

Impact of Health Indicators and Socio-Economic Inequalities on Greek Population's Health Level in Relation to Causes

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Abstract

The present work deals with the change in the health indicators in Greece over time and the socio-economic factors that cause health inequality, focusing on the economic crisis. At the same time, it is attempted to explain the causal parameters-mechanisms of provoking the abovementioned inequalities and to propose interventions to reduce their intensity in the context of a more fair socio-economic policy.

GOOGLE SCHOLAR has been sought in order to analyze the term «health» through health indicators and to investigate the epidemiological understanding of the disease and its domestic prevalence, through socio-economic indicators. In addition, statistical data were extracted from the Eurostat database and processed diagrammatically to record an average level of health and long-term inherited domestic health inequalities.

Through the aforementioned methodology, the author recorded the evolution of health indicators of the Greek population (healthy life years, life expectancy, infant mortality, population with long-term disease, health problem and activity limitation), the negative impact of the economic crisis on their level and their association with socio-economic factors (income-education-urbanization) that have a long-lasting effect on the classification of the health of the domestic population, causing health inequalities.

The domestic health level, through the use of health indicators, recording its long-term grading, had been heavily hit by the onset of the economic crisis and in combination with the change in socio-economic indicators, has highlighted the importance of the latter in the health of individuals and the wider community and by adopting the proposed policy of stigmatizing the intensity of the inequalities caused, the differentiations can be eliminated (or at least mitigated) and social balance can be achieved.

Keywords: Economic Crisis; Health Indicators; Socio-Economic Inequalities; Health Inequalities

Introduction

Individual and social health, as a multifactorial term, is directly dependent on changes in the wider socio-economic environment and in particular, during the period of domestic economic recession, was severely affected, as evidenced by the downgrade of the level of Greek population's health indicators in relation to the general socio-economic indicators' disintegration. By exploring the multidimensional health issue and the characteristics of the

financial crisis, the change of certain domestic health and socio-economic indicators is recorded, as well as the Greek population's average health level was correlated with that over time change. Due to the correlation mentioned above, certain policies are proposed in order to cope with the identified inequalities.

Financial crisis

The financial crisis refers to one of the two phases of economic fluctuations (downward phase), is characterized by economic

activity's decline, including macroeconomic figures and is approached through indicators concerning unemployment, Gross Domestic Product (GDP) change, available/over-budget family budgets and public spending on social protection [1]. The domestic crisis has led to economic indicators' deterioration and increase in unemployment, inequality, poverty and private catastrophic health expenditures [2]. At the same time, social benefits were reduced and labor market (employment-income) was transformed, affecting the budget (reduction of tax revenues, cuts in health expenditures, welfare state's shrinking).

Existing social inequalities, such as living conditions' deterioration and increased overall mortality, have widened, affecting the micro-level (stressful experiences through pro-cyclical/anti-cyclical behaviour and aggression). The health effects are related to an increase in epidemiological, cardiovascular and respiratory diseases, mortality, unmet health needs and worsening of provided services' and living conditions' level [3].

In addition, there was a slowdown in business and industrial activity, an increase in hospital admissions [4] and a reduction in health expenditures (medical, hospital and pharmaceutical), drawing an impact on income's distribution, through general taxation, participation in social security and private expenditure [5]. What's more, the increase in private health expenditure led to an increase in impoverishment (satisfaction of health needs' meeting at the expense of other services/goods of equal value) [6].

Health and epidemiological approach of disease

The definition of health is the state of complete physical, mental and social well-being (not exclusively the absence of illness or disability) (WHO, 1946). Therefore, in addition to medical factors, a number of other factors (including interacting socio-economic, cultural, environmental and temperamental characteristics) determine the definition of this multidimensional asset [7]. Given the number of factors that determine the health level, their interaction and correlation with it, the model used is the Dahlgren-Whitehead model, that maps the person-environment-health relationship, placing people in the center and capturing the perimeter of the rest of the other factors' stratification at the health level (Figure 1). The health level is recorded with the help of certain indicators such as mortality, morbidity, life expectancy, healthy life years and quality of life (OECD) [8].

Figure 1: Model Dahlgren-Whitehead.

Source: <http://www.esrc.ac.uk/about-us/50-years-of-esrc/50-achievements/the-dahlgren-whitehead-rainbow/>.

To understand the onset of the disease and the determinants of its epidemic, the originally formulated microbial theory, enriched by that of the eugenic (Galton transferable trait study) and Frost-Greenwood assisted focus on the host and environment (spatio-temporal disease allocation), was additionally framed by socio-environmental conditions and included ethnic, racial and socio-economic differences in health, justified by genes, microbes, evolution and environment (interactive organism-environment mechanisms in gene expression).

Later, the role of biological-social factors in the epidemiology of disease distribution (Hamilton) emerged, while the effect of classes (more important than ethno-racial characteristics) was identified, indicating the dependence of health differences on socio-economic conditions (DuBois).

The health-poverty relationship was then diagnosed (US National Health Survey, 1935 - 1936), while Sydenstricker, taking into account environmental variability, extended the epidemiological theory, focusing on the relationship between economic conditions and health level, considering the effect of natural environment, population, society and political conditions. Thus, geography (urban/rural residence) and socio-occupational conditions, combined with heredity, affect the disease-disability-death incidence rate.

At the same time, the characteristics of individuals and those of society were connected through methodological view (social phenomena reducible to individualized behaviors) as well as through lifestyle aspect (restrictions/choices based on professional-income criteria, Max Weber) and extended from

Adler's perspective that the socio-economic content is based on the way of life of individual sections (individuals/groups). Of particular importance is the introduction of the term «risk factor» (Framingham) which Mac Mahon., *et al.* emerged as a broader social determinant of populations' health and health inequalities.

Three theories have been formulated concerning the spread of disease and the interpretation of health inequalities:

1. Social-political theory. Social determinants of health (governance, property, work, property, citizens' rights) are influenced by social status, by social environment (policies, class hierarchy as causes) and by political-economic factors (power, privileged people, as causes of causes),
2. Psycho-social theory. Interaction of factors such as hierarchy, social disorganization, marginalization, harmful decisions that cause neuroendocrine response and stress) and
3. Eco-social theory - Bronfenbrenner model. Connection of individual to micro/medium/outside/ macro-social systems (family, school, work) and consideration of experience integration, through populations' relations for disease distribution and differences in health levels (different impact from exposure to socio-economic deprivation) [9].

The socio-economic health rating, concerning material expression of health inequalities-tangible material conditions and psychological reflection-effects of stress, including the allostatic load (McEwen) from exposure to difficult situations, determines the behaviour and with social status are the psychological health determinants [10], while education, income and employment are indicators of the relationship between social class and psychiatric disorders. [11].

Furthermore, the mechanisms of disease distribution concern: a) social choice/mobility (health determines socio-economic status), b) social causation. Social status determines health through intermediate factors - in the lower classes there is an indirect effect on health (material/psychological/behavioral/biological factors and health system) and c) life perspectives and time for understanding exposure-outcomes during generation's lifetime and disease trends among populations [12], measuring exposure-risk through standardized critical-sensitive period-cumulative effects' study methods [13].

Health determinant factors and health indicators

The health determinant factors are health-medical (health-epidemiological-medical knowledge), economic-political (socio-economic development, distributive ways of income, effectiveness/efficiency of economy), socio-economic (housing, rural-urban structure, inequalities, way of life), socio-economic structure-society's functioning (relations, ways of production, labor division, social stratification), psychosocial-cultural (education, social tendencies, behavior), demographic (population's development, urban/rural density, gender, age, occupation, internal/external migration), geophysical (climate, raw materials, land productivity), environmental (pollution) [14] and the indicators which are used to highlight population/individual health are: positive (survival expectancy, birth/fertility indicators), negative (morbidity, mortality), financial-administrative (health expenditures, per capita health expenditures, number of doctors, nursing staff, hospital beds, admissionsdischarges, visits to outpatient clinics, laboratory examinations, average hospitalization length, bed coverage rate), equivalent healthy years (perfect health status), weighted years (self-evaluated), potentially lost years (by avoidable causes), healthy life expectancy (years without severe disability) and years weighted by main causes of disability [7]. The importance of infant mortality is also emphasized (infant-neonatal-perinatal indicators).

The deterioration of indicators in countries under fiscal surveillance is underlined, accompanied by a decrease in revenues and public health expenditures, increase in prices of basic consumer goods and health prevention programs' cuts (i.e. vaccinations). Differences in material conditions (between social classes) characterize the determinants of health inequalities [15]. In addition, the improvement of life expectancy is primarily attributed to the amelioration of material conditions (combined with the improvement of hygiene conditions and public health measures). A high correlation between reduced health level and poverty is noted, highlighting it as the most important health determinant factor [16], while the role of income distribution is also catalytic. Indicatively, the evolution of domestic health indicators is shown in figure 2 to 9.

Inequalities

In the present study, inequalities are distinguished in social inequalities and health inequalities. As far as the social inequalities

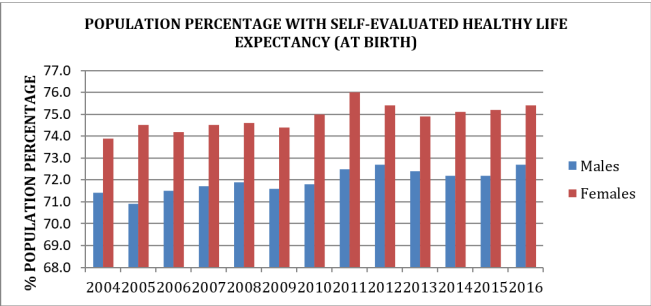


Figure 2: Healthy Life Expectancy.
Source: EUROSTAT
(<https://ec.europa.eu/eurostat/data/database>).

Figure 5: Life Expectancy change rate.
Source: EUROSTAT
(<https://ec.europa.eu/eurostat/data/database>).

Figure 3: Healthy Life Expectancy change rate.
Source: EUROSTAT
(<https://ec.europa.eu/eurostat/data/database>).

Figure 6: Long Term Disease / Health Problem.
Source: EUROSTAT
(<https://ec.europa.eu/eurostat/data/database>).

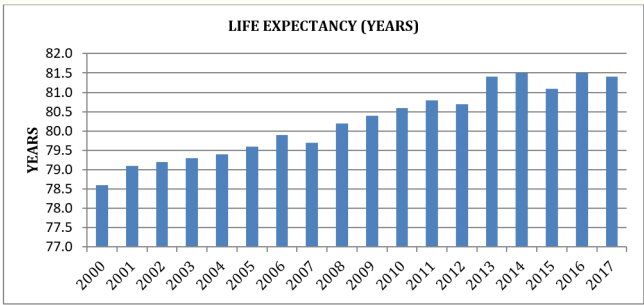


Figure 4: Life Expectancy.
Source: EUROSTAT
(<https://ec.europa.eu/eurostat/data/database>).

Figure 7: Activity Limitations.
Source: EUROSTAT
(<https://ec.europa.eu/eurostat/data/database>).

Figure 8: Activity Limitations change rate.

Source: EUROSTAT

(https://ec.europa.eu/eurostat/data/database).

Figure 9: Baby Mortality change rate.

Source: EUROSTAT

(https://ec.europa.eu/eurostat/data/database).

are concerned, according to Bourdieu (1986), they are related to three types of capital: financial (income, property, production), culture (education credentials) and social (obligations, recognition) and valued (Olin Wright) through a) ownership of productive resources, b) control-power at work and c) recognized skills-specialization (indirect impact on health through differentiation of exposure to employment stressors, affecting the association of socioeconomic status with health inequalities) [11]. The main social indicators used are social sustainability (protection of basic material needs, full employment, social security, fair distribution of burdens to future generations), employment rate, percentage of households with car/income category, net national income, consumption/household, GDP-derivative indicators and trend of household consumption.

Poverty reflects the per capita available resources and is divided into absolute (non-satisfaction of basic needs, ie food,

housing, disease prevention), measured by a defined monetary threshold (poverty line) and relative (inequality, compared to social standards, relative deprivation, absence/adequate coverage of needs), reflected in distance from income/expenditure average [10]. Consequently, the effects of social inequalities on health are proportionally graded, with people in lower positions of socio-economic stratification living in conditions of increased morbidity, derivative of relative/absolute deprivation of goods [17]. At the same time, wider economic, social and political issues are recorded, ie undermining of human rights in the economic (labor), social (access to care, education, poverty reduction programs), political (freedom of expression-association with others) and cultural sector (participation in cultural life). Income is used as a poverty measure (a threshold below which, people are considered poor) with frequent use of monetary indicators.

Health equality is defined as the absence of unjust, avoidable, «curable» health differences between socially, financially, demographically and geographically defined groups [12]. They are distinguished in inevitable differences (physical function, age, sex) and avoidable (deriving from socio-economic/socio-political factors), highlighting fluctuations in living standards, with the most characteristic being the income inequality (source of other inequalities, describing differences in assets, income and its distribution) and inequalities in sectors of education, health, nutrition, energy consumption, documenting the endemic-resistant class character of socio-economic health inequalities.

Health inequality is a term that identifies differences/changes in individuals'/groups' health. Most health inequalities are characterized as unfair, reflecting unfair distribution of social determinants of health (access to education, safe work, health care, social bases of self-esteem) [10] and include ethical, conceptual, pragmatic issues, distinguished in absolute and relative inequalities (vary over time), measured by multiple indicators.

In the BLACK report (England 1980), as the first analysis of social health inequalities, differences in mortality rates of socio-occupational categories, increased morbidity rates in lower classes, more frequent use of health services (mainly preventive) from higher classes were highlighted, emphasizing the importance of class stratification, interpreted: a) artificially (non-connection of social class with mortality), b) through physical/social choice

(health determines social class), c) materially/structurally (material conditions, income, nutrition, working environment) and d) culturally (behavior: smoking/alcohol related to social class) [18]. The distinctive element of health inequalities is the social classification (morbidity and mortality gradually increase from upper to lower income levels), expressing social escalation of health based on income.

Mechanisms increasing health inequalities

The Diderichsen model interprets how health inequalities are caused by social classification through social content (socio-political mechanisms that produce-maintain hierarchies in the field of labor market, education system, culture and social values, most importantly the welfare state and the redistributive policies) and social stratification (at risk-vulnerability and with different effects on health of privileged and non-privileged). It is necessary to distinguish social causes of health and social factors of their distribution between privileged and non-privileged populations.

The studied mechanisms (as being social determinants of health inequalities) are divided in structural (and policies such as: a) governance, b) macroeconomic, c) social (work structure, housing, property, redistribution policy of the welfare state), d) public (education, health, social protection), e) culture-social values that produce/enhance social stratification, defining social status, through power-prestige-resource access mechanisms such as income-consumption [wages, transfers, pensions (mechanisms: better access to material resources, food-, housing, services, better health)], education (and that of previous generation), employment, social class (power-control), gender (biological, women's access to prestige/power/resources) and racial-ethnic.

The mechanisms mentioned form the socio-economic class (education, employment, income) and through social cohesion and social capital, the intermediate social determinants of health emerge: a) materials (work, nutrition), b) behaviors, biological factors, c) social, environmental and psychological factors (job insecurity, unemployment) and d) health system, with a causal priority of structural social determinants of health over intermediates [12]. In addition, the importance of social capital is emphasized, defined as the resources available through social relations that often take the form of tangible factors (loans, work, access to information) in conjunction with psychological ones (trust, reciprocity) [10]. Figure 10 to 13 show the change of unmet health needs, the level of self-evaluated health and the percentage

Figure 10: Education- Unmet Health Needs.

Source: EUROSTAT

(<https://ec.europa.eu/eurostat/data/database>).

Figure 11: Education – Moderate Health Level.

Source: EUROSTAT

(<https://ec.europa.eu/eurostat/data/database>).

Figure 12: Education - Chronic Disease / Health Problem.

Source: EUROSTAT

(<https://ec.europa.eu/eurostat/data/database>).

Figure 13: Education-Activity Limitations due to health problem.

Source: EUROSTAT
(<https://ec.europa.eu/eurostat/data/database>).

Figure 15: Income-Chronic Disease / Health Problem.

Source: EUROSTAT
(<https://ec.europa.eu/eurostat/data/database>).

of population with chronic disease, health problem and limitations of activities, taking into account the educational classification.

In addition, income reflects the annual disposable income (absolute-relative) of households (earnings, self-employment, capital income, public cash transfers) and the usual index for measuring statistical dispersion, representing its distribution, is the GINI index, which was developed by the Italian statistician and sociologist Corrado Ginny and published in his book in 1912 entitled «Variability And Mutability». In an economy such as the Greek one, characterized by high unemployment, tax increase and deficit of public benefits, income inequalities increase and social cohesion is affected, reducing social prosperity. Figure 14 and 15 show the increasing health level, resulting by the increase of the income level and the Figure 16 and 17 detect the change in health level depending on the urbanization level.

Figure 14: Income – Moderate Health Level.

Source: EUROSTAT
(<https://ec.europa.eu/eurostat/data/database>).

Figure 16: Urbanization – Chronic Disease / Health Problem.

Source: EUROSTAT
(<https://ec.europa.eu/eurostat/data/database>).

Figure 17: Urbanization – Moderate Health Level.

Source: EUROSTAT
(<https://ec.europa.eu/eurostat/data/database>).

Results

Austerity acted as a generative cause of declining levels of health indicators (decrease in healthy years and life expectancy, increase in population with disease, long-term health problem and induced activity limitations) due to inability to meet the financial requirements of health services (Figures 2-9). To strengthen, according to European database, the social indicators changed (decline in income's and social benefits' decline, increase in unemployment), resulting from the adoption of a strict fiscal policy. Also, the detailed study of the above points out: a) the inversely proportional relationship of unmet health needs-health level with educational level, b) the directly proportional activities' restriction (due to health problem) with educational level's reduction (due to knowledge utilization, use of income for wider use of health services), c) the health level's raise resulting by increasing income level (more frequent access to health system) and d) the worsening of health level, depending on a lower grade of urbanization (partly justified due to lower income and more difficult access to health system as distance from urban centers, where medical staff and health services are concentrated, increases) (Figures 10 to 17).

Analytically, from the above mentioned, a decrease of population percentage (in both sexes) with healthy survival expectation (2004 - 2016) on birth has been recorded: [average 72 (men) -74,9 years (women), average change rate 0.15% (men) -0.17 (women) (Figures 2 and 3)]. Life expectancy changed (2000 - 2017) with average 80.2 years [average change rate 0.21% -0.20% (men) (average 77.8 years) -0.16% (women) (average 83.2 years)] declining considerably in 2015 (Figures 4 and 5). The population percentage with long-term illness/health problem (2008 - 2017) increased (declining from 2016, average 24.2%) (Figure 6). The population percentage with long-term disabilities due to health problem (2008 - 2017) increased (2010 - 2016) (average 12.8%), with average change rate 2.19% (Figures 7 and 8). The average change rate (2003 - 2017) of infant mortality was negative (-1.29%) (average of 373 cases, gradually increasing) (2012 - 2016) (Figure 9).

Furthermore, according to European database, the percentage of population at risk of poverty (for all incomes) increased, resulting from a) the increase of GINI index, with decreasing change rate (since 2012), b) the increase of GINI index of disposable income, with declining change rate and c) the income decrease (2009 - 2017), with decreasing change rate. As education level reduced,

the population percentage at risk of poverty/social exclusion increased and an income decrease (of all educational levels) was recorded, where unemployment increased, with decreasing change rate, increase of long-term unemployed, peak in 2014 and decreasing change rate at all educational levels (lower percentages at the highest). Also, the provision of allowances decreased due to political austerity's adoption (based on memorandum obligations).

In addition, the increase of percentage of unmet health needs is depicted (higher in lower educational levels) (Figure 10), as well as, the decrease of self-evaluated health level (derived from crisis progression), with lower health level directly proportional to lower educational level (Figure 11). At Figure 12, an increase of population percentage with chronic disease/health problem is detected, resulting from educational level's reduction (constant at all levels) and the same is reflected in activities' limitations due to health problem per educational level (Figure 13). Furthermore, there is an increasing health level, following the increase of income level (Figure 14) and the same is recorded for people with chronic disease or health problem (with an overall increase in incidents). (Figure 15). Finally, there is a health level's decrease (chronic disease/problem, self-evaluated health level) correlated to the urbanization level's reduction, partly due to lower income and reduced access to health system, as distance from urban centers (where medical staff and health services are concentrated) increases (Figures 16 and 17).

Discussion

Social health measurement is assessed through a) government priority, b) collective responsibility for health services' organization and c) social distributive responsibility of health resources [12]. The extent of the economic changes' effects on health depends on the protection level, requiring investigation of exposure to risk factors, the existence of social cohesion (informal) and social protection (formal welfare). Financial protection requires adequate, qualitative and equal health care [2]. Due to the multidimensional changing nature of social inequalities in health, it is proposed to focus on living, working and social capital support's conditions (the latter is a structural component of social life).

The above mentioned favorise the treatment of determinants (structural-intermediate) with macro (public) -medium (community) -micro (individuals) actions (such as patients' protection from income loss due to job loss, strategies for keeping

people with chronic problems at work), treatment and equal access of privileged/non-privileged groups to health system through policies based on effective governance (setting of priorities, needs, social participation, accountability, transparency of public administration), long-term measures (monetary-trade policy-labor structures), social actions (in the field of work, welfare and property), public interest's protection (in sectors of education, health care, hygiene), culture-social values' enhancement and epidemiological situations.

Diderichsen proposes reduction of social stratification (work-education) and exposure's differentiation to risk factors, vulnerability factors of non-privileged and unequal effects of disease on socio-economic (social cohesion-social capital) and health terms, cross-sectoral action and social participation (information, advice, collaboration, empowerment interventions) [12]. In detail, certain interventions below are proposed:

1. Health system's reconstruction (harmonization with principles of availability-accessibility) and medical staff's redistribution, aiming to social benefit's maximization
2. Reinforcement of the institution of family doctor
3. Primary, secondary and tertiary health care separation (costly hospital admissions' reduction)
4. Total population's health coverage (disconnection from employment status)
5. Financial reinforcement of health system (including tobacco-alcohol-fat taxes), favorizing health behavior's modification
6. Spending reduction, medicines consumption restraint and cost containment of vulnerable populations
7. Encouragement of citizens' participation in co-decision concerning the allocation of available resources
8. Family budgets' monitoring
9. Institutionalization of a minimum standard of living, expanding the framework for granting tax exemptions, allowances and subsidies and implementation of modern social protection programs (emphasizing on improving income distribution)
10. Income transfers concerning vulnerable groups (activation of a fiscal mechanism in the context of social equality, distributive efficiency and social justice, with a view to combating poverty by tackling social exclusion

11. More efficient correlation of educational system with labor market needs
12. Measuring of catastrophic health costs-correlation with inequalities upgrading of financial risk protection, implementation of Cost-Effectiveness Analysis
13. Development of mental health promotion programs
14. Monitoring of consumption changes (measurement of solvency)
15. Progressive tax increases (income inequalities' reduction) [5]
16. Promotion of generics- Health Technology Assessment (HTA)- Diagnosis Related Groups (DRGs) and, consequently, reduction of catastrophic costs [2]. Greece could be a center for generics production based on comparative advantages (such as reliable productive processes and lower production-distribution costs) [19] under the auspices of European Union's (EU) competition authorities, against anti-competitive corporate attitudes incompatible with EU law in member states' internal market (concerning medical and pharmaceutical sectors) and ensuring the non-discriminatory provision of medicines and medical services, taking as primary concern the strict harmonization of business practice with the relevant provisions of existing EU legislation and defense of health as a public good [20].

Conclusion

The level of domestic health, adversely affected by economic crisis and coupled with the negative shift in the level of socio-economic indicators, highlighted the urgent and mandatory need to introduce concrete measures in order to extinguish health inequalities and restore equality so as, through their in time implementation, tackling social welfare's regression (resulting of economic hardship), meeting of domestic health needs, maximization of social benefits and defense of health's public feature (as a social good) could be feasible.'

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