CHAPTER 6

Depopulation and Public Health

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Depopulation is the social phenomenon of a reduction in the population of a country, the drivers of which are essentially simple – low fertility rates, external and internal migrations and high mortality rates.

From the public health perspective, the increase in fertility rates and high mortality rates are intercorrelated and joint measures are necessary to overcome the current situation. All three driving forces of depopulation (fertility, migration, and mortality) result from human decisions – when to have children and how many, where to live, and a series of decisions over the course of life, affecting how long we live and reflecting the full complexity of human decision-making. This includes a web of interlinked personal resources (such as knowledge and skills, personal ties, socioeconomic status, etc.) and the spatial and social structures influencing access to opportunities (including culture, infrastructure, governance, or the environment).

One of the main causes leading to a low fertility rate is infertility[101] as a global problem that happens in one out of five couples. Lifestyle factors, the rise in obesity and environmental factors in relation to urbanization are also affecting fertility and leading to a rise in male and female subfertility.[102.]

Couples and women are postponing childbirth and this has led to a true drop in their fertility level due to ovarian ageing and related reasons leading to receding prospects for conception. Postponement of childbirth is becoming one of the key determinants of negative trends in fertility and overall demographic development. There are various causes behind this postponement. One of them is extended education. More and more women are focused on acquiring higher levels of education. Consequently, the time of childbirth is postponed until the woman completes her education. Based on recent research, a direct relationship has been established between the increase in the age at which women give birth to their first child, which is a ubiquitous trend in many European countries, and a higher level of education of women and the higher portion of their participation in paid employment (Veljović, 2017).

General instability in social, intimate and business relationships is also strongly reflected in adapting to the everyday life context, especially when it comes to major life decisions such as childbirth (Conger et al., 2010). On the other hand, delaying in family planning as a complex social phenomenon could be associated with the absence of enough formally educated and trained professionals to care for older people, when the young carry an additional financial and emotional burden, but also with the time potential parents have to dedicate to older relatives, causing them to postpone childbearing (Rijken, 2009).

High mortality rates caused by a higher prevalence of risk factors for chronic non-communicable diseases (NCDs), availability of healthcare services and other factors, directly contribute to a decrease in population size. Furthermore, the rising share of the older population (persons aged 65 or over) contributes to the high mortality rate due to the poor health of this population and associated diseases that can lead to lethal outcomes. Wider determinants that influence health, such as socioeconomic status, lifestyle and health services, should be aimed at improving the health of the population and, consequently, decreasing the mortality rate. In order to prevent depopulation, we need to seriously address and reduce the incidence of NCDs.

Given that the overall goal of public health is to prevent disease, promote health and improve the quality of life, in this chapter we will review what can be done in the existing context in order to change the current picture of depopulation. This chapter will discuss the basic characteristics of the healthcare system in Serbia, the main causes of low fertility and high mortality rates, health indicators of the elderly population, and the health consequences of the current COVID-19 pandemic. The chapter ends with policy recommendations on how to adjust public policies to the new demographic reality.

[101] Infertility is defined as the inability to conceive after 12 months or more of regular unprotected intercourse.

[102] Subfertility is a reduced reproductive capacity in a woman or man.

1 Health system of the Republic of Serbia

The health system of the Republic of Serbia is mostly centralized with the Ministry of Health as the main decision maker, which closely cooperates with the Republic Health Insurance Fund (RHIF) and the Institute of Public Health of Serbia "Dr Milan Jovanovic Batut" (IPH). The Republic Health Insurance Fund (RHIF) represents the state agency for the fiscal distribution of funds collected through social security contributions.

Provision of health care services. In terms of accessibility, Serbia has a comprehensive universal health system with free access to health services at the primary level, but there are inequalities in the use of health services, with the most vulnerable, uninsured and Roma having more problems accessing health care. Financial constraints are the most common reason why needs for health care go unmet, and these are more common among people with lower levels of education and among the poorest sections of the population. In addition, a survey of catastrophic direct payments among the population showed 2.3% of the population was affected, with a higher incidence rate in rural areas, numerous households, the poorest households, and those with a chronic illness (WHO, 2019).

State-owned health facilities form a wide network at the primary, secondary and tertiary levels, and are overseen by the Ministry of Health. The first level of contact with the healthcare system is realized in primary healthcare institutions that are established for the territory of the city, i.e. one or more municipalities in accordance with the Decree on the Plan of the Health Institutions' Network (2020). From this level, users, i.e. patients are referred to higher levels, primarily to the level of secondary healthcare – specialist-consultative and hospital, where more complex health services are provided. When the health problem exceeds the hospital's capacity, patients are referred to the tertiary level of healthcare (Law on Health Care, 2019). Services provided in the private sector are paid for out of pocket or through additional private health insurance (Law on Health Insurance, 2019).

The state or autonomous province provides the funds for the construction and equipment of state health institutions, which includes: capital investments, investments for maintenance of premises, procurement of medical and other equipment necessary for the operation of the health institutions and transportation means, procurement of equipment for the development of an integrated health information system, and for other obligations determined by law and the founding act.

At the national level, the Ministry of Health develops a plan for the number of health workers in health institutions based on the Decree on the Plan of the Health Institutions' Network (2020), which includes employees covered by the individual health plans of health institutions. The public sector is the main employer of health workers in Serbia.

Funds for the functioning of the health system are provided through contributions for compulsory health insurance, general taxation, out-of-pocket payments, voluntary health insurance premiums, and international donation-based financing initiatives. The main source of income for financing health care in Serbia are contributions for compulsory health insurance that come from the salaries of employees and the profit of the employer. The Law on Contributions for Compulsory Social Insurance (Official Gazette, 2022) defines the contribution rate including the rate for compulsory pension and disability insurance (26%), for compulsory health insurance (10.3%) and for unemployment insurance (0.75%). Contributions for compulsory pension and disability insurance and unemployment insurance also go partly into the RHIF, through contributions from the Republic Pension and Disability Insurance Fund and the National Employment Service. In relative terms, as a percentage of its gross domestic product (GDP), Serbia spends a significant part of its funds on healthcare.

The Republic of Serbia allocates a higher percentage of gross domestic product (GDP) to healthcare compared to a number of European countries. However, in terms of absolute amounts, Serbia allocates modest funds to healthcare compared to other European countries, which is a consequence of the relatively low level of gross domestic product. According to available data, in 2018, total health expenditures accounted for 8.5% of GDP, more precisely 1484 USD per capita (according to purchasing power parity) (Krstic et al., 2019). Total health care expenditures grew over a ten-year period, showing a steady decline in their share of the gross domestic product (WHO, 2021). Public sources of financing in the health system have constantly declined over the last decade, reaching 59.4% of total health expenditures in 2018. Consequently, private expenditures are a significant source of funding, accounting for 39.6% of total healthcare expenditures in 2018 (WHO, 2021). Out of pocket payments (OOP), in the form of co-payments and direct payments, account for the vast majority of this private spending (around 96%), while voluntary health insurance accounts for less than 1% of total health spending. Compulsory health insurance contributions from the National Health Insurance Fund, RHIF, represent the largest share in total health revenues from public sources (94%) (IPH, 2018). Currently, the system of financing social health insurance is seriously over-stretched and most of the burden of financing falls on employees in the public sector.

2 Infertility

Infertility is defined by the International Committee for Monitoring Assisted Reproductive Technology (ICMART) and WHO as the failure to achieve a pregnancy after 12 months or more of regular unprotected sexual intercourse (Zegers-Hochschild et al., 2009). Infertility is a global problem and it affects a significant proportion of humanity. Global infertility prevalence rates are difficult to determine, due to the presence of both male and female factors which complicate any estimate which may only address the woman and an outcome of a pregnancy diagnosis or live birth (WHO, 2022b). The WHO has calculated that over 10% of women in a stable relationship of five years or more have tried unsuccessfully to conceive, and estimates using a two-year time frame, result in prevalence values 2.5 times higher. The burden on men is unknown. The overall burden of subfertility and infertility is significant, likely underestimated, and has not displayed any decrease over the last 20 years (WHO, 2022c).[103]

According to the data of the Institute for Health Metrics and Evaluation (IHME), University of Washington, one in every four couples in developing countries was affected by infertility. A WHO study has shown that the overall burden of infertility in women from 190 countries has remained similar in estimated levels and trends from 1990 to 2010 (IHME, 2022). Unfortunately, the data on infertility is not available for the Republic of Serbia. As a result, we will rely on European estimates. Although these figures are not encouraging, the field of reproductive medicine and endocrinology is rapidly expanding, with success stories that have resolved infertility and fertility problems and methods of raising awareness of more advanced innovations in fertility. The availability of assisted reproduction technologies (ART) has been evolving over the years, and their application in the Republic of Serbia differs in fertility clinics which are covered by the Decree on the Plan of the Health Institutions' Network (public institutions) and those outside the Plan of the Health Institutions' Network (private institutions). Since the end of 2006, the National Health Insurance Fund (NHIF) has been financing the National Infertility Treatment Programme. In the period from 2009 to 2017, the Ministry of Health passed the Law on the Treatment of Infertility using Biomedically Assisted Fertilisation Procedures (2009) and a number of bylaws, while in 2017 the Law on Biomedical Assisted Insemination (2017) was adopted. In order for a couple with state health insurance to be included in the *in vitro* fertilization programme at the expense of their health insurance, either in a public or private healthcare institution, they must meet the prescribed conditions (IPH, 2018).

According to the last available data, during 2017, the entitlement to infertility treatment using ART was provided in 16 health institutions (state and private-owned) that carried out 3,108 ART procedures, which is 22% more than in the previous year. After private health institutions were introduced into the health insurance system in 2016, there was a decrease in the total number of services provided in public institutions, while the number of services provided in private healthcare institutions increased significantly. One of the possible explanations could be a better quality of care in private institutions but also the question of privacy, that is, of patient anonymity. Patients whose medical indications require any of the other technologies can access them at biomedically assisted fertilization (BAF) centres that are outside the Network Plan at their own expense.[104]

According to statistics from the Report of the Special Monitoring Body of the European Society for Human Reproduction and Embryology (ESHRE), which analysed the work of clinics in 2013, 15 Serbian clinics reported 2,720 cycles of in vitro fertilization and the birth of 908 new-borns (EIM, 2017). In Serbia, the practice of ART is presented as a contribution to the birth rate despite the data which shows that the share of births resulting from successful *in vitro* fertilization is negligible in the total birth rate, i.e. around 1.5% of babies in relation to the total average number of births in Serbia (about 65,000), which is a low share of participation relative to Slovenia (6%), Denmark (6.2%) or Finland (5.8%) (Kupka et al., 2016; Kričković, 2018).

[103] World Health Organization. Infertility is a global public health issue. Available at: https://www.who.int/reproductivehealth/topics/infertility/perspective/en/ (accessed September 15, 2021)

[104] The region of Vojvodina records a significant increase in the provision of ART services, especially in private health care institutions (IPH, 2018). The reasons underlying these regional disparities of ART service should be a subject of future research.

3 Lifestyles

Lifestyle factors refer to the behaviour and ways of life that could influence the general health and wellbeing of individuals including fertility. While many aspects of life are not modifiable, lifestyles may be changed. As fertility can be influenced by a variety of factors, one possible explanation for the declining fertility trend would be that there are different lifestyle practices that contribute to the deterioration of male and female fertility. Research shows that lifestyle factors such as nutrition, weight, exercise, sleeping, physical and psychological stress, risk behaviours e.g. smoking, alcohol consumption, substance and drug use and abuse, etc. have profound effects on health and dis- ease. Fertility is no exception. They play a key role in determining re- productive health and can positively or negatively influence fertility in women, in men, or in both (Acharya et al., 2017; Sharma et al., 2013).

While it is true that lifestyle influences the possibility of conception, it must be recognized that choices are significantly impacted by socio-economic determinants. Poverty is one of the key factors in explaining differences in lifestyle and health outcomes. These differences are also affected by differences in the position held in society by an individual or population group (which is also reflected in access to resources such as education, employment, housing), and the level of participation in society and control over one's own life. Higher incomes and higher social status are associated with healthier choices and better health outcomes. The greater the difference between the richest and the poorest people, the greater the difference in health. Also, a low level of education increases the likelihood that a person will choose an unhealthy lifestyle, which leads to poorer health outcomes. Better access to health services improves disease prevention and leads to earlier treatment. These socio-economic determinants strongly interact and influence lifestyle choices and health in general. Improvement in one of them can produce an improvement in health behaviour or in health outcomes among individuals, but also in entire populations (WHO, 2003; WHO, 2008).

According to our information, there is no adequate data on the manner and extent to which health topics are covered by school curricula. It is known that there are no individual subjects that deal with public health issues, but that such teaching units are sporadically processed within other subjects such as biology or physical education. On the other hand, right after the home, children spend most of their time in school, which is why school is identified as an institution where it is necessary to intervene in order to raise the awareness of children and employees about the importance of a healthy lifestyles and to stimulate them to take action i.e. change.

Nutrition from the earliest period of life has a significant impact on health, reproductive potential and mortality. Children's nutritional status reflects their overall health. When children have access to adequate food, are not exposed to frequent illness, and are well cared for, they reach their growth potential and are considered well-nourished. On the other hand, malnutrition is associated with nearly half of all child deaths worldwide. Children suffering from malnutrition are more likely to die from common childhood ailments, and those who survive fall ill more often and experience faltering/slow growth. Three-quarters of children who died from causes related to malnutrition only had mild or moderate forms of malnutrition, meaning they showed little outward sign of vulnerability. Malnutrition is not the only aspect of nutrition that has health implications. The results of numerous studies that have dealt with nutritional status have shown that the phenomenon of obesity in childhood and adolescence is the best indicator of the burden of risk factors for the development of chronic non-communicable diseases later in life. Obesity is closely linked to other risk factors (diet and physical inactivity) (WHO, 2022d).

The results of the Multiple Indicator Cluster Survey (MICS) conducted in 2019 showed that the prevalence of child malnourishment (moderate and severe) in Serbia as a whole is relatively low. Indicators of nutrition status from 2019 show a better picture in comparison to 2014 and 2010 (Chart 2) (SORS & UNICEF, 2021).[105]

The Roma population, which is among the most vulnerable in Europe, especially in the Republic of Serbia, is often exposed to discrimination, social marginalization and poverty, which also leads to less access to health services. The nutritional status of children under the age of five living in Roma settlements shows a less favourable situation than in the general population. In 2019, 7.3% of children under the age of 5 were malnourished, 22.6% were stunted in growth, 3.4% were stunted in weight in relation to height, and 9.7% were obese. Compared to 2014 and 2010, almost all indicators of nutrition (except obesity) are favourable in this population (Chart 2), but still much less favourable than in relation to the general population.

In order to improve the nutritional status of the Roma population, both health education and the health system need to be strengthened. In the broader sense, the overall socio-economic status of Roma families' needs to be improved - by educating parents, through schooling, preventing early marriages and empowering family planning. Regular monitoring of child nutrition indicators is necessary in order to better plan initiatives intended for children. Given that the risk of obesity in the later years of childhood and adolescence is often established in the early stages of life, it is important to pay necessary attention to obesity among young people. Combating obesity and providing better services for children require a multi-sectoral approach, in particular cooperation between the education and health systems. Malnutrition in Roma children requires additional attention outside the health system in order to resolve the issue of food avail- ability, hygiene, and other socioeconomic determinants that affect health outcomes.

[105] Statistical Office of the Republic of Serbia and UNICEF. 2019. Multiple Indicator Cluster Survey in the Republic of Serbia. Final Report. Belgrade, Serbia: Statistical Office of the Republic of Serbia and UNICEF.

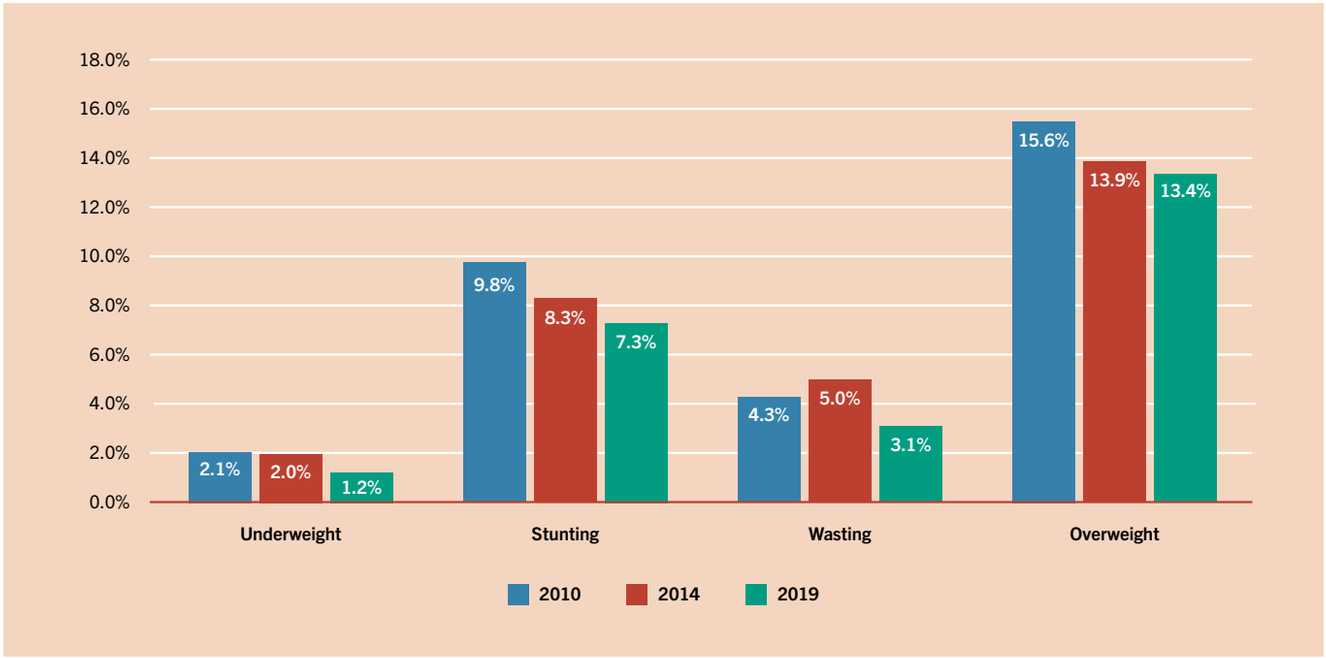

Chart 1. Nutrition status among children under the age of 5

Among adults, malnourishment, obesity and related non-communicable diseases represent not only a health but also an economic and social burden for individuals, families, the community and society as a whole. Being overweight is associated with an increased risk of developing one of the leading non-communicable diseases such as type 2 diabetes, cardiovascular diseases and malignancy (Guh et al., 2009). A higher body mass index (BMI)102 can impact hormonal imbalances, pregnancy risks and the number of drugs needed for fertility treatments, in females and sperm numbers in males (Amiri et al., 2020).

The frequency of obesity has long been epidemic in nature on a global level, and the WHO formally noted the obesity epidemic as early as 1997, pointing it out as an important public health problem (WHO, 1998). Serious health risks, shortening of life expectancy and the enor-

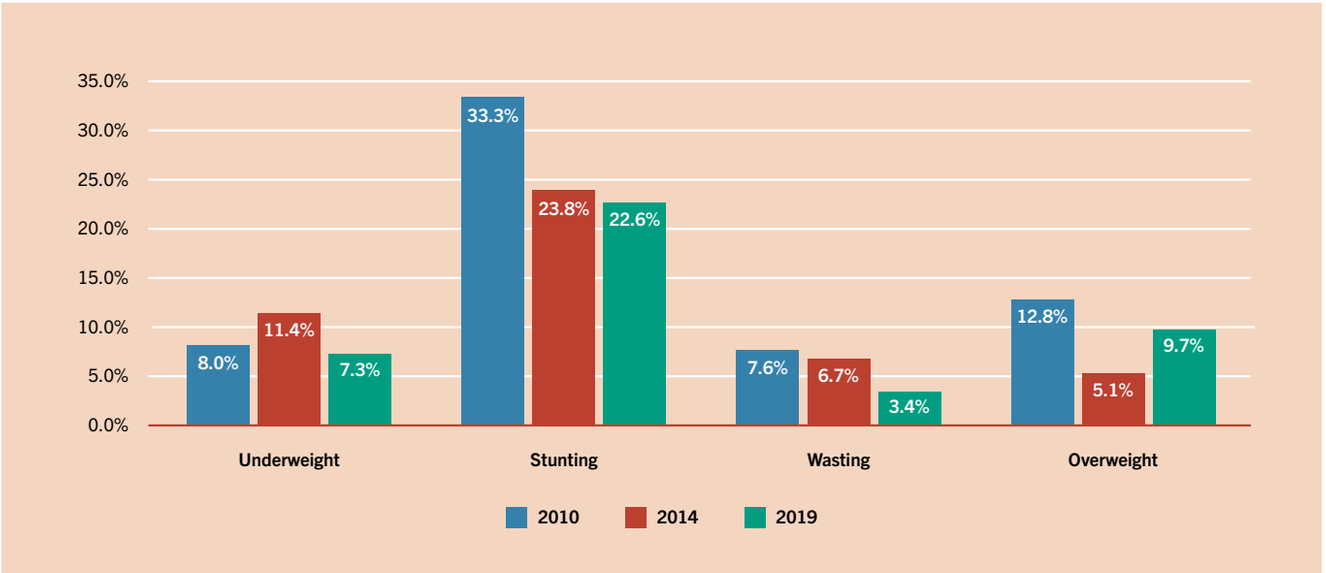

Chart 2. Nutrition of Roma children under 5, living in Roma settlements

Source: SORS and UNICEF, 2021.

[106] Body mass index (BMI) is a measure for indicating nutritional status in adults. It is defined as a person's weight in kilograms divided by the square of the person's height in metres (kg/m2). BMI values indicate the following: BMI below 18.5: underweight; BMI 18.5-24.9: normal weight; BMI 25.0-29.9: overweight; BMI ≥ 30: obesity.

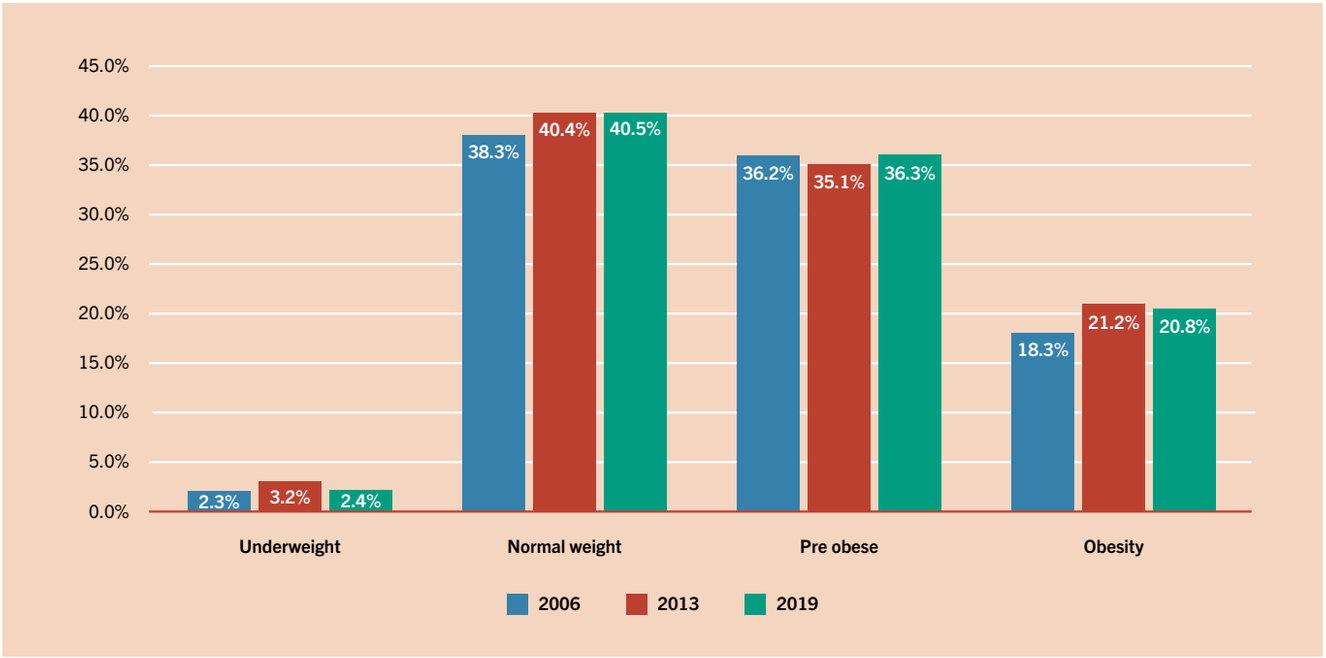

Chart 3. Nutrition status on adult population in Serbia

mous economic effects concomitant with obesity represent an additional burden, especially when it comes to chronic non-communicable diseases and disability (Gardner & Halweil, 2000).

The results of the last three health surveys (2006, 2013 and 2019) show that, in the adult population in Serbia, there have been no significant changes in the nutritional categories over time (Chart 3) (Milić et al., 2021; Grozdanov et al., 2014). Nevertheless, the fact that every third person is pre-obese and every fourth is obese is alarming and demands that measures be taken to prevent obesity and reduce its impact during a life span.

With the understanding that the risk of obesity in later childhood and adolescence is often established in the early stages of life, regular monitoring of child nutrition is necessary in order to better plan initiatives intended for children under the age of five and school-age children. The fight against obesity and the provision of better services for children requires a multi-sectoral approach, and in particular cooperation between the education and health systems. In order to improve the nutrition status in the Serbian population, which will later have a positive impact on health outcomes, overall socio-economic status needs to be improved. Good nutrition is also influenced by care practices and the pursuit of a healthy lifestyle.

Proper eating habits ensure optimal intake of nutrients needed to maintain good health and, among other things, include a daily balanced intake of all types of food divided into several meals during the day (breakfast, lunch, dinner and two snacks). In addition to the choice of foodstuffs, the frequency of their intake is also important, i.e., the number of meals and food preparation methods. Malnutrition is one of the leading risk factors for many diseases such as diabetes, heart and blood vessel diseases, malignant and oral diseases (WHO, 2003). During a 2019 health survey (Milić et al., 2021) eating habits were examined such as daily intake of fruit and vegetables, milk and dairy products, bread, fish, types of fats used in the diet/for food preparation, breakfast prevalence and salt consumption habits among adults above the age of 15. The results showed that 83.8% of the population of Serbia had the habit of eating breakfast every day (Milić et al., 2021). Compared to 2013, progress was observed in terms of an increase in the percentage of the population having breakfast every day (78.1%) (Grozdanov et al., 2014). The daily consumption of fruit (fresh, frozen, canned, dried, excluding freshly squeezed juices) and vegetables or salad (fresh, frozen, dried, canned, excluding vegetable juices and soups) was less favourable in 2019 than 6 years earlier (39.4% compared to 45.6% ate fruit; 50.2% compared to 57.1% ate vegetables). The same pattern was also observed in the daily consumption of milk and dairy products which had fallen to 41.8% of the population by 2019. This is a significant decline compared to 2013 when the percentage was 51.7% (Milić et al., 2021; Grozdanov et al., 2014). In Serbia, in 2019, 86.2% of the population used bread in their diet every day. The use of animal fats for meal preparation increased in 2019 (39.2%) compared to 2013 and 2006 (25.9% and 33.6%, respectively) (Milić et al., 2021).

Based on this data, we can conclude that people in Serbia have been worsening their eating habits in recent years, especially in the intake of dairy products and fruit and vegetable consumption. The reasons are numerous and range from a faster pace of life and modernization, to availability and affordability of unhealthy food. For these reasons, additional efforts are needed to raise awareness among the population of the importance of healthy eating, and of adherence to eating recommendations, which would significantly reduce the risk of chronic disease.

Regular physical activity reduces the risk of overeating, chronic non-communicable diseases such as breast and colon cancer, diabe-

tes, and heart and vascular diseases, and has positive effects on mental health and the quality of life (WHO, 2018a). Furthermore, physical inactivity is one of the factors that significantly contribute to infertility (Foucaut et al., 2019). According to the 2019 data, half of the Serbian population (46.3%) undergoes moderate physical exertion or walking, during their work activities (including paid and unpaid work, work at home or around the house, family care, studying), while 41.1% was exposed to light physical effort (involving mainly sitting or standing) (Milić et al., 2021). Heavy physical exertion (which implies very hard work or physically demanding activities) was recorded in 9.8% of the population, while 2.9% of the population did not perform any work activity. The majority of the Serbian population (93.8%) underwent 10 minutes of physical activity not related to work activities at least once a week (93.2% walking, 23.2% cycling, 13.8% practicing fitness, sports or recreation and 7.2% were doing an intense physical activity intended to increase muscle strength) (Milić et al., 2021).

Continuous walking for at least 10 minutes per day is a rather widespread practice (75.2% of respondents in 2019) and it does not differ significantly compared to 2013 (72.9%). Cycling is less popular with only 9% of the population cycling for at least 10 minutes per day. This sort of activity is somewhat more common in Vojvodina (23.5%) compared to other geographical areas, probably due to the flat terrain in Vojvodina and existing cycling paths (Milić et al., 2021; Grozdanov et al., 2014).

All in all, it seems that physical activity is not a priority for the Serbian Population, although it may contribute to positive health outcomes. They are less physically active compared to 6 years ago. Every fourth citizen does not walk for at least 10 minutes per day. If only young people were to turn to moderate physical activity, which can be a 30-minute walk a day 5 times a week, the risk of developing the most common chronic non-communicable diseases such as hypertension and diabetes would be significantly reduced. It is widely recognized that a supportive environment may be needed to promote and achieve an enduring increase in activity at the population level. This is particularly the case with cycling which is rare and requires the provision of cycling infrastructure.

We need to pay particular attention to the lifestyles and habits of young people103 who represent a special population group contributing most to the rate of fertility and population growth. The results of a 2021 survey on the position and needs of young people show that only 14% are physically active and the majority (85%) would like to be more physically active. Bearing in mind the most common reasons given by young people as the cause of their inactivity (fatigue, lack of time, lack of company for exercise, lack of exercise space), it is necessary to devise a strategy that supports building an environment for physical activity so that exercise infrastructure is easily accessible to all, especially in open spaces, and that the contents are promoted through modern communication channels (MoS, 2020).

Tobacco use is associated with an increased risk of illness and death from respiratory diseases, heart and blood vessel diseases, numerous malignant and other diseases (WHO, 2008a). In Serbia, the use of to- bacco has been one of the most common health risk factors for many years. This is confirmed by the results of the 2019 and 2013 Popula- tion Health Surveys. In 2019, the prevalence of the habits of smoking tobacco products (daily or occasional) in the population of 15 and over was 31.9% (Milić et al., 2021). This prevalence is somewhat lower than in 2013 when it was 34.7% but still very high and requires additional efforts to reduce it (Grozdanov et al., 2014). As regards the young, 24.5% are active smokers (MoS, 2020). This is particularly important because smoking affects reproductive potential and may significantly reduce the ability to conceive (Kovac et al., 2015; Levine et al., 2017). Surveys clearly indicate that the infertility rates among smokers are double those among non-smokers (American Society for Reproductive Medicine, 2022).

One step to reduce this habit in the population would be to implement evidence-based tobacco control measures, in accordance with the World Health Organization's Framework Convention on Tobacco Control (WHO, 2008b). In recent years, new tobacco and nicotine products have appeared on the market and their popularity is growing. Heated tobacco products and electronic cigarettes represent a new challenge in global efforts to protect the population from the effects of tobacco use and exposure to tobacco smoke. In 2019, electronic cigarettes or similar electronic devices (daily or occasionally) were used by 3.3% of the population.

With the ratification of the World Health Organization's Framework Convention on Tobacco Control in 2007, the Republic of Serbia, together with 139 other countries, committed itself to comprehensive action to control tobacco and adopted the Tobacco Control Strategy (2007). The state has, thereby, set tobacco control as a priority. A step forward was made in 2010, when the Law on the Protection of the Population from Exposure to Tobacco Smoke was passed. This Law regulates measures restricting the use of tobacco products in order to protect the population from exposure to tobacco smoke, control the smoking ban and supervise the implementation of this Law (Law on the Protection of the Population from Exposure to Tobacco Smoke, 2010). Various anti-smoking campaigns were conducted prior to and after the Law was enacted, but the prevalence of smoking is still very high. The results of the 2019 health survey indicate that the legislation and its implementation need to be improved in line with the WHO Framework Convention on Tobacco Control (2003) by a total ban on smoking in all workplaces and public places without exception, including a total ban on smoking in cafes and restaurants, where exposure to tobacco smoke is highest. Since almost half of the population (48.9%) over the age of 15 was exposed to tobacco smoke indoors every day (Milić et al., 2021) it is necessary to strengthen mechanisms that would have, as their ultimate goal, less non-smoker exposure to tobacco, and thereby timely reduce the risk of the harmful con- sequences of smoking (either active or passive).

Alcohol abuse is a significant health, social and economic problem. Alcohol abuse is a common cause of traffic and other accidents, violence, liver disease and other chronic diseases, and is one of the leading risk factors for premature death (WHO, 2018b). The harmful use of alcohol is determined not only by the volume but also by the frequency of drinking. The volume of alcohol consumption and the pattern of drinking affect both health and social outcomes. Specifically, intoxication[107] on certain occasions is a major public health concern,

[107] Intoxication is the most common form of excessive alcohol use and is typically manifested after males consume in excess of 5 and women in excess of 4 drinks in around 2 hours.

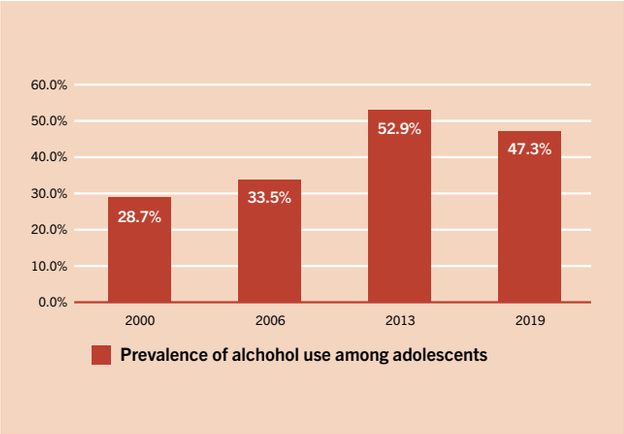

Chart 4. Prevalence of alcohol use among adolescents

Source: DevInfo, Republic of Serbia. Statistical Office of the Republic of Serbia. Electronic Database. Available at: http://devinfo.stat.gov.rs/SerbiaProfile-Launcher/

as it has adverse consequences on an individual's well-being, as well as on social and mental behaviour.

Half of the Serbian population (50.7%) does not consume alcohol (39.3% have never tried alcohol and 11.4% have not consumed alcohol in the previous 12 months). According to data from 2019, 3.1% of the population consumed alcohol on a daily basis, which is a slight drop compared to 2013 (4.7%) and 2006 (3.4%) (Milić et al., 2021).

However, the use of alcohol among adolescents in 2019 has increased by almost 60% compared to 2000 (Chart 4). There is a trend of alcohol consumption among young people called the culture of consumption in- stead of communication, which means that the earlier pattern of drinking "socializing with alcohol" has now been replaced by "intoxication with possible socializing" (Đorđević, 2016). This pattern of drinking is harmful because it is associated with different types of deviant and criminal behaviour including fights, quarrels, thefts or traffic violations. The largest number of violent acts – hooliganism and vandalism - were committed by young people under the influence of alcohol. This behaviour represents a global trend and it has grave consequences on physical and mental health, in addition to the wider social consequences.

4 Mortality data

High mortality rates are caused by a higher prevalence of risk factors for chronic NCDs, unavailability of healthcare services and other factors, and directly contribute to a decrease in population size. As a result, the prevention of chronic NCDs must be central to any effort to tackle depopulation.

In this section, we will analyse mortality rates by periods of life – from infants, through the perinatal period, to maternal mortality rates. In the next section, we will analyse mortality rates by cause.

4.1 Mortality rates by period of life

The infant mortality rate[108] is a significant and delicate indicator of both the health status and healthcare of the population, and more widely, of the overall level of socioeconomic development. Over the last decade, the infant mortality rate in the EU fell from 4.2 deaths per 1,000 live births in 2009, to 3.4 deaths per 1,000 live births in 2019, when 14,000 children died before the age of one (Eurostat, 2021a).

The mortality rate of new-borns in the Republic of Serbia has significantly improved; it has dropped from 6.7 infants per 1,000 live births in 2010, to 4.8 per 1,000 live births in 2019 (SORS, 2021). The infant mortality rate in Roma settlements is 8 per 1,000 live births, which is notably higher than the national average (SORS & UNICEF, 2021).

However, the infant mortality rate in 2019, in Roma settlements, shows significant progress compared to 2014 (13 per 1,000 live births) and 2010 (14 per 1,000 live births) (SORS, 2014; SORS, 2012).

The most common causes of infant death are premature birth, complications relating to childbirth (birth asphyxia), infections and congenital defects (WHO, 2020). In Serbia, the most common causes of death are certain conditions originating in the perinatal period, and congenital malformations, deformations and chromosomal abnormalities (IPH, 2020).

Such causes indicate the need to step-up the monitoring of the health of infants and pregnant women through mandatory examinations, counselling centres, and home-visit nurses. In addition, health education should be specifically focused on the health of infants and children in order to detect and treat disease, and prevent infant death.

In the light of the overall improvement in the infant mortality rate, the slow progress in the reduction of the perinatal mortality rate is disturbing.[109] The rate of stillbirths and deaths during the first week after birth was 8.1 per 1,000 live births in 2019 (which is a decrease compared to a rate of 9 per 1,000 in 2010). The perinatal mortality rate is relatively high compared to the EU, where the rate was 6.7 in 2015 (WHO, 2021). A necessary measure to reduce the stillbirth rate,

[108] The rate of infant mortality is the number of deceased children of up to one year of age per 1,000 live births during one calendar year.

[109] Perinatal mortality is defined as the number of fetal deaths past 22 (or 28) completed weeks of pregnancy plus the number of deaths among live-born children up to 7 com pleted days of life, per 1,000 total births (live births and stillbirths). From: International Encyclopedia of Public Health, 2008

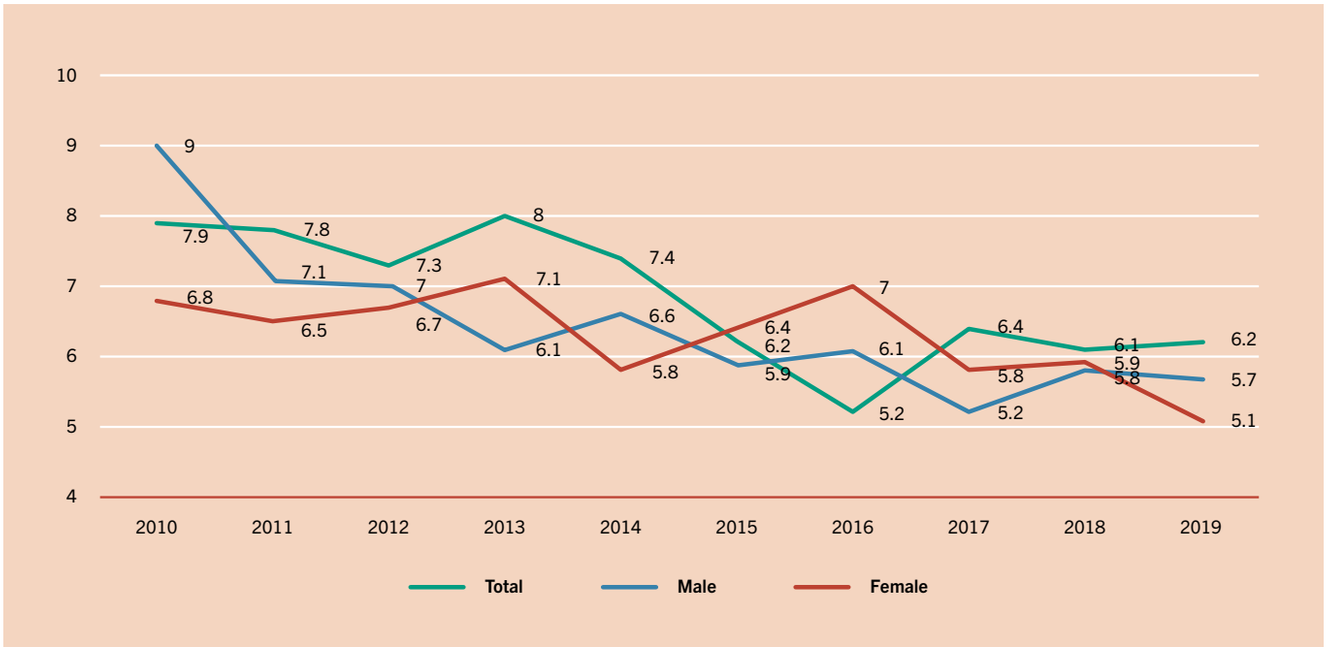

Chart 5. Mortality rate of children under the age of 5 in the Republic of Serbia, 2019, 2019

Source:

and thereby reduce mortality in the perinatal period in Serbia, is foetal death analysis according to the methodology applied in all countries with developed perinatal and neonatal healthcare systems (e.g. perinatal revision). Special attention should be paid to social determinants of health. Efforts by the Ministry of Health to improve the organization of perinatal health care are underway through the strengthening of four perinatal centres (in Belgrade, Novi Sad, Niš and Kragujevac), and through improving human resources, equipment, and transportation.

In order to obtain more information on the social, economic and environmental conditions in which children live, including their health status, the mortality rate of children under the age of five is used (calculated as the deaths of children between the ages of 0 and 5, per 1,000 live births). The mortality rate of children under the age of five in the Republic of Serbia is 5.7 (IPH, 2020). Observed by sex, the under-fives mortality rate shows a gradual decline among boys, while there was significant fluctuation among girls over the last ten years (SORS, 2021). Looking at the European Union, as a reference framework where the mortality rate of children under five is 3.91 (WB, 2022), there is room in Serbia to improve practices in paediatric health care, which would, consequently, reduce the number of children that die in this age bracket.

The under-fives mortality rate among Roma children is almost double that of the general population (10 per 1,000 live births). Although this rate among Roma children in the 2019 MICS survey was almost twice as high, it is significantly lower than in previous MICS surveys (2014: 14.4 per 1,000 live births, 2010: 15 per 1,000 live births, and 2005: 28 per 1,000 live births) (SORS, 2021).

With the SDG target (3.2) for child mortality – on ending preventable deaths among new-borns and children under 5 years of age – the international community has retained the overarching/comprehensive goal of reducing child mortality. While the global target calls for a reduction in neonatal mortality to at least as low as 12 deaths per 1,000 live births, and the under-fives mortality to at least as low as 25 deaths per 1,000 live births, reducing child mortality continues to be one of the most important objectives in national plans and programmes in every country (UN, 2015).

The value of the maternal mortality indicator[110] for 2019 at the level of the Republic of Serbia is 6.21 (IPH, 2020), which practically does not differ from the European Union, where the maternal mortality rate is also 6 per 100,000 live births (WHO, 2022). These figures may be due to unforeseen complications such as bleeding, infection or high blood pressure, which can occur during pregnancy, childbirth or puerperium (a period of 6 weeks after delivery) and which are lethal. The maternal mortality rate has been dropping since 2012 (SORS, 2021), which is a result of the introduced recommendations and protocols during pregnancy and puerperium. These recommendations include a minimum of 4 check-ups during pregnancy, the presence of a skilled attendant at delivery and delivery in a health institution, which is a World Health Organization recommendation. These results are a signpost indicating the direction in which we should continue applying good practices in the field of women's health care during pregnancy and childbirth.

[110] The maternal mortality rate is the number of women who had died in pregnancy, in labour or puerperium (for reasons related to these conditions) per 100,000 live-birth children. The rate of maternal deaths or death of the mother is the death of a woman during pregnancy or within 42 days of pregnancy termination, regardless of the duration and location of the pregnancy, for whatever reason which is linked to aggravated by pregnancy or its course, but not as a result of accidental or indirect causes.

4.2 Deaths by causes of death

Cardiovascular diseases, malignant tumours, diabetes, obstructive lung disease, injury and poisoning, and mental health disorders have been recognized as major chronic NCDs in our national pathology for decades. Cardiovascular diseases and malignant tumours accounted for more than two-thirds of all deaths in Serbia in 2019. More than half of all lethal outcomes (51.6%) are the consequence of dying from diseases of the circulatory system, and almost one in five persons who died (21.0%) was the victim of a malignant tumour (Table 1). This is far higher than in the EU, where 37.1 % of all deaths are the consequence of cardiovascular diseases, while 25.8% are due to malignant neoplasms (Eurostat, 2021b). In the Republic of Serbia, 3% of the population died as a consequence of diabetes complications. This is somewhat more than in the EU, where over 2% of all deaths are associated with diabetes (Eurostat, 2021c).

In the 2010 to 2019 period, there was a slight increase in the overall mortality rate (3.2%) due to higher mortality from leading chronic NCDs. The highest mortality increase was associated with obstructive lung disease (6.8%), malignant diseases (6.0%), and diabetes (0.7%), while the biggest drop in mortality was associated with a fall in the number of injuries and poisonings (12.3%), and in circulatory diseases (2.7%) (Table 2).

	Total			Male			Female		
Causes of death (ICD-10)	n	%	Mortality rate*	n	%	Mortality rate*	n	%	Mortality rate*
Total	101,458	100.0	1460.8	51,309	100.0	1516.3	50,149	100.0	1408.1
Certain infectious and parasitic diseases	735	0.7	10.6	405	0.8	12.0	330	0.7	9.3
Neoplasms	21,976	21.7	316.4	12,483	24.3	368.9	9,493	18.9	266.5
Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	298	0.3	4.3	120	0.2	3.5	178	0.4	5.0
Endocrine, nutritional and metabolic diseases	3,196	3.2	46.0	1,416	2.8	41.8	1,780	3.5	50.0
Mental and behavioural disorders	1,448	1.4	20.8	637	1.2	18.8	811	1.6	22.8
Diseases of the nervous system	2,586	2.5	37.2	1,135	2.2	33.5	1,451	2.9	40.7
Diseases of the eye and adnexa	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Diseases of the ear and mastoid process	1	0.0	0.0	1	0.0	0.0	0	0.0	0.0
Diseases of the circulatory system	52,330	51.6	753.5	24,112	47.0	712.6	28,218	56.3	792.3
Diseases of the respiratory system	5,504	5.4	79.2	3,220	6.3	95.2	2,284	4.6	64.1
Diseases of the digestive system	3,151	3.1	45.4	1,794	3.5	53.0	1,357	2.7	38.1
Diseases of the skin and subcutaneous tissue	129	0.1	1.9	58	0.1	1.7	71	0.1	2.0
Diseases of the musculoskeletal system and connective tissue	164	0.2	2.4	48	0.1	1.4	116	0.2	3.3
Diseases of the genitourinary system	2,310	2.3	33.3	1,258	2.5	37.2	1,052	2.1	29.5
Pregnancy, childbirth and the puerperium	4	0.0	0.1	0	0.0	0.0	4	0.0	0.1
Certain conditions originating in the perinatal period	201	0.2	2.9	114	0.2	3.4	87	0.2	2.4
Congenital malformations, deformations and chromosomal abnormalities	114	0.1	1.6	64	0.1	1.9	50	0.1	1.4
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	4,478	4.4	64.5	2,430	4.7	71.8	2,048	4.1	57.5
Injury, poisoning and certain other consequences of external causes	2,833	2.8	40.8	2,014	3.9	59.5	819	1.6	23.0

Table 1. Death by causes of death and sex in the Republic of Serbia, 2019

** per 100,000 people*

Sources: Health-Statistical Yearbook of the Republic of Serbia 2019 Belgrade: Institute of Public Health "Milan Jovanović Batut". 2020.

As can be observed, additional efforts are needed in promoting a healthy lifestyle and in increasing knowledge and awareness of healthy habits, periodical check-ups and screening programmes that can significantly influence the decrease in the mortality rate from chronic NCDs.

As observed above, cardiovascular diseases are still the leading cause of death in Serbia even though, over the last decade, the mortality rates from such pathologies fell from 774.2 per 100,000 to 753.4 per 100,000 residents (Chart 6).

In 2019, 52,330 people in the Republic of Serbia died from cardiovascular diseases, but the mortality rate in females was 792.3 per 100,000, and in males it was 712.6 per 100,000. This female/male mortality ratio which is 1.1 times higher for women than for men is completely opposite to that prevailing in the EU, where the rate for men is 1.4 times higher than for women (Eurostat, 2021b). This is despite the fact that women in Serbia use health services and visit specialists more often than men (Milić et al., 2021). It is not known why this is so, but it is certainly necessary to work on preventive activities, not only within the health sector and in health institutions (usually at the primary level of health care), but also outside health institutions (in the community) in order to reduce mortality from cardiovascular dis- eases (both in men and women).

Diseases and conditions	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Cardiovascular diseases										
Total	774.2	764.8	763.6	744.9	757.1	766.3	738.2	764.4	754.2	753.4
Male	722.8	720.9	721.9	702.5	711.0	714.5	692.0	712.4	710.9	712.6
Female	822.8	806.4	803.2	785.2	800.8	815.5	782.0	813.8	795.4	792.3
Malignant neoplasms										
Total	289.9	289.4	295.4	294.4	299.0	301.3	305.0	305.9	309.4	307.3
Male	341.8	342.3	346.1	346.9	348.9	358.2	356.4	353.4	357.9	358.6
Female	240.8	239.3	247.4	244.6	251.6	247.2	256.1	260.7	263.4	258.5
Injuries and poisoning										
Total	46.5	45.8	45.6	44.3	43.1	43.1	40.5	42.5	40.2	40.8
Male	69.7	68.9	69.7	66.9	64.7	63.7	60.1	62.1	60.7	59.5
Female	24.4	23.9	22.8	22.7	22.6	23.5	21.9	24.0	20.7	23.0
Diabetes										
Total	43.8	43.2	41.7	39.1	35.2	42.7	44.8	49.7	45.5	44.1
Male	38.5	37.6	36.2	36.6	31.6	38.7	39.3	45.7	42.3	40.2
Female	48.9	48.5	46.9	41.5	38.73	46.4	49.9	53.5	48.6	47.8
Chronic obstructive pulmonary disease										
Total	36.6	37.3	37.5	36.0	35.0	38.3	37.8	41.6	38.8	39.1
Male	47.3	49.0	48.5	45.3	43.7	48.0	46.6	50.6	46.8	47.4
Female	26.5	26.3	27.1	27.1	26.8	29.2	29.4	33.0	31.2	31.3
All causes of death										
Total	1415.5	1418.1	1422.4	1400.0	1419.7	1461.2	1428.6	1477.3	1445.8	1460.8
Male	1466.0	1475.9	1480.7	1459.4	1468.9	1509.1	1475.1	1513.4	1499.0	1516.3
Female	1367.7	1363.3	1367.1	1343.7	1373.0	1415.7	1384.4	1443.1	1414.9	1408.1

Table 2. Mortality rates (per 100.000) from the most common non–communicable diseases by sex, Republic of Serbia, 2010–2019

Source: Health-Statistical Yearbook of the Republic of Serbia 2019 Belgrade: Institute of Public Health "Milan Jovanović Batut". 2020.

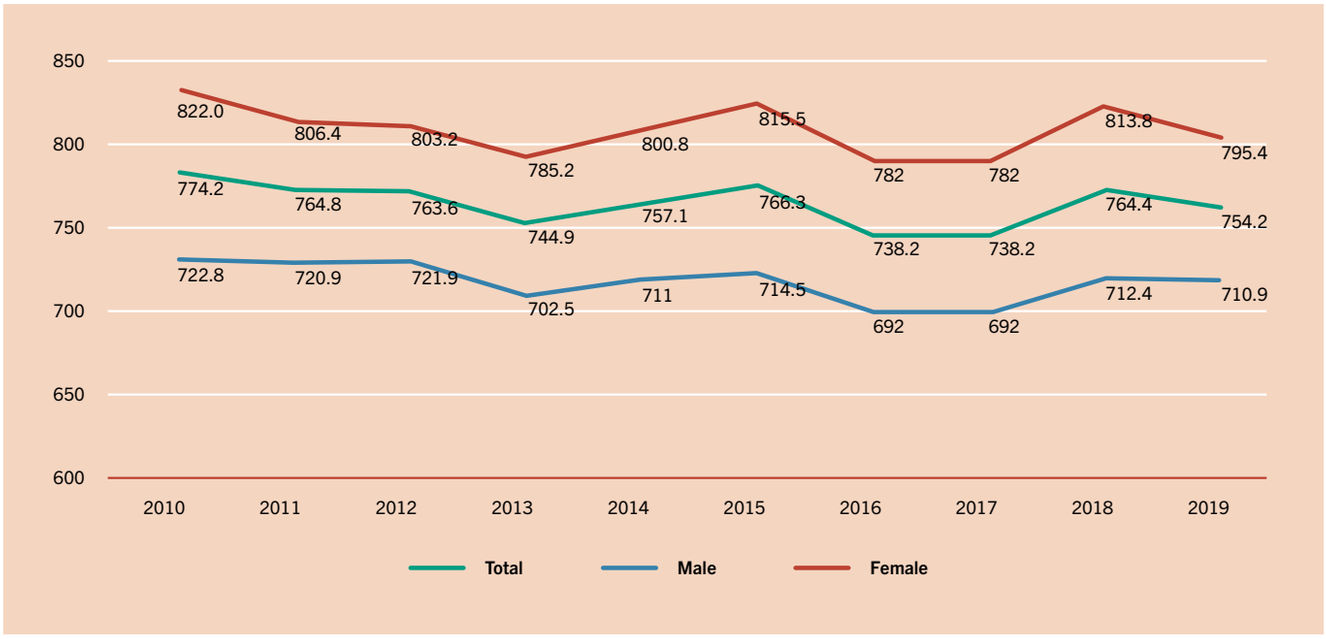

Chart 6. Mortality rates (per 100.000) from cardiovascular disease, Republic of Serbia, 2010-2019

Source: Health-Statistical Yearbook of the Republic of Serbia 2019 Belgrade: Institute of Public Health "Milan Jovanović Batut. 2020

The second important causes of death are malignant tumours. Until recently, the epidemiological situation with regard to malignant tumours in our country was monitored on the basis of mortality rate data alone (although the cancer registry was established in 1970). When the Population-Based Cancer Register in Central Serbia was reorganized in 1996, the number of recorded newly diagnosed cases had doubled. This is a huge step which is important for monitoring the situation of the incidence rate in different regions in the Republic of Serbia. When cancer is diagnosed at an early stage, the prognosis and success of the therapy are better.

In the territory of the Republic of Serbia, in 2019, 21,340 people died of cancer. The registered mortality rates in men were 358.6 per 100.000, and in women 258.5 per 100.000 residents (male/female

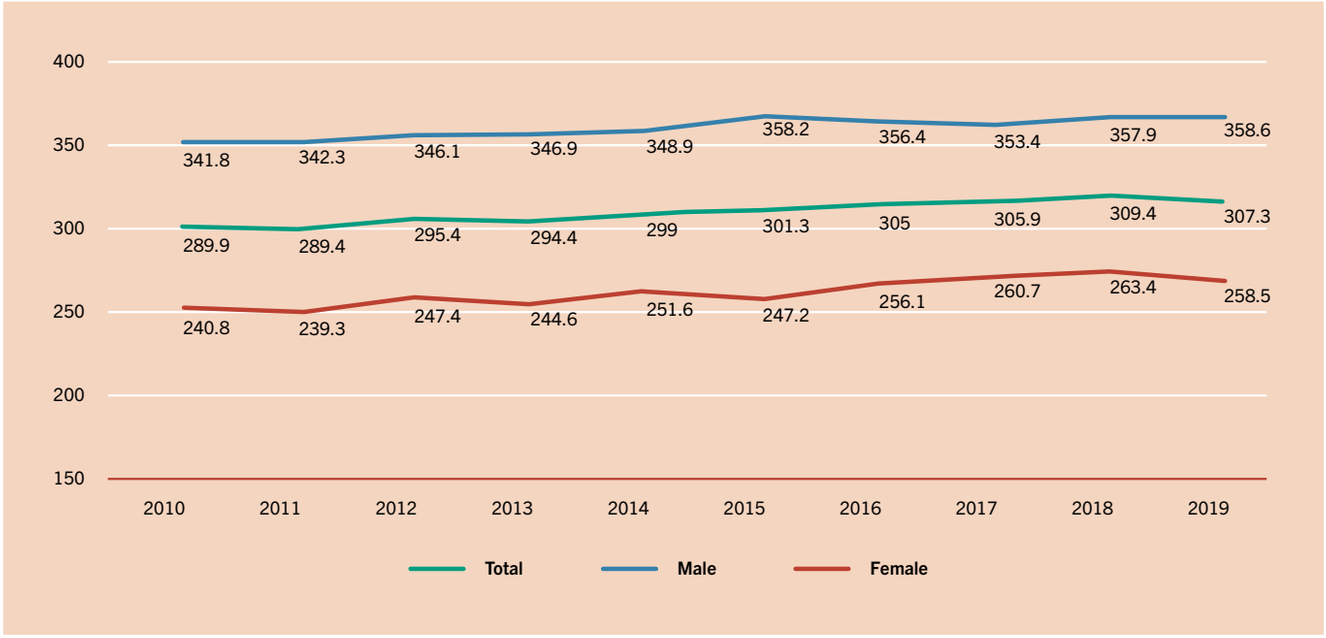

Chart 7. Mortality rates (per 100.000) from malignant neoplasms, Repubic of Serbia, 2010-2019

Source: Health-Statistical Yearbook of the Republic of Serbia 2019 Belgrade: Institute of Public Health "Milan Jovanović Batut. 2020.

ratio 1.4) (Chart 7). In the EU, the standardized cancer death rate for men is 344.0 per 100,000, and for women 196.2 per 100,000, which is 75% higher (male/female ratio 1.7) (Eurostat, 2021d).

According to the Cancer Register data, men most often die of bronchial and lung cancer, colon, rectum, and prostate cancer. In women, the most frequent sites of malignant tumours are the breasts, bronchia and lungs, colon and rectum (Table 3). High mortality rates from breast cancer and colon cancer are ambiguous having in mind that there are three existing National screening programmes (breast cancer, cervical and colon cancer). The low response rate could be caused by poor organization of the screening programmes, as well as by the low level of health literacy109 in the population. Besides this, the low educational and socio-economic level of the population additionally contributes to the low response rate in our country, which is also a problem on a global scale. Some research has even shown that certain life habits, such as smoking or frequent alcohol consumption, reduce the likelihood of a person responding to a screening call (Chang et al., 2017). [111] However, preventive check-ups are of crucial importance for health problems to be identified at an early stage and efficiently treated, thus reducing overall healthcare costs. Better organization and motivation of primary healthcare, with adequate political support (resources and funding), can increase the coverage of screening programmes.

Male		Female	
Primary localizations	Mortality rates per 100,000	Primary localizations	Mortality rates per 100,000
Lung and bronchus	52.6	Breast	20.7
Colon and rectum	20.7	Lung and bronchus	19.6
Prostate	11.1	Colon and rectum	10.7
Urinary bladder	7.8	Pancreas	5.5
Pancreas	8.4	Ovaries	5.3
Stomach	6.4	Cervix	7.4
Oral cavity and pharynx	5.7	Stomach	3.7
Larynx	5.5	Liver	3.4
Liver	4.6	Corpus uteri	2.9
Kidney	4.8	Brain	3.7
Other localizations	37.7	Other localizations	26.0
All localizations	165.3	All localizations	108.8

Table 3. Cancer mortality rates according to the leading localizations for males and females in the Republic of Serbia, 2017

Source: Health-Statistical Yearbook of the Republic of Serbia 2019. Belgrade: Institute of Public Health "Milan Jovanović Batut". 2020.

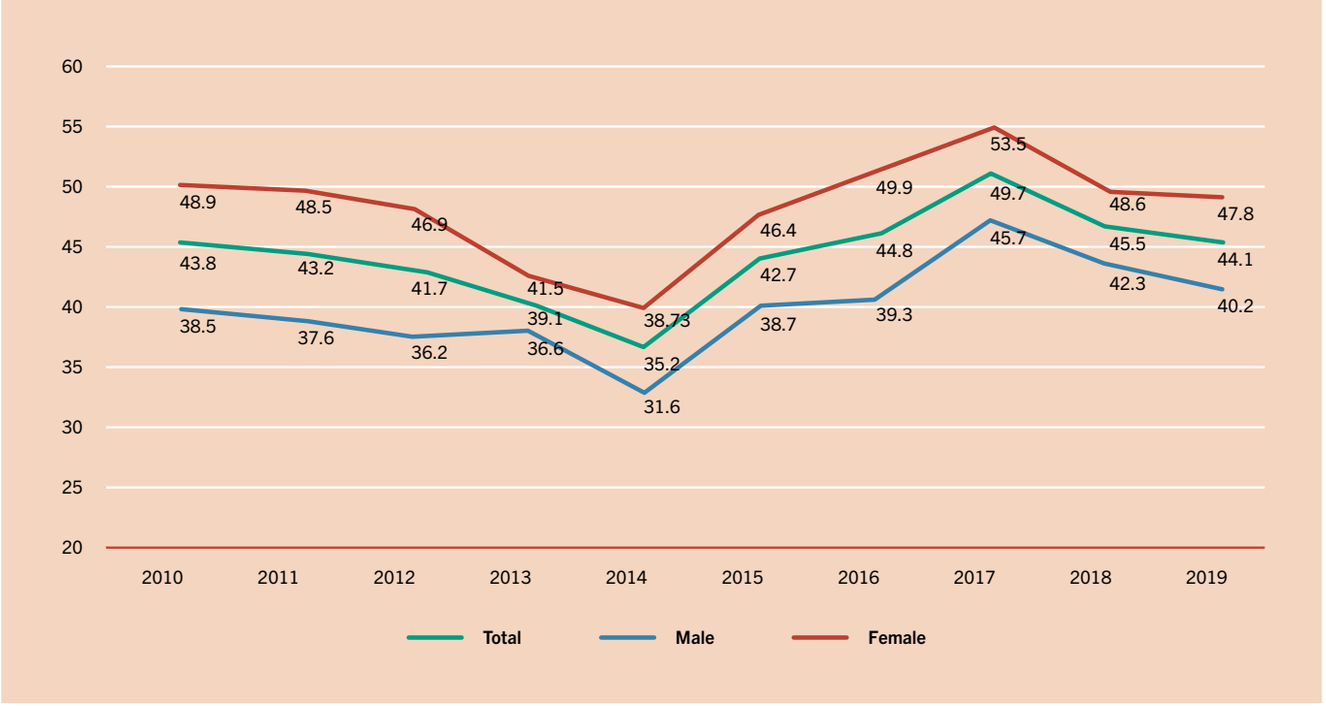

Chart 8. Mortality rates (per 100.000) from diabetes, Repubic of Serbia, 2010-2019

Source: Health-Statistical Yearbook of the Republic of Serbia 2019 Belgrade: Institute of Public Health "Milan Jovanović Batut. 2020.

[111] Health literacy is the level up to which an individual is capable of finding, understanding and using information and services in order to reach decisions and act for the benefit of his/her own health or health of another.

In addition to cardiovascular disease and malignant tumours, diabetes is one of the most common chronic non-communicable diseases. The prevalence of diabetes has been increasing for a long time, bearing in mind the global distribution of this epidemic. The World Health Organization (WHO) and the International Diabetes Federation (IDF) estimated in 2011 that 366 million people worldwide have been suffering from diabetes, and that the number of diabetics will increase to 552 million by the year 2030 (Whiting et al., 2011).

Diabetes is the third leading cause of death in the world, while in Serbia it is the fourth leading cause of death and the fifth cause of the burden of disease. In our country, approximately 3,000 people die from diabetes annually (IPH, 2020). For the last ten years, an increasing trend of diabetes mortality has been observed in Serbia. Mortality rates due to diabetes mellitus have increased from 43.8 in 2010 to 44.1 per 100,000 residents in 2019 (Chart 8). Compared to the EU, Serbia's diabetes mortality rates are almost double (total mortality rate 23.99 per 100,000 residents, male 27.84 and female 20.88 per 100,000 residents) (Eurostat, 2021). These values are not surprising given the fact that diabetes in Serbia is often discovered by chance, when the disease has progressed and complications have occurred. Almost a third of patients already have one or more late complications at the time of the diabetes diagnosis being made (IJZ, 2021). Although diabetes depends on genetic factors, a healthy balanced diet and physical activity can contribute to maintaining optimal blood sugar levels.

Preventive check-ups are important in order to identify health problems at an early stage, enable more efficient treatment and reduce overall healthcare costs. Measuring blood pressure, measuring blood sugar or cholesterol levels and their deviations from reference values may be the earliest indicators of cardiovascular disease and diabetes. Also, adhering to the recommendation for mandatory screenings that exist in Serbia (for breast cancer, cervical and colon cancer), and in- creasing the coverage of the target population with national screening programmes is crucial in order to reduce the number of deaths from certain types of cancers.

5 Health aspects of aging

The main characteristics of the population in the Republic of Serbia are perpetuating the low birth rate and aging population trends, with an increase in general mortality rates. These changes have brought the population to the threshold of demographic age. As life expectancy increases at birth, so does the number and share of older people, over 65, in the population. While the share of older persons in 2002 was 16.6%, it increased to 17.3% in 2011, and reached one fifth of the total population (21.1%) in 2020. This increase in the number of older persons is projected to continue, reaching as much as 24.1% (SORS, 2022; Nikitovic, 2021).

Age is one of the factors that contribute most to low health literacy (Cutilli, 2007). There are several different age-related changes that could contribute to reduced health literacy in older people, such as reduced cognitive capacity that impairs an elderly person's ability to understand or recall new topics (Cornett, 2006; Kintsch, 1998). Physical impairments such as hearing and vision loss may also contribute to reduced ability to process health information (Cornett, 2006; Speros, 2009). Unfortunately, as the gap in physical and cognitive abilities between younger and older generations widens, it can lead to feelings of shame and embarrassment that reduce effective communication channels and further complicate the health literacy of elderly adults (Cornett, 2006; Speros, 2009). Lack of knowledge and/or skills related to health can serve as an obstacle to engaging in healthy behaviour, prevention services, and management of acute and chronic diseases (Chesser et al., 2016).

As the number of elderly people in the population increases, so does the risk of developing chronic non-communicable diseases. Data show that 34 million deaths worldwide are attributed to chronic non-communicable diseases each year, three-quarters of which are persons over the age of 60 (Jones, 2016). With the increase in the number of elderly people, the pressure on the healthcare system is growing, as are the treatment costs of elderly people for whom chronic non-communicable diseases are the primary reason for using healthcare services (Boutayeb et al., 2005).

In Serbia, the share of people with a chronic disease under the age of 65 is at the level of 20.6%, while over four fifths of the elderly (85.7%) have a long-term illness or health problem, which is an increase compared to 2013. The most common chronic disease among older persons is hypertension, i.e. high blood pressure, which is present among 63.8% of the older population. This is the most common disease in other European countries among the population aged 65 and over. The value of this parameter ranges from 29.5% in Norway to 68.4% in Hungary in the 65 to 74 age group, while in the 75 and over age group, the lowest percentage was also recorded in Norway (33.7%) and the highest in Bulgaria (72.6%) (Eurostat, 2022). High blood pressure is followed by painful changes in the lower back (32.2%), coronary heart disease (24.7%), pain in the cervical spine (23.3%), high lipids (21.0%), diabetes 18.6%), arthrosis (18.0%) and urinary incontinence (10.4%), while others accounted for less than 10%. Observed by de-

mographic characteristics, the frequency of all mentioned diseases is significantly higher among people aged 75 and over, compared to those aged 65-74 (Milić et al., 2021).

When it comes to elderly persons, it is important to emphasize the functional limitations that can significantly affect the ability to perform daily routine tasks, including personal hygiene, care and dressing. [112] Functional limitations also have an impact on lifestyle and participation in social activities. It is essential to evaluate and monitor functional limitations in older persons in order to provide them with timely support, therapy or appropriate assistance.

A 2019 survey of the health of the population in Serbia showed that just under one third of older people in Serbia had serious difficulties in performing daily household activities, and almost every tenth resident in performing personal care activities, which is unchanged compared to 2013. Almost half of the older population (44.8%) had a functional walking restriction, 40.7% had a functional limitation of vision, and 45.9% had a hearing impairment. Persons over 75 were also significantly more likely to have these functional difficulties (with walking 41.0%, vision 14.0%, and hearing 24.5%). Compared to the period 6 years ago, when every third older resident (37.1%) had difficulty walking, every ninth (10.7%) with vision, and almost every fourth (23.6%) with hearing, there was an increase in the prevalence of functional limitations in the older population (Milić et al., 2021; Grozdanov et al., 2014). In the EU, around two thirds of people over the age of 65 reported a functional (physical or sensory) limitation. While in the population over 65 years of age these values differ slightly compared to Serbia (walking restriction 44.1%, vision restriction 31.2% and hearing restriction 44.9%), in the population aged over 75 the share of people with visual impairments has almost tripled (38.9%) while with hearing this value is double (55.3%) (Eurostat, 2022). The aging trend of the population inevitably brings with it the challenge of providing resources to overcome the limitations that older people face in order to preserve and improve their health and quality of life.

Due to the presence of diseases and accompanying functional limitations, old persons are unable to perform daily activities and are therefore in a situation to use the home care and assistance services provided by health workers or social services workers. Furthermore, given the high representation of older persons living alone, often without family support, people over the age of 65 already have and will continue to have a greater need for home care and palliative care services in the future.

In 2019, 5.2% of older people used these services, which is significantly less than the percentage of older people who stated that they needed help. In the older population with difficulties in performing house- hold activities, more than a third (37.0%) had an unmet need for help. In the population of older people with difficulties in performing personal care, almost half (44.8%) had an unmet need for help. The largest percentage of the population who cannot perform activities related to personal care without the help of another person are people aged 65 to 74 (Milić et al., 2021). Such data clearly point to the lack of capacity of health and social services to provide adequate and timely care and assistance to older persons, and to meet their needs for the use of home care and assistance services, and for palliative care.

"Palliative care is another type of health care that includes care for patients with severe chronic diseases, most often in the terminal stages of diseases that have a progressive course (cardiovascular disease, malignant diseases, diabetes, neuromuscular, cerebrovascular diseases, HIV/AIDS, traffic injuries and others), as well as their families. The Strategy for Palliative Care (2009) adopted in 2009 included palliative care into the health system of the Republic of Serbia. Its goal was to strengthen the organization and personnel of existing home treatment and care services at the primary level of health care, and establish home treatment and care services where they did not exist (in 88 primary health care centres). At the secondary level, the establishment of special palliative care units within the department for extended treatment and care was envisaged, as was an increase in bed capacity for palliative care (40 beds per 1,000,000 residents). The Decree on the plan of the network of health institutions defines the total number of beds for extended treatment and care, which includes geriatrics, palliative care, chemotherapy, physical medicine and rehabilitation, but there is no data on the exact number of beds provided for palliative care. For comparison, in the European Union, which has a very similar demographic trend, the estimated palliative care capacity is 80 beds per 1,000,000 residents (Radbruch et al., 2010).

In the absence of sufficient bed capacity for palliative care in health institutions, the care of persons in need of palliative care is taken over by the social welfare system. Due to the lack of capacity of the health system or the inability of the family to adequately care for the sick family member, older persons mostly end up in social care accommodation institutions (founded by the Republic of Serbia or the Autonomous Province of Vojvodina, but also in private homes for the elderly). This is not an ideal solution due to staffing shortages and lack of standards, but it is often the only solution for both the patients and their families. Institutions for the accommodation of the older population thus unofficially become socio-health institutions, for which there is a legal basis, but standards have not yet been adopted. As the largest number of patients in these wards consists of the oldest population, and bearing in mind the percentage of the old population that is increasing from year to year, palliative health care requires additional reorganization in terms of capacity building (infrastructure, organization and staffing) to adapt to the age structure of the population.

[112] Functional limitations represent the basis for the assessment of the population health in terms of capacity for daily functioning regardless of the reasons for the limitation (congenital limitations, limitations brought on by illness, accident, aging, etc.)

6 Health consequences of the COVID-19 epidemic in the Republic of Serbia

In 2020, the world faced a pandemic[113] of a new type of corona virus, SARS-CoV-2, which causes the disease COVID-19. Healthcare organizations and healthcare workers were the first to be hit by this newly discovered disease. The early response to COVID-19 in Serbia was based on the strong existing framework of the Law on Public Health (2016). Adequate emergency response and disease control systems, highly qualified teams of public health professionals at the Institute of Public Health, and a network of 24 regional public health institutes helped delay the onset and magnitude of the outbreak in Serbia.

Although the health sector has been relatively resilient to COVID-19, the outcomes have been uncertain, primarily due to a shortage of qualified medical staff who have migrated to Europe in the recent past, attracted by higher salaries. According to some estimates, over 10,000 doctors have left Serbia in the past 20 years, and the health system lacks 3,500 doctors and 8,000 nurses (Harris and AFP, 2020). While access to health care is relatively equal, people in sparsely populated areas and those with lower incomes report higher unmet health needs, and frequent evasion of health insurance contributions by employers prevents affected workers from exercising their right to health care. This deficit has significantly compromised Serbia's health response to the COVID-19 crisis (OECD iLibrary, 2022).

The first case of COVID-19 in the Republic of Serbia, in Vojvodina, was confirmed on March 6, 2020 and a state of emergency was introduced on March 15, 2020 with the decision on the declaration of a state of emergency. On March 19, the Minister of Health of Serbia passed an order declaring the epidemic of the infectious disease COVID-19 over the entire country (2020), and the epidemic is still ongoing. COVID-19 leads to a serious acute respiratory condition that requires intensive care and hospitalization, especially in older patients and those with pre-existing chronic health problems. High-risk groups are immunosuppressed persons, persons with respiratory diseases, older persons, cancer patients, pregnant women and people with serious congenital diseases of the heart and blood vessels.

In 2020, 5660 people died as a result of infectious disease, with a mortality rate of 82.04/100,000, which is significantly higher than in the previous year 2019 (2.64/100,000). Such a high mortality rate is a consequence of the large number of deaths associated with COVID-19. In 2020, COVID-19 was the most dominant disease in the group of infectious diseases with a total share of 78.93% of all infections. In 2020, COVID-19 ranked a high third in causes of death at 8.9% (men 11% and women 6.6%). The first two places are still occupied by diseases of the circulatory system (47.3%) and tumours (18.3%) (IPH, 2021).

The percentage of deaths from COVID-19 increases significantly among the older population, and while the percentage of deaths among young people does not exceed 1%, in the population over 65 it exceeds 15% (Table 4). By February 21, 2022, 1,887,596 cases of COVID-19 had been con- firmed in Serbia, resulting in 14,904 deaths, giving a mortality rate of 0.79% (Corona virus, 2022).

At the end of 2020, the first contingent of vaccines against COVID-19 arrived in Serbia. Currently, 5 types of vaccines are available. Vaccines are administered free of charge, and citizens of the Republic of Serbia can choose the vaccine they want to receive. The level of collective immunity required to successfully eliminate or control a disease depends on the epidemiological characteristics of each individual infection. According to the epidemiological characteristics of the COVID-19 disease observed so far, a collective immunity of around 80% is expected to be sufficient to successfully control a coronavirus pandemic. This does not mean that the virus and the disease will disappear, but a reduction in the frequency of the disease, sporadic occurrence or seasonal character is expected. In Serbia, unfortunately, vaccination coverage is far from the recommended 80%. 48.62% of the population was partially vaccinated while 47.39% were vaccinated with two doses of the vaccine. The percentage of the population that received a booster dose of the vaccine is 26.94% (Our World in Data, 2022).

Age category (in years)	0	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	>85	Ukupno
N	2	2	0	0	1	10	24	20	60	123	198	348	591	979	1664	1921	1548	1590	1271	10356
%	0.02	0.02	0.00	0.00	0.01	0.1.	0.23	0.19	0.58	1.19	1.19	3.36	5.71	9.45	16.07	18.55	14.95	15.35	12.27	8.86

Table 4. Number and percentage of deaths from COVID-19 by age groups, 2020

Source: Health-Statistical Yearbook of the Republic of Serbia 2020. Belgrade: Institute of Public Health "Milan Jovanović Batut". 2021.

[113] A pandemic is an outbreak of a disease that occurs over a wide geographical area (such as multiple countries or continents) and typically affects a significant proportion of the population

One of the most serious consequences that the population has encountered and continues to face during the epidemic is the inability of residents/insured to access healthcare services due to lack of capacity of the health system (resource allocation, occupancy of hospital wards converted into Covid-wards, transformation of complete inpatient institutions at the secondary and tertiary level into the Covid regime). Due to the inability to access healthcare services in the public sector, they often had to turn to private health services, which consequently led to the services being paid for directly from the "pockets of citizens". Such expenditures are already very high for the citizens of the Republic of Serbia, and the COVID-19 epidemic will only accentuate the inequalities that exist in access to health care, especially for the poorest. Such outcomes for the health system require serious analysis, as the impact of the epidemic on the health system will be felt in the future. (World Bank Group, 2020),

In addition to direct allocations for health services, available information shows that standard, ongoing immunization programmes have been discontinued to some extent. Almost one in four children were in need of health services during the crisis (23%), and approximately one third (33%) did not have their needs met for specialist examinations, including vaccinations, either due to lack of staff in institutions or because parents do not want to access this service during the crisis and in light of the health risks and restrictions on movement (UNICEF, 2020a). Data from UN research show that almost 27% of women and 19.9% of men had difficulty accessing health services during COVID-19 (UN WOMEN & UNFPA, 2020; UNFPA, 2020). Access to sexual and reproductive health services was problematic for 4.5% of women, with young women reporting the most common problems in accessing these services (UNFPA, 2020). More than half of young people (54%) confirmed that their access to health services had been limited due to the crisis. They stated that they were denied services such as access to their chosen doc- tor at the health centre for preventive purposes (25%), gynaecologists (14%), specialists (14%), doctors for the purpose of treatment (12%), psychological counselling (4%) and reproductive counselling (1%), while 30% stated that there were other services they could not access that did not fall into any of the given categories (UNICEF, 2020b).

The general situation regarding access to health care and other services for vulnerable persons and vulnerable groups in Serbia creates an- other social risk that has been exacerbated by the crisis. Persons with disabilities, the Roma population, residents of shelters and care facilities, older persons, persons without health insurance, persons with chronic diseases, migrants, single parent households, the economically marginalized, residents of geographically challenging areas, prisoners, among other groups face systemically unequal access to health services that has only become worse during the pandemic (United Nations human rights team in Serbia). In addition to directly affecting the health of individuals due to disruptions in health services, the disruption to economic activity is expected to seriously affect employment levels, access to education and income security, all of which affect people's ability to procure basic goods such as food, fuel and housing, which further negatively affects health outcomes, exacerbating health inequalities and disproportionately affecting people living in poverty and other vulnerable groups (UNDP, 2020).

7 Use of digital technologies / telemedicine in the era of the COVID-19 pandemic

The COVID-19 pandemic has also affected the use of digital technologies in the daily work of health professionals and has led to the expansion of telemedicine in many other countries as well as in the Republic of Serbia (CDC, 2020)[114]. The *eZdravlje* (eHealth) portal (also avail- able as a mobile application) is designed to provide information and enable the use of electronic services in the Serbian healthcare system. Currently, the portal is intended for insured persons tested for the presence of coronavirus, in order to obtain feedback on test results. Also, through the application, it is possible to download electronic confirmation of vaccination against COVID-19 (MoH, 2022a).

At the time of the pandemic, an additional challenge is to continuously provide health care to patients who are not infected with the SARS-CoV-2 virus. Telemedicine is used as a strategy to maintain the continuity of health care, as far as possible, in order to avoid the negative consequences of delaying preventive examinations or providing services to patients with chronic diseases. Using telemedicine, the doctor can determine when it is best for the patient to come to the health institution for an examination, all with the aim of reducing unnecessary patient visits. Since 2017 doctors have been able to prescribe electronically and order multi-month repeat prescriptions in order to further reduce the need for patients to attend appointments (MoH, 2022a). With the introduction of the state of emergency, the validity of electronic prescriptions has been extended by three months in order to minimize the risk of coronavirus transmission.

[114] Telemedicine is defined as the use of information technology – tablet devices, telephones and computers – for providing health care services when the health care worker and patient are not in the same location.

This means that electronic prescriptions and therapy are used for a maximum of nine months, counting from the last prescription instead of the previous six months (MoH, 2020).

In addition to electronic platforms, it is important to emphasize the existence of national telephone lines for suicide prevention, for psychosocial support in the COVID-19 epidemic, for adolescents, for psychological support for women before, during and after pregnancy, and for women victims of violence. All of these lines operate 24 hours a day and conversations must be confidential and may be anonymous. Also, the telephone counselling centre "Hallo baby", which has existed since 2001 within the Centre for Health Promotion of the City Institute of Public Health in Belgrade, receives calls and answers parents' questions regarding the health and development of children (Hallo baby, 2022). Some of these lines, such as the National Line for Psychosocial Support in the COVID-19 Epidemic were established specifically during the epidemic, but others are equally important, because they provide information, assistance and advice in crisis situations to people in need.

It is clear, however, that in circumstances of patient conditions requiring clinical examination, radiological or laboratory examination, telemedicine will not suffice. In addition, the availability of devices or internet connections may prove a further limiting factor for the use of telemedicine. This is especially true for patients living in rural areas and for older people. The older population has acquired the habit of going to the doctor's office to be seen in person. This cultural habit, as well as the age of the patients, are factors that can significantly impact uptake of innovations in telemedicine.

8 Conclusions and Policy Proposals

A healthy start to life and healthy habits later in life result in fewer fertility problems, more favourable health outcomes, and a longer, more productive and better quality of life, which overall leads to later death. On the other hand, demographic changes, which are characterized by the aging of the population, require changes to the existing framework of health policy and adaptation to new demographic conditions in the following directions: more and better preventive services and more health services for older persons.

All health policy measures aiming to tackle depopulation should, in essence, be preventive in nature. Preventive healthcare deals with the prevention of illness to decrease the burden of disease and associated risk factors. Preventive measures should be applied at all stages across the lifespan and along a disease spectrum, to prevent further decline over time. Prevention is described as primordial, primary, secondary, or tertiary and they often overlap.

Primordial prevention is a population health approach characterized as actions taken to prevent future hazards to health and to decrease (known) risk factors. The broad determinants of health are addressed rather than individual exposure to risk factors. Primordial prevention consists of actions to modify population health determinants and inhibit the establishment of factors (environmental, economic, social, behavioural) known to increase the future risk of disease. Primordial prevention is typically the responsibility of governments. The government is expected to modify the system and factors that damage health, but also to contribute to actions that have a positive impact on health. This could include, for example, tobacco control strategies or urban planning.

Primary prevention prevents the onset of chronic disease by reducing the risk factors for its development. One type of primary prevention is risk reduction through changes in either behaviour or exposure, e.g. reducing cardiovascular risk through lifestyle changes such as healthy eating and not smoking. Another form of primary prevention is increased resistance to exposure to illness by means of vaccination. Immunisation is particularly important in times of great epidemics or pandemics, such as the current COVID-19 pandemic.

Secondary prevention involves the detection and treatment of preclinical changes. Screening procedures are often the first step, leading to early and more cost-effective interventions. The screening process is the combined responsibility of the individual and their health care providers, with an emphasis on patient engagement.

Tertiary prevention focuses on improving the quality of life by reducing disability, limiting or delaying complications, and restoring functions. It helps to lessen the impact of disease on the patient's life as a whole. The patient has more contact with the healthcare system, and care providers in many roles and settings. Although tertiary prevention is important for patients and their families to provide a better quality of life, it cannot help as much in the prevention of depopulation.

At the level of primordial prevention, government should introduce additional taxes to producers of fatty and salty foods, restrict advertising of unhealthy products, and impose stricter requirements for opening and expanding fast-food restaurants, especially near schools. There is no doubt about the importance of constantly reviewing the consistency in the implementation and effectiveness of existing tobacco control measures, but also the need to adopt new, more radical legal solutions. Also, a revision of current curricula in elementary and high schools should be a priority.

Educational institutions such as kindergartens and schools are crucial entry points for primary prevention measures for several reasons. Increasing the awareness and knowledge of the importance of

a healthy lifestyle (primarily on risk factors), from a very early stage of life in educational institutions, will later reflect in a healthy start in life and more control over personal health. Ultimately, this will significantly improve population health. Within current educational curricula, more focus should be placed on health, public health, and the significance of a healthy lifestyle. Physical education is an integral part of the curriculum but it should be promoted more, insisting on increasing physical activity among boys and especially among girls. Promoting a higher level of physical activity in schools may contribute to a wide range of health benefits, including reduced risk of many chronic NCDs, improvement of mental health and quality of life. Physical activity also has an indirect effect on health if it promotes academic achievement, which further contributes to the higher socio-economic status of an adult.

Besides learning, it is important to translate knowledge into practice so, concerning this, healthy meals could be served in schools, where possible. When fast food is less available to children, they will turn to what is available to them and thus eat healthier. The development of healthy habits, in this case related to diet, will significantly contribute to higher levels of awareness and, consequently, better health outcomes both now (e.g. prevent obesity) and later in life.

It is especially important to mention the activities and efforts to learn more about ones sexual and reproductive health in order to achieve full fertility potential in the future. Interactive workshops within the curriculum and not as voluntary activities, where students can learn more on the prevention of sexually transmitted diseases, unwanted pregnancies and different types and proper use of modern methods of contraception must be imperative. These activities will result in more usage of modern contraceptives, while the level of unwanted pregnancies, abortions and health consequences will decline and protect the fertility potential of younger generations.

So far, sexual and reproductive health have been covered in the curriculum in biology and in some voluntary workshops. In order to encourage young people to use modern methods of contraception and thus prevent unwanted events such as unwanted pregnancies and sexually transmitted diseases that can later lead to other complications (AIDS as the consequence of HIV infection or cervical cancer as a consequence of Human Papillomavirus infection), it is necessary to focus efforts on raising young people's awareness of the importance of these methods and their use. Through family conversation, through formal and informal (peer) education in schools (primary and secondary), it is necessary to remove the taboo from the topic of sexual and reproductive health and to change the cultural pattern where there is a negative attitude towards condoms.

During childhood, there are some time points when children have mandatory check-ups. They include examinations performed by different specialists (paediatricians, ophthalmologists, physiatrists, dentists). These preventive examinations may indicate changes that are detected at an early stage and can be corrected and treated in time. When it comes to adults, many are unaware of the importance of preventive check-ups. Although some institutions and companies provide preventive check-ups for their employees, a majority of employers in the Republic of Serbia do not. Therefore, one option would be the introduction of mandatory check-ups of all employees in the public and private sector. Once a year, preventive check-ups lead to the early diagnosis, timely treatment and better outcome of the majority of diseases. A limitation with this type of examination would be the high proportion of workers in the informal labour market, who do not pay taxes and healthcare contributions, and therefore do not qualify for preventive examinations.

In addition to general health examinations, health screening programmes have an important role in preventative health. Although there are three national screening programmes (for breast cancer (Decree on the National Breast Cancer Early Detection Programme, 2013), colon cancer (Decree on the National Programme for Early Detection of Colorectal Cancer, 2013), and cervical cancer (Decree on the National Programme for Early Detection of Cervical Cancer, 2013) in the Republic of Serbia, they are not fully implemented.

The National Programme for the Early Detection of Breast Cancer is implemented by organizing mammography examinations of healthy women between the ages of 50 and 69. Detection of breast cancer at an early stage, in addition to a high chance of cure, enables the application of minimal surgical interventions, rapid recovery, reduced disability, better quality of life, and reduced treatment costs and indirect costs of the disease.

Cytological screening of the cervix every three to five years can prevent four out of five cases of cervical cancer. In countries, mostly developed, where organized screening programmes have been successfully implemented for several decades, there has been a dramatic decline in cervical cancer mortality, such as in the Republic of Finland, by as much as 80%. A cytological smear of the cervix (Papanicolaou test) is used as a screening test for early detection of changes in the cervix. European guides recommend that screening should start between 20 and 30 years of age, and last up to the age of 60-65. Screening for colorectal cancer is conducted in the territory of the Republic of Serbia in the form of an organized, decentralized pro- gramme. The target populations are men and women aged 50 to 74, and the screening cycle is every two years.

However, the coverage of the target population with national screening programmes is very low and huge efforts are needed in order to achieve it. Evidence-based data support the fact that certain interventions can significantly increase the screening coverage of the population. These interventions are based on different approaches and can be targeted at the individual, the community, health professionals, or the health services and management themselves (Camilloni et al., 2013; Zielonke et al., 2021).

When it comes to individual interventions, an invitation letter combined with a reminder sent by mail has shown a positive effect, as have phone calls. Different styles of invitation letters can affect participation in screening programmes. In particular, there is evidence that long, detailed letters can increase inequalities in participation, i.e. that a detailed explanation of the procedures, as well as the advantages of the test itself, can encourage people to respond, especially those with lower educational status. There is strong evidence of a positive effect of the invitation letter being signed by a physician (Toes-Zoutendijk et al. 2017; Jepson et al. 2000; Globocan, 2022).

Community interventions, such as mass media campaigns, providing publicity through different types of media, educational information through pamphlets, leaflets and other written content can also contribute to increasing the screening response rate (Clover et al., 1996; Camilloni et al., 2013).

Interventions which can facilitate a screening test are: conducting screening tests during regular examinations or consultations with a specialist, or sending self-sampling tests by mail. Sending self-sampling kits to people who have not responded to a screening call significantly increases their participation in cervical cancer screening. Also, sending a stool sample kit for an occult bleeding test could drastically reduce the burden on screening services. Interventions aimed at reducing logistical barriers, mobile mammograms, and the use of pharmacies to handle occult bleeding test samples greatly facilitate testing and may lead to a greater response to screening programmes (Globocan, 2022). The linking of data from cancer and screening registries and other repositories of demographic data and causes of death is also crucial for the application of European screening standards, and thus for reducing the burden of disease on society (Anttila et al. 2015).

Pursuant to the Law on Health Insurance (2019), if an insured person does not respond to an examination invitation or does not come in for a screening examination, then such a person shall bear certain consequences in terms of paying a higher price for treatment. Although the coverage of the targeted population for all three screening programmes is far from planned, the higher prices for treatments have not been recorded. Full implementation of the law or certain benefits for those responding to the screening (such as a day off from work) may have a greater impact on increasing the screening response rate.

Due to the current demographic reality and a large proportion of older persons in the population, a particular effort within health institutions should be oriented towards the allocation of funds for nursing care for older people within the department for home care and treatment service, i.e., increasing the number of staff for home visits.

Another proposal is related to human resources allocation, with the possibility of creating an environment where formal home care for older persons should replace informal care delivered mostly by family members. This would relieve young people of a duty of care, allowing them to put their efforts into family planning. Formal home care includes assistance with personal care (such as dressing and bathing), homemaking (e.g., laundry and cleaning), and clinical care (e.g. wound care).

In a global trend (evident in nations including Germany, Japan, and the U.S.) governments are reallocating resources from residential to home care and community care. Added to the benefits of aging in one's place of residence, this approach more importantly offers savings on the low cost-efficiency of traditional modes of residential care (nursing homes). Moreover, increased support for formal care at home can effectively reduce the burden on informal caregivers (Murphy et al., 2017). Formal caregivers tend to have more professional experience providing care for older adults. These caregivers include licensed professionals such as social workers, registered nurses, medical doctors, occupational therapists, physiotherapists, and so forth. In addition, formal care is also provided by unlicensed direct caregivers who had received short-term training; these caregivers provide services to older people in institutions such as nursing homes, assisted living facilities, community-based facilities, and private residences (Stone et al., 2010). Whether the experience of using formal care is positive or negative may be influenced by a number of factors, such as older adults' preference to receive formal care at home instead of institutionalization, and the quality and professionalism of the care providers.

Future planning should take into account external factors such as the strong trend of a drain of medical professionals to Western European countries. If, in such a context, additional education programmes were to be introduced for nurses to specialize in areas relating to the needs of the elderly, there is a risk of them leaving the country following completion of training. In spite of the risk that people trained for work with the elderly, may leave the country, effort, primarily financial, but also in respect of other benefits, needs to be invested in order to retain such staff in the country, given that the labour market demand for such a training profile is high. In addition to institutions for the elderly, they can be employed in all medical institutions where there is a geriatrics ward.

The healthcare system in Serbia is facing rising costs of care for the elderly, and there are insufficient funds to finance all the entitlements guaranteed by health insurance. This situation undoubtedly requires the implementation of necessary healthcare system reforms, primarily in the field of financing, but also in the field of strengthening the institutions of voluntary health insurance. More intensive use of private health insurance services could provide more equal access to health care services for all segments of the population, which primarily refers to the release of state resources for the poorer population.

The private sector, both as a service provider and as a source of financing for health spending, is insufficiently covered in the National Health Account.[135] Therefore, data collection for the private sector and its inclusion in linked accounts is one of the important issues to which special attention should be paid in order to obtain a more accurate picture of the total healthcare expenditures at the national level.

The healthcare system also requires reorganization in the field of palliative care for older persons. Although palliative care is implemented by allocating a number of beds for palliative care in primary and secondary care, and providing home care services at the local level in the most remote places with older populations, this type of health care requires further reorganization in terms of capacity building (re infrastructure, organization and personnel), in order to adapt to the new demographic reality. The introduction of mobile teams that would provide palliative care and home treatment services is one of the potential solutions in the absence of adequate resources.

Today, there is growing evidence on the best management technique for complex chronic conditions in the elderly. The key issues are the coordination of care in all settings and the promotion of self-help

[135] The National Health Account (NHR) is a framework for standardized reporting on health care costs and financing, measuring the overall - public and private and health costs of a country's population.

(where possible), the development of appropriate staff and, in particular, the optimal combination of skills, but also information support systems and funding mechanisms that encourage integration rather than fragmentation of different sectors. Increased health literacy and better access to technology, such as computers and the Internet, can help improve understanding and enable patients to become more involved in self-care (Rechel et al. 2009). Much can be achieved through relatively simple interventions, such as those that facilitate mobility through the use of assistive technology.

Insufficient knowledge of digital technologies, i.e. lack of digital literacy, as well as fear of possible misuse of data, can lead to resistance to the use of telemedicine services. Bearing in mind that not all health workers and users in the healthcare system are ready to accept and use telemedicine services as a means of distance communication, it is necessary to legally regulate and standardize which services can be provided by means of telemedicine and how. Thereby, firstly patients, and then the medical staff will be sure that the services provided through telemedicine are legally justified. Also, the application of telemedicine will bring long-term benefits and help with everyday challenges in health systems.