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## Review

# Effects of the economic crisis on health and healthcare in Greece in the literature from 2009 to 2013: A systematic review



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## ABSTRACT

**Background:** Due to the current economic crisis in Greece, effects on health and healthcare have been reported. The aim of this study was to present a systematic overview of the consequences that the financial crisis has had for health and healthcare in Greece.

**Methods:** Systematic literature review was conducted in order to identify articles that were published from January 2009 to March 2013 and explicitly referred to the effects of economic crisis on health or healthcare, in Greece. Data extraction and synthesis was performed with the use of thematic analysis.

**Findings:** Thirty-nine studies were considered for further analyses. Various existing and potential relevant effects were identified, including reductions in public health expenditure and changes in healthcare services and the pharmaceutical market, with an increasing number of admissions in public healthcare sector, and efficiency and organizational-related issues being evident, overall. Indications were found for post-crisis deterioration of public health with increasing rates of mental health, suicides, and epidemics, and deterioration of self-rated health.

**Conclusion:** The recent efforts to reform the Greek National Health System have been focusing mainly on short-term effects by reducing expenditure, while the measures imposed seem to have dubious long-term consequences for Greek public health and healthcare.

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## 1. Introduction

Since the year 2009, Greece has been undergoing one of the most severe debt crises in its history which led in 2010 to the signing of a Memorandum of Economic and Financial Policies with the so-called “Troika” – comprising

by the European Commission, the European Central Bank and the International Monetary Fund – in exchange to a €110 billion loan referred to as financial rescue package or bailout programme. The Memorandum included borrowing requirements agreed between the Troika and the Greek government, ratified also by the Greek Parliament in May 2010 [1]. Socio-economic consequences of the debt crisis emerged immediately with unemployment rates reaching 14.2% and the Gross Domestic Product (GDP) of the country falling to –3.5% in 2010, with figures for 2011 being even more alarming [2]. Following the signing of Memorandum – and other financial rescue packages after that – a sequence of austerity measures has been imposed on the Greek population since 2010 requiring both emergency and

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vital reforms of the public sector. The Greek National Health System (GNHS) could not be excluded from these measures for reform as it has had serious structural problems regarding financing, organization and delivery of services, for at least a decade; these problems have now been intensified due to the severe current economic conditions [3,4]. According to the Greek Ministry of Health (MoH), due to the irrational organization of the GNHS the Greek population do not currently receive the health care services that they should, despite the fact that Greece spends more than 10% of its GDP on health, thus reforms need to take place in primary health care (PHC) and hospital system, together with cuts in costs [5].

Consequently, there has been ongoing extensive discussion on the existing and potential effects of the financial crisis on health and healthcare as well, with negative outlook on the effects being apparent in scientific research and press releases, referring to a potential “health tragedy” [6,7]. On the other hand, the financial crisis has been also considered as the catalyst that generates changes towards reformation, improvement, and enforcement of regulations of the GNHS—and the welfare state’s in general – which had been postponed for many years prior to the crisis [1,8–10].

Based on all the above, the aim of the current paper is to present a systematic overview of the consequences that the current financial crisis has had for health and healthcare in Greece based on evidence from the scientific literature. The main initiative for this study was to determine the current and preliminary health and healthcare-related concerns of the scientific community due to the economic crisis. Detecting the repercussions of the economic crisis at an early stage could contribute to the development of stronger health policies that would diminish—or even eliminate—the detrimental consequences and endorse the beneficial ones, with the utter goal to optimize all resources available in the GNHS considering the current barriers.

## 2. Methods

A systematic review was conducted in order to detect current scientific literature referring to the effects of the economic crisis on health and healthcare in Greece. The steps followed for the data collection and analysis were based on the recommendations by the Centre for Reviews and Disseminations [11]: first, an electronic literature search was performed, secondly, papers corresponding to the criteria were selected, thirdly, data from the papers selected were extracted, and finally, qualitative and semi-quantitative analyses were conducted.

### 2.1. Search strategy and selection criteria

The literature search was performed via online resources using the following research platforms: PubMed, Scopus, EBSCOhost, and Thomson Reuters (formerly ISI) Web of Knowledge. The search was conducted in the title/abstract of papers using combinations of the following search terms/keywords: “financial”, “economic”, “crisis”, “troika”, “IMF”, “debt”, “bailout”, “austerity”, “measures”, “Greece”, “Greek”, “health”, and/or “healthcare”.

Only articles published in English between January 2009 and March 2013 were included. The specific time range was chosen due to the fact that 2009 has been repeatedly referred to as the year of the beginning of the economic crisis in Greece. Only publications in peer-reviewed journals were included. Publications that their full text was not available online to the reader were excluded. No limit was applied regarding publication type (e.g. original research, review, or commentary) to avoid publication bias; however, all conference proceedings found were later on excluded as their full text was not provided. Although editorials, correspondence and commentaries are many times excluded from systematic literature reviews, in the present study they were deemed acceptable for inclusion if they reported data on the impact of the economic crisis on Greek health or healthcare. Plus, given the preliminary nature of the data reported by the current publications on the impact of the economic crisis, corrections and judgments (found e.g. in correspondence) were considered useful for a more precise exploration of the topic. The inclusion criteria were decided based on the principle that they should capture all studies of interest, and were not narrowly defined in order to avoid the risk of excluding potentially relevant studies and to allow the generalization of results [11]. Papers were included if the search terms were mentioned in the title or abstract, and their content explicitly referred to the effects of economic crisis on health or healthcare, in Greece. Papers were excluded if they did not present results explicitly for Greece, but for a group of countries instead, such as Europe or European Union (EU). The reference lists of all studies included in the qualitative analysis were examined manually to identify additional studies that would meet the inclusion criteria.

A screening process took place where the abstracts were read independently by two reviewers (ES and EK) to decide which papers would be included based on the abovementioned inclusion criteria. Next, the full texts of the studies were assessed for eligibility for further analyses based on the inclusion criteria. For the studies that there was a disagreement or non-definite decision between the two reviewers, an external reviewer was consulted, and when necessary, discussion among the three researchers took place in order to reach final decision.

### 2.2. Data extraction and synthesis

Data were extracted and categorized according to their most dominant meaningful concept, under the following two categories: Consequences for health; and Consequences for healthcare. Following this categorization, the full text of papers was thoroughly read and the data synthesis was performed with the use of thematic analysis. According to thematic analysis, text segments (i.e. sentences, phrases or paragraphs), which were relevant to the aim of the study and met all inclusion criteria, were identified and extracted [12]. Corresponding text segments were coded under themes, which contained all similar data and meaningful concepts found across the selected studies. Thematic analysis is one of the recommended methods for systematic reviews that aim to inform health care

managers and policy-makers, since it highlights information that is relevant for decision-making [13,14].

The data extraction and coding process were conducted by one reviewer (ES) and each extraction and theme were checked for accuracy independently by a second reviewer (EK), and when disagreement occurred an external reviewer was consulted to reach final decision.

All papers included in the current study were also semi-quantitatively analyzed based on the frequencies of the characteristics of included publications and data extracted. All papers were categorized under three publication types: conceptual (including commentaries, editorials, viewpoints etc.); review; and original research papers [15].

### 3. Results

The electronic search process, via the abovementioned research platforms, yielded in total 966 citations, plus two relevant publications were identified through the reference lists of the included studies. After applying the inclusion criteria, 39 studies were considered eligible for further analyses (as shown in Fig. 1). The frequencies of the characteristics of the papers selected are presented in Table 1.

As shown in Table 1, since 2009 there has been a continuous increase in scientific publications on the effects of economic crisis on health and healthcare in Greece, with the majority of publications being recorded in 2012 (38.5%) and the first quarter of 2013 (28.2%) – more publications are expected by the end of 2013. Seven authors appeared at least two times as first authors in the selected studies: Economou M. (3), Kentikelenis A. (3), Karamanoli E. (2), Oikonomou N. (2), Polyzos N. (2), Stuckler D. (2), and Vandonos S. (2). The country of the affiliation of the first author of each paper revealed that the country that the majority of papers originated from was Greece (69.2%), followed by United Kingdom (25.6%). On the total of included studies, 59% were classified as conceptual papers and 38.4% as original research papers. From the 59% of the conceptual papers, 39% of them were correspondence, 22% commentary, 9% viewpoint and 30% other (editorial, essay, report, etc.). The majority of the selected studies were published at the following journals: The Lancet (28.2%), European Journal of Public Health (10.3%), Health Policy (10.3%), BMJ (5.1%), Clinical Medicine (5.1%), and World Journal of Surgery (5.1%).

Data on consequences for healthcare were extracted from 32 of the publications, and data on consequences for health from 17 of the publications (Table 2).

The themes that emerged from the current analysis are summarized below:

#### A. Consequences for health

- Mental health
- Suicides
- Epidemics
- Self-rated health
- Otorhinolaryngologic disorders

**Table 1**

Frequencies (N; %) of the characteristics of the papers included in the review.

	Frequency	
	N = 39	%
<i>Country</i>		
Greece	27	69.2
United Kingdom	10	25.6
Austria	1	2.6
Ireland	1	2.6
<i>Year of publication</i>		
2013 (first quarter)	11	28.2
2012	15	38.5
2011	11	28.2
2010	2	5.1
2009	0	0.0
<i>Publication Type</i>		
Conceptual paper	23	59.0
Original research paper	15	38.4
Review paper	1	2.6
<i>Journal of publication</i>		
The Lancet	11	28.2
European Journal of Public Health	4	10.3
Health Policy	4	10.3
BMJ	2	5.1
Clinical Medicine	2	5.1
World Journal of Surgery	2	5.1
British Journal of General Practice	1	2.6
Drugs and Alcohol Today	1	2.6
European Child and Adolescent Psychiatry	1	2.6
Emergency Nurse	1	2.6
Hippokratia	1	2.6
International Journal of Epidemiology	1	2.6
International Journal of Medical Sciences	1	2.6
Journal of Affective Disorders	1	2.6
Journal of European Social Policy	1	2.6
Journal of Nursing Management	1	2.6
Journal of Preventive Medicine and Hygiene	1	2.6
Nursing Philosophy	1	2.6
Southern Med Review	1	2.6
World Psychiatry	1	2.6

#### B. Consequences for healthcare

- Public health expenditure and management
- Healthcare workforce
- Healthcare services
- Pharmaceutical market
- Biomedical research.

These themes are described in the following sections of the paper.

#### 3.1. Consequences for health

In this section are presented the key findings regarding consequences for health based on the literature reviewed. Given the lack of up-to-date data on morbidity and mortality, the assessment of the impact of the financial crisis on health cannot be precise at this stage [17–19], so here are presented mainly preliminary or expected outcomes.

##### 3.1.1. Mental health

The economic crisis has had various consequences on the daily lives of Greeks as well as their mental health,

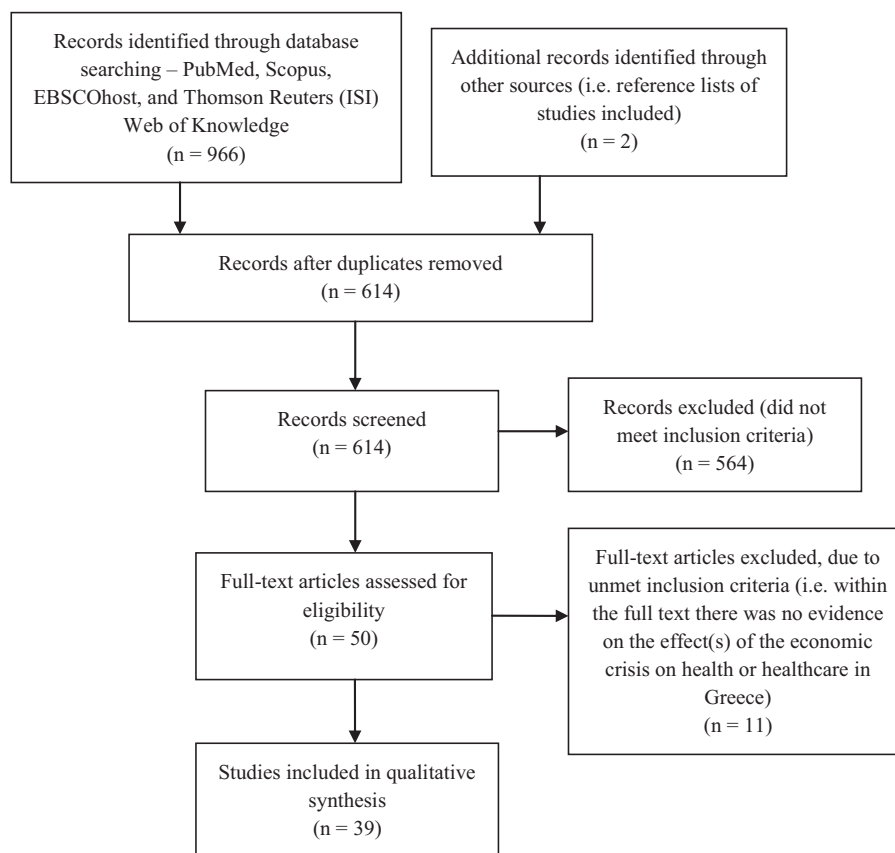


Fig. 1. Flow chart of selection process of studies (PRISMA 2009 flow diagram).

Source: Moher et al. [16].

which has been found to worsen, also due to the increased unemployment [19–23]; however, the funding for mental health has been reduced after 2010 [24]. From 2007 to 2009, increased violence rates, and nearly doubled homicide and theft rates were recorded [6,23,25]. In addition, an association between major depression and economic crisis was found since in 2011 it was 2.6 times more likely for Greeks to undergo major depression compared to 2008 [2]. Regarding the association between major depression and economic crisis, poverty conditions can affect mental health status, but also individuals with mental health illnesses can be forced into poverty due to their health condition [2,18,22].

### 3.1.2. Suicides

Suicides in Greece have increased by 17% from 2007 to 2009, with unofficial data mentioning a 25% increase in 2009–2010, the MoH reporting in 2011 an increase in suicides by 40% [6,10,18–20,23,4,26], and a study finding an increase of 36% between 2009 and 2011 of the persons who declared to have attempted suicide within the month before the survey [20,21].

### 3.1.3. Epidemics

The number of human immunodeficiency virus (HIV) infections has been continuously rising mainly due to the increasing numbers of injecting drug users (IDUs)

affected also by disruptions of preventive programmes which lead to low provision of relevant services, with the number of cases of HIV infections in IDUs being 10–15 in 2007–2010, 256 in 2011, and 314 in the first 8 months of 2012 [6,17,19,23,25]. During 2009–2011 Greece experienced unevenly high morbidity and mortality burden of various large-scale epidemics: high mortality burden of pandemic influenza A (H1N1) in 2009, major outbreak of West Nile Virus (WNV) infections in 2010 and 2011, outbreak of autochthonous *Plasmodium vivax* malaria in 2009–2011, and major HIV outbreak among IDUs in 2011 [7]. The impact of the current Greek economic crisis on the infectious diseases burden is not able to be proven quantitatively yet; however, it is expected that the current socio-economic and environmental circumstances that lead to the deterioration of public health will assist epidemics to flourish [7]. Furthermore, the current unsafe and instable economic environment of the country hinders rehabilitation process for drug users and their families [25].

### 3.1.4. Self-rated health

Among the first effects attributed to the economic crisis was the significant increase in 2007–2009 in poor self-rated health (SRH) [6,19,27], however these calculations did not include control group comparison, so this finding should not be attributed among the effects of economic crisis [22]. Subsequent analyses have found that there is a statistically

**Table 2**  
Data extracted under the two categories of themes from selected studies.

Author(s), year of publication	Consequences for health	Consequences for healthcare
Anagnostopoulos and Soumaki, 2013	X	X
Bonovas and Nikolopoulos, 2012	X	
Dervenis et al., 2013		X
Economou et al., 2011	X	X
Economou et al., 2013a	X	
Economou et al., 2013b	X	
Emmanouilidou and Burke, 2013		X
Falagas et al., 2012		X
Fountoulakis et al., 2012	X	
Fragkoulis, 2012		X
Houston, 2011		X
Kalafati, 2012		X
Karamanoli, 2011		X
Karamanoli, 2012		X
Karanikolos et al., 2013	X	X
Karatzanis et al., 2012	X	
Karidis et al., 2011		X
Kastanioti et al., 2013		X
Kentikelenis et al., 2011	X	X
Kentikelenis and Papanicolas, 2012		X
Kentikelenis et al., 2012	X	X
Liaropoulos, 2012	X	X
Matsaganis, 2011		X
McKee et al., 2012	X	X
Milionis, 2013		X
Notara et al., 2010		X
Oikonomou and Mariolis, 2010		X
Oikonomou and Tountas, 2011		X
Polyzos, 2012		X
Polyzos et al., 2013		X
Pouloupoulos, 2012	X	X
Stuckler and McKee, 2011	X	X
Stuckler et al., 2011	X	
Triantafyllou and Angeletopoulou, 2011		X
Tsoufias, 2012		X
Vandoros and Stargardt, 2013		X
Vandoros et al., 2013	X	X
Vogler et al., 2011		X
Zavras et al., 2012	X	

significant negative impact of the economic crisis on SRH trends in Greece, probably reflecting the fact that deteriorated SRH may have occurred due to reduced access to care during economic crisis – and thus to worse physical health – or due to changes in mental health because of the economic crisis [22,28].

### 3.1.5. Otorhinolaryngologic disorders

Increased number of outpatient hospital visits on two otorhinolaryngologic disorders, namely vertigo and tinnitus, were diagnosed between 2009 and 2011, potentially related to the increased distress and social anxiety caused by the economic crisis [27].

## 3.2. Consequences for healthcare

As mentioned previously, the majority of the data extracted from the selected papers included consequences of the economic crisis for healthcare.

### 3.2.1. Public health expenditure and management

For many years the GNHS has been in a state of continuous crisis with problems in efficiency and efficacy, healthcare service provision, organization, structure, management, with lack of feasibility assessments, a fragmented administrative framework, a significant private sector, inadequate PHC services, and insufficient hospitals and workforce [29,30]. The weaknesses, and thus the need for imminent reform of the administrative and organizational system in healthcare with enhancement of its efficiency, have been reported in the selected articles extensively [4,10,17,29–32]. Crisis of management in the GNHS has also been apparent, while substantial cuts in health expenditure have been made, but the real problem is not the amount of money spent on healthcare, but how and where it is spent [10,4]. According to official annual data by the MoH there was no short-term negative effect of the crisis on the GNHS services as there was an increase in hospital efficiency in 2010–2011, while health expenditures were reduced by 5% in 2009–2010, 30% in the first quarter of 2011 [5,9,33,34], and, overall, between 2009 and 2011 the annual public expenditure on health decreased by 19.5% [35]. Several of the first measures imposed by the MoH included the merging of four of the largest social security organizations under the National Organization for the Provision of Healthcare Services (EOPYY), collecting data on activity and expenditures of hospitals on monthly basis, cutting health workforce's salaries, limiting recruitment of health personnel, implementing a diagnosis-related group (DRG) payment system, and reducing the prices of pharmaceuticals and procurement of medical supplies [4,8,19,36,37]. These reductions in health budgets imposed after 2009 came along with increased numbers of persons not being able to access health care [4,6,17,19,38] and vulnerable groups being mostly affected [6,38], plus user fees for visits at outpatient clinics have been increased from €3 to €5 [19].

Nevertheless, the lower public expenditure on health did not signify the rise of service users' out-of-pocket spending on health – at least by the end of 2010 [35]. The new system for providing medical supplies introduced by the MoH (in 2010) has resulted to annual savings of €80 million [9]. Specifically, procurement of pharmaceuticals and medical devices since 2010 has been performed by the Health Procurement Committee (EPY) resulting to reductions in GNHS expenditure [34]. The financial crisis could be considered also as a chance to address reforms in the health sector that will potentially lead to better access for patients and quality of healthcare, together with more incentives for health professionals to provide more efficient and less expensive healthcare services [8,9,39]. On the other hand, the viewpoint that the financial crisis is giving the opportunity for the GNHS to progress [40], has found direct opposition on the grounds that the dramatic spending cuts have actually harmed the GNHS [41].

### 3.2.2. Healthcare workforce

The healthcare workforce was also affected by the economic changes imposed after 2009 on public sector's salaries and pensions, namely 15% cuts in all public sector salaries, abolishment of the thirteenth and fourteenth



monthly salary, and 10% cuts in pensions – reduced from 7% at €800 per month to 23% at €3.500 per month [1,5]. After 2010, not only all the pension benefits were reduced by law (Law 3863), but also the retirement age has increased [1] (from 65 to 67). The GNHS currently operates with 10–40% fewer workers whose salary has been cut by 40% [24], therefore, understaffing has been reported [6,25] while the demand for supportive work in community and schools has increased due to escalating new cases [24].

It has been estimated that due to the financial crisis about 1/3 of graduate nurses will remain unemployed for up to four years upon graduation, and emergency nurses will have to work overtime, with fewer resources (e.g. drugs and sterilized equipment), with fewer days-off and lower salary than three years ago [42]. These factors affect the quality of healthcare offered, plus the current alterations in pensions schemes have led to high levels of job dissatisfaction and burnout for nursing staff, therefore many emergency nurses have recently applied for early retirement [42], together with many other healthcare workers [4].

### 3.2.3. Healthcare services

The financial crisis had major impact on the provision of services in PHC and university hospital units [43]. Concerning is the fact that closures of several healthcare units occurred when increased number of Greeks have reported that they do not seek health or dental care examination or treatment even though they believe it is necessary for them [4,6,17,23], because of the cost, waiting time, travel distance, and other reasons; however, these results cannot be directly associated yet to the economic crisis [22]. Also, the surgical community is concerned by the significant reductions in health expenditure followed by lack of appropriate equipment for surgical interventions, all that resulting in problematic provision of surgical healthcare services and thus deterioration of surgical patients' health [39].

Changes in admission rates have had an impact on health services with patients shifting from private towards public healthcare sector, as shown by a rise of 24% of the number of admissions to public hospitals in 2009–2010, continuing to rise also in the first half of 2011 by 8%, whereas in 2009–2010 there was a decrease of admissions to private hospitals by 25–30% mainly because patients could no longer afford private care [4,6,8–10,19,38–40,42]. Post-crisis, an increasing number of Greeks seek medical advice from street clinics which were previously used mainly for providing care to undocumented migrants [6,17,38], with a growing number of uninsured immigrants treated by the GNHS [5,40].

The expenditure on social benefits of pension, illness and pharmaceuticals dropped by 9.6% [10]. Cuts in salaries, social benefits, such as health insurance and pensions, and their loss after someone becomes unemployed,<sup>1</sup> are also issues related to the austerity measures resulting to increasing numbers of individuals seeking assistance from charity organizations and the church [10]. Finally, the lack

of a well-organized referral system has been identified as well, a fact that contributes to the poor coordination of healthcare services [4,10].

### 3.2.4. Pharmaceutical market

The GNHS confronted major implications due to the measures imposed on the pharmaceutical market prices and supply [10]. It has been evident in the last decade that the pharmaceutical expenditure has increased enormously, with the pharmaceutical expenditure per capita being slightly less than €200 in the year 2000, whereas in 2008 it was almost €700, plus, five years before the economic crisis the total pharmaceutical expenditure of the country nearly doubled, being €4.329 billion in 2004 and climbing up to €7.788 billion in 2008 [35]. This increase of pharmaceutical expenditure has been attributed to the lack of appropriate parallel measures – such as the promotion of generics, electronic prescriptions and monitoring of prescriptions, the lack of a strong enforcement of regulations, and positive list's abolishment in 2006. Also, changes in the wholesaler mark-ups resulted in the increase of expenditure with older and cheaper pharmaceuticals being replaced by newer more expensive ones [35]. In order to reduce costs, the government imposed reductions in pharmaceuticals' prices, wholesale margin and decrease of the price of generics (at 90% of original medicines' prices), along with twice an increase of the value-added tax (VAT) in medicines in 2010, and then a decrease of it in 2011, all of them leading to significant shortages of pharmaceuticals in many parts of the country [17,35,44]. These shortages and frequent strikes of the pharmacists caused public dissatisfaction and pharmaceutical companies preferring not to sell their products in Greece due to the financial crisis [19,45].

### 3.2.5. Biomedical research

In addition, biomedical research productivity had been continuously increasing between 2006 and 2009, followed by a decrease in 2010–2011, which the researchers argue that may have resulted also from the reduction of funds or the psychological stress that researchers could have had because of the economic crisis [43], however this speculation needs to be controlled through future findings.

## 4. Discussion

The current systematic review explored the reported consequences of the economic crisis for health and healthcare in Greece since 2009. Based on the findings, consequences of the economic crisis for health are concerning, including increased rates in mental health problems, suicides, and epidemics, affected by the rapid increase of unemployment or economic conditions. Consequences for healthcare were more prevalent, including mainly cuts in public health expenditures with reductions in the number of healthcare workforce and their salaries, cuts in pensions, cuts in procurement of medical goods, rapid reforms in the pharmaceutical and social insurance sectors, merging of healthcare units, access and corruption issues, inadequate PHC services, while there has been a higher demand for public healthcare services – contrary to private – and the

<sup>1</sup> Once unemployed, individuals are covered by health insurance only for the first 18 months of unemployment.

GNHS has had long-lasting efficiency/transparency, organizational, structural and financial-related problems. The findings of the present review confirm previous expectations [46] for deterioration of access to and provision of healthcare services, increasing out-of-pocket contributions, and growing monitoring and efficiency issues.

The situation in Greece has been characterized as “alarming” with indications that its health system could potentially collapse [17]. According to the studies included in the current review, reforms of the GNHS should be considered along with tackling corruption through enhancement of efficiency and transparency, endorsing education of personnel especially in PHC, performing regular controls of quality on medical products and services, maintaining social stability with strong social cohesion mechanisms, implementing technological and organizational advancement, while drawing attention to mental health issues.

The authors of this paper view that the social issues related to health and healthcare are of top priority, such as the problems that emerged from the increase of the number of persons without health insurance coverage and with low access to medication and health care treatment. It is evident that the issues that the GNHS is confronting during the economic crisis have magnified its pre-existing problems not only at organizational and state-level, but also at interpersonal level, with pre-existing negative established social norms and attitudes, such as corruption in healthcare and clientelism in the political system. More specifically, the GNHS's management has been suffering because of corruption, with informal “under-the-counter” payments being customary [10]. Patients are dissatisfied by the out-of-pocket payments they are required to occur make informally to physicians for treatment, including PHC services, or to “jump” queues in overloaded hospitals, all that having negative impact on the GNHS, but unfortunately such activities remain unrecorded; however, illegal payments in Greece have been estimated to cover more than 20% of the total private expenditure [6,30,31,35]. The issue of corruption was also evident in the pharmaceutical market with physicians prescribing more specific medicines or brands than necessary [35]; therefore an electronic prescribing system was implemented post-crisis [36]. Moreover on the irrational excessive public health expenditure, according to the OECD data [47], Greece is the country that has the highest rates in the EU on MRI units (22.6 per million population) and CT scanners (34.3 per million population), on MRI and CT exams (97.9 and 320.4 per 1000 population, respectively), and on the antibiotics' consumption (dose of 39 per 1000 population per day). In addition, it appears that the PHC system has gaps [20], and an organized PHC system is absent [10], having ineffective administrative and control mechanisms, and poor information system which allows repetition of prescriptions and tests leading to high costs for the PHC system, while there are increased needs for PHC services which are unmet since the rate of general practitioners (GPs) is a lot smaller than the specialists', and one of the lowest in Europe [4,31,32]. Greeks are not familiar with GPs and PHC is under-funded with a highly hospital-oriented healthcare system, despite WHO's recommendations the past 30 years (since the

Declaration of Alma-Ata) urging health systems to place PHC in their priorities [31,36]. The enhancement of the role of PHC is considered here a main issue, as it could contribute significantly towards a more efficient GNHS in the long-term. Nevertheless, the outset of EOPYY at the beginning of 2012, with the merging of the main public health insurance providers, has initiated significant changes in primary care with the introduction of a new agency to purchase care and coordinate activities across the GHNS.

Based on experience from previous economic crises regarding their impact on health in countries of Europe, research has shown that there had been noted an increase in suicides in such periods, therefore the issue of suicides during the economic crisis in Greece, is considered by the authors of the current paper to be an alarming issue requiring more focused attention. For example, a systematic review regarding mortality during periods of economic crisis [48] has shown that in the majority of the cases the mortality rates (from any cause) of the countries had risen during economic crisis compared to pre or post-economic crisis periods in the same countries. According to the same source, all studies found a rise in infant mortality and in the mortality rates due to suicides and homicides, while their majority reported a decrease in traffic accidents' mortality during periods of economic crisis [48]. Although no change in mortality rates has been observed for Greece since the onset of the economic crisis [9], the traffic accidents' mortality rates have gradually decreased since 2008 in Greece, being 1387 in 2008, 1314 in 2009, 1157 in 2010, and 1011 in 2011 [49].

Apart from the findings that emerged from the current review, attention should be placed on the way that health information is transferred to the public (i.e. “health literacy”), which is important since it affects health outcomes and health behaviour, but unfortunately Greece has fallen behind this issue [50]. Also, although the lack of an appropriate referral system was identified only by two of the studies included [4,10], the existence of a clearly-defined and organized referral system is vital, also for controlling the expenses of insurances, but in order to achieve that, a higher degree of coordination between PHC and hospital physicians is required [3].

The reforms in supply and pricing of pharmaceuticals was a topic stressed extensively in the scientific literature, having caused more out-of-pocket contributions for patients, and worrying is the fact that service users have increasing unmet needs for medical examination. Concerning are the associations found between major depression and economic crisis, and the increasing number of HIV infections among IDUs. Economic crises affect infectious disease dynamics in various ways, and although currently it is not feasible to quantitatively assess the exact impact on health, the up-to-date findings are not in favour of the Greek public health, which is potentially on the verge of a tragedy despite the seemingly positive effects of the cuts of economy [7].

Public trust towards formal social networks (e.g. government, political parties and public institutions) has been declining since the debt crisis commenced, as the public blames for the economic situation mainly Europe and the two political parties that have governed Greece

consecutively for the past 35 years [10], considering also that Greece had been presenting false data about its public finances for years [19]. Generally, decision-makers have to design and implement policies that aim to protect and improve public health, and reduce health inequalities [28], while health ministers should not be excluded from decision-making discussions regarding economic crises [17].

The most important limitation of the current study is that the majority of the studies included present preliminary evidence on the effect of the economic crisis on health and healthcare, often assuming a connection between their findings and the economic crisis due to comparisons between the pre and post-crisis period; however the exact impact of the economic crisis remains yet to be seen through future research. Nevertheless, the current paper offers evidence on the relevant alarming issues as they have been pointed out by the scientific community, without the authors of this paper claiming that these issues reflect the full, neither the precise, effects of the economic crisis on the health and healthcare of Greeks—these will be confirmed or annulled in the future as already mentioned. One of the limitations of the current study was that data serving the aim of the review may have been omitted; however this was avoided as much as possible by conducting repeated controls of the full text of included papers. Other limitations were that data extracted could have been placed in one category/theme instead of another, or different categories/themes could have been attributed, and often the meaning of the identified themes overlapped (unavoidably). Also, it has to be considered that Greece-based scientists reporting on the effects of the crisis could have had personal bias due to the difficulties their interpersonal contacts or even themselves may have experienced because of the crisis.

Despite the abovementioned limitations, the current systematic review provides foundations for further discourse and research on topics related to the effects of economic crisis on health and healthcare in Greece, both at national and international level, since Greece is up-to-date the most severely stricken European country by the economic crisis [17], so its experience can assist policy-planning in similar situations. Finally, it is proposed that more scientific research on the impact of the Greek economic crisis on health and healthcare should be performed in the near future in order to establish the precise extend of the consequences of the crisis, to confirm the findings of the studies presented here, and to establish the nature of consequences as negative or positive; a gap of the academic community which seems to be currently filled in – to a significant degree – by mass media reports.

## 5. Conclusion

The current paper focused on the early effects of the Greek economic crisis on public health and healthcare. Post-crisis, mostly problematic effects and concerns have been identified, especially regarding health status, with beneficial effects and positive prospects being less evident. Since the onset of the Greek economic crisis, the efforts for reform have focused mainly on short-term effects by

reducing expenditure, while the measures imposed seem to have potentially damaging long-term consequences for public health and healthcare. It is early to estimate precisely the impact of the economic crisis on health and healthcare in Greece. Nevertheless, the current findings showed that alarming issues already exist, thus, more concentration should be drawn towards achieving enduring beneficial effects for public health and healthcare, through the implementation of more concrete and reasonable measures, not aiming only to short-term cost-cutting solutions that may cause in the future more problems than they will have solved.

## Conflict of interest

No conflicts of interest have been reported by the authors or by any individuals in control of the content of this article.

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