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RELATIONSHIP BETWEEN SUSTAINABLE DEVELOPMENT AND PUBLIC HEALTH. CASE STUDY ROMANIA

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Abstract

Health and well-being are the key drivers of social and economic development, as well as a major priority for the population and communities, as the deterioration in health generates the loss of life and the waste of resources in all sectors, besides suffering to people. Factors contributing to the prosperity also contribute to an increase in the health of the population, since fair access to education, decent living conditions and decent incomes contribute to maintaining health. At the same time, increasing work productivity, healthier aging of the population, and lower spending on sick leave and social benefits are influenced by population health. It is noticed that the current globalization process is becoming more and more conflicting from the point of view of the distribution of its offers, as it is accompanied by profound social inequality. In middle and low income countries, there is a marked increase in chronic disease that is increasingly worrying, we see increasing nutritional problems, an acute frequency of obesity worldwide, a demographic transition with population growth of the third age. Under these conditions, we consider that the relationship between sustainable development and public health are issues that are worth analyzing, so that public policies can take this into account and thus can contribute to increasing the well-being of the present and future generations.

Key words: *sustainable development, public health, Romania*

INTRODUCTION

Sustainable development is an increasingly controversial concept of the global ecological crisis of 1929-1930, nowadays representing a new path of humanity and being integrated with the economic, social and human spheres. Through sustainable development, we aim to ensure the best quality of life for all the inhabitants of the planet, both for the present generation and for future generations, putting man and his needs in a central place alongside the natural environment and protecting and preserving [6].

The strategic objectives for sustainable development of the European Union include, in addition to limiting climate change and its negative costs, promoting sustainable consumption patterns or avoiding overexploitation of natural resources, and human resource issues, such as: promoting good public health in fairness and improvement of protection against threats that may affect health; social inclusion, security and quality of life; solidarity between generations.

Therefore, health is an integral part of the concept of sustainable development, being integrated with sustainable development strategies and policies promoted for this purpose.

Starting with Agenda 21 that highlighted the role that health plays in sustainable development, concerns over this area have not ceased to exist.

Public health has officially become an area that has been within the competence of the European Union, with respect for the principle of subsidiarity, with the adoption of the Maastricht Treaty of 1992, and the Treaty of Amsterdam of 1997 stipulated that all policies in other areas, key aspects of Community action must take account of human health protection requirements [1].

The EU Sustainable Development Strategy of 2001 considered that one of its four priorities

is public health. The 2000 Millennium Summit in New York, which adopted the United Nations Millennium Declaration, promoted the idea of poverty reduction by analyzing the causes it generates and setting goals directly linked to global health improvement, such as: reducing child mortality; improving maternal health; combating HIV/AIDS, malaria and other diseases; eradication of extreme poverty and hunger; Ensuring environmental sustainability; stepping up a global partnership for development. The 2002 World Summit on Sustainable Development highlighted the relationship between health and environmental issues, highlighting the fact that sustainable development can not be achieved if there is a high prevalence of disease and the health of the population is dependent on a healthy environment.

It has been shown that there is a direct relationship between health, the environment and poverty. In 2006, the Sustainable Development Strategy of the United States introduced new public health challenges, as it was found that unsustainable trends persisted (Word). In 2007, the WHO report shows that high mobility, interdependence and interconnection as phenomena of the modern world offer many opportunities for rapid spread of infectious diseases, other major health risks for people who cause these diseases not only to spread faster, but also at shorter intervals [5]. At the EU level, there is a General Health and Consumer Protection Directorate of the European Commission that is active in the public health field and the Action Program 2007-2013 has made important contributions in reducing human health gaps / inequalities [7].

Among the 17 Sustainable Development Objectives of Agenda 2030 that aim to eradicate extreme poverty, combat inequalities and injustice and protect the planet, there is also objective 3 Health and well-being - Ensure a healthy life and promote the well-being of all at all ages [7].

As a member country of the European Union, Romania must ensure the implementation of the necessary measures to improve the health of the citizens, in harmony with the regional health policies and to contribute to the fulfillment of the Sustainable Development Objectives not only at national level but also at international level, supporting less developed countries through development assistance.

The National Strategy for Sustainable Development of Romania - Horizons 2013-2020-2030 has among its main directions the accelerated modernization of the education and training and public health systems, taking into account the unfavorable demographic evolutions and their impact on the labor market [3].

As far as public health is concerned, the national objective for Horizon 2013 was: Improving the structure of the health system, the quality of the medical act and the care provided in the health services; improving the health of the population and increasing the performance of the health system. The national 2020 target is: Achieving some parameters close to the current average level of population health status and quality of health services in other EU Member States; integrating health and demographic aspects into all Romanian public policies, and the national target for Horizon 2030 is: Full alignment with the average performance level, including in terms of funding for health services, of other EU Member States.

Therefore, public health is a concept to be followed and analyzed considering its importance in achieving sustainability goals [8].

MATERIALS AND METHODS

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The EU Sustainable Development Strategy of 2001 considered that one of its four priorities is public health. The 2000 Millennium Summit in New York, which adopted the United Nations Millennium Declaration, promoted the idea of poverty reduction by analyzing the causes it generates and setting goals directly linked to global health improvement, such as: reducing child mortality; improving maternal health; combating HIV/AIDS, malaria and other diseases; eradication of extreme poverty and hunger; Ensuring environmental sustainability; stepping up a global partnership for development. The 2002 World Summit on Sustainable Development highlighted the relationship between health and environmental issues, highlighting the fact that sustainable development can not be achieved if there is a high prevalence of disease and the health of the population is dependent on a healthy environment.

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RESULTS AND DISCUSSIONS

This paper aims to analyze the main public health indicators correlated with the population of Romania as well as GDP, given that there is a proportionality relationship between the GDP and the fraction allocated to health services, the poverty being directly related to the allocation health resources.
Based on the statistical data, it is observed that during the period 2007 - 2016 there was a continuous decrease of the population as a result of the migration of the labor force with Romania's entry into the European Union but at the same time due to decreased birth rate, aging population and increasing mortality. Compared to 2007, the decrease was 5.38% in 2016 for the resident population and 1.56% for the home population.

Table 1. Population by residence and population by residence in 2007-2016

Year	Population by home		Population by residence	
	Number of people	%	Number of people	%
2007	20,882,980	100.00	22,562,913	100.00
2008	20,537,848	98.35	22,542,169	99.91
2009	20,367,437	97.53	22,520,477	99.81
2010	20,246,798	96.95	22,492,083	99.69
2011	20,147,657	96.48	22,441,740	99.46
2012	20,060,182	96.06	22,401,865	99.29
2013	19,985,814	95.70	22,359,849	99.10
2014	19,913,193	95.36	22,299,730	98.83
2015	19,819,477	94.91	22,260,158	98.66
2016	19,760,314	94.62	22,214,995	98.46

Source: Own processing, Tempo online National Institute of Statistics [4].

By age group, during the period 2007-2016, there is a population aging process, with changes in the age group for the resident population showing a decrease of the young population aged 0-14 years by 1.2% and 1.8% of the population aged 15-49. Over the same period, the population aged 50-64 increased by 0.6%, and those aged over 65 increased by 2.4%.

Table 2.Structure of the population by age groups during the period 2007-2016 (%)

Year	Population by home				Population by residence			
	0-14 years	15-49 years	50-64 years	Over 65 years	0-14 years	15-49 years	50-64 years	Over 65 years
2007	16.6	49.9	18.4	15.1	15.4	52.4	17.8	14.4
2008	16.0	48.7	19.5	15.8	15.3	52.0	18.2	14.5
2009	15.8	48.1	20.0	16.1	15.3	51.7	18.5	14.5
2010	15.8	48.1	20.0	16.1	15.3	51.4	18.8	14.5
2011	15.8	48.1	20.0	16.1	15.2	51.2	19.0	14.6
2012	15.8	48.0	20.0	16.2	15.2	51.1	19.0	14.7
2013	15.6	48.1	19.9	16.4	15.1	51.1	19.0	14.8
2014	15.5	48.2	19.5	16.8	14.9	51.1	18.8	15.2
2015	15.5	48.2	19.1	17.2	14.8	51.2	18.5	15.5
2016	15.4	48.1	19.0	17.5	14.7	51.2	18.3	15.8

Source: Own processing, Tempo online National Institute of Statistics [4].

Regarding the share of age groups in the total population by residence, the same demographic population aging trend (figure 1), increasing the population aged between 15-49 years, followed by the share of the population between 50 and 50 -64 years, implying certain measures related to Romy ear's public health policy and the development of those areas that are characteristic of the health system that responds to the specific needs of an elderly population (Fig.1).

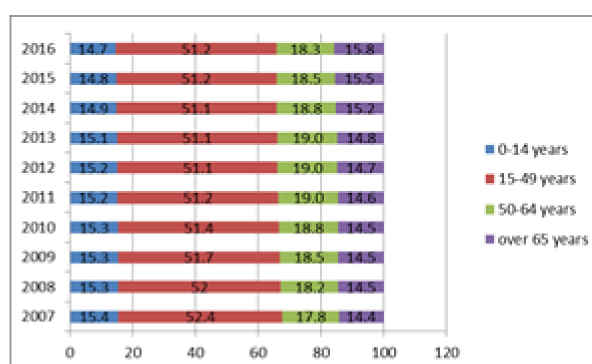

Fig. 1. Population structure by domicile and age groups over 2007-2016
Source: Tempo online National Institute of Statistics [4].

Analyzing the statistical data on birth rates highlights the fact that during the period 2007-2016 a negative natural increase was registered. The highest values of the indicator were recorded in 2012 and 2015, when the number of deaths exceeded by 73.3 thousand

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persons, respectively 73 thousand newborns, which represented a 96% increase of negative growth compared to 2007. High values were also recorded in 2013, 2014 and 2016, with negative growth increases of 90%, 87% and 78% respectively (Table 3). The causes of the negative growth of the population are the decrease in the birth rate as well as the massive migration, one of the consequences being the decrease of the working population and the aging of the labor force, which influences the ratio of the active population to the inactive population. This has led to an increase in healthcare needs, with effects not only on the health system but also on the whole of society. Under these conditions, it is necessary to take measures that will contribute to the increase of the birth rate in Romania.

Table 3. Evolution of Birth, Mortality, and Natural Population of the Population (thousands people)

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Born Live	214.7	221.9	222.4	212.2	196.2	180.7	176.0	183.7	187.3	190.2
Death	252.0	253.2	257.2	259.7	251.4	253.7	246.8	253.3	260.6	256.7
Natural growth	-37.3	-31.3	-34.8	-47.5	-55.2	-73.0	-70.8	-69.6	-73.3	-66.5

Source: Own processing, [4].

Fertility is the number of live births per 1,000 women of childbearing age 15-49 years of age. It can be seen that during the analyzed period this rate increased from 1.2 in 2007 to 1.6 in 2016 (Table 4).

Table 4. Total fertility rate (number of live births to a woman of childbearing age)

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Fertility Rate	1.2	1.3	1.3	1.3	1.2	1.4	1.4	1.6	1.6	1.6

Source: Own processing, [4].

Mortality measures the number of deaths within a population over a defined period of time. The variation in mortality rates influences both the natural growth rate and the life expectancy, while being influenced by the social, economic and biological factors as well as by the health services.

The mortality rate increased in the analyzed period from 11.2 deaths/1,000 inhabitants in 2007 to 13.1 deaths/ 1,000 inhabitants in 2016 (Table 5).

Table 5. General mortality rate (deaths per 1,000 inhabitants)

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Number of death	11,2	11,2	11,4	11,5	11,2	12,6	12,4	12,8	13,2	13,1

Source: Own processing - Tempo online National Institute of Statistics, [4].

Life expectancy at birth is a major demographic indicator analyzed in correlation with the population mortality indicator but having an impact on all components of the standard of living. The standard of living is linked to the wealth and prosperity level of a population and is measured by the quality and quantity of the goods and services that a population and a person have.

The World Health Organization and Eurostat use information not only about life expectancy at birth, but also about healthy life expectancy, meaning the healthy lifestyle of life expectancy at birth. The indicator is the average number of years that a born is expected to live with good health and combines information on age-related health status and age-related morbidity data.

The analysis of the data in Table 6 shows that life expectancy increased in 2016 as compared to 2007 by 2.95 years. Life expectancy for men increased by 2.94 years, while in women it increased by 2.93 years. Women's life expectancy is almost 7 years higher for women than for men in 2016.

Table 6. Life expectancy at birth, by sex (%)

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Male	69.17	69.99	70.19	70.27	70.63	71.24	71.73	71.97	71.94	72.11
Female	76.14	77.05	77.45	77.64	77.86	78.20	78.60	78.89	78.90	79.07
Total	72.61	73.47	73.76	73.90	74.20	74.69	75.15	75.41	75.39	75.56

Source: Own processing - Tempo online National Institute of Statistics, [4].

The evolution of life expectancy by gender highlights the fact that life expectancy has increased continuously from 2007 to 2016 for both male and female populations. A global study highlights the fact that the indicator has risen globally as a result of the decrease in mortality rates due to cancer and cardiovascular disease in rich countries and the increase in the survival rate of tuberculosis, diarrhea and malaria patients in poor countries (Global Burden of Disease, 2013).

Life expectancy is an important element in developing policies that take into account the life cycle, namely: employment policies, retirement policies, or health care policies (Fig. 2).

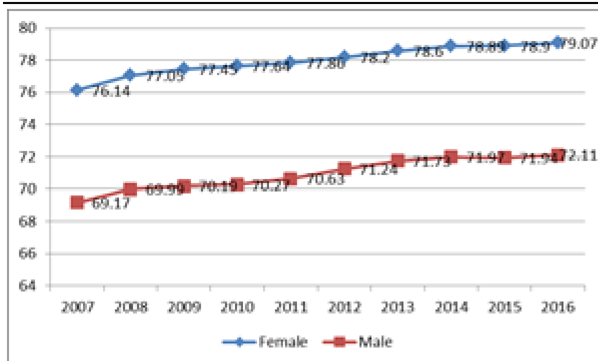

Fig. 2. Evolution of life expectancy at birth, by sex
Source: Own processing, [4].

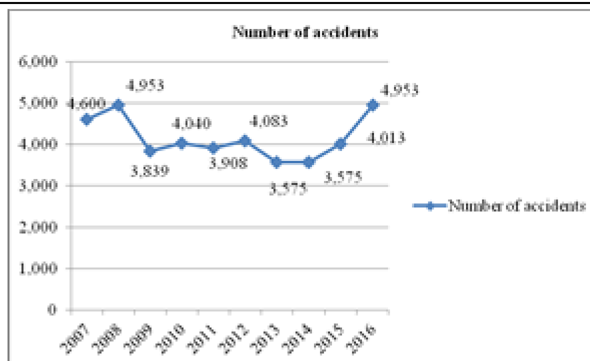

Fig. 3. Evolution of number of work accidents
Source: Own processing, [4].

Occupational accidents represent an area of contemporary public health with major consequences in the economic, social, legal or political sector. Concerns about improving health and safety at work must be a priority for all governments, given that these accidents generate both societal and organization costs but also suffering and disability that can compromise the life of the victim and family. Although safety and health at work have seen a development in recent years leading to a reduction in the number of work-related accidents, Romania needs to make further efforts to meet the European Union's 2020 targets and 2030 respectively.

The data analyzed show that the number of injuries at the workplace had an oscillating evolution. The smallest number of injuries registered in 2013, respectively 2014, when their number was 3,573 injured, and the highest number was registered in 2016 when it was 4,953 injured.

Table 7 - Number of injured at work

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Number of injuries	4,601	4,953	3,839	4,040	3,908	4,083	3,575	3,575	4,013	4,953

Source: Own processing, [4].

Starting with 2008 and until 2015, however, there is a decrease in the number of injuries at the workplace (Figure 3).

We believe that promoting a national strategy to reduce work-related accidents should take into account the premise that a policy of preventing and combating the phenomenon of labor crunching is less costly and far more efficient than the costs generated by the globalization of its consequences.

The quality of life is given by the perceptions of individuals on their social situations, in the context of the systems of cultural values in which they live and their own needs, standards and aspirations (WHO, 1998). One of the eight dimensions of quality of life is given by the affordability and quality of medical and social assistance services that are influenced by financial stability. Therefore the indicator Self reported unmet need for medical examination for financial reasons, is an important indicator of public health.

It is noticed that the share of persons who could not consult a specialist for financial reasons decreased from 72.5% in 2007 to 61.2% in 2016. The peak year was represented by 2011 when the number of these persons was 76.8%, followed by a further drop in this share by 2016.

Table 8. Self reported unmet need for medical examination for financial reasons, by sex (%)

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Male	71.5	71.6	70.4	71.0	74.2	73.6	72.6	74.1	69.6	57.3
Female	73.2	72.7	74.7	74.9	78.4	75.8	72.5	72.7	73.7	63.5
Total	**72.5**	**72.2**	**73.0**	**73.4**	**76.8**	**74.9**	**72.5**	**73.2**	**72.1**	**61.2**

Source: Own processing - Tempo online National Institute of Statistics, [4].

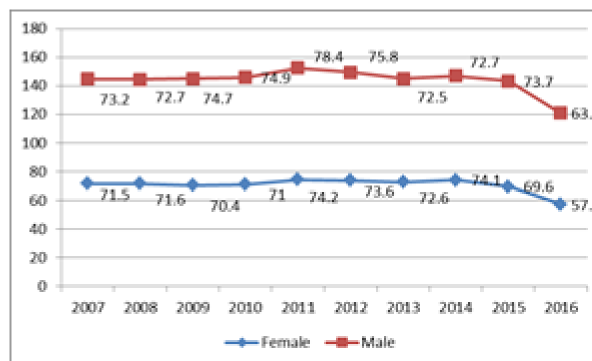

Fig. 4. Evolution of self reported unmet need for medical examination for financial reasons, by sex
Source: Own processing, [4].

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Analyzing the Self reported unmet need for medical examination for financial reasons, by sex it is found that the number of women who give up medical services is higher than the number of men, but the indicator's evolution is relatively similar (Fig.4).

Analyzing the self-reported situation, the highest share of age groups is represented by people over 50 years old. From one year to another, however, it is found that the share of persons aged 15-24 years has increased from 45.3% in 2008 to 70.9% in 2016, for persons aged 25-34 the share decreased from 85.4% in 2011 to 60.5% in 2016. Decreases were also recorded between 2007 and 2016 for age groups 50-64, 65-74 years and over 75 years.

Table 9. Self reported unmet need for medical examination for financial reasons, by age groups (%)

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
15-24 years	59.7	45.3	68.4	86.9	79.6	79.5	62.7	65.2	52.0	70.9
25-34 years	68.9	59.9	56.7	73.9	85.4	74.6	64.7	69.6	60.7	60.5
35-49 years	67.2	70.1	72.7	70.2	72.5	74.5	68.9	79.9	58.6	71.0
50-64 years	71.9	75.2	80.7	76.4	80.6	75.4	75.6	72.3	58.7	61.9
65-74 years	77.5	76.4	72.7	71.9	75.7	75.4	73.1	73.0	87.3	59.5
75 years and Over	76.5	72.7	67.7	70.5	71.8	73.8	73.7	72.3	86.0	55.7

Source: Own processing - Tempo online National Institute of Statistics, [4].

Suicide is the most important public health issue globally. Statistics show that suicide has become a third cause of mortality, especially among certain population groups, the most affected being the age group of 25 to 54 years. From the existing data on Romania in the period 2007-2016, it is noted that there have been various variations from one year to the next. The magnitude of the suicide rate calculated as suicide rate per 100,000 inhabitants is over six times higher among men than among women in 2013 and 2015, more than 4 times higher in 2007 and 2008 and more than 5 times higher in the rest of the period. The causes of suicide are mental disorders, alcohol addiction, chronic or acute illness, etc. People are confronted with the lack of money, the loss of jobs, the couple's problems, and the hardships of daily living that pushes them into taking suicidal decisions. On age groups, the largest proportion of suicides is recorded for men over age 45, and among women over 50 years of age.

Although the WHO report shows that most countries in the world are committed to reducing suicide rates by as much as 10 percent by 2020, few countries have included suicide prevention among the priorities of public health programs.

Table 10. Suicide rate, by sex (%)

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Male	18.0	18.4	20.0	21.0	19.6	21.9	20.9	19.4	19.5	17.1
Female	3.9	3.9	3.4	4.0	3.4	3.4	3.6	3.2	3.4	3.2

Source: Own processing, Tempo online National Institute of Statistics, [4].

Romania is facing a profound socio-economic transformation as a result of recent demographic changes. Estimates show that the proportion of the population aged 65 or over will increase from 15% today to 30% in 2060, which will result in a strong pressure on the costs of medical services, long-term care services and on pension insurance. On the other hand, the current health status of the young and middle-aged population, as well as the quality of medical services, will influence how life expectancy will evolve and increase the need for long-term care.

Analyzing the Death Rate of Chronic Diseases, for people with age less than 65 years, the number of deaths due to chronic diseases increased by 5% in 2016 compared to 2007. The highest death rate was recorded in 2012 of 240.4 deaths to 100,000 inhabitants. By sex, it is found that the number of deaths is higher among men, almost double the death of women due to cortical diseases, throughout the analyzed period.

Therefore, chronic growing diseases place great pressure on public health budgets, which implies the need to develop modern and flexible policies that allow for investment and innovation to adapt and rethink care systems through better integration services and ensuring continuity of care.

Achieving a long-term health level as well as ensuring a productive life can be achieved by preventing, early diagnosis or treatment of chronic diseases, but also by reviewing the health and pharmaceutical policies that will help increase the quality of health care of the population elderly.

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Table 11. Death rate of chronic diseases, for persons with age less then 65 years, by sex (deaths per 100,000 inhabitants)

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Male	291.3	298.6	304.7	301.7	284.2	321.2	313.2	318.7	315.5	311.0
Female	150.2	149.0	149.6	145.7	139.2	158.5	158.7	157.8	155.2	152.1
Total	221.1	224.2	227.5	224.3	212.1	240.4	237.9	239.2	236.3	232.6

Source: Own processing - Tempo online National Institute of Statistics. [4].

Life expectancy shows the average number of years a person has to live with, living in the rest of his life in terms of age-related mortality over the reference period. This life expectancy for each person changes as the individual ages or as mortality trends change.

Statistical data shows that while we live on average more, the healthy life expectancy is decreasing. Analyzing Life expectancy at age 65 for the period 2007-2016 we find that women have a higher life expectancy than men, and this life expectancy has increased for both categories. If in 2007 women's life expectancy was over 81 years, and in men of nearly 79 years, it grew from one year to another reaching 83 years for women in 2016 and nearly 80 years for men.

The setting up of public health policies, employment policies, retirement policies must take into account life expectancy at certain ages as they take into account the life cycle. Life expectancy at age 65 is an important indicator in assessing the longevity of an aging population, given that the elderly have a poor health status and have a high mortality rate compared to other age groups.

Table 12. Life expectancy at age 65, by sex (years)

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Male	13.61	13.97	14.07	14.09	14.16	14.30	14.53	14.67	14.58	14.61
Female	16.44	16.97	17.22	17.32	17.35	17.49	17.78	18.01	17.97	18.02
Both sexes	15.17	15.62	15.80	15.86	15.91	16.06	16.32	16.51	16.44	16.48

Source: Own processing, Tempo online National Institute of Statistics, [4].

According to a study by the World Health Organization (WHO), at least 20% of Europe's population suffers from noise, and noise pollution is the cause of many diseases: cardiovascular disease, hearing loss, insomnia, speech difficulties, psychiatric disorders, neuroses, etc. . Environmental noise assessment and management refers to the noise exposure of urban areas built, public parks and gardens, quiet areas in agglomerations and open spaces, proximity to educational establishments, hospitals and other buildings and areas sensitive to noise.

Between 2007 and 2016, the share of the affected population oscillated between 27% in 2012 and nearly 35% in 2007 and 2016. Given the many health problems that can be generated by noise, this indicator should be taken into account when elaborated public health policies.

Table 13. Proportion of population living in households considering that they suffer from noise (%)

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nuber of people	34,5	31,3	34,9	31,5	28,0	27,1	26,5	34,5	31,3	34,9

Source: Own processing, Tempo online National Institute of Statistics, [4].

Another aspect to be pursued in public health policy-making is the value of GDP, based on several assumptions, namely: the role that GDP has in developing to improve health; health investment, although indispensable for healthcare, has a subsidiary, additive or multiplier impact on public health; a national economic and social development program should cover the requirements of health insurance and be subordinated to the need to increase the quality of life [2].

Table 14. Gross National Income (as GDP share) %

Year	2007	2008	2009	2010	2011	2012	2013	201 4	2015	2016
Gross National Income	97.3	98.1	99.1	99.1	99.0	98.7	98.1	99.0	97.9	97.6

Source: Own processing, Tempo online National Institute of Statistics, [4].

Thus, at the level of Romania, the gross national income reached the highest weight at the level of 2009-2011 when it stood at 99% of GDP, decreasing by almost 2% in the years 2015 and 2016.

Table 15. GDP per capita ($/resident)

Anul	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
GDP	8,326	10,352	8,445	8,212	9,127	8,542	9,568	9,998	8,951	9,540

Source: Own processing - Tempo online National Institute of Statistics, [4].

GDP per capita has increased over the period under review, which means an increase in productivity and, at the same time, an increase in living standards with direct health implications.

CONCLUSIONS

Sustainable development is closely linked to the quality of life and the life expectancy of the population. At the same time, the relationship between economic growth and population health is evident, because sustainable economic growth is based on a healthy workforce and, in turn, economic well-being contributes to maintaining health. Therefore, public health can be considered as one of the major factors of socio-economic development.

Romania faces the phenomena mentioned in the paper, such as the decline in the labor force due to the aging of the population, the increase in mortality, the decrease in the birth rate. All these aspects can be offset by an increase in the health of the population and by the increase in life expectancy.

At the same time, healthcare affects public spending on medical services, early retirement, medical leave, etc. these expenditures can be directed to increasing the quality of life. In other words, maintaining the health of polluting and its productivity is closely linked, and the cost of productivity is one of the indicators that influences GDP.

Another element that can be tracked by using the information presented in the paper is prevention, which in turn can reduce the incidence of diseases and reduce public spending.

Therefore, the health aspect is important for countries with an aging population, such as Romania, is at the basis of public policy formulation, because it is obvious that public health investments for health are much lower than expenditures related to improving health.

In conclusion, we believe that maintaining health and prolonging life expectancy must be an important objective of each country's policy, given that improving the health of the population is an important indicator of the sustainable development of a society.

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