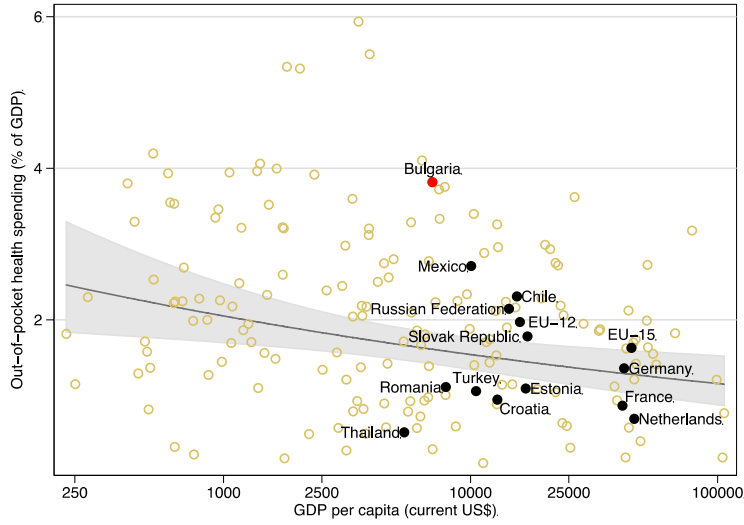
Out-of-pocket spending represented 97.7 percent of all private health spending. As a share of total health spending this constituted 47.5 percent. Figure - Figure 59 provide global comparisons of out-of-pocket spending measured as: shares of total health spending and GDP and in per capita exchange rate-based and international dollar terms for 2012. All measures of out-of-pocket spending are significantly above global averages for comparable income countries. Given that OOP represents 47.5 percent of total health spending, Bulgaria fails to meet the broad WHO macro 15-20 percent criterion for financial protection.

Figure 56: Out-of-Pocket Spending as a Share of Total Health Expenditure versus Income Per Capita, 2012



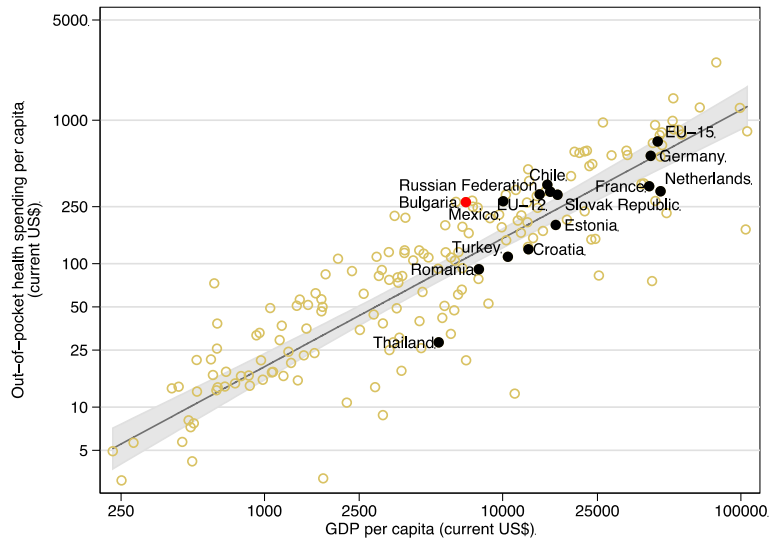
Note: x-axis log scale.

Figure 57: Out-of-Pocket Health Expenditure as a Share of GDP versus Income per Capita, 2012



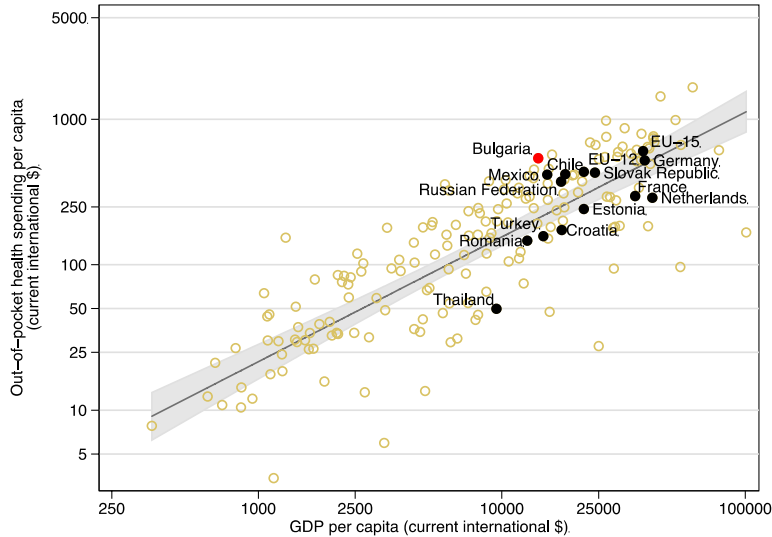
Note: x-axis log scale.

Figure 58: Out-of-Pocket Health Expenditure Per Capita versus Income Per Capita Current US\$, 2012



Note: both axes log scale

Figure 59: Out-of-Pocket Health Expenditure Per Capita versus Income Per Capita Current International \$, 2012



Source: World Development Indicators & WHO, 2011.  
 Note: both axes log scale.

### 2.3. Fiscal space for health

It is important to analyze the available fiscal space to understand whether the observed expenditure trends will be sustainable in the future.

#### **What is Fiscal Space for Health?**

Fiscal space can be defined as the country's ability to increase Government spending without undermining the country's future fiscal sustainability or solvency (Heller, 2006). Additional funds for health can be generated using a combination of different sources, which can be more broadly grouped into the following six categories (Tandon, 2010, Heller 2006):

- a. Conducive macroeconomic conditions, such as economic growth and rising revenue shares
- b. Reprioritization of expenditure on health, within the Government budget
- c. Borrowing
- d. Increase in other health-specific resources (earmarked taxation or premiums)
- e. Health-specific foreign aid and grants
- f. Increase in efficiency in health outlays

The first four categories lie largely outside the scope of the health sector and are dependent on macroeconomic policies and conditions. Nevertheless, it is important to analyze what implications these policies and factors have on the available fiscal space for health. The last two lie within the domain of the health sector and garner particular attention, as they are able to generate additional sector-specific resources (Tandon and Cashin, 2010), although Bulgaria is unlikely to raise health specific foreign aid and grants.

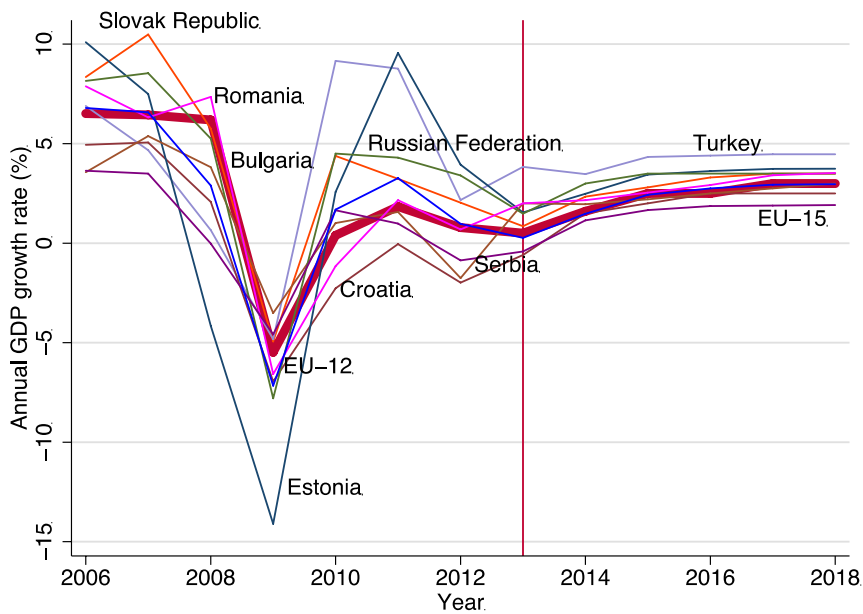
In the paragraphs below, we only discuss the macroeconomic environment using IMF’s projections until 2018.

### *Conducive macroeconomic conditions*

#### *Economic growth*

As shown in Figure 60, Bulgaria experienced a large economic shock during the financial crisis. While the growth rate dipped to the lowest rate of -5.5 percent in 2009, IMF projections indicate that growth rates are expected to rise to 2.5 percent in 2015, with expected annual GDP growth of roughly 3 percent until 2019 .

**Figure 60: Annual Economic Growth Rates; Actual: 2006-2013; Projected: 2014-2018**

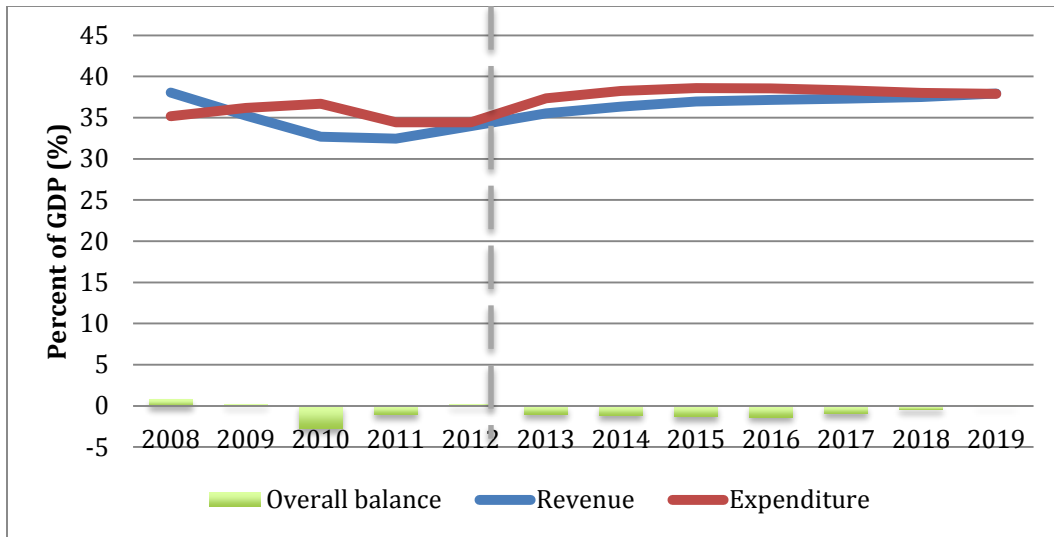


Source: IMF World Economic Outlook, 2014.

Note: Projections for Bulgaria start in 2014

However, Bulgaria’s key fiscal indicators are not projected to change substantially over the next five years. Both general government revenues and expenditures are expected remain roughly stable around 38 percent over the following four years (Figure ).

Figure 61: Key Fiscal Indicators: Actual: 2008-2012; Projected: 2013-2019



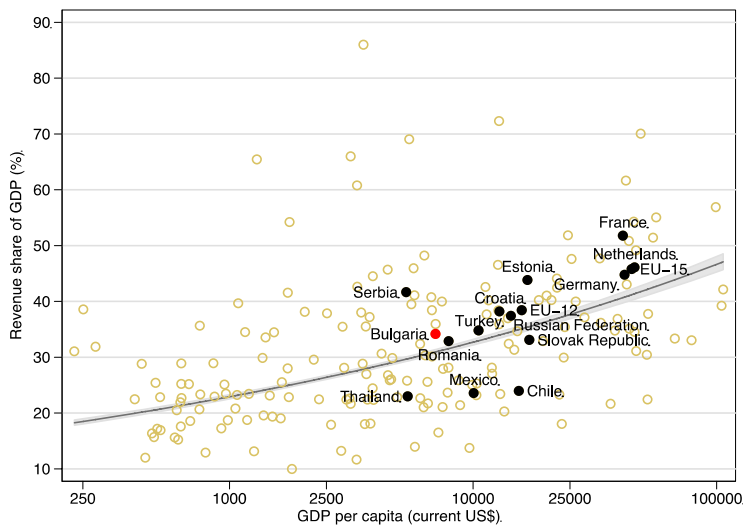
Source: IMF World Economic Outlook, 2014.

Note: Projections for Bulgaria start in 2013

### Improved Revenue Generation

Bulgaria's revenue and expenditures efforts are above average relative to other comparable income countries (Figure 62 and Figure 63). This suggests that it might be difficult to increase public spending on health. Instead, efficiency measures could be pursued.

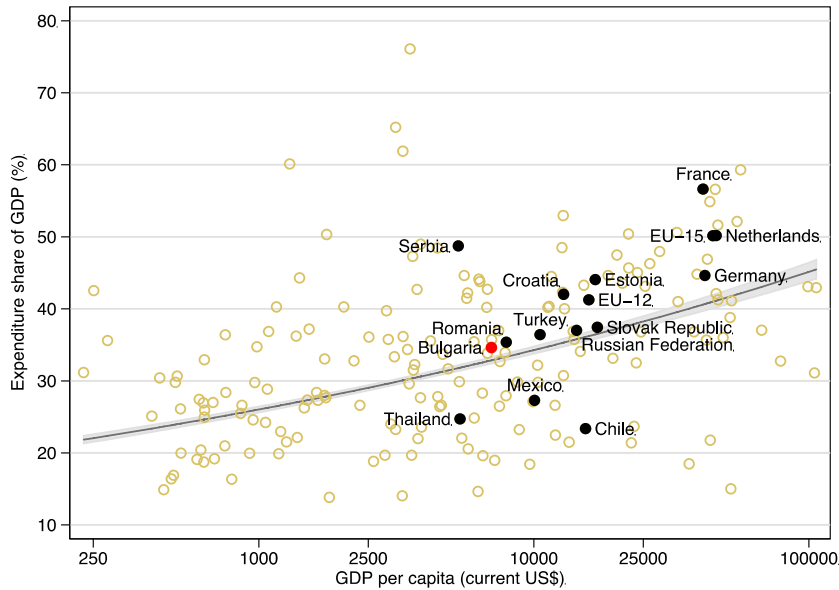
Figure 62: Revenue Share of GDP versus GDP Per Capita, 2012



Sources: World Development Indicators & WHO, 2014.

Note: Both axes log scale.

Figure 63: Expenditure Share of GDP versus GDP Per Capita, 2011



Source: World Development Indicators and WHO NHA, 2014

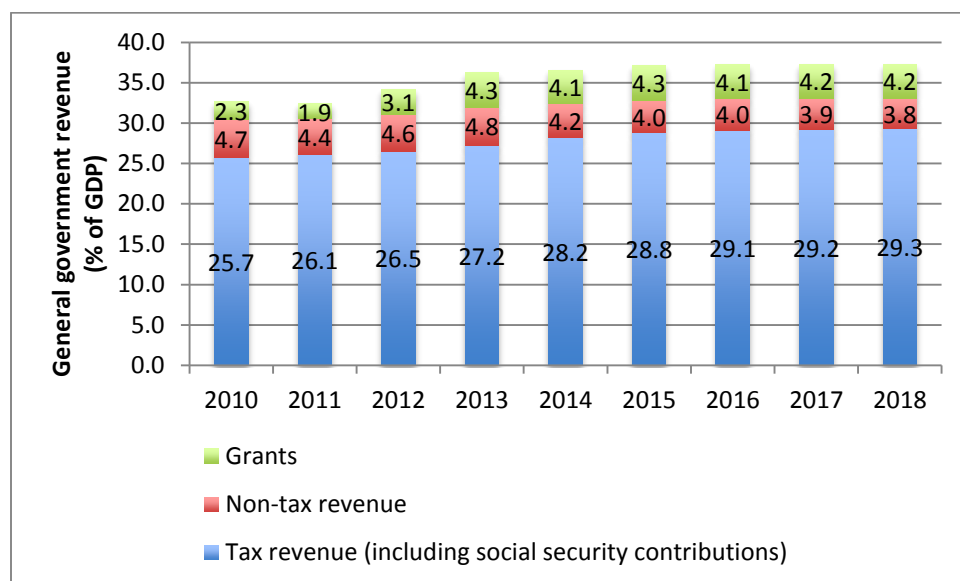
The composition of revenues is not expected to change significantly. As reported in the IMF Article IV, tax revenue (including social security contributions) will continue to represent the bulk of government revenues (almost 80 percent). The main sources of taxes are value-added taxes, social contributions, and excises (Figure 64).

Revenue figures vary depending on the source. According to data from IMF Article IV, in 2012 general government revenue represented 34.2 percent of GDP. Meanwhile, the World Bank Aging Report reports a figure of 30.5 percent of GDP in 2012. The latest report on taxation trends in the European Union from Eurostat (2014) presents a figure of 27.9 percent of GDP. The difference can be partly explained by the difference in the type/definition of revenue.<sup>7</sup> While IMF figures suggest that revenue is expected to increase slightly in the medium term, projections from the World Bank Aging Report suggest that revenue will decrease by slightly more than 1 percentage point between 2012 and 2020.

<sup>7</sup> IMF Article IV uses general government, which consists of the central government (budgetary funds, extra budgetary funds, and social security funds) and local governments. General government revenue includes tax revenue, including social security contributions, non-tax revenue, and grants. EU Tax Report (2014) also appears to use general government revenue but only includes tax revenue (indirect taxes, direct taxes, and social contributions). It does not take into account grants and non-tax revenue. If we compare the general government tax revenue from IMF Article IV with the general government tax revenue reported in the EU Tax Reports, the numbers still differ by more than 1 percentage point (26.5 percent of GDP versus 27.9 percent of GDP, respectively). The World Bank Aging Report (2013) and Onder et al. (2014), which serves as the basis for the figures presented in the Aging Report, do not specify whether the figures refer to general government revenue. The Aging Report does, however, include tax revenues, non-tax revenues, and grants when calculating the total revenue figure.

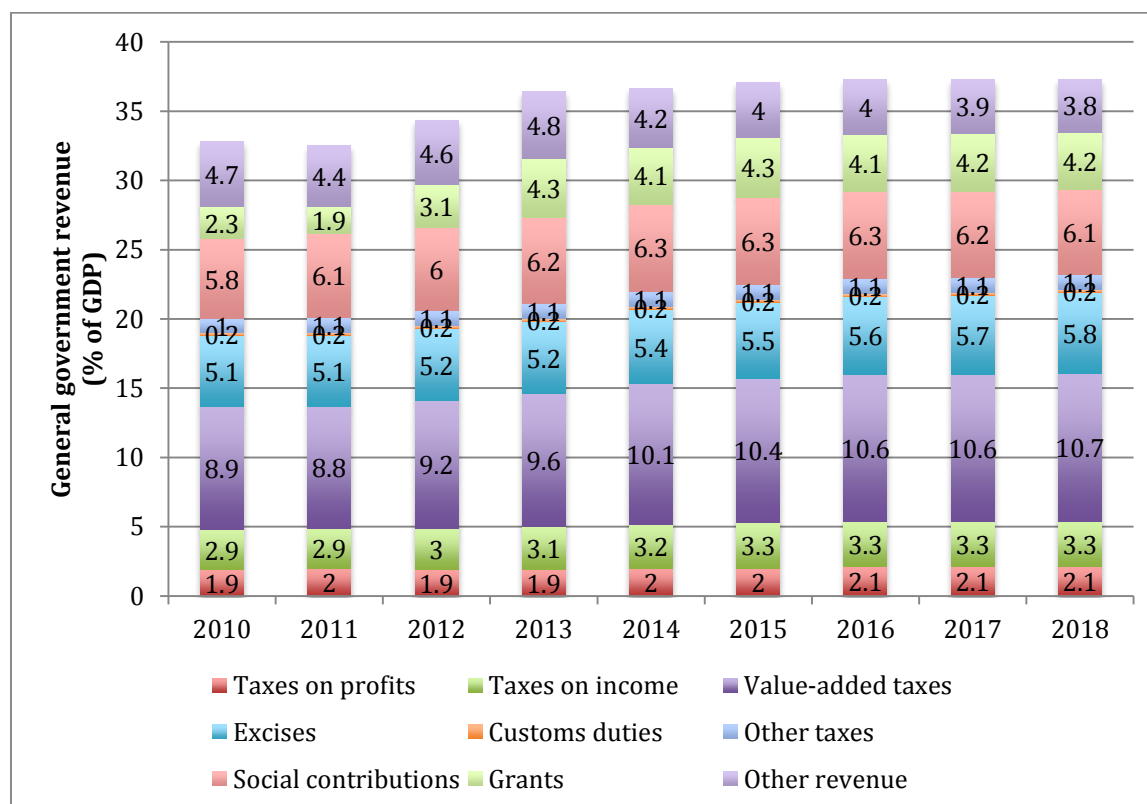


Figure 64: Bulgaria's revenue composition (Percent of GDP), 2010-2018



Source: IMF Article IV (2014)  
Notes: Projections begin in 2013

Figure 65: Bulgaria's revenue composition (detailed breakdown), 2010-2018



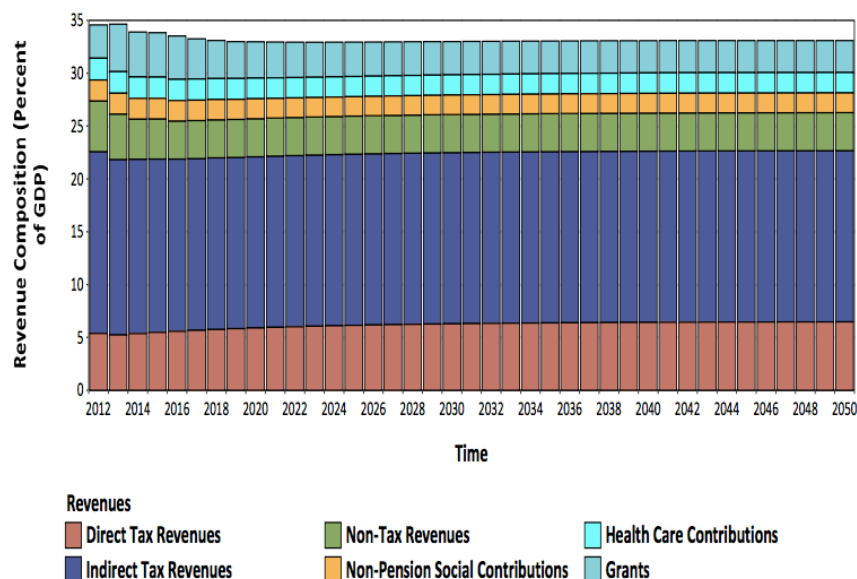
Source: IMF Article IV (2014)  
Notes: Projections begin in 2013

Figure 66: Revenue composition (Percent of GDP) in Bulgaria, 2012-2050

	2012	2015	2020	2025	2030	2035	2040	2045	2050
	Percent of GDP								
Direct tax revenues	5.4	5.5	5.9	6.1	6.3	6.4	6.4	6.5	6.5
Indirect tax revenues	17.2	16.4	16.2	16.2	16.2	16.2	16.2	16.2	16.2
Non-tax revenues	4.8	3.8	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Grants	3.1	3.8	3.4	3.3	3.2	3.1	3.1	3.0	3.0
Total	30.5	29.5	29.1	29.2	29.3	29.3	29.3	29.3	29.3

Source: World Bank (2013). Mitigating the Economic Impact of an Aging Population. Options for Bulgaria

Figure 67: Revenue composition (Percent of GDP) in Bulgaria, 2012-2050



Source: Onder et al. (2014)

Bulgaria is one of the two countries in the European Union, which relies heavily on indirect taxes, with indirect taxes representing more than 55 percent of government revenue in 2012.<sup>8</sup> VAT<sup>9</sup> accounted for 61

<sup>8</sup> The other country is Croatia, where indirect taxes also represent more than 50 percent of government revenue.

<sup>9</sup> The standard VAT rate is 20 percent, with a reduced rate of 9 percent applicable to hotel accommodation only (Eurostat, 2014).

percent of indirect tax revenue, while excise duties represented 33.3 percent. Social contributions represented 25.8 percent of total taxation in 2012 (Eurostat, 2014).<sup>10</sup>

Compared to other EU countries, Bulgaria relies more heavily on the central government for revenue collection. According to Eurostat (2014), revenue collected by the central government represented 70.3 percent of overall revenue in Bulgaria. This is almost 22 percentage points higher than the EU average share of revenues collected by the central government. The remaining 25.8 percent was collected through social security funds, and local government revenues represented only 3 percent of tax receipts (Eurostat, 2014). Revenue from labor taxation remains low, representing 9.2 percent of GDP. This is the lowest share in the EU and is almost 11 percentage points below the EU average.

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<sup>10</sup> Social insurance funds include contributions for pensions (17.8 percent), general sickness and maternity (3.5 percent), health (8 percent), and unemployment (1 percent). The contributions are shared between the employer and employee. For pension contributions, the employer is responsible for 9.9 percent and the employee for 7.9 percent. The other social contributions are shared between the employer and employee using a ratio of 60:40. The monthly ceiling income is set at BGN 2,400 (EUR 1,227).