REVIEW

10.2478/AMB-2026-0027

COMPARATIVE ANALYSIS OF THE SOCIAL DETERMINANTS AND HEALTH IN BULGARIA AND THE REPUBLIC OF SOUTH AFRICA: LESS OR MORE SIMILARITIES AND CONTRASTS?

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Abstract. Aim. *The aim of this review is to compare selected social determinants and population health indicators between Bulgaria and the Republic of South Africa (RSA), with a focus on how economic conditions, education, gender equity, and health system access influence health outcomes in both countries with differing historical and structural contexts.* ***Methodology.*** *A document-based comparative review was conducted using data from 2014 to 2024 drawn from international databases, national statistics, and peer-reviewed sources. Indicators were selected according to the Social Determinants of Health framework of the World Health Organization (WHO). The analysis was descriptive, focusing on several key domains (economy, education, gender equality, healthcare access) and significant health outcomes.* ***Results.*** *Bulgaria demonstrates lower maternal and infant mortality rates, higher life expectancy, and more stable healthcare access, although regional inequalities and minority exclusion remain a challenge. The RSA demonstrates more gender-diverse political representation and broader policy commitment to universal healthcare, but faces greater burdens from communicable diseases, high youth unemployment, and persistent poverty. In both countries, rural populations and vulnerable groups continue to experience significant barriers to health equity.* ***Conclusions.*** *Bulgaria and the RSA exhibit different health profiles shaped by social, economic, and historical factors. Reducing health inequalities in both settings will require sustained, context-sensitive, and multisectoral policy interventions.*

Key words: *economic conditions, gender equity, healthcare access, vulnerable groups, health inequalities*

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Received: *23 July 2025;* ***Revised/Accepted:*** *08 August 2025*

INTRODUCTION

The idea for this article was inspired by our visit to Kwazulu-Natal University in the Republic of South Africa (RSA) in March 2025. We had the opportunity to participate in the World TB Day and listen to different opinions of experts, teachers and students who were really worried about the situation in the RSA, where tuberculosis (TB) is one of the leading causes of death nowadays [1]. Travelling between different areas, we were confronted with the harsh reality of the huge social divide existing between the rich and the poor.

Bulgaria, on the other hand, along with the rapid population decline [2, 3], faces problems with marginalization and poverty affecting many Roma people, people in rural and remote areas, as well as many elderly people. These problems can partly explain the health inequalities that exist [4-6].

Significant differences between Bulgaria and the RSA are evident in terms of the geographic location, political and economic system, as well as culture. Whilst Bulgaria has been facing political instability and regional economic disparities in the last few years [4-6], the RSA continues to contend with its long legacy of racial discrimination, widespread poverty [7, 8] and a quadruple burden of disease [9, 10].

While a number of studies have found health inequities between low- and high-income countries, fewer have undertaken detailed comparisons between countries with different socio-political trajectories.

The main research question we raise in this review is if there are systematic differences in health outcomes between Bulgaria and the RSA and if these differences happen in a specific social, cultural and political context. We assume health inequalities within and between countries are associated with significant and persistent social disparities.

The comparative analysis done emerged from the academic collaboration between researchers from the Medical University – Sofia (Bulgaria) and the University of KwaZulu-Natal (RSA) and was prompted by the topics of mutual interest discussed during the visits in each country, such as: leading health conditions, social determinants of health, health systems, etc.

MATERIALS AND METHODS

A comparative document analysis was done based on the WHO Conceptual Framework on the Social Determinants of Health [11, 12]. Data were drawn from publicly available sources, including international databases (World Bank, WHO, UNICEF, Statista, Institute for Health Metrics and Evaluation, European Observatory on Health Systems and Policies) for country classifications by income level, gross domestic product (GDP), inflation, poverty ratio, literacy rate, and children out of school (primary) in 2023; key health indicators such as birth and death rates, maternal mortality ratio (MMR), infant mortality rate (IMR), child mortality (U5MR), and life expectancy (LE) in 2023, leading causes for death and disabilities and related risk factors in 2021, health system in 2024 [2 ,10, 13, 14], national statistics (Bulgaria's National Statistical Institute; Statistics South Africa) for poverty and social inclusion, and unemployment rates in 2024 [5, 6, 15], and peer-reviewed literature. Only data published between 2014 and 2024 were included, with the most recent values used for each indicator.

Key indicators were grouped into four domains: economic status, education, gender equity, and healthcare access, along with selected health outcome measures. Where needed, data were aligned by year or converted to common formats for comparability.

Broader global context

Bulgaria and the RSA occupy distinct geopolitical spaces, Southeast Europe and Southern Africa respectively, with different political histories, organizational frameworks and patterns of living [4, 7, 8, 16-18]. Indeed, both countries are not spared by global economic integration, geopolitics and its related risks for the political stability, national economy, welfare, environmental pressures, and population health. While each nation has made progress in improving access to healthcare and addressing social needs [19], health disparities are still persistent [8, 14, 20, 21], mirroring global patterns of inequality.

The effects of globalization on health and health systems are increasingly apparent. Liberalization of markets, trade of unhealthy commodities, and persuasion of commercial health influences have altered consumption patterns, and threaten regulatory capacity in many middle-income countries. For example, the global tobacco and processed food industries have successfully penetrated vulnerable markets, often targeting low-income groups and younger populations with aggressive marketing strategies. This is concerning, particularly in contexts where health education, regulatory control and access to preventive health initiatives are found wanting [22-24].

In parallel, many low- and middle-income countries (LMICs) continue to face the dual burden of disease. While communicable diseases such as TB and HIV/AIDS are responsible for significantly high mortality rates in some countries, including the RSA, non-communicable diseases (NCDs) such as cardiovascular diseases, diabetes and cancer are acutely on the rise in many countries around the world. These conditions are driven by the combination of metabolic risk factors (RFs), behavioral patterns shaped by social context, rapid urbanization and global consumer behavior. This situation requires a sustained and coordinated response that is not fixated on healthcare delivery alone, but is multifaceted, including urban planning, food systems, taxation and education [22].

Another shared concern across LMICs is the migration of health professionals to high-income countries (HICs). That contributes to workforce shortage in the public sector, undermining the ability of countries to provide equitable care, especially in rural and underserved communities. Although healthcare systems play a critical role in improving health outcomes, they cannot work in isolation, and cannot ameliorate the effect of poor housing, overcrowding, inadequate education, poverty, or environmental hazards. Achieving the sustainable developmental goals (SDGs) will require a collaborative multisectoral effort to address the structural determinants that perpetuate health inequality and deny the universal health coverage [22].

In light of these challenges, the comparative analysis of Bulgaria and the RSA offers an opportunity to reflect on how these countries, despite their differing trajectories, confront common pressures that shape their population health outcomes. The following sections provide a contextual overview of each country, followed by a comparative examination of key social and health indicators.

Brief description of countries

Bulgaria

Bulgaria was founded in 681 AD and is one of the oldest states globally. Bulgaria is a country in Southeast Europe bordered by Greece and Turkey in the south, Serbia and North Macedonia in the west, and Romania in the north [16, 17]. The country is characterized by two climatic regions: a continental climate in the north and a Mediterranean influence in the south [18].

Bulgaria is a parliamentary republic [16, 17]. Over the past three decades, the country has undergone a significant political and economic transformation, moving from a socialist political system and highly centralized planned economy to a democratic republic and market-oriented, high-income economy [4]. Sofia is the Bulgarian capital, with more than one million inhabitants.

As of 2023, the country's economy is primarily service-based, with services contributing over 60% to the GDP, followed by industry (22.7%) and the much smaller agricultural sector (2.5%) [7].

Bulgaria joined the European Union (EU) in 2007, a move that has supported structural reforms and access to the EU funding, but internal disparities still remain.

Republic of South Africa

The RSA became a republic in 1961 after hundreds of years of Dutch and British colonization and decades of apartheid. Situated at the southern tip of the African continent, it shares borders with Namibia, Botswana, Zimbabwe, Mozambique, and Eswatini. It has a diverse climate, ranging from subtropical in the east to more temperate zones in the interior. The country transitioned from a system of racial segregation to a democratic system in 1994, and today operates as a multiparty parliamentary republic. It has three capitals: Pretoria (administrative), Cape Town (legislative), and Bloemfontein (judicial) – reflecting its complex political structure [8, 18].

As Africa's most industrialized economy, the RSA has a large and diverse economic base, with services contributing the largest share to the GDP (62.6%), followed by industry (24.6%) and agriculture (2.6%). However, economic growth has been inconsistent in recent years due to infrastructure constraints, energy instability, and labor market inefficiencies. The country continues to experience deep structural inequalities, including high levels of unemployment, spatial segregation, and limited access to basic services in many areas. These factors intersect with historical legacies to shape present-day disparities in health and wellbeing [7, 8].

Social determinants of health

The concept of social determinants of health (SDH) refers to the conditions under which people are born, grow, study, play, work, live, age, and die along with the wider social context (policies, programs, social norms, political systems) that influence those conditions. The SDH have both positive and negative effects on health equity [11] and the complex mechanism of their influence at different levels [12] is presented on Figure 1.

Health inequalities are caused by the uneven distribution of power, money and resources between countries and within countries. Numerous studies have found that both structural determinants and circumstances are responsible for more than 50% of health problems and their roots are outside the healthcare sector. Yet, the role of the healthcare system is important through ensuring access to goods and products for the citizens and managing intersectional actions with direct and indirect effect on health [11, 12].

In this analysis we adopt the World Health Organization's SDH framework to examine selected indicators for Bulgaria and the RSA by summarizing data of macroeconomic, education, gender equality, and some other indicators in Table 1.

Economy

Bulgaria

According to the World Bank classification for 2023, Bulgaria moved from the upper-middle-income to the high-income group of countries with a modest economic growth [13], mostly due to household consumption [25]. GDP per capita in Bulgaria in 2023 was 15,886.5 US$ [2]. There is an upward trend of the employment rate (70.7%, respectively 67.4% for women and 73.9% for men in 2023). Labor and skill shortages have become more prominent: scarcity of available skilled workers is a long-term barrier for investments, along with the continuous shrinking of the working-age population [4, 25].

Bulgaria faces significant social disparities both within and between its regions. Economic activity is highly concentrated in the capital region, and mostly in urban areas. Unfortunately, economic activity for youth aged 15-24 is 2 times lower than in the EU, but only one-third reported education as a reason for unemployment. Variations of unemployment rates exist between different subgroups of the total population (Table 1), which are closely related to disparities of economic activity and productivity. Despite the progress of performance of all SDG 1 indicators over time, people at risk of poverty and social exclusion are mainly children (39.1%), those living in rural and remote areas (42.5%), people with disabilities (45.3%), and Roma people (78.7%) [4-6].

Republic of South Africa

The RSA has the largest economy in Africa and it is an upper-middle-income economy, with GDP per capita of 6,002.5 in 2023 [2, 8]. However, deceleration of the economic growth resulted from infrastructure constraints, a weak business environment and low productivity. The pace of job creation is slower than the growing labor force, which results in high unemployment rates (32.1% vs. 41.1% employment rate), especially among women, and youth 15-24 years of

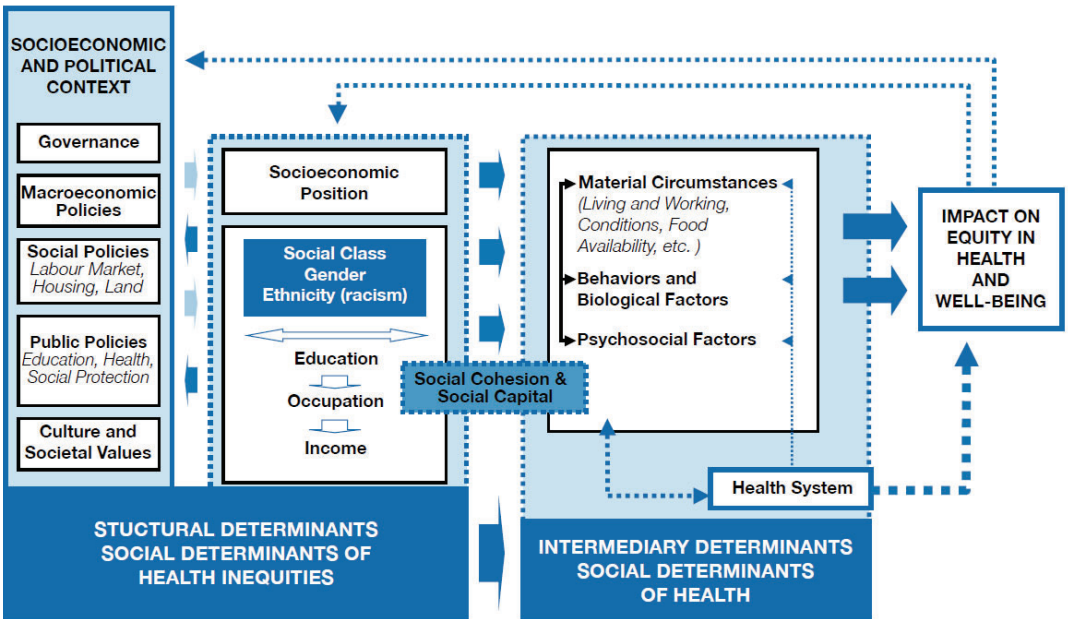

Fig. 1. The WHO Conceptual SDOH framework [11]

Table 1. Key social determinants of health data for Bulgaria and South Africa (latest available data)

Indicator	Bulgaria	Republic of South Africa
Economy		
GDP per capita $US[1]	15,885.5	6,002.5
Unemployment rate (%)		
Total[2]	4.3	32.1
Capital[3]	3.5	22.9 (Cape Town in 2022)
Least developed region[4]	11.0	53.3
Urban/Rural areas[5]	3.2/7.5	10.1/25.5
Men/Women[6]	4.4/3.9	9.5/14.0
Age groups 15-24 yrs/55 and over yrs[7]	12.3/3.1	59.6/11.4
Inflation, consumer prices (%)[8]	2.4	4.4
Poverty ratio at $2.15 a day (%)[9]	0.7	20.5
#at national poverty lines (%)		
Total (%)[10]	20.6	55.5
Children[11]	39.1	49
Retired[12]	26.4	29
People living in rural and remote areas[13]	42.5	81.3
People with disabilities[14]	45.3	
Ethnic/Race[15]	78.7	64
Education		
Literacy rate, adult total (% of people aged 15+)[16]	98	90
Children out of school (% of primary school age)[17]	5	12
Gender equity		
Gender gap index (0-100)[18]	0.723	0.785
Economic participation and opportunity	0.748	0.653
Educational attainment	0.993	0.997
Health and survival	0.979	0.979
Political empowerment	0.174	0.513
Universal healthcare		
UHC service coverage index[19]	73	71

Sources of data: [1,2,6,8-10,16,17]World Bank Database [2], [3-7,11-15]European Commission (2023) [4], [3-7,10-15]Ministry of Finance (2024) [25], [3-7]National Statistical Institute [5], [10-15]National Statistical Institute [6], [3-7,11-15]World Bank (2022) [26], [11-15]World Bank Group (2020) [27], [11-15]Bila et Biyase (2022) [28], [18]World Economic Forum (2024) [29], [19]WHO, World Bank Group, OECD (2021) [19]

GDP = Gross domestic product; UHC = Universal Health Coverage

In 2023, the average monthly poverty line for Bulgaria was 637.92 ($US 370.82) BGN per person. In contrast, the national level of poverty was ZAR 992 ($US 53.1) a month in the RSA.

age [8, 15, 30]. Inequality measured by the Gini coefficient remains among the highest in the world and race is the most important driver of inequality (41%), followed by educational attainment (30%) and disparities by employment outcomes (16%) [8, 26, 31]. After the democratic elections of 1994, high levels of income disparities (vertical inequalities) have been noted: a few high-income earners, a relatively small middle class and high levels of chronic poverty (30.3 million people, or 55.5%, lived at the national level of poverty of ZAR 992 and 13.8 million people, or 25%, experienced food crisis in 2014) remain the predominant economic picture [8, 27, 28]. However, it also has horizontal inequalities (Table 1) and people with disabilities, and Black South Africans are mostly poor and unemployed [32].

Economic realities in both countries differ sharply. Bulgaria's relatively high GDP per capita, low unemployment rate, and EU membership provide a degree of economic stability, though regional disparities and demographic decline remain key concerns. The RSA, on the other hand, faces persistently high unemployment – especially among youth and women – and structural inequality, much of it rooted in the historical disadvantage. Income distribution in the RSA is more unequal, with poverty affecting a larger share of the population and intersecting strongly with race, geography, and disability status. These economic differences affect social development and health outcomes in both countries.

Education

Education is one of the most important social determinants that shape development and well-being. If competences are acquired, people can lead more independent and fulfilling lives. This process is closely related to organization, structure and interpersonal relations in the educational facilities, and policies implemented there to tackle social inequalities [12, 33].

Educational attainment is one of the indicators of current socioeconomic status. It is usually acquired by early adulthood and provides formal qualifications contributing to socioeconomic status (occupation and

income) of individuals and is more likely to promote a healthy lifestyle [12]. A number of studies found experiences in early and later education, along with those in early childhood, have a crucial role for the entire life course [11].

Bulgaria

Education in Bulgaria is secular and free in state-owned and municipal schools. School education is mandatory from the age of 7 to the age of 16 [17]. Educational public policies (school and preschool activities, kindergartens, activities for children and students with special educational needs, etc.) run and funded by the state and municipalities are crucial for children's development and well-being [34]. However, challenges persist regarding the effectiveness of inclusive education and early learning for most vulnerable groups (poor, ethnic minorities, and children with disabilities). More than 150,000 children are out of school (14,000 children with disabilities) and around 15,000 children drop out of primary (45% of Roma children) and lower-secondary education (15% of Roma children) a year. Out of those who attend school, over 40% are nonetheless illiterate in reading, mathematics and science [35-37].

Republic of South Africa

The RSA education system remains in a state of transformation. Multiple factors (such as poverty, unemployment, corruption, teenage pregnancy, violence, gang warfare, low moral values, under-performance of teachers, poor sanitation, lack of transport to school) within and outside the educational system lead to difficulties both in teaching and learning. The quality of early learning and development programs remain a challenge due to inadequate accommodation and facilities, lack of assistive technology, and insufficient staff. Poverty and inequality are harsh determinants, preventing many children from accessing the quality basic education that they need. All these result in high rates of absenteeism, truancy, children out of school (32% of children and youth aged 5-24 with disabilities) and children who drop out of school (from 14% among those aged 5 to 28% among those aged 18), as well as poor academic performance (reading and writing skills significantly decreased by 10 per cent for the period 2016-2021, and only 41% of children had acquired mathematical knowledge and skills), fewer job opportunities, and lower wages [8, 38].

Bulgaria shows higher national literacy rates and lower school dropout levels, though vulnerable populations, including Roma children and those in remote areas, still face substantial barriers to educational attainment. The RSA continues to confront more systemic challenges: insufficient infrastructure, under-resourced schools, and high dropout rates, especially among the poorest and among children with disabilities. In both contexts, education remains a powerful SDH, influencing employment prospects, health literacy, and access to services. While Bulgaria's challenges relate more to equity within a functioning system, the educational system in the other country is more foundational and systemic, with direct links to long-term health inequality.

Gender equity

Gender inequalities are socially generated and this is present in the way in which institutions are organized and policies are implemented, as well as in power, prestige, resources, and social values. In many societies women earn less, have less opportunity for education and employment, and do not have the same rights as men [11, 12].

The Global Gender Gap index was used as a measure of gender parity across four key dimensions: economic participation and opportunity, educational attainment, health and survival, and political empowerment. Ranging from 0 to 100, it is interpreted as a percentage of the gender gap that has been closed total and in each dimension [29]. Bulgaria had a score of 0.723 and 60th rank globally, respectively 28th in Europe. The RSA performed better in 2024, with a total score of 0.785 and ranked 2nd and 18th, respectively, both regionally and globally (Table 1). Disparities between countries are significant when comparing gender parity in two dimensions. Bulgaria fell behind in political empowerment (92nd rank): the share of women in parliament and on ministerial positions, and years with female/male head of state [29]. In contrast, the RSA lagged behind in economic participation and opportunity for women (96th rank), especially senior positions held by women, estimated earned income, and wage equality for similar work [8, 29].

The overall gender equity scores of both countries reflect different strengths and weaknesses. The RSA's strong performance in political empowerment contrasts with Bulgaria's more limited female political representation. Conversely, Bulgaria has narrower gender gaps in economic participation and educational attainment. Despite these differences, both countries continue to face structural and cultural barriers that limit equal opportunities for women. These inequities negatively affect access to health services, increase exposure to violence, and worsen the social and economic conditions that underpin women's health. Gender disparities remain an important axis of health inequality in both contexts, though the nature and manifestations of these disparities differ.

Universal healthcare

Contemporary systems for healthcare are based on the principles of equity, disease prevention and health promotion and focus on primary healthcare. They must guarantee universal healthcare (UHC) coverage to the full range of quality health services people need without financial hardship [11, 12]. We used the UHC service coverage index (UHC SCI), which covers 14 tracer indicators and is measured on a 5-level scale of 0-100 (< 20, very low to > 80, very high), to examine the status of UHC in both countries. There is a strong positive relationship between UHC SCI and gross national product per capita. Persistent inequalities in UHC exist both between and within countries [19]. In 2021 both countries had high UHC SCI (Table 1). Despite these similar results, there are a number of weaknesses of the health systems that hinder the provision of equal and fair access to the basic health services for everyone in both countries. Around 11-12% of Bulgarian citizens remain uninsured, mostly those living abroad, long-term unemployed people and many people without valid identity cards (Roma population, homeless people and undocumented migrants) [32]. Technically, the RSA health system complies with the requirements for UHC but considerable weaknesses (weak and uneven leadership, systemic corruption, inequality and inefficiency in resource distribution, shortage of health workers) exist that result in ineffective, inefficient and poor quality of care provided in many public health facilities (longer waiting times, poor hygiene, weak financing approaches), as well as poor health system performance (175th rank across 191 countries). In 2023, only 16 per cent of South Africans were covered by a medical aid scheme, and Black Africans, especially those residing in Limpopo, KwaZulu-Natal and Eastern Cape, were least likely to be health insured [8, 20, 21].

Both countries score similarly on the UHC SCI, but the nature of healthcare access challenges diverges. Bulgaria's health system, supported by EU frameworks, offers fairly broad health service coverage, though regional disparities and gaps in insurance coverage for specific groups still persist. The RSA's two-tiered system presents a more pronounced divide between public and private healthcare, with significant disparities in service quality, staffing, and infrastructure. While both countries face challenges related to workforce shortages and rural access, the scale and depth of inequity in the RSA's health system have a more direct and visible impact on population health outcomes.

Population health and health inequalities

Bulgaria

Bulgaria had an estimated population of 6,445,481 in 2023, out of which 51.9% were female, and 23.8% – people aged 65 and older. Since 1989 Bulgaria has been at the fifth stage of the demographic transition, with birth rates of 8.9‰ (total fertility rate was 1.81 per woman) and death rates of 15.7‰ in 2023 [2, 3]. Bulgaria remains the country with the highest mortality rate among EU countries. Leading causes for mortality in 2023 were: cardiovascular diseases or CVDs (61.1%, mostly stroke and ischemic heart disease), neoplasms (16.5%, mostly lung cancer), and diseases of the digestive system (4.3%) [3, 10]. Almost half of the deaths were attributed to behavioral and environmental RFs, respectively low fresh fruit and vegetable intake and high salt and sugar consumption (29%), smoking (18%), air pollution (9%), and alcohol consumption (7%) [7]. Main contributors for both cases of premature death and disability (Table 2) were mostly metabolic RFs and an upward trend has been observed for the period of 2011-2021 in the prevalence of the high body mass index, high fasting plasma glucose, and high alcohol use [3, 10, 39].

The IMR was reduced up to 4.9‰ in 2023, but still remains higher than the average for the EU (3.3‰). The difference between the lowest and the highest values in IMR regionally was more than 10-fold (Table 2). Disparities also exist between urban (4.2‰) and rural areas (7‰), drawing attention to gaps in healthcare for pregnant women and children in the first year of life, differences in parental health knowledge, and deterioration of socioeconomic conditions in rural areas [40]. Although most deaths occurred during the perinatal period, postneonatal mortality rate was higher than the EU average (2.3‰ vs. 1.0‰). Perinatal conditions, congenital malformations, respiratory diseases and symptoms, signs, abnormal clinical and laboratory findings, are leading causes for IMR [3].

The MMR was 8.7 per 100,000 live births in 2023 and was higher than the average (5 per 100,000 live births) for the EU [2, 3]. Direct maternal deaths (79%) predominated due to: hemorrhages (30%), embolism (24%), and preeclampsia and sepsis (14%) [41]. Pregnant women living in rural areas remain considerably more vulnerable to complications. Ante- and postnatal hemorrhages were the leading complications, especially related to the Cesarean section. A number of omissions and violations due to noncompliance with medical standards have been found in relation to maternal deaths [40]. The existing shortage of general practitioners, obstetricians and gynecologists hinders the access of women to key healthcare services in many villages and small towns, [38] along with a high number of health uninsured Roma women [4, 36, 39].

Bulgaria had 5-year-lower LE than the rest of the EU [14] and Bulgarian men live on average 8 years less

than women at birth (Table 2). Disparities in LE also exist by residence – rural dwellers live 3 years less (71.29 yrs vs. 74.37 yrs) than urban citizens [42] – and reflect lower socioeconomic status and limited access to healthcare in rural areas.

Bulgaria has made notable progress in reducing maternal and infant mortality and controlling NCDs risk factors for the last two decades. However, it still records some of the highest mortality rates in the EU, largely dominated by cardiovascular diseases and ageing demographics. Health inequalities are strongly influenced by regional disparities, rural underdevelopment, and socioeconomic marginalization of specific groups, such as the Roma population. While health service availability has improved, access to quality healthcare in rural and economically depressed areas remains uneven. These trends highlight the role of social and geographic inequality in shaping health outcomes in a post-transition, high-income European context.

Republic of South Africa

The population of the RSA was estimated to be 63,212,380 people in 2023, with just over half of them being women (51.4%), and with people aged 65 and older accounting for 7% of the total population. Population growth is primarily driven by fertility, although the total fertility declined to 2.2 children per woman in 2023 [8]. The RSA is currently undergoing the third stage of the demographic transition with both birth rates (19‰) and death rates (9‰) declining in 2023 [2]. HIV/AIDS remains the leading cause of death, accounting for 23.3% of all deaths, and concomitant TB infection contributing to 45.7% of these deaths (Table 2). Unfortunately, the prevention and treatment of TB lags behind the SDG targets, the treatment rate of 80% is below than the desired 85% [9]. This is due to the challenges posed by late detection and diagnosis, stigma, co-infection with HIV, and insufficient healthcare infrastructure. Deaths due to NCDs (CVDs, cancer, diabetes, chronic lower respiratory diseases, and mental disorders) increased by 59% for the last 20 years due to a rapidly ageing population, sharply increasing co- and multimorbidity and the prevalence of RFs, such as smoking, sedentary lifestyle, harmful alcohol consumption, unhealthy diet and air pollution [31, 10]. An upward trend of the prevalence of three metabolic RFs (high body mass index, high fasting plasma glucose and dietary risks) has been noted over the preceding ten years, most likely driving the morbidity and mortality patterns observed [10].

The health and well-being of many children in the RSA is at risk, as half of all households struggle to meet basic food needs, which renders children vulnerable to malnutrition. More than one-third (34.3% or 4.8 million) were children living below the poverty line in 2022; multidimensional child poverty was higher in households with ≥7 members, where the head of household was a Black African, had lower education, and in the provinces of Limpopo (82.8%), Eastern Cape (78.7%) and KwaZulu-Natal (75.8%), as opposed to the Western Cape (37.1%) and Gauteng (33.6%). Poor nutrition in childhood, particularly due to food insecurity related to climate change, is a common problem and is closely related to many cases of child mortality (U5MR), stunting and wasting, and poor cognitive development [8].

Despite the progress of reducing IMR and U5MR globally, it still remains a major challenge for the RSA. The IMR was 24 per 1,000 live births (medium) in 2023 compared to the worldwide high of 27 per 1,000 live births [2, 8]. Most deaths occurred in the post-neonatal period (28th day after birth – 1 year of age) and leading causes of IMR were: diarrheal disease, meningitis, lower respiratory tract infections such as pneumonia, perinatal conditions associated with HIV/AIDS and malnutrition [1]. Besides biological determinants, there are social and economic determinants that influence IMR and U5MR and hinder RSA meeting the SDGs. Regional disparities of IMR (Table 2) still exist and are mostly predetermined by HIV/AIDS and poverty [43]. More than half of the RSA's children are not exclusively breastfed due to poor maternal nutrition and aggressive marketing of breastmilk substitutes. Vaccination coverage has been improving over time, and 84% of children had received all basic vaccinations up to one year of age, along with the reduction in HIV prevalence among pregnant women and children, and better case management of diarrhea and pneumonia [8, 31].

Over the past two decades, MMR has been reduced – from 173 deaths per 100,000 live births in 2000 to 118 per 100,000 live births in 2023, particularly due to decreased prevalence of HIV/AIDS. The MMR was lower than the average value for the world (197 per 100,000 live births) and the Sub-Saharan region (448 per 100,000 live births), but is still higher than in the average upper-middle income countries (61 per 100,000 live births) [8, 43, 44]. Differences in the MMR existed by province (Table 2) and might be associated with differences in allocation of trained staff and healthcare facilities, number of antenatal care visits and frequency of seeking medical aid, as well as medical errors. Leading causes of maternal deaths were: non-pregnancy related infections (29%), obstetric hemorrhages (16-17%), hypertensive disorders of pregnancy (15-17%), medical and

surgical disorders (14%) [8, 31, 1]. Of note, complications during pregnancy and childbirth are associated with a high adolescent fertility rate (61 per 1,000 vs. 100 per 1,000 for Sub-Saharan Africa, and 28 per 1,000 for upper-middle income countries) and significant regional disparities. This is influenced by incomplete education levels and poverty [8].

Improvements in LE over the last three decades have resulted in reducing overall mortality; and sustainable reductions in infant, child and maternal mortality; in particular, the erosion of LE as a result of the HIV/AIDS epidemic was reversed, mainly as a result of the implementation of the National Strategic HIV/AIDS and STI Policy, which governed the successful antiretroviral program since the early 2000s, making it the largest treatment program globally [31, 45, 46]. The LE at birth was 66 in 2023 (Table 2), although still lower than the average global of 73, but higher than that of 63 for Sub-Saharan Africa [2]. Disparities in LE exist by sex and residence – newborn boys had LE 7 years lower than girls, and lower LE are experienced in rural compared to urban areas [45]. While HIV/AIDS might be the main driver of these urban/rural health disparities, other factors include: poor overall health status and quality of life, and higher functional disability and underweight, which may be related to its lower socio-economic status and higher unemployment. In contrast, urban residence was significantly associated with higher prevalence of diabetes, which may be explained with a higher prevalence of combined RFs (unhealthy diet, sedentary lifestyle and obesity) [42].

The RSA continues to carry the high burden of infectious diseases, particularly HIV/AIDS and TB, alongside a growing prevalence of NCDs. Maternal and infant mortality rates remain substantially higher than in Bulgaria, with marked provincial and socioeconomic disparities. Structural challenges within the health system, compounded by poverty, food insecurity, and adolescent pregnancy, contribute to elevated mortality and morbidity. While improvements in antiretroviral therapy and maternal health programs have shown impact, service delivery gaps and systemic inequities continue to limit progress, particularly in rural provinces and historically disadvantaged communities.

Table 2. Health inequality indicators in Bulgaria and South Africa (latest available data)

Indicator	Bulgaria	South Africa
Infant mortality rate		
Total	4.9	24
Male	5.1	26
Female	3.8	22
The lowest	1.3 (Kyustendil)	0.9 (Northern Cape)
The highest	12.8 (Razgrad)	6.3 (KwaZulu-Natal)
Maternal mortality ratio		
Total	7.1	118
The lowest	N/A	71.8 (Western Cape)
The highest	N/A	156.5 (Northern Cape)
Leading causes of death	Stroke – 17.4% Ischemic heart disease – 12.9% Digestive diseases – 4.3% Lung cancer – 3.3%	HIV/AID – 23.3% Stroke – 7.7% Tuberculosis – 6.3% Hypertension – 6.3%
Life expectancy at birth		
Total	76	66
Male	72	63
Female	80	70
Leading causes of DALYs	Ischemic heart disease – 12,836.71 COVID-19 – 11,878.18 Stroke – 6,588.2 Hypertensive heart disease – 2,390.3 Trachea, bronchus, lung cancers – 2,029.59	COVID-19 – 9,505.15 HIV – 5,919.61 Tuberculosis – 5,716.72 Interpersonal violence – 3,351.83 Lower respiratory infections – 2,693.72
Leading RFs drive the most DALYs cases	High blood pressure Dietary risks High body-mass index Tobacco High fasting plasma glucose	Unsafe sex Malnutrition High body-mass index High blood pressure High fasting plasma glucose

While Bulgaria and the RSA face different public health priorities – NCDs management in the context of an ageing population versus dual disease burden and inequality – both countries illustrate how health outcomes are shaped by broader social and structural forces. In each case, addressing rural-urban disparities, improving access to maternal and child healthcare, and mitigating the effects of poverty and marginalization remain essential to reducing avoidable mortality and strengthening population health.

Social production of health and disease – a view of what is known and how the health disparities between Bulgaria and the Republic of South Africa might be explained

A holistic and systematic view of SDH is the only way to understand how health inequalities arise and persist between countries and within a country using three main theoretical mechanisms: social selection, social causation and life course perspective [11, 12]. Improving health and well-being globally, regionally and at the state level is closely related to addressing inequalities existing between privileged and disadvantaged groups, improving conditions of daily living (early childhood, schooling, working conditions, housing) and guaranteeing a fair access to goods and products for everyone through timely, effective, adequate and long-term policies and actions.

This review article confirms the presence of a significant healthcare gap between Bulgaria and the RSA as a result of differing social gradients in health [12]. Despite the progress of reducing mortality over time, there are dramatic differences in mortality patterns which partly reflect imbalance in the power and prosperity of nations as a result of globalization [11, 22-24]. Infant mortality in the RSA was five times higher than in Bulgaria, and the differences are more striking when comparing MMR (118 per 100,000 vs. 7.1 per 100,000). Gender and regional disparity rates of these indicators in each of the countries are signs for existing socioeconomic inequalities and differences in healthcare access. Similarly, there is a longevity gap between men and women, as well as an urban-rural gap within countries in parallel with 10 years' difference in LE between countries. Economic processes and political decisions (e.g. urban planning, finance, education, housing, employment, transport, healthcare) in a country determine allocation of the resources between individuals and population groups, thus ensuring opportunities and access to public goods and services [11, 12]. This is evident when health disparities are viewed in parallel with differences in macroeconomic indicators and educational achievements. For countries at all levels of economic development, increasing public spending on activities promoting child development, education, living and working conditions, and healthcare, is fundamental to the welfare and well-being of citizens [12]. Therein, Bulgaria [4-6, 13, 14] and the RSA [8, 15, 20, 21, 30, 31] have different opportunities, along with differences in topography and climate changes resulting in health disparities. Despite better overall performance in the Gender gap index [29], the higher MMR in the RSA might be explained through the persistence of gender inequalities; economic opportunities, unemployment rates, poverty rates, educational achievements were higher in women than in men [8, 15, 30, 38].

Under globalization, it has been observed that increasing market integration with subsequent significant changes in labor, employment, working conditions and commercialization of goods and services, may contribute to some of the observed detrimental effects on health [11, 22-24]. Both countries have failed to tackle the epidemics of NCDs attributed mostly to the metabolic and behavioral RFs [3, 10, 31, 39]. Social causation perspective considers that social position determines health through intermediate factors, such as material factors, personal behavior, health system; although behavioral patterns differ significantly from one country to another [12], influenced also by cultural and social norms.

The social production of health in both Bulgaria and RSA reflects the embedded effects of inequality, shaped over time by historical, political, and economic systems. In Bulgaria, the lingering impact of post-socialist transitions is evident in regional economic imbalances, ageing demographics, and unequal access to care for minority groups. In the RSA, persistent structural inequality – rooted in historical racial discrimination – continues to influence patterns of poverty, education, employment, and health access. While both countries grapple with the health consequences of social stratification, their specific challenges differ in scope and depth. What unites them is the need for policy responses that address not only individual health behavior, but the upstream conditions – economic, social, and institutional – that determine health across generations.

CONCLUSION

This comparative review has highlighted how both countries, Bulgaria and the RSA, experience markedly different health outcomes, shaped by distinct historical trajectories, political transitions, and structural inequalities. While both nations have taken steps to address the social determinants of health, the distribution of health risks and access to healthcare re-

mains uneven within each country, and the scale and character of these inequalities differ substantially.

Bulgaria's challenges are primarily linked to regional economic disparities, demographic ageing, and the exclusion of marginalized groups such as the Roma population. In contrast, the RSA faces a more pronounced dual burden of disease, with a high prevalence of communicable diseases persisting alongside rising NCDs. This burden is compounded by persistent poverty, systemic inequality, and uneven health system performance – particularly in under-resourced provinces.

Despite these differences, both countries face common challenges in realizing equitable health outcomes. These include improving access to quality healthcare in rural and underserved areas, addressing structural unemployment, and ensuring that vulnerable groups are not left behind in national health and development strategies. Addressing such disparities will require policy efforts that go beyond the health sector, including investments in education, gender equity, infrastructure, and social protection.

This analysis does not propose a single solution, but rather illustrates how context matters in understanding health inequality. While the pathways differ, the need for sustained, multisectoral approaches to reducing health disparities is shared. The collaborative nature of this work reflects the recognition that learning across diverse settings can enrich local responses and support more inclusive approaches to health policy and planning.

Conflict of Interest Statement: *The authors declare no conflicts of interest related to this work.*

Funding: *The authors did not receive any financial support from any organization for this research work.*

Ethical Statement: *This study has been performed in accordance with the ethical standards as laid down in the Declaration of Helsinki.*

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