

ORIGINAL ARTICLE

High-burden epidemics in Greece in the era of economic crisis. Early signs of a public health tragedy

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Key words

Economic crisis • Public health • Infectious disease

Summary

Background. *Economic hardships have unleashed epidemics of infectious diseases in many countries in the past. In the era of the current financial crisis in Greece, it is interesting to assess the preliminary evidence concerning outbreaks of infectious diseases.*

Methods. *Description and evaluation of published surveillance data.*

Results. *Greece has been suffering a high burden of different large-scale epidemics during the last three years. These include*

the increased mortality of influenza during the pandemic and the first post-pandemic seasons, the emergence and spread of West Nile virus, the appearance of clusters of non-imported malaria and the outbreak of Human Immunodeficiency Virus infection among people who inject drugs.

Conclusion. *The economic turmoil in Greece seems to impact the infectious disease dynamics. It is essential to safeguard and even bolster budgetary allocations to the public health sector, in order to alleviate the effects of the economic downturn.*

Introduction

The financial crisis started in the American continent but the biggest tremors were felt in the southern corner of Europe. Greece, having been hit hard by the global financial upheaval, faces now three consecutive years of scorching recession, significant reductions in government spending and a steep upwards shift in unemployment rates. Under intense pressure by the International Monetary Fund, the European governments and the international markets, the Greek government has unveiled several packages of tough austerity measures and budget reforms, including health sector, with a view to shrinking the country's fiscal deficits and public debt.

While the Greek economy is still hobbled by numerous weaknesses, a rising chorus discusses extensively on the effectiveness of budget cuts and austerity programs, and their potential for facilitating recovery or, unhelpfully, depressing the economy [1, 2]. Alas, little attention has been paid to the possible impact on public health, though there is substantial evidence suggesting that adhering to draconian austerity policies may have adverse consequences on infectious diseases burden by precipitating their transmission while also limiting capacity for control [3, 4].

In the context of previous economic crises, a striking spread of infectious diseases has been observed. Marked increases in incidence, prevalence and mortality of tuberculosis [5-10]; large-scale outbreaks of diphtheria [11, 12], leptospirosis [13], and tick-borne encephalitis [14, 15]; sharp increases in mortality rates of pneumonia and influenza [16]; increases in incidence of salmonellosis [17]; and in incidence and mortality due to acquired immune

deficiency syndrome [6, 18] have occurred in countries of Eastern and Central Europe and former Soviet Union, during the economic crisis of the 1990's.

Interestingly, Greece has been suffering a disproportionately high morbidity and mortality burden of different large-scale epidemics since the beginning of the economic crisis:

High mortality burden of 2009 pandemic influenza A(H1N1) in Greece

In 2009, the novel A(H1N1) influenza virus spread rapidly across the globe. Though the pandemic was considerably less lethal than initially anticipated, having caused a rather small number of deaths, mortality rates varied widely from one country to another. Greece suffered a disproportionate burden of death, with 149 fatal cases [19]. In terms of mortality, it corresponds to one of the highest annual rates in Europe (13.2 deaths per million population; ranked 4th among 30 European countries) [20]. Interestingly, during the subsequent (2010/11) influenza season, a higher number of fatalities that surpassed the death figure in the pandemic was reported in Greece (n = 180; 15.9 deaths per million population) [21, 22].

Major outbreak of West Nile virus (WNV) infections, 2010 & 2011

During 2010, a major outbreak of WNV infections occurred in Greece [23, 24]. This was the first time that

WNV infection was documented in humans in the country. Overall, 262 human WNV cases were notified mainly from the Central Macedonia region in northern Greece. Among these cases, 197 presented with WNV neuroinvasive disease and 35 died. However, the scale of the outbreak was much larger, as an estimated number of over 25,000 WNV infections may have occurred in the affected area. During 2011, WNV human infections were reported in Greece for a second consecutive year [25]. A new geographic pattern of WNV spread was noticed. The virus dispersed southward to newly affected areas, suggesting that WNV is established in Greece and its transmission will continue to occur in the future.

Outbreak of autochthonous *Plasmodium vivax* malaria, 2009 to 2011

Malaria is considered eradicated in Europe, and Greece has been malaria-free since 1974. After several years of zero reports, cases of autochthonous *Plasmodium vivax* infection were reported in 2009 [26], and again in 2010, all residing in the same area of Evrotas in Lakonia, southern Greece. During 2011, several new cases of autochthonous *Plasmodium vivax* infection have been reported from the same geographic area [27, 28]. Thus, local transmission of *Plasmodium vivax* malaria to humans has occurred for three consecutive years and may continue to occur in the future. Though re-establishment of autochthonous transmission of malaria in Greece continues to be unlikely, it cannot be totally excluded.

Major Human Immunodeficiency Virus (HIV) outbreak among injecting drug users (IDUs), 2011

The HIV epidemic in Greece was mostly concentrated on men who have sex with men. The number of HIV infected IDUs was constantly low, comprising around 1.5-4.5% of the total number of HIV cases reported annually [29]. During 2011, however, a sharp 15-fold increase in the rate of newly diagnosed HIV cases among IDUs was recorded, which now consist approximately one fourth of the total figure [30]. Given the estimated large number of over 10,000 drug injectors in Greece, there is fertile ground for a rapidly growing HIV epidemic in this vulnerable population but, also, possibly to the wider community through sexual contacts, with dramatic consequences [31].

Discussion

Is there a link between the devastating economic crisis and the occurring epidemics in Greece?

In the communicable diseases' sector, an economic hardship may impact the infectious disease dynamics through

several pathways. These may include changes in human behaviour that increase disease exposure or decrease host immunity; development of "super spreading" environments that consist of the very poor, the unemployed, the homeless, the drug addicts, and the migrant populations with a different disease epidemiology in their country of origin; reduced treatment availability; decreasing quality of the public sector health system resources or even obstructed access to medical care services; and underfunded or ineffective public health interventions. Through these pathways, an economic crisis could have detrimental effects on the communicable diseases burden, both early (by means of increasing transmission rates) and in the longer term (by means of constraining the health system capacity for prevention and control) [3].

Doubtless, Greece experiences an unprecedented debt crisis and the nation struggles for staving off the default. Hard decisions and tough measures were probably unavoidable. However, economic turmoil impacts adversely public health and, though there is currently limited capacity to quantitatively predict the impact of the economic crisis on infectious diseases burden, the above-mentioned omens for future health and prosperity of the Greek population are, unfortunately, not good.

In order to alleviate the effects of the economic downturn, we should consider redistributing national resources through social spending for the common good [32]. Thus, it is essential to safeguard and even bolster budgetary allocations to the public health sector [33]. Contrary to common belief, increased investment in health seems not only to secure human lives but can also boost economic recovery while reducing poverty [34]. In other words, healthier people are more likely to be employed and productive, to live longer investing in education (itself an accelerator of economic growth) and save much for retirement, providing thus money for capital investment. In addition, the existence of health facilities could also play an important role in the development of disadvantaged regions [34].

Finally, health authorities should always bear in mind that infectious diseases respond successfully to scaling-up less expensive but unfortunately neglected preventive interventions. Sufficient vaccination coverage in high-risk population groups and timely implementation of integrated vector-control programmes can provide a cost-effective management of influenza and malaria/WNV infection, respectively. Even in the field of HIV, the seemingly expensive preventive approach of expanding the coverage of antiretroviral treatment can induce significant cost gains in the long-term [35].

In conclusion, Greek austerity plans are currently endorsed with remarkable cuts in health spending [36]. In parallel, unwanted outbreaks of infectious pathogens are observed. Financial constraints seem to "treat" economic figures, at least temporarily, but the society is potentially on the brink of a modern public health tragedy. And most importantly, in contrast to the ancient Greek art, a "deus ex machina" may not appear.

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