

SOCIO-ECONOMIC INEQUALITIES IN HEALTH: A REVIEW OF THE GREEK EVIDENCE

By

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Abstract

The socioeconomic status effects on individual health state are increasingly recognised in academic literature. This survey reviews the existing theoretical and empirical findings in Greece, the indicators applied and the methodological problems encountered in the existing literature. Thus, the study aims at informing both the researcher and the policy maker about the state of knowledge regarding the effects of socioeconomic and occupational status on health.

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1. Introduction

Many studies, originating in different countries, have successfully proved that socio-economic status (SES) effects do exist and contribute significantly on the observed individual health inequalities (Bartley *et al*, 1997; Wamala *et al*, 1997; Theodossiou, 1998; Lynch *et al*, 2000; van Rossum *et al*, 2000; Duncan *et al*, 2002). The relation between individual SES and health is bi-directional, with many underlying mechanisms that intervene in the relationship. For example, restricted access to economic resources may influence individual health state, through various mediating pathways, such as the adoption of unhealthy lifestyles (Metcalfe *et al*, 2003). Thus, the association between SES inequalities and health should be well understood in order to enable policy makers to design policies that enhance the well-being of nations.

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2. Health and SES Indicators

2.1 Health Status Indicators

The complexity in approximating health status arises from its multidimensional concept and the fact that it is difficult to be measured adequately. According to World Health Organization, "health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity". Health status is usually approximated in applied research by mortality measures, self-assessment of overall individual health state, and from the presence of specific medical conditions, both physical and mental.

2.1.1 Physical Health Status Indicators

Mortality indicators have been used extensively in the Greek literature, mainly because they are considered to be an objective indicator of health status and furthermore, due to the availability of resources on mortality data (Kyriopoulos *et al.*, 1983; Le Grand, 1987; Tsimpos *et al.*, 1990; Petridou *et al.*, 1994). Age-standardised mortality rates are applied extensively since they have the advantage of taking into account the population's age distribution (Kyriopoulos *et al.*, 1983; Tsimpos *et al.*, 1990). Applied research has also investigated the relative importance of SES inequalities on specific causes of death, namely deaths from leukaemia, pestilent diseases, neoplasms, diabetes melihus, ischaemic heart diseases, accidents and injuries and suicides (Tsimpos *et al.*, 1990; Petridou *et al.*, 1994; Zacharakis *et al.*, 1998). Kogevinas *et al.* (1992) used as health status indicator premature mortality, namely the Potential Years of Life Lost (PYLL) index. This index expresses the number of years lost when a person dies before the age threshold of 70 years.

Self-assessed health status is widely used in applied research since it has the advantage of being significantly correlated with mortality and it is considered to be a significant indicator of individual health (Allison and Foster, 2004). Kyriopoulos *et al.* (2002) have used self-assessed health status in a nationwide sample of different age groups. Mergoupis (2001) also used self-reported short-term and long-term individual health status, based on the respondents' answers. Various other health status indicators are applied, covering different dimensions of physical health status, namely chronic coexisting diseases, blood lipid data, injuries and their severity, duration of gestation, eyesight and hearing acuity, history of past accidents, and hospital admissions (Kouri *et al.*, 1994, 1995; Petridou *et al.*, 1995, 1996, 2000; Lascari *et al.*, 2000). A number of studies controlled for physical health status problems in relation to occupational

status. Alamanos *et al.* (1986) examined the incidence and the severity of work-related accidents for different types of physical impairment (such as fractures, amputations, concussions, burns, and other injuries). Other researchers have controlled for morbidity incidence by certain medical work-related causes, such as diseases of the circulatory system, musculoskeletal problems, neoplasms, mental diseases, injuries and poisoning (Kagialaris *et al.*, forthcoming; Xidea-Kikemeni *et al.*, forthcoming).

2.1.2 Mental Health Status Indicators

Madianos and Stefanis (1992) examined the SES effects on the existence of depression detected by the respondents' answers on different aspects of mental and psychological well-being. The use of psychoactive medication was also controlled in many studies as an indicator of individual psychological health status (Madianos and Stefanis, 1992; Petridou *et al.*, 1996). Other studies investigated the existence of mental health problems generated from work-related factors (Xidea-Kikemeni *et al.*, forthcoming), such as tension, stress, depression and job satisfaction (Lascari *et al.*, 2000; Xidea-Kikemeni and Aloumanis, 2002). Madianos *et al.* (1999) examined regional age-standardised discharge rates from mental hospitals in relation to regional economic development and provision of health care services.

2.1.3 The Validity of Self-reported Health Measures

A debate among applied researchers focus on the appropriateness of employing self-reported health status measures. Mergoupis (2001) argues that self-perception of own health status is a rather weak source of information because of the subjective nature of the question and the available responses. On the contrary, other researchers argue that self-assessment of health status is an important indicator of individual health because it accommodates individuals' own perceptions of their health status (Allison and Foster, 2004).

Kyriopoulos *et al.* (2002) reviewed the existing findings regarding the validity of self-assessed health status. They argue that self-reported measurement of health is correlated with objective health indicators, namely mortality and future morbidity problems. They also report findings that support a strong positive correlation of subjective measurements of health with objective measurements of health status. At the same time, they highlight the possibility that different age, gender and SES groups tend to overestimate or underestimate their health status. For example, older age groups tend to report lower health status in comparison to younger individuals. Women also report systematically lower

levels of health in comparison to men (Redwood, 2002) and women tend to relate bad health with the presence of painful symptoms and mental health problems while men tend to perceive bad health in terms of inadequate physical skills and capacities (Kyriopoulos *et al.*, 2002).

2.1.4 Health Related Behaviours

Health related behaviours have been repeatedly found to affect individual health state both through direct and indirect mediating pathways (Metcalf *et al.*, 2003). Tountas (2000) argues that the social and ethical values of the individual are those affecting his/her health-related behaviour and lifestyle. Individual lifestyle is often approximated by smoking, drinking, weight, or body mass index (Madianos and Stefanis, 1992; Kouri *et al.*, 1995; Petridou *et al.*, 1995,1996; Mergoupis, 2001; Xidea-Kikemeni and Aloumanis, 2002). Petridou *et al.* (1997) constructed an index of "risky behavior" based on individual attitudes and their aversion to risky activities.

2.2 Socio-economic, Occupational and Demographic Indicators

2.2.7 Economic Status Indicators

Tountas (2000) argues that individual SES, is defined by individual position in the production process and the material resources owned and it constitutes one of the main factors affecting health. Kyriopoulos *et al.* (2002) approximated SES by income, while Mergoupis (2001) controlled for both self-reported household income and predicted household income, in order to overcome measurement errors. Alternative approximations of individual SES include the ownership of a car, the ability to choose a private medical facility, the freedom in the choice of the attending physician, the existence of primary or secondary health care insurance, and the area of residence based on its economic development (Petridou *et al.*, 1994,1995,1997; Kyriopoulos *et al.*, 2002). Educational level is also considered by researchers of being a representative indicator of individual SES, since it defines individual investment in human capital and hence, earnings from work. The educational level of the respondent, paternal or maternal educational level, and the children' school performance are usually encountered in the Greek literature (Petridou *et al.*, 1994, 1995, 1996, 1997; Kouri *et al.*, 1995; Laskari *et al.*, 2000; Mergoupis, 2001; Kyriopoulos *et al.*, 2002; Xidea-Kikemeni *et al.*, 2002; Kagialaris *et al.*, forthcoming).

Le Grand (1987), in a cross-country comparison study including Greece, used regional socio-economic status indicators, namely per capita expenditures on public and private medical care and the proportion of public medical care expenditure to total medical care expenditures. Other studies controlled for regional socio-economic development in terms of per capita GDP, the degree of industrial employment, and per capita consumption of foods (Kyriopoulos *et al.*, 1983; Tsimpos *et al.*, 1990). Tsimpos *et al.* (1990) also controlled for the regional availability of health services as an indicator of the development in each region. Madianos *et al.* (1999) constructed a regional "general index of development" based on four indicators, namely population growth, local infrastructure (such as network of roads and health care delivery), economic well being (for example, electric power consumption, and availability of telephones), and economic productivity.

2.2.2 Occupational Status Indicators

The effect of occupational status in individual health state is investigated by a number of studies in Greece. Occupational class is widely controlled in applied research (Madianos and Stefanis, 1992; Laskari *et al.*, 2000; Mergoupis, 2001; Kagialaris *et al.*, forthcoming), since it is an important source of income for the individual. Furthermore, Madianos and Stefanis (1992) tested the effect of unemployment status on mental health symptoms, since conventional wisdom underlines the detrimental effects on mental and physical health state of the unemployed (Bartley and Owen, 1996). Other work-related indicators, frequently introduced in applied research, include paternal and maternal occupational class (Petridou *et al.*, 1994, 1995, 1997), respondent's working experience, specific work tasks, shortage of staff in respondent's workplace, job demands, respondent's working hours and respondent's work-load (Xidea-Kikemeni and Aloumanis, 2002; Kagialaris *et al.*, forthcoming).

2.2.3 Demographic Indicators

Applied research has systematically shown that health status is greatly affected by individual characteristics. Demographic factors such as age, gender, nationality, birth order, household type, marital status, number of the children in the family, daily supervision of children, residence (ground floor or other), and urban or rural residence are used widely in the Greek studies (Madianos and Stefanis, 1992; Kouri *et al.*, 1995; Petridou *et al.*, 1995, 1996, 1997, 2000; Zacharakis *et al.*, 1998; Laskari *et al.*, 2000; Mergoupis, 2001; Kyriopoulos *et al.*, 2002; Xidea-Kikemeni *et al.*, 2002). Petridou *et al.* (1996) constructed a

"house safety score" based on respondents' self-reported housing amenities ensuring safety conditions in the household. Madianos *et al.* (1999) controlled in their analysis for regional urbanisation in order to examine if health differentials do exist for different degrees of population density.

2.3 Research on Methodological Issues

There are a number of difficulties encountered when analysing the relationship between SES and individual health state. The complex nature of the relationship between SES and health status, raises a number of methodological issues.

2.3.1 Estimation Techniques

The socio-economic status and health status relationship may be bi-directional which gives rise to concerns about the endogenous nature of this relationship. Furthermore, confounding factors intervene in the relationship and may cause identification problems. For example, does unemployment *per se* has an effect on individual health or it also induces individuals to the adoption of unhealthy lifestyles, which in turn affect their health state? Research has shown that such confounders do exist and studies dealing only with the causal effect of SES on health might overestimate its impact (Contoyannis and Jones, 2004). Finally, selection problems arise, since empirical studies have shown that the SES-health relationship is a dynamic one. Thus, unfavourable health-related environments in earlier stages of individual's life, affect negatively his/her future socio-economic position, which in turn affects future health state (Lynch *et al.*, 1997).

To the authors' knowledge, greek literature does not address the above issues to a satisfactory degree. Most studies rely on descriptive tools, such as cross-tabulations, or on parametric or non-parametric test statistics, Pearson product moment correlations, factor analysis and analysis of variance (Alamanos *et al.*, 1986; Tsimpos *et al.*, 1990; Kogevinas *et al.*, 1992; Madianos and Economou, 1999; Laskari *et al.*, 2000; Karydis *et al.*, 2001; Kyriopoulos *et al.*, 2002). The problem encountered in the studies adopting such statistical analysis is that no specific direction of the association is implied. Yet, some studies have focused on the causation issue, namely on the direction of the SES on health status effect. In case of continuous health status indicators, for example mortality rates, linear regression analysis is used (Kyriopoulos *et al.*, 1983; Le Grand, 1987; Madianos and Stefanis, 1992; Petridou *et al.*, 1995, 1996, 2000; Zacharakis *et al.*, 1998; Madianos *et al.*, 1999) or hazard modelling tech-

niques (Petridou *et al.*, 1994). When the indicator of health status is qualitative and categorical, appropriate econometrical modelling includes logistic regression or ordered probit regression techniques (Kouri *et al.*, 1994, 1995; Petridou *et al.*, 1996, 2000; Mergoupis, 2001).

2.4 Data

There are not many available data sources in Greece regarding information on SES and health data. Several studies constructed questionnaires to collect original data on health and socio-economic status and demographic characteristics which were administered to different age (Madianos and Stefanis, 1992; Petridou *et al.*, 1994, 1995, 1996, 1997; Kouri *et al.*, 1995; Kyriopoulos *et al.*, 2002) or occupational groups (Lascari *et al.*, 2000); Kagialaris *et al.*, forthcoming; Xidea-Kikemeni *et al.*, forthcoming). Some of these studies have used standardised questionnaires, tested for their validity, in order to capture adequate information on individual health status, namely the General Health Questionnaire, the Hospital Anxiety and Depression Scale, the Job Satisfaction Scale (Lascari *et al.*, 2000) and the Current Major Depression Syndrome Questionnaire (Madianos and Stefanis, 1992).

Official databases are available both from national agencies and from large global organisations. Statistical data used in the relevant studies are drawn from the Vital Statistics Bureau, the National Statistical Service of Greece, the Ministry of Coordination, the National Insurance Foundation (IKA) and from local medical associations and hospitals (Kyriopoulos *et al.*, 1983; Alamanos *et al.*, 1986; Zacharakis *et al.*, 1998; Tsimpos *et al.*, 1990; Madianos *et al.*, 1999). Other studies exploited information from the World Health Organisation, OECD, the World Bank Database, Eurostat, Eurobarometer survey and the United Nations Database (Kyriopoulos *et al.*, 1983; Le Grand, 1987; Tsimpos *et al.*, 1990; Kogevinas *et al.*, 1992; Mergoupis, 2001). Available information include a wide range of health indicators, namely mortality rates, work-related health accidents and hospitalisation rates, and regional economic indicators, national product, level of industrial employment and provision of health services, namely availability of doctors and other health-related structural components.

3. Empirical Evidence in Greece on the Socio-economic Status-Health Relationship

The cornerstone in the theory of SES inequalities in health is Grossman's model (1972) for the demand of health, built within a human capital frame-

work. He views health as a durable capital stock, that depreciates over time with an exogenous rate and can be increased with investment in health. This health capital produces an output of "healthy time" which in turn increases individual utility both directly and indirectly, through the amount of time the individual spends in the labour market (thus, contributes in the determination of his/her wage rate), in the consumption of other commodities and in the engagement of other non-market activities. Under some assumptions, he shows that as age increases, health capital declines and medical expenditures rises. In addition, wage seems to affect positively health stock and the demand of medical services, whereas education is associated with a rise in the demand for health capital. The effects of individual SES, approximated by income and educational level, as well as the deteriorating effects of age on individual health state have been confirmed in Greece (Kyriopoulos *et al.*, 2002).

3.1 Physical Health Status and Socio-economic Status

The positive relationship between self-assessed health status and SES is revealed in applied research (Wagstaff *et al.*, 2001). Indeed, higher levels of income and educational attainment are correlated with higher self-assessed health status (Mergoupis, 2001; Kyriopoulos *et al.*, 2002). Redwood (2003) in a literature review survey argues that education operates protectively in favour of good health. Education was found to have a positive impact on other physical health aspects as well, such as the duration of gestation (Petridou *et al.*, 1996). In addition, the existence of primary health care insurance also appears to have a positive effect on individual health (Kyriopoulos *et al.*, 2002). Furthermore, Zacharakis *et al.* (1998) argues that marriage seems to operate protectively against deaths from suicides. In a study of the socio-economic factors affecting the risk of injury in an elderly sample, Petridou *et al.* (1996) argues that housing conditions are critical as well. Tountas (1999) reviewed studies dealing with the effect of unemployment on health. He argues that there is a close positive relationship between unemployment, mortality and morbidity symptoms, with high-risk behaviors and unhealthy habits intermediating strongly in the relationship. Lifestyle factors approximated by smoking, alcohol consumption, and dietary habits are also directly associated with individual health state (Petridou *et al.*, 1996). Kogevinas *et al.* (1992) argues that the adoption of healthier lifestyles would have a favourable impact on the preventable causes of mortality.

A substantial part of the applied research in Greece is devoted to health problems caused by work-related factors. The working environment and the

social relations among co-workers as well as work-related accidents influence the health of the working population by generating physical, biological, psychological and social risk factors. In the Athens area the Union of Workers (1998) conducted a survey regarding the working conditions of the workforce and they argue that one out of two employees is subjected to unsatisfactory conditions of exposure to noise and heat. Tountas and Alamanos (1999) categorised health effects from work, namely accidents from work, work related diseases and stress at work. The authors report that in the European Union countries every year almost ten million cases are recorded as being in one of the two first categories. Furthermore, occupational injuries were found to be of the greatest severity among all kinds of injuries (Petridou *et al.*, 2000).

Mergoupis (2001) emphasised on the strong negative "manual work" effect on individual health status compared to employees in non-manual occupations. Higher mortality rates from accidents at work are observed more often at mines, quarries, in construction, in agriculture, and in the transportations sector (Tountas, 2000). The Centre for Occupational Health and Safety (2002) investigated work-related accidents reported in Greece for the period 1970-1998 and reported that the vast majority of fatal work-related accidents are exhibited in manual and technical occupations of the primary sector of production. Indeed, workers in construction services exhibit more frequently musculoskeletal problems in comparison with employees in other professions, such as clerical (Tountas, 1999). The duration of working activity seems to be associated to work-related injuries and diseases, such as diseases of the circulatory system and musculoskeletal problems (Xidea-Kikemeni *et al.*, forthcoming). Kagialaris *et al.* (forthcoming) argues that there exists an association between damaging effects on health and specific working tasks (for example, standing up for a long time or carrying heavy objects), shortage of staff, job demands and workload.

Kyriopoulos *et al.* (2002) provided evidence that self-reported health status seems to worsen in older age groups. Older individuals seem to have higher duration when hospitalised, exhibit greater severity of injuries and they are at higher risk of an unfavourable outcome, such as death or disability (Petridou *et al.*, 2000). Furthermore, employees aged less than 55 years appear to have worse general health status in comparison to their counterparts (Laskari *et al.*, 2000). Age is positively associated with work-related health problems (Xidea-Kikemeni *et al.*, forthcoming) and affects not only the incidence but the severity of work-related accidents as well, independently of any physical impairment (Alamanos *et al.*, 1986). In addition, the adoption of unhealthy and

risky lifestyles increases sharply with age (Petridou *et al.*, 1997). Although women appear to report lower levels of overall health status in the short-run (Mergoupis, 2001), women have more years of life expectancy (Kogevinas *et al.*, 1992; Lascari *et al.*, 2000) compared to men, independently of age. Another survey from the Athenian Union of Workers (1998) reports that males are more often victims of work-related accidents in comparison to females.

The issue of the dynamic character of the SES-health relationship (Lynch *et al.*, 1997) is not adequately addressed in the Greek literature. The only evidence that imply the existence of a cumulative effect of individual SES on health state come from studies investigating SES inequalities in health during childhood and adolescence. Socio-economic status in these studies is usually approximated by the educational and occupational level of the parents and from the child's school performance. Indeed, children from less socially and economically advantaged families suffer from much higher fatality rates (Petridou *et al.*, 1994), are at greater risk of injury (Petridou *et al.*, 1994, 1995; Kouri *et al.*, 1995), or they adopt riskier behaviours and unhealthy lifestyle habits, such as dietary habits (Petridou *et al.*, 1995, 1997) in comparison to children from families of lower SES. Furthermore, riskier behaviors are more frequently observed in the case of boys in comparison to girls (Petridou *et al.*, 1997).

In addition, many studies provided evidence of a negative relationship between regional socio-economic inequalities and population health (Kyriopoulos *et al.*, 1983; Tsimpos *et al.*, 1990; Kogevinas *et al.*, 1992; Zacharakis *et al.*, 1998; Madianos *et al.*, 1999). Although Tsimpos *et al.* (1990) found that Greece exhibits one of the lowest levels of mortality rates among the European Union countries their study confirmed the effect of regional socio-economic inequality, approximated by per capita GDP, upon mortality levels. The regional level of industrial employment and per capita income were found to be inversely related to the overall and cause-specific mortality (Kyriopoulos *et al.*, 1983). Le Grand (1987) argues that there exists a positive relationship between income inequality and mortality, and a negative relationship between income inequality and health status in the case of Greece. In fact, a study of the Department of Hygiene and Epidemiology of the University of Athens (1992) argues that individuals living in rural regions exhibit a mortality level of 740 per 100,000 individuals, while individuals living in urban centres had a mortality level of 755 per 100,000 persons and individuals living in semi-urban areas a level of 720 individuals per 100,000 population. Moreover, while trends of mortality levels for all regions were downward sloping in 1996, this decrease was slower for regions with low socio-economic status (Tountas, 2000).

3.2 Psychological Health Status and Socio-economic Status

Individuals of low socio-economic status are those mostly disadvantaged in terms of adverse psychological and mental health symptoms (Theodossiou, 1998). Tountas and Alamanos (1999) in a literature review survey concerning the mental health-SES relation, argue that work-related stress is one of the main mental health problems employees experience and Greece ranks high amongst the European countries regarding the incidence of work-related stress. In particular, work-related tension and stress were found to be negatively associated with job satisfaction, workload and working environment conditions (Xidea - Kikemeni and Aloumanis, 2002). Madianos and Stefanis (1992) argue that if an individual is female, older, divorced or widowed, a residents of Athens, currently unemployed and of lower socio-economic status, she has a greater risk of exhibiting a higher number of depression symptoms. In their study, SES and demographic factors accounted for about 28% and 33% of the total variance of depression rates in two respective surveys. Mental health problems appear to worsen as age increases (Xidea-Kikemeni *et al.*, forthcoming). Gender differences also do appear in SES inequalities in mental health, with women appearing to suffer more than men from stress (Lascari *et al.*, 2000). Furthermore, Tountas and Alamanos (1999) argue that more exposed to stress appear to be women and younger workers compared to their counterparts.

One of the issues that complicate the investigation of SES inequalities in health, is the fact that different dimensions of individual health status interrelate and play a mediating role in the relationship of interest. Mental health state often mediates in the SES-physical health relationship. For example, long-run exposure to stress factors can lead to serious physical health problems, like cardiovascular diseases or hypertension. In addition, Economou (1997) argues that certain social and psychological factors are responsible for the appearance of serious psychosomatic disorders. Yet, there is no significant empirical evidence to support this view. Finally, Zoutzoglou-Kottarides (1984) shows the significant effect of societal factors on the cause and the course of cancer. The study points out that such factors do not only affect cancer directly but also indirectly since they generate stressful experiences.

4. Conclusions

Greek studies provide sufficient evidence about the gender and age differentials on individual health state. Age is positively related to the appearance of both physical and mental health problems. Furthermore, women are disadvan-

taged in terms of poor psychological and mental health state compared to men. Both low socio-economic and occupational status have a detrimental effect on individual health regardless of how socio-economic or health status are approximated.

A limited number of studies revealed socio-economic inequalities in health, which can be traced back to childhood and adolescent years. This implies that there is a dynamic relationship between SES and health. However, the research does not persuasively deal with the dynamic character of the relationship of interest.

A number of studies in Greece reported significant socio-economic regional differences in mortality and others tackle the mediating pathways, namely lifestyle and mental health status, on the SES-health relationship. Yet, these issues are not addressed systematically and the evidence provided is not clear-cut. Importantly, an issue not confronted by Greek studies is the endogeneity in the SES - health relationship. Not only SES affects health, but also health status may affect individual SES. Further research is needed in order to disentangle the complex mechanisms that contribute to health inequalities in Greece.

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