Health Financing and Population Health in Crisis-Ridden Greece

MAGOULIOU THEONYMFI, Postgraduate Studies Program, University of Crete Medical School,
nonimag@outlook.com.gr
MAGOULIOS GIORGOS, Department of Economics Science
International Hellenic University,
magulios@es.ihu.gr
BORBOUDAKI LENA, PhD candidate, University of Crete Medical School,
lena_borb@yahoo.gr

Abstract
The aim of this article is to investigate the health of citizens in relation to health economics in Greece during the recent economic crisis (2008). Using relevant literature and research findings on the impact of the economic crisis on health and health systems, indicators related to human health, the health system and health costs were analyzed during different periods of implementation of economic adjustment programs in Greece. A comparative analysis based on EU indicators is carried out and the impact of the economic adjustment programs on health and health system of Greek citizens was analysed. It can be concluded that the intensity and duration of the crisis in Greece as well as the intensity of the fiscal adjustment measures implemented had a worse impact on the population's health and on the basic components of the health system than on those in other EU Member States. This is evident when examining all relevant indicators.

Keywords: health, financing, population, crisis, Greece.

JEL Classification: I100 Health: General, I180 Health: Government Policy; Regulation; Public Health.

Introduction

This article aims to investigate the impact of the economic crisis on the population's health and health financing in Greece. The research questions we pose are the following:
a) What is the relationship between financial health and population health, and what are the implications of the economic crisis for health, based on relevant international and Greek literature and research findings in various parts of the world?
b) What were the consequences of the economic crisis and the policies implemented to address it, the health of the Greek population and the health system of Greece?
c) How has the financial crisis affected health finances in Greece?
d) What is Greece's position on the impact of fiscal adjustment measures on population health and the key components of the health system compared to other EU Member States?

Methodologically, the review of relevant international and Greek literature explores research findings in various regions of the world concerning the impact of economic crises on health. The data presented in this article come from national and international databases, sources and research projects, which are used to analyze population health indicators, health financing and the health system in Greece. A comparative analysis of Greece's indicators with those of EU Member States is carried out and the findings of the survey are extracted. The reference period for the quantitative data is from 2009 to 2016, which varies according to their availability.

Literature review

Health expenditure in all OECD countries (Organization for Economic Co-operation and Development) is estimated to have increased by 1.0% in real terms in 2013, starting from 0.7% in 2012 and showing near zero growth in 2010. However, growth rates in 2013 remained below pre-crisis levels, with average healthcare spending increasing by 3.8% between 2000 and 2009. As a percentage of GDP it has remained stable in recent years, as opposed to the years before the economic crisis, when it exceeded the growth rate of the rest of the economy. Expenditure excluding investment was 8.9% of average GDP in OECD countries in 2013, while in Greece it stood at 9.2% (public and private expenditure). In Greece, Italy and Portugal there was a further reduction in per capita health expenditure in 2013. In Greece, a fall of 2.5% in real terms marked a fourth continuous decline in health spending, leaving per capita funding at around 75% [of pre-crisis levels?]. Significant changes were seen in the annual growth rates for health expenditure in certain countries prior to (2005–2009) and during the financial crisis (2009–2013). Annual increases were reversed in Greece (5.4% vs. −7.2%) and Ireland (5.3% vs. −4.0%), and slowed down in the vast majority of OECD countries. Only six countries – Hungary, Mexico, Switzerland, Israel, Japan and Chile – recorded a higher average increase during the crisis compared to 2009. Annual changes in Greece were: 2009/2010, −10.9%; 2010/2011, −2.8%; 2011/2012, −12.2%; 2012/2013, −2.5% (OECD. 2015.1-3).

Study of healthcare expenditure in OECD countries has revealed that within limits, a range of policies are appropriate for controlling increases in expenditure in different countries, depending on the per capita growth rate in the sector. In countries with low per capita expenditure, increases in the number of doctors and the elderly, greater life expectancy and higher labour productivity may slow down the increase in health expenditure. In high-level countries, it seems that nothing can prevent an increase (Fengping,T. Ke,Y. 2018. 1942).

If we examine the relationship between health and GDP in 13 OECD countries over the last two centuries and for the periods from 1820–2001 to 1921–2001, there was a long-term positive relationship between life expectancy, total GDP and GDP per capita in all countries under study. In most of the countries concerned, 1% increase in life expectancy resulted in an average increase of 6% of GDP in the long term and a 5% increase in GDP per capita. Overall GDP and per capita GDP also have a significant impact on life expectancy. Health improvement can lead to economic growth not only through the increase in total GDP, but also through long-term gains in human and physical capital, which increase productivity and GDP per capita. The 13 OECD countries surveyed are characterized by a long-term positive correlation between life expectancy and total GDP and per capita GDP, and also stability of these relations over very long periods of time, ranging from 80 to 180 years. The results prove that in developed countries, health care improvements can continue to make a valuable contribution to their economic growth. There are also impacts on developing countries that seek to imitate the developmental path of OECD countries over the last two centuries. If any 1% increase in life expectancy has contributed to an average 5% increase in per capita GDP in Europe during that period, then policies that promote better health in developing countries deserve high priority for their potential economic benefits; and not only for the humane motivations of quality of life (Swift, R. 2011. 306, 321-322).

Based on Brenner's hypothesis that economic cycles are harmful to the population’s health, the impact of changing economic conditions on mortality

was explored. The relevant findings suggest that economic cycles have a permanent effect on the health of the population (Laporte, A. 2004. 776).

If we examine income-related health inequalities (IRHI) in Spain both before and during the economic crisis, we find that health inequality based on income increased for 4 years before the start of the economic crisis, though at a moderate rate. By contrast, after 2008 it began to decline at a faster rate. The declining differences in health per income were mainly due to the unequal distribution of the income consequences of the crisis. The incomes of the younger, healthier groups were much more seriously affected by the increase in unemployment than those of groups of over 65s, which mainly consisted of pensioners. Due to the consolidation of retirement benefits in Spain and therefore the fact that they were relatively unaffected in the early years of the crisis, retirees significantly improved their relative position in the distribution of income. On examining the role of labour market participation and employment, other studies found that deterioration in the income of the unemployed and the employed, especially in the construction sector, was mainly responsible for the drop seen in their income classification (Coveney, M. Garcia-Gomez, P. Doorslaer, E. and Ourti, T. 2016. 156).

One article analyzes the effects of the financial crisis on birth rates after the unexpected collapse of the Icelandic economy, whose banking failure was the largest relative to the size of its economy. The findings help us to understand the impact of economic pressure on children's health, which is high in advanced countries, where financial anxiety is one of the most common forms of stress. Economic anxiety has detrimental effects on child health at birth, which has proven to be important for success later in life, even in contexts where the welfare system ensures that everyone has access to health care (Olafsson, A. 2016. 54).

Informal care continues to be the main source of long-term care (LTC) in most European countries (either as a single or combined source of care). It seems that the crisis was associated with a significant increase in informal care and that this change came almost entirely from unofficial care outside the household. As well as in previous studies, there is a significant gap between North and South in Europe. Comparing different European regions, the impact of the crisis seems to have been more powerful in the North and weaker in the South. This may be unexpected, considering that northern countries have much more extensive formal care. One possibly important aspect of this issue is that population aging is progressing at different levels and speeds in different countries. The countries of the South and the East experienced a particularly rapid increase in the 80-year-old population in the wake of the crisis, while the proportion of elderly people in Nordic countries and Sweden in particular remained stable. These different demographic trends represent a puzzle, since one would expect needs to have grown faster in the South during the crisis, as a growing number of elderly people struggled to access public resources impacted by austerity, which in turn enhanced the relationship between the crisis and informal care in these countries. The fact that we observe the opposite confirms the previous conclusion that long-term care systems (LTCs) in South European countries are largely isolated from labour market shocks and that southern European systems are much more divided between formal and informal care than their Nordic counterparts. (Costa-Font, J. Karlsson, M. Øien, H. 2016. 40).

An analysis of the evolution of mortality-based health indicators in 27 European countries before and after the recession found that in countries where the crisis was particularly severe, the decline in mortality in 2007–2010 was significantly higher than that in 2004–2007. Classification of the 27 countries according to the severity of the recession into three groups shows the changes before and after 2007, and reveals that mortality rates

that in decline from 2004 to 2007 continued to decrease in 2007–2010. However, in those countries where the crisis was more severe, there were greater improvements in the population's health during these three years of the recession than in the previous three years of economic expansion. Between 2007 and 2010, general mortality fell to 4.3% in the countries with mild recession, 6.4% in the group of countries where the crisis was moderate and 10.5% in the countries where the crisis was the most severe. Suicides escape bucked the trend observed in most other mortality categories, as in all three groups of countries they were lower in 2004–2007 than in 2007–2010. Later on in the recession, however, suicides increased by 0.2% in countries experiencing a mild downturn and by 6.0% in those moderately affected, but decreased by 1.6% in countries where the recession was most severe. The Baltic States, Spain, Greece and Slovenia, which were worst affected, saw the largest improvement in life expectancy over the recession from 2007-2010 as compared to the previous period of expansion in 2004–2007. According to World Health Organization estimates (WHO, 2016), total health expenditure as a percentage of GDP was higher in 2009 in most European countries, with significant declines between 2009 and 2010 in Austria, the Czech Republic, France, Germany, Greece, Ireland, Lithuania, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and Switzerland. Significant gains in population health were recorded in 2007–2010 in Greece, Slovakia, Spain and the Baltic countries, where the recession was the most severe and austerity policies were implemented from 2009 at the latest. These figures do not appear to be compatible with recent claims that reductions in health expenditure have had a significant harmful impact on the population's health. Apart from health spending cuts, the quality of health care services may have worsened in many European countries where austerity policies have been implemented. If this is the case, the findings may well suggest that a significant deterioration in healthcare may not have a short-term effect on mortality (Tapia Granados, J. Ionides, E. 2017. 226–227, 230–231).

For the developed world, the current crisis will be a short-lived bad patch for its prosperity in terms of both intensity and duration. For many developing countries, however, there is a risk that a decade of efforts to combat poverty and exclusion will be lost, resulting in serious harm for the next generation (European Parliament, 2010, 2009/2150 INI). The human consequences of the global financial crisis in the developing world are presented in an article on the human cost as regards the crucial dimension of infant mortality in Sub-Saharan African countries. Data from 639,000 births, 264,000 women and 30 countries were analyzed. The expected number of excessive deaths was calculated, combining these estimates with growth deficiencies resulting from the crisis. The results indicate 28,000 to 50,000 additional infant deaths in sub-Saharan Africa in 2009 were attributable to the fact that the crisis that started in the developed world expanded to African countries. Most of these additional deaths were of girls. The rise in infant mortality as a result of the financial crisis is a small fraction of the total in Africa, where about 30 million children are born per year, 3 million of whom die before reaching their first year of life. The greatest tragedy is not that 28,000–50,000 additional infants probably died in Africa in 2009, but that so many infants die every year. Policies to protect poor households' incomes and maintain main health services during periods of economic contraction may reduce any anticipated increase in mortality, while interventions targeting female infants and young girls may be particularly beneficial (Friedman, J. Schady, N. 2013. 611, 619–620).

Health crises are a major barrier to economic growth and poverty reduction. Poor health costs much more than ever. Malaria has slowed down economic growth in Africa by up to 1.3% per year; if African countries were free of that disease alone, they would have an average of three times their present per capita GDP. By 2010, it is estimated that HIV / AIDS cost South Africa about US $ 22 billion, down by 17% of the country's GDP. The World Bank has

estimated that as a result of HIV, Africa's growth rate in the 1990s was three times lower than it would otherwise have been. In addition, education and health systems in many less developed countries are seriously affected by the high mortality rates of health workers and teachers. There is a direct, well acknowledged link between better health and strong economic growth. Health contributes to growth via higher labour productivity, higher investment and savings rates, higher education levels and lower birth rates. Therefore, healthcare expenditure is a necessary and productive investment for development, and good health can purvey the growth engine (United Nations. 2001. 1).

In 1992, the Russian government implemented a shock program that resulted in a substantial increase in poverty. Over the following years, the average life of men dropped by 6 years and that of women by 3 years. The main causes of death of citizens were cardiovascular diseases and violent deaths (suicides, accidents, bodily injuries, poisoning). Increased Russian mortality was attributed to two main causes, stressful socio-economic situations and severe alcohol consumption. In the Baltic countries (Latvia, Estonia, Lithuania) dramatic social and economic changes were recorded during the same period. There was a rapid increase in poverty, unemployment, divorce, general mortality and a marked rise in suicide. Social changes mostly affected men, due to their traditional role as breadwinners. In 1997, the economic crisis that started in Thailand spread rapidly to the economies of neighbouring countries such as the Philippines, South Korea, Japan, India, Malaysia and Indonesia. There was an increase in overall mortality and, crucially, an increase in suicide in most countries. Epidemiological studies have attributed increased mortality to rapid and large increases in unemployment and shrinking incomes. The European economic crisis began in 2008 and its effects were particularly evident in the Greek population. The effect of drastic cuts in public spending was a reduction of beds and health professionals in public hospitals and generally lower health costs. As a result, there was an increase in admissions to public hospitals and a corresponding reduction in those seeking treatment at private hospitals. Furthermore, there were increases in suicide, suicide attempts, violent behaviour and homicide, and also in HIV-positive people and heroin users. The chief conclusion to be drawn is that the impact of a given crisis on citizens' health mainly depends on the depth and duration of the crisis, as well as on the capacity to develop mechanisms to protect society. In conditions of financial crisis, the unemployed, the poor and patients with chronic physical or mental disorders are high-risk groups for morbidity / mortality and suicidal behaviours (Kontaxakis, V. Havak-Kontaxaki, B. 2012).

Health in crisis-ridden Greece

Both bibliography reviews and official data have found that public health and access to health services were directly affected by the recent global crisis, as high unemployment rates and reductions in social protection spending are historically linked to a worsening of health indicators and inadequate access to health services. With regard to social policy and health policy in particular, most health systems faced major budget cuts as a result of the crisis. More specifically, some governments reduced the amount of public health resources, either directly or indirectly, by limiting public participation in the provision of specific health services. At the same time, in an attempt to reduce the cost of public funding, they limited payments to health service providers, or they even merged structures, reduced hospital beds, and reduced jobs for health professionals. An indicator of the impact of the economic crisis on international health policy is that since 2007, 18 of the 28 EU Member States have seen a reduction in health expenditure. Since 2009, the health system in Greece has been increasingly under-funded by public sources, while citizens are unable to cover the cost of care at their

own expense due to a drop in the family budget. Five years from the onset of the crisis, the proportion of low-income people who reported being unable to meet a medical need doubled from 7% in 2008 to 13.9% in 2013. At the same time, in terms of major reforms, the merging of public hospital structures in combination with reduced public funding for hospitals appears to have hampered access to health services. In particular, it has been recorded that older people and patients with chronic disorders encounter greater difficulties in accessing treatments and health services, especially in the hospitals. In a relevant survey conducted in 2015, about 30% of the population reported that they failed to address health issues due to financial difficulties. A further study conducted in 2012–2013 involving patients with rheumatoid arthritis, 26% experienced problems with access to a rheumatologist, while 49% had difficulty receiving medication. Inequalities in access to health care have been also reported in patients with cancer. A 2014 study revealed that 31% of cancer patients encountered obstacles to accessing their treatment in the last year, 51% were unable to schedule a medical visit on time and 44% could not cover the cost of visiting a private physician. Furthermore, financial difficulty has been found to be negatively correlated with mental health. Findings suggest that people with financial difficulties are three times more at risk of experiencing a serious psychological disorder regardless of their income. Thus, in recent years, the mental health of Greek citizens seems to have worsened, as reflected in a 120% increase in the use of mental health services over a three-year period. Concerning the relationship between the economic crisis and increased deaths and suicides, although Greece (and Cyprus) has the lowest suicide rates in Europe, there was a significant increase over four years, from 377 suicide deaths in 2010 to 565 in 2014. The highest rate in the country was recorded in 2012; each percentage point of increase in unemployment coincided with an increase in the suicide rate by 0.19 per 100,000 inhabitants. Observations revealed that for every 1% increase in unemployment level there was a 0.79% rise in the suicide rate. On the other hand, a number of positive effects have been seen, such as a reduction in cardiovascular disease by 4.7% on average per year, and a decrease in deaths from road accidents. Significant contributions to this were made by a gradual reduction in smoking, an increase in exercise and minor changes to nutrition habits, involving increased consumption of fruits and vegetables (Souliotis, K. Papadonikolakis, T. Papageorgiou, M. Economou, M. 2018. 9–13).

The risk of a humanitarian crisis is recorded in the database of the 50,000 patients visiting medical centres run by Doctors of the World. Over two years, centres set up for refugees and migrants were transformed into social clinics for the poorest and most excluded Greeks, whose number grew fivefold, looking for free medical and pharmaceutical care, food and social care. What ought by rights to have been the exclusive responsibility of the State was being provided by humanitarian organizations, local government, the Church and social initiatives (Kanakis, N. 2012). According to data from the Greek Police, suicides or attempted suicides rose to 3,124 cases nationwide over the period from 1/1/2009 to 23/08/2012. From 2009 to 2011, incidents increased by 37%. Suicide incidents reached 677 in 2009, 830 in 2010, 927 in 2011, and 690 by 23rd August 2012 (To Vima. 2012). The economic downturn began to affect infants, the most sensitive group in the Greek population. For the first time since 1950 there has been an increase in infant mortality in Greece. This situation has also impacted life expectancy in the general population, which is expected to fall by two to three years. Since 2008, when Greece entered economic recession, infant mortality has risen from 2.7 to 3.8 per 1,000 children aged one year, according to data from a study conducted by a network of European professors on behalf of the World Bank. As the researchers mention, economic crises always have a significant impact on infant mortality and life expectancy. In Russia, for example, there was an increase in infant mortality and a decline in life expectancy after 1989, marking the transition from the socialist system to the free market. In the

ensuing shock to society, life expectancy fell four to five years due to alcoholism, cardiovascular disease and mental disorders (Fytanidou, E. 2012).

From the data on the natural change of the Greek population (Table 1), it is clear that throughout the entire period up to 2010, births exceeded deaths and the overall balance was positive. After 2010 (when the first Economic Adjustment Programme came into effect) birth rates decreased by 22.84% (2017/2010), deaths increased by 14.13% and the deficit in the demographic balance reached 532.66% over the same period. The birth rate of 10.15 per 1,000 inhabitants in 2010 dropped to 8.48 / 1,000 in 2015 (-16.45%), while deaths increased from 9.65 to 11.16 per 1,000 inhabitants (15.64%) over the same period. It appears that the economic crisis and the policies implemented to address not only led to a significant reduction of GDP (25%), but also had dramatically negative effects on the natural change of the Greek population.

Table 1: Demographic Balance of Greek Population

Year	Births (a)	Per 1000 inhabitants	Deaths (b)	Per 1000 inhabitants	Balance (a-b)
2008	118,302	10.53	107,979	9.61	10,323
2009	117,933	10.45	108,316	9.60	9,617
2010	114,766	10.15	109,084	9.65	5,682
2011	106,428	9.57	111,099	9.99	-4,671
2012	100,371	9.05	116,668	10.52	-16,927
2013	94,134	8.51	111,794	10.20	-17,660
2014	92,149	8.43	113,740	10.41	-21,591
2015	91,847	8.48	121,212	11.16	-29,365
2016	92,898	na	118,792	na	-25,894
2017	88,553	na	124,501	na	-35,948
Change 2017/2010	-22.84%	-16.45% 2015/2010	14.13%	15.64% 2015/2010	-532.66%

Source: Hellenic Statistical Authority, Natural change of Population 1932-2015 and 2017.

According to field research conducted by the Hellenic Statistical Authority (HSA, 2014) on the health status of the population aged 15 years and over (sampling 8,223 households and their members throughout Greece), 74.8% of respondents reported very good or good health, 18.2% moderate health, and 7.0% bad or very bad health (Table 2). Compared to 2009, the proportion reporting very good or good health in 2014 decreased slightly (-0.7%), while there was an increase (9.6%) in those claiming moderate health, and a decrease (-13.6%) in those reporting bad or very bad health. Just under half of the informants (49.7%) reported suffering from a chronic illness or health problem. Chronic illness or health problems are any complaints lasting or expected to last 6 months or more with or without medication. Such complaints are reported by five in ten women (54.1%) and four in ten men (44.8%). Six out of ten people (61.8%) in this category are aged 55 years and over. In 2014 there was an increase of 25.2% in those claiming to suffer from chronic illness or health problem when compared with 2009 (39.7%). The survey records data on the prevalence of several chronic diseases/conditions in the previous 12 months. 4.4% of informants reported suffering from asthma (including allergic asthma), showing virtually no change (4.3%) since 2009. 61.0% of sufferers are women and 39.0% are men. 2.1% reported having a myocardial infarction (heart attack), representing a 50.0% increase on 2009 (1.4%). 7 out of 10 were men (69.7%) and 3 out of 10 women (30.3%). 2.6% of people aged 55-64 and 4.7% of people aged 65-74 came into this category. One in five informants reported suffering from hypertension (high blood pressure, 20.9%), an increase of3.5% on figures for 2009 (20.2%). Of this group, 4 in 10 were men (43.6%) and 6 in 10 women (56.4%); 3 in 10 were aged 55-64 and 1 in of 2 aged 65-74. 2.1% of informants reported suffering from a cerebral stroke or

from the chronic consequences of a previous stroke, up 23.5% on 2009 (1.7%). Among stroke victims, women accounted for 52.6% and men 47.4%). With regard to age distribution, 2.5% of the above were aged 55–64, 4.4% 65–74 and 8.2% 75+. Diabetes was reported by 9.2% of informants suffered from diabetes, recording an increase of 16.5% on 2009 (7.9%); women represented 54.4% of this group and men 45.6%. More than 1 in 10 aged 55–64 and 2 in 10 aged 65–74 reported suffering from the condition. Concerning mental health, 4.7% of the population had suffered from depression, representing an increase of 80.8% on 2009 (2.6%). Three in ten sufferers were men (33.0%) and 7 were women (67.0%). Over the 12 months preceding the survey, 4.7% of informants had visited a psychiatrist or psychologist. The proportion of men and women registered was 3.3% and 6.0% respectively. With regard to suicidal ideation and frequency of occurrence, 3.3% of those who responded clearly to the specific question of mental health reported having "thoughts that it would be better not to live or to harm oneself" in the 2 weeks before the survey, (Table 2).

Table 2: Population Health Status (15 years and older) 2009, 2014

Status	2009 Rate (%)	2014 Rate (%)	Change 2014/2009
Very good or good health	74.8	75.3	-0.7%
Fair health	18.2	16.6	9.6%
Poor or very bad health	7.0	8.1	-13.6%
Chronic health problem or chronic disease	39.7	49.7	25.2%
Limited activities due to health problems:			
Severely limited	8.9	10.3	15.7%
Limited, but not severely	13.9	19.4	39.6%
Asthma *	4.3	4.4	0.02%
Myocardial infarction *	1.4	2.1	50%
Hypertension *	20.2	20.9	3.5%
Stroke or chronic consequences of stroke *	1.7	2.1	23.5%
Diabetes *	7.9	9.2	16.5%
Depression	2.6	4.7	80.8%
Suicides	391	565	44.50%
Life expectancy at age 65:			
women	20.8	21.6	+8 months
men	17.9	18.7	+8 months

Source: Hellenic Statistical Authority (HSA), Health Survey years 2014 and 2016

*over the 12 months prior to the survey.

In the 12 months prior to the survey, 12.9% of informants needed vital nursing care and delayed receiving it or did not receive it at all because the time needed to obtain an appointment was too long; 6.0% did so due to distance or transport problems and 9.4% due to a lack of medical specializations and health professionals. The following health care services were needed but could not be afforded: medical care or treatment by 13.6% of informants; dental care and treatment by 15.2%; mental health care, provided by a psychologist or a psychiatrist, by 4.2%. Furthermore, 11.3% of informants needed but could not afford to buy medicine prescribed by a doctor. (HSA, Health Survey. 2014 and 2016).

It is noticeable that most of the health indicators surveyed were worse in 2014 than in 2009. In particular, there was a small decrease in the proportion of the population indicating very good or good health, an increase in those indicating moderate health, and is a decrease in those indicating poor or very poor health. Increases were also seen in the proportion of the population reporting they suffered from: a chronic health problem or chronic disease; a limitation of their activities to a serious or less serious extent; a myocardial infarction, stroke or the chronic consequences of an

earlier stroke; diabetes; depression. A significant percentage of respondents needed necessary nursing care and delayed receiving it or did do so at all, either for reasons related to the health care system or due to financial constraints.

More than half of the country's hospitals and clinics (accounting for 35% of total bed capacity) are private, in addition to which there are over 3,500 private diagnostic centres. Health facilities, staff and medical equipment are unequally distributed in the country, with greater concentration in urban areas, thus contributing to a high level of unmet medical care needs in rural areas. The hiring freeze on public sector professionals imposed in 2010 has hindered a steady increase in the number of people employed in healthcare, a trend typical of the period before the crisis. This has led to a 15% reduction in staff employed in hospitals, though Greece continues to record by far the highest proportion of physicians in relation to the population (6.3 per 1000) in the EU (registered doctors include the unemployed). The overwhelming majority are specialists, with only a small minority (6%) working in general practice or as family doctors. In contrast to the number of physicians, the proportion of nursing staff to the population is by far the lowest in the EU (3.2 vs. 8.4 per 1,000). Unsatisfied need has increased, and lower income groups face greater difficulties in accessing care. In Greece, self-reported unsatisfied need for medical treatment due to cost, distance or waiting time has tripled over the last decade and is now the second highest in the EU (12.3% vs. 3.3% EU average). The difference between the highest (3.9%) and the lowest (18.7%) quintile of income is enormous, underlining the unequal access to services experienced by different income groups. Costs are reported as the most common cause of unsatisfied need in Greece: these may not only concern financial difficulties regarding the accessibility of services, but also changes in household income and consumption patterns as well as user preferences. The percentage of the population reporting unmet healthcare needs due to high costs more than doubled between 2010 and 2015 (from 4.2% to 10.9%), with inequalities being particularly high depending on the income group. In the poorest quintile the figure reached 17.4%, the highest rate in the EU, where the average is only 4.1% (OECD/European Observatory on Health Systems and Policies. 2017).

Over the period from 2009 to 2016, the number of public hospitals declined by -12.67% and their beds by -22.54%. The number of private hospitals remained stable, but beds decreased by -38.63%, while private clinics decreased by -9.03% and beds by -1.75%. Total health facilities dropped by -10.54% and beds by -17.24%. Health centres increased by 6.80%, while beds decreased by -7.56%. (Table 3).

Table 3: Hospitals by legal status and category, Greece, 2009-2016

Treatment	2009	2012	2014	2016	Change 2016/2009
1. Public entities:					
Hospitals	142	133	124	124	-12.67%
Beds *	38,115	32,814	30,157	29,521	-22.54%
2. Private entities:					
Hospitals	5	5	4	5	0.0
Beds *	1,465	1,310	884	899	-38.63%
3.Private clinics:					
Number	166	164	155	151	-9.03%
Beds *	15,124	14,976	15,119	14,853	-1.79%
Total 1-3:					
Number	313	302	283	280	-10.54%
Beds	54,704	49,100	46,160	45,273	-17.24%
Health Centres:					
Number	191	194	205	204	6.80%

Beds	1,004	974	967	928	-7.56%

Source: Hellenic Statistical Authority,
* Closed hospitalization, Military Treatment Centres and their beds are not included.

Doctors increased by 2.80% and dentists fell by -10.48% in the period 2016/2009, while the total of doctors increased by 0.45%. Over the first five years of the crisis and the implementation of the Adjustment Programs, the number of doctors decreased by -0.32%, dentists by -6.95% and all doctors -1.49% (Table 4).

Table 4: Doctors and Dentists in Greece, 2009-2016

Year	Doctors	Change %	Dentists	Change %	Total	Change %
2009	69,030	-	14,774	-	83,804	-
2010	69,265	0.34	14,661	-0.76	83,926	0.14
2011	69,435	0.24	14,518	-0.97	83,953	0.03
2012	69,215	-0.31	14,208	-1.64	83,423	-0.63
2013	68,886	-0.47	13,911	-2.09	82,797	-0.75
2014	68,807	-0.11	13,746	-1.18	82,553	-0.29
2015	68,491	-0.45	13,301	-3.23	81,792	-0.92
2016	70,964	3.61	13,225	-0.57	84,189	2.93
Change 2014/2009	-223	-0.32	-1,028	-6.95	-1,251	-1.49
Change 2016/2009	1,934	2.80%	-1,549	-10.48	385	0.45

Source: Hellenic Statistical Authority

Empirical Survey of Health Expenditures in Greece

The basis for the austerity policy implemented in Greece involved a process of internal depreciation, imposed in cases where a real devaluation of the national currency is not possible (Holezas, I. 2012. 25-31). As far as social policy is concerned, program interventions have worked as a catalyst to implement a rights cancellation strategy, through cuts in social spending on pensions and health, and deregulation of the labour market (Venieris, D. 2011. 134-135). During the crisis period, and as a result of the implementation of anti-developmental Adjustment Program policies, the indicators recorded are those most often seen in a wartime economy. Unemployment reached 23%; employment dropped to 50.1%; research and development spending is half that of the EU28 average; foreign direct investment accounts for 1.08% of GDP, whereas it stands at 39.90% in the EU28; net savings are at around -10%; public debt continues to grow (176.3% of GDP) and the deficit is -7.50%; non-performing loans to households and enterprises have reached 45.2% overall. The population at risk of poverty or social exclusion reached 35.7% in 2015. Based on the Human Development Index, Greece ranked 29th among 188 countries in 2015, placing it among the 49 countries with very high human development (UN, 2015). The country was in 24th place in 2007, 18th in 2008 and 22nd in 2010 respectively (Magoulios, G. Maniadis, J. 2017. 35-62).

The deep and lasting economic crisis continues to affect the health system to this day. Greece spent 8.4% of GDP on health in 2015, but in the context of a drastically shrinking GDP health spending actually declined. Expenditure per capita fell from 2,287 euros in 2009 to 1,650 in 2015 (adjusted for purchasing power), a decrease of 28%, placing Greece well below the EU average. Although public health spending in the country has traditionally never exceeded the EU average, the crisis has had a significant impact. Aiming to achieve more efficient use of public funds, the first Economic Adjustment Program (EAP) set a ceiling of 6% of GDP in order to reduce total public sector spending. Public health expenditure accounts for 5% of GDP,

compared to an EU average of 7.2%, and represents only 59% of total health expenditure, which is the fourth lowest percentage among EU Member States. High private health expenditures mainly in the form of direct payments from patients have always been an important feature of the Greek health system, and they are still rising. In 2015 direct payments accounted for more than a third (35%) of the total, which is more than twice the EU average (15%) and the fourth highest percentage among Member States. The majority of direct payments from patients (90%) relate chiefly to the purchase of private services rather than to their contribution to payments. A third of these private costs consist of informal payments given mainly to surgeons due to long waiting lists in order to ensure the best care faster. Greece spends less than two-thirds of the EU average on health care. Material resources are shared between public hospitals and health centres, private hospitals and clinical and diagnostic centres. Greece has one of the highest levels of private health spending in the EU. In 2015, direct medical expenditure in Greece as a percentage of final household consumption reached 4.4%, the third largest percentage among Member States after Bulgaria and Malta, and almost double the EU average (2.3%). The highest share of private health expenditure consists of direct payments by patients rather than contributions by insured persons to the cost of the services provided. Among others, reasons for this include the following: waiting lists for certain services; substantial differences between the rates of official compensation and the actual remuneration paid to contracted providers (extra charge); monthly caps on the number of visits per doctor, which may lead patients to seek primary care in private structures; fragmented public services; an oversupply of private doctors; patient visits to afternoon care in public hospitals, for which they pay an immediate fee; and the extensive use of informal payments (OECD/European Observatory on Health Systems and Policies. 2017).

Total current health expenditure in Greece stood at 10.03%, 9.34%, 9.67% and 9.16% of GDP for 2009, 2010, 2011 and 2012 respectively. Total current public health expenditure decreased by 2.0% in 2011 compared to 2010 and by 12.6% in 2012 compared to 2011. Total current private expenditure in 2011 decreased by 4.4% compared to 2010 and also by 11.4% in 2012 compared to 2011. Concerning the contribution of the public sector to total current expenditure, there was a reduction from 69.5% in 2009 to 68.0% in 2012. Total funding for health expenditure in terms of GDP in Greece for 2016 rose to 8.45% of GDP, 8.19% in 2015, 7.95% in 2014 and 8.41% in 2013, respectively. Public funding for health expenditure increased by 7.3% in 2016 compared to that for 2015, whereas private funding declined by 2.4% in over the same period. Overall, the public sector contribution to total funding grew from 58.3% to 61.3% in those two years, whereas that from the private sector decreased from 39.9% in 2015 to 38.2% in 2016 (Table 5), (Hellenic Statistical Authority. Health Accounts System 2009, 2012, 2016).

Table 5: Health Expenditures by Financial Institution 2009–2016 (current, Euros million)

Financing Institution	2009	2012	2014	2016
General Government (excluding Social Security Organizations)	6,270.9	5,076.6	4,210.5	4,595.9
% of the total	27.0	28.7	29.6	31.2
Social Security Organizations	9,835.5	6,956.8	4,056.5	4,438.8
% of the total	42.4	39.3	28.6	30.1
Total Public Expenditure	**16,106.4**	**12,033.4**	**8,267.0**	**9,034.7**
% of the total	69.5	68.0	58.2	61.3
Total Private Expenditure	**7,027.1**	**5,621,6**	**5,737.8**	**5,625.4**
% of the total	30.3	31.7	40.4	38.2
Private insurance	433.8	525.7	534.9	567.5
% of the total	1.9	3.0	3.8	3.9
Private Payments	6,593.3	5,095.9	5,202.9	5,057.9

% of the total	28.4	28.8	36.6	34.3
Other expenses*	**52.6**	**53.5**	**198.4**	**67.2**
Total Health Expenditure	**23,186.1**	**17,708.5**	**14,203.2**	**14,727.3**

Source: Hellenic Statistical Authority, Health Account System, *Non-Governmental Organizations (NGOs), Church etc.

In absolute terms, public expenditure funding for suppliers of health goods and services decreased in hospitals, nursing care facilities, outpatient care providers, retailers and other operators in 2016/2009, but recovered in 2016/2014. The corresponding private expenditure, increases in hospitals and nursing care facilities, reduces in out-patient care and increases in retailers and other operators (Table 6).

Table 6: Funding for Suppliers of Health Goods and Services, 2009–2016 (current, EURO million)

Suppliers	2009	2012	2014	2016
Total Public Expenditure	**16,106.4**	**12,033.4**	**8,267.0**	**9,034.7**
Hospitals, Residential long term facilities	7,880.8	7,051.3	4,242.2	4,551.8
Ambulatory health care	2,177.6	1,443.8	954.7	1,180.3
Retailers and other operators	6,047.8	3,538.3	3,070.1	3,302.6
Total Private Expenditure	**7,027.1**	**5,621.6**	**5,737.8**	**5,625.4**
Hospitals, Residential long term facilities	1,477.1	1,764.8	1,919.0	2,002.9
Ambulatory health care	3,968.6	2,138.2	1,533.9	1,373.2
Retailers and other operators	1,581.4	1,718.5	2,284.9	2,249.3
Other expenses*	52.6	53.5	198.4	67.2
Total Health Expenditure	**23,186.1**	**17,708.5**	**14,203.2**	**14,727.3**

Source: Hellenic Statistical Authority, Health Account System, *Non-Governmental Organizations (NGOs), Church etc.

Public health expenditure decreased by -43.90% between 2016/2009, -48.67% in 2014/2009 and -25.28% in 2012/2009, and private expenditure dropped by -19.94%, -22,47% and -20%, while total health expenditure shrank by -36.48%, -38.74% and -23.62% in the corresponding periods. The decline in public spending was more than double that of private spending, with the largest decline in public, private and total health expenditure being recorded in the first five years of the economic crisis (Table 7).

Table 7: Change in Health Expenditures by Financial Agency 2009–2016 (%)

Financing Institution	2012/2009	2014/2009	2016/2009
General Government (excluding Social Security funds)	-19.4	-32.85	-26.71
Social Security funds	-29.26	-58.75	-54.86
Total Public Expenditure	**-25.28**	**-48.67**	**-43.90**
Total Private Expenditure	**-20.00**	**-22.47**	**-19.94**
Private insurance	21.18	23.30	30.82
Private Payments	-22.71	-21.08	-23.28
Other expenses*	1.71	277.18	27.75
Total Health Expenditure	**-23.62**	**-38.74**	**-36.48**

Source: Hellenic Statistical Authority, Health Account System, data processing

Regarding the financing of suppliers of health goods and services, public expenditure decreased by -42.24% to hospitals and nursing care facilities, by -45.79% to non-hospital care providers and by -45.39% to retailers in the period 2016/2009, while private expenditure increased by 35.59% to hospitals and nursing care facilities, decreased by -65.39% to outpatient care providers and increased by 42.23% to retailers, during the same period. It is

noted that despite the large reduction in public spending on all suppliers and a similar trend in private expenditure on out-patient care providers, there was a significant increase in private expenditure on hospitals and nursing care facilities and retailers (Table 8).

Table 8: Change in funding to suppliers of Health Goods and Services, 2009-2016, (%)

Suppliers	2012/2009	2014/2009	2016/2009
Total Public Expenditure	**-25.28**	**-48.67**	**-43.90**
Hospitals, Residential long term facilities	-10.52	-46.17	-42.24
Ambulatory health care	-33.69	-56.15	-45.79
Retailers and other operators	-41.49	-49.23	-45.39
Total Private Expenditure	**-20.00**	**-18.34**	**-19.94**
Hospitals, Residential long term facilities	19.47	29.91	35.59
Ambulatory health care	-46.12	-61.34	-65.39
Retailers and other operators	8.66	44.48	42.23
Other expenses*	**1.72**	**277.18**	**27.75**
Total Health Expenditure	**-23.62**	**-38.74**	**-36.48**

Source: Hellenic Statistical Authority, Health Account System, *Non-Governmental Organizations (NGOs), Church etc., data processing

The change in public health expenditure relative to GDP in the period 2016/2009 was much higher than the corresponding change in private expenditure and total health expenditure. The greatest shrinkage was seen over the period from 2014-2009, when the First and Second Fiscal Adjustment Programs were being implemented (Table 9).

Table 9: Change: GDP, Public Health Expenditure (PHE), Private Health Expenditure (PrHE), Total Health Expenditure (THE) of Greece, 2009-2016, (%)

Period	GDP	PHE	PrHE	THE
2016/2009	-26.6	-43.90	-19.94	-36.48
2012/2009	-19.50	-25.28	-20.00	-23.62
2014/2009	-24.78	-48.67	-22.47	-38.74

Source: Eurostat, Hellenic Statistical Authority, data processing

Table 10 calculates the Health Expenditure Multiplier (HEM) as the ratio of change (c) in the Public Health Expenditures (PHE), Private Health Expenditures (PrHE) and Total Health Expenditures (THE) relative to GDP change as follows:

$$HEM\ (PrHE,\ THE) = cHE\ (PHE,\ PrHE,\ THE)\ /\ c\ GDP$$

Data processing reveals that the PHEM is much higher than PrHEM throughout the period under study, meaning that GDP reduction has had a greater impact on public health expenditure (and vice versa). Furthermore, with regard to the THEM, it appears that each GDP reduction unit causes a reduction in total health expenditure (and vice versa) of more than one unit (Table 10).

Table 10: Public Health Expenditure Multiplier (PHEM), Private Health Expenditure Multiplier (PrHEM), Total Health Expenditure Multiplier (THEM) Greece, 2009-2016

Period	PHEM	PrHEM	THEM
2016/09	1.64	0.74	1.36
2012/09	1.29	1.02	1.21

2014/09	1.96	0.90	1.56

Source: Eurostat, Hellenic Statistical Authority, data processing

On comparing health system and citizens' health indicators in the same survey (OECD, European Commission) between 2007 and 2016-17, two different periods before and after the crisis, it was found that both total and public health expenditures declined as a percentage of GDP, as well as the gross birth rate per 1,000 inhabitants, the number of children per woman, the proportion of adults in good health, the prevalence of diabetes, the incidence of AIDS and the consumption of alcohol, while there was an increase in the proportion of the population aged 65 and over, life expectancy at birth and infant mortality rate over the same period (Table 11).

Table 11: Health System Indicators and Health of the Population, Greece 2007, 2016-17

Indicators	2007	2016-17	Change
Total health expenditure, % of GDP	9.6%	8.4%	-1.2%
Public health expenditure, % of GDP	5.8%	5%	-0.8%
Gross birth rate / 1,000 inhabitants, 2010	10.3	8.6	-1.7
Number of children per woman aged 15-49	1.4	1.38	-0.02
Proportion of the population aged 65 and over	18.6%	21.5%	2.9%
Life expectancy at birth by gender: Men Women	 77 82	 78.9 84	 1.9 2
Infant mortality per 1,000 births	3.6	4.2	0.6
Percentage of adults in good health	74.2%	74%	-0.2%
Diabetes prevalence estimates, aged 20-79, 2010	6%	4.5%	-1.5%
Percentage of AIDS, New cases per million population, 2006	7.7	5.7	-2
Alcohol consumption, litres per capita (15 years+)	9.0	6.5	-2.5

Source: OECD, Health at a Glance 2009, INDICATORS, OECD, European Commission, Health at a Glance: Europe 2018, STATE OF HEALTH IN THE EU CYCLE, data processing

Greece and EU Health System Comparative Indicators

According to data from the OECD and the European Observatory on Health Systems and Policies (2015), almost three-quarters of the population in Greece (74%) report good health status, which is higher than the average in most EU countries, but slightly lower than that 10 years ago (77% in 2005). Ischemic heart disease, strokes and lung cancer still have a significant impact on mortality. In 2014 27% of adults smoked daily – a significant drop on the 2008 figure (40%) but still the second highest rate among EU Member States. On the other hand, alcohol consumption per adult declined and is significantly lower than the EU average, as is occasional alcohol consumption. While the rate of obesity among adults (17%) is just slightly higher than the EU average, almost a quarter of those aged 15 years are overweight or obese, which is the second highest percentage among EU countries. Since the onset of the financial crisis, there has been a remarkable increase in suicide deaths (from 362 suicides annually from 2000-2008 to 475 between 2009-2014). On the other hand, a significant (38%) reduction has been seen in the number of deaths related to road accidents after 2009, although the percentage remains among the highest in the EU (OECD / European Observatory on Health Systems and Policies. 2017).

In the annual health assessment of 45 countries by the Euro Health Consumer Index (ECHI), Greece ranked 28th in 2015 with 577 points (out of a maximum 1,000), 22nd in 2012, 25th in 2013 the 25th, and 28th in 2014. Among individual performances, Greece did well in the following areas: direct access to medical specialties; reductions in stroke mortality and infant mortality; childhood vaccination; frequency of hypertensive patients; moderate alcohol consumption. By contrast, negative performances included many of the criteria for information and patient rights; family doctors; waiting lists for cancer patients; survival of cancer patients; inpatient infections; social inequalities in healthcare access; illegal payments; smoking; lack of physical exercise; road deaths; delayed introduction of innovative drugs; and high consumption of pharmaceuticals, mainly antibiotics. The economic crisis has led to a significant drop in sales as well as in personnel employed in the pharmaceutical sector (around 30%). It has also resulted in tax revenue losses of €207 million and total losses of €500 million, as well as in a general shrinkage in domestic production. As far as generic medicines are concerned, despite their small increase, their market share remains limited in Greece compared to other European countries due to a lack of incentives and a lack of control over the substitution of cheaper generic medicines with other more expensive ones. The reduction in public pharmaceutical costs encumbered patients, whose participation in medicine costs increased from 12.8% in January 2012 to 29.3% in July 2014, stabilizing at 25% in 2015, by which time income was down by about 30%. Although medicine consumption and per capita sales remained high in the period 2012–2014 when compared to other EU countries, (mainly antibiotics), a quarter of people taking medication on a regular basis reduced their consumption of essentials in order to cover the cost of medicines, while one in five delayed filling a prescription or refused it out of inability to bear the cost involved (Institute of Social and Preventive Medicine. 2016. 9–11).

Comparing some indicators of Greece's healthcare system with those in the EU as a whole (2015), Greece shows a negative deviation in the following areas: health expenditure and public health expenditure relative to GDP; the number of hospital beds for acute hospitalization (per 100,000 inhabitants); the ratio of doctors per 1,000 inhabitants; the fertility index (children per 15–49 year-old woman; and per capita GDP. On the other hand, positive deviations are seen in private expenditures; direct payments (% of total health expenditure); self-reported unsatisfied need for medical care; unsatisfied need for medical care due to costs in the poorest quintile; direct medical expenses as a percentage of final household consumption; population over 65; and unemployment. It is evident that the Greece's health system indicators are worse than those in the EU overall (Table 12).

Table 12: Comparative Indicators of the Health System, Greece and EU, 2015

No	Indicators	Greece	EU	Difference
1	Health expenditure (% of GDP)	8.4%	10%	−1.6%
2	Public health expenditure (% of GDP)	5%	7.2%	−2,2%
3	Private expenditure, direct payments (% of total health expenditure)	35%	15%	+20%
4	Number of hospital beds for acute hospitalization (per 100,000 inhabitants)	360	418	−58
5	Doctors to population ratio (per 1,000 inhabitants)	6.3	8.4	−2.1
6	Nursing staff to population ratio (per 1,000 inhabitants)	3.2	8.4	−5.2
7	Self-reported unsatisfied need for medical care	12.3%	3.3%	9.0%
8	Unsatisfied need for medical care due to costs in the poorest quintile	17.4%	4.1%	13.3%
9	Direct medical expenditure in Greece as a percentage of final household consumption	4.4%	2.3%	2.1%

10	Population over 65 years old	20.9%	18.9%	2.0%
11	Fertility index (children per 15-49 year-old woman)	1.3	1.6	-0.3
12	Unemployment	24.9%	9.4%	+15.5%
	Per capita GDP (euro, PPP)	19,700	28,900	-9,200

Source: OECD/European Observatory on Health Systems and Policies. 2017).

Conclusions

With respect to our first research question, literature on the impact of economic crises on health systems and the health status of citizens in different regions of the world recognizes a direct link between better health and healthy economic growth, as well as the fact that good health can feed the development engine (Africa). Considering the relationship between health and GDP (OECD), it has been found that there is a long-term positive relationship between life expectancy, total GDP and per capita GDP, and that economic circles have a lasting effect on a population's health. The human consequences of the global financial crisis on the developing world (Sub-Saharan Africa) and especially on infant mortality were acute. In other countries, the average life of men and women has decreased in times of crisis (Russia), or an increase has been noted in general mortality, and above all an increase in suicides (Thailand, the Philippines, Malaysia, Indonesia, etc.).

On our second research question, in Greece it seems that the economic crisis and the policies implemented to deal with it not only led to an unprecedented drop in material wealth, but also had a dramatic negative impact on human capital and its reproductive conditions, such as a negative demographic balance. Most health indicators worsened during the crisis. Suicides increased, and lower income groups faced greater difficulties in accessing care. Threats concerning the future prospects for health and the health system grew, as the gross birth rate, the number of children per woman, the infant mortality rate and the proportion of the population over 65 years old increased.

With respect to our third research question, regarding the country's health system, in the first five years of the crisis the implementation of the Adjustment Programs coincided with a reduction in the number of doctors and (especially) of nursing staff, public hospitals and their beds. Total and per capita health expenditure decreased, with public spending being more than twice as high as private spending. What were already high private health costs in the form of direct payments from patients increased? The multiplier of public health expenditure was much higher than that of private ones, and it seems that for every unit of GDP lost, there is more than a unit reduction in overall health costs. Bearing in mind that reduction in expenditure occurs directly or in the short term, while the impact on human health extends over the medium to long term, further research is of interest over a deeper time horizon.

Regarding our fourth research question, it can be concluded that the intensity and duration of the crisis in Greece as well as the intensity of the fiscal adjustment measures implemented had a worse impact on the population's health and on the basic components of the health system than on those in other EU Member States. This is evident when examining all relevant indicators. For that same reason, particularly as Greece returns to development, strengthening the resources of the health system should be seen as a prerequisite for the health of society and economy. The system's effectiveness on users is also in need of improvement, especially for members of vulnerable social groups that have borne the brunt of the crisis and its impact on the health sector. Improving health and the ensuing upgrading of

human capital, which is the primary condition for development, will enhance the quality conditions for the economic and social development of Greece.

The relation of health of citizens to health economics during the crisis distinguishes this article from other studies cited in the literature. It is found that the depth and duration of the economic crisis, as well as the intensity of its response measures, have a greater impact on the health of the population and the health system, as in the case of Greece. These are the contribution of this article.

The limitations and limits of our research are related to the limited time period of available data, with the fact that some health indicators such as e.g. life expectancy is related to more other factors than health finances, and that spending cuts are immediate, while health effects are medium to long-term. We also did not correlate the organization and management of the health system in Greece with its efficiency, and the impact of the crisis on other EU countries implementing fiscal adjustment programs, issues that may be the subject of further research.

References

Cost-Font, J. Karlsson, M. and Øien, H. (2016). Careful in the crisis? Determinants of older people's informal care receipt in crisis-struck European Countries. *Health Economics* 25, Suppl. 2, 40.

Coveney, M., Garcia-Gomez, P., Doorslaer E. and Ourti, T. (2016). Health disparities by income in Spain before and after the economic crisis. *Health Economics* 25, Suppl. 2, 156.

European Parliament. (2010). Report on the Consequences of the Global Financial and Economic Crisis for Developing Countries and for Development Cooperation. 2009/2150 INI. Committee on Development, Rapporteur: Enrique Guerrero Salom.

Fengping, T., Ke, Y. (2018). A quantile regression approach to panel data analysis of health-care expenditure in Organisation for Economic Co-operation and Development countries. *Health Economics,* 27, 1942.

Friedman, J., Schady, N. (2013). Health economics letter how many infants likely died in Africa as a result of the 2008–2009 global financial crisis? *Health Economics* 22, 611, 619–620.

Funtanidou, E. TO VIMA. 18/11/2012.

García-Gómez, P., Jiménez-Martín, S. and Labeaga, J, M. (2016). Foreword consequences of the economic crisis on health and health care systems. *Health Economics,* 25, Suppl. 2, 5.

Hellenic Statistical Authority: Physical Population Movement 1932–2015 and 2017. Health Survey years 2014 and 2016. Treatment of Greece in legal form, 2009–2016. Doctors and Dentists of Greece, 2009–2016. Health Account System 2009, 2012, 2016.

Holezas, I. (2012). Labour Market Developments, *Economic Developments,* 17. KEPE Quarterly Issue. Athens. Papanikolaou AVEE. 25–31.

Institute of Social and Preventive Medicine. (2016). The Health of Greeks in Crisis, A Mapping of the Health Situation of the Greeks and the Health Structures of the Country. 9–11.

Kanakis, N. To VIMA 25/11/2012.

Kontaxakis, V., Havaki-Kontaxaki, B. (2012). The Consequences of Major Economic Crisis in the Physical and Mental Health of Citizens. *Hellenic Psychiatric Society,* Vol. 23, Issue 2.

Laporte, A. (2004). Do economic cycles have a permanent e˜ect on population health? Revisiting the Brenner hypothesis. *Health Economics,* 13, 776.

Magoulios, G., Maniadis, J. (2017). From the Economic Crisis to the Fundamental Conditions of an Other Development of Greece, 2nd International

Scientific Conference "Productive Reconstruction of Greece: Economic Crisis and Prospects for Development", Serres 5-6 May 2017, Collective Volume with Selected Works, 35-62.

OECD, Health Statistics. (2015). *Focus on Health Spending,* 1-3.

OECD / European Observatory on Health Systems and Policies. (2017), Greece Health Profile 2017, State of Health in the EU.

OECD, Health at a Glance 2009, INDICATORS, OECD, European Commission, Health at a Glance: Europe 2018, STATE OF HEALTH IN THE EU CYCLE.

Olafsson, A. (2016). Household financial distress and initial endowments: evidence from the 2008 financial crisis. *Health Economics,* 25 Suppl. 2, 54.

Souliotis, K., Papadonikolakis, T., Papageorgiou, M. and Economou, M. (2018). The Impact of the Crisis on Health and the Health System: Thoughts and Facts on the Greek Case. *Archives of Hellenic Medicine* 35, Suppl 1, 9-13.

Swift, R. (2011). The relationship between Health and GDP in OECD countries in the very long run. *Health Economics* 20, 306, 321-322.

Tapia Granados, J., Ionides, E. (2017). Population health and the economy: Mortality and the Great Recession in Europe. *Health Economics* 26, 226-227, 230-231.

To VIMA, 22/11/2012.

United Nations. (2001). Third Conference on the Least Developed Countries, thematic session *«Enhancing Productive Capacities: the role of Health».* Brussels, Belgium, 14-20 May 2001, 1.

Venieris, D. (2011). Economy Crisis, Social Policy Deviation: The New" Micro Hellenic "Disaster 2010-2011", Social Research Survey, A-B 2011, 134-135, http://www.grsr.gr/ index.php / eke / issue / view / 5).