Editorial

The evolution of the burden of viral hepatitis from 1990 to 2013: still an open challenge to global public health policy

Elisabetta Franco[1], Valentina Pettinicchio[2], Ermanno Zorzoli[2]

[1]Department of Biomedicine and Prevention, [2]Specialization School for Hygiene and Preventive Medicine, University of Rome Tor Vergata, Rome, Italy

Correspondence to: Elisabetta Franco. Department of Biomedicine and Prevention, University of Rome Tor Vergata, Via Montpellier, 1, 00133 Rome, Italy. Email: franco@med.uniroma2.it.

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The global burden of viral hepatitis is still not well defined, but it represents a very significant proportion of the global burden of disease. The relevance of chronic forms of the diseases and the different causes of observable liver outcomes are not easily attributed to viral etiology and present a challenge to researchers and public health strategies.

Stanaway *et al.* (1) have taken up this challenge and through rigorous statistical and epidemiological methods they have used data from the Global Burden of Disease Study 2013 (2-4) and from other sources to estimate several key indicators for the four most important hepatitis viruses: hepatitis A virus (HAV), hepatitis B virus (HBV), hepatitis C virus (HCV) and hepatitis E virus (HEV). The analysis was performed by authors with a resolution to country-, age group-, gender- and year-level from 1990 to 2013.

Since viral hepatitis can present both as acute and chronic clinical phenomena, with various implications for their evaluation, the authors have adopted different approaches to their analysis. For acute hepatitis, prevalence was modeled through literature review of seroprevalence studies and specific surveys for each hepatitis virus (HAV, HBV, HCV, HEV) and attributable mortality and morbidity were estimated using natural history models. For chronic forms of the diseases, the outcomes of interest were cirrhosis and liver cancer (hepatocellular carcinoma).

Authors considered also the impact of these diseases on quality of life, by using disability adjusted life years (DALYs) and years lived with disability (YLD) and years of life lost (YLL).

They explored the relation between the burden of viral hepatitis and economic status, by stratifying countries into low-income and high-income, according to World Bank Classification 2014.

Considering the period, between 1990 and 2013, all indicators (absolute number of deaths, YLLs, YLDs and DALYs) increased; however, when taking into account demographic variables, particularly changing population size (from about 5 billion people in 1990 to about 7 billion in 2010) (5) and age structures, the age specific rates actually declined. Therefore, the influence of demographic variables is the main driver for observed increases.

Taken together, in 1990, deaths from acute infections, cirrhosis and liver cancer were the 10th cause of death worldwide, while in 2013 they were the 7th cause of death. This result is meaningful when we consider that the number of deaths from the main communicable diseases (diarrheal diseases, malaria and tuberculosis) fell over the same time period (6).

Furthermore, the majority of deaths are from chronic forms of hepatitis B and C, with changing patterns both in space and in time (1990 and 2013) (*Figure 1*) (7). Worldwide, the proportion of deaths and DALYs due to HAV, HBV and HEV has diminished, whereas the one from

World regions	Number of deaths	
	1990	2013
Australasia	80	166
Central Europe, Eastern Europe, and Central Asia	3,168	1,197
High-income Asia Pacific	1,727	641
High-income North America	1,846	1,036
Latin America and Caribbean	2,860	2,477
North Africa and Middle East	6,118	5,769
South Asia	83,902	57,910
Southeast Asia, East Asia, and Oceania	41,228	19,818
Southern Latin America	161	161
Sub-Saharan Africa	13,925	15,084
Western Europe	1,188	1,296

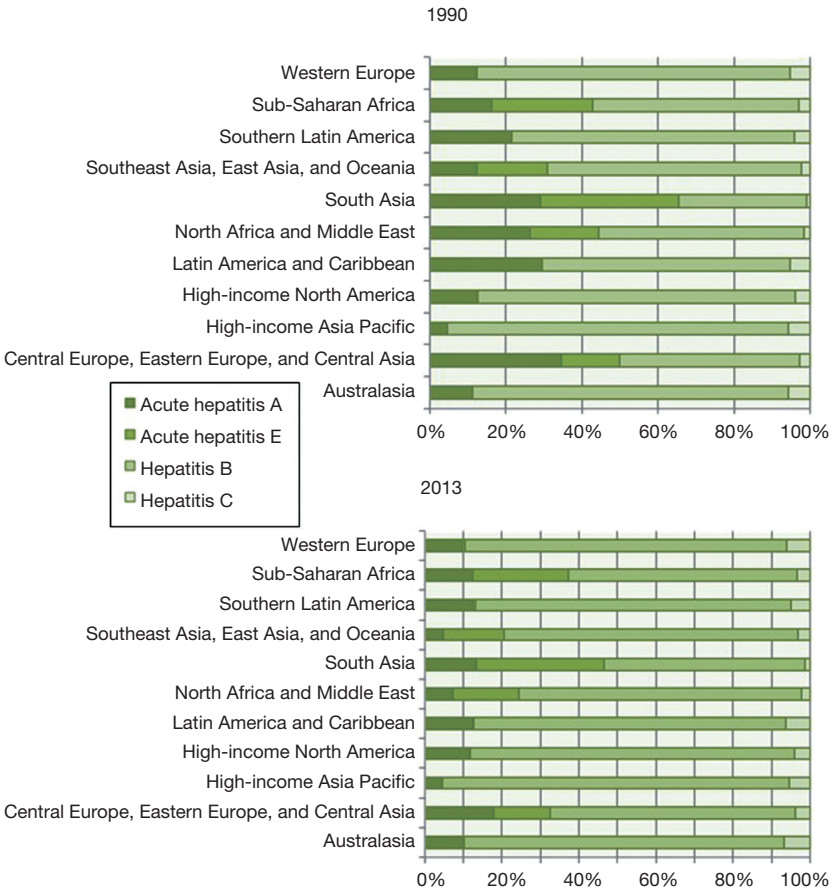

Figure 1 Absolute number and proportion of deaths from different hepatitis viruses in major world regions in 1990 and 2013.

HCV has increased. Vaccination programs and improved social and sanitary conditions have probably played an important role in determining this trend.

The relationship between the burden of viral hepatitis and economic status yielded interesting, but expected data that is a higher age-standardized rate of both deaths and DALYs in low-income countries.

The authors correctly point out that this study has some limitations: the available data, especially on hepatitis seroprevalence, were not at a very high resolution, that is few large scale surveys had been done and therefore, estimates were needed, potentially causing underestimation or overestimation and minimizing geographic differences. The same issue affects the estimate of the proportion of cirrhosis and liver cancer, because of the relatively few data available. Furthermore, the available data and the models that were used led to simplify the different possible disease states and, in the case of chronic HBV and HCV infection, did not assign any disability between acute infection and end-stage diseases (cirrhosis and/or hepatocellular carcinoma). This leads to an almost complete "disappearance" of the health effects of mild to moderate disease that represents the majority of cases over a considerably long time frame.

Another interesting peculiarity that is highlighted by the study is that on a global scale, unlike other important communicable diseases, viral hepatitis morbidity is fairly evenly distributed between high and low-income countries. In spite of its importance in terms of death and disability and of currently available and effective health interventions, viral hepatitis appears to receive far less attention (and funding) than other communicable diseases (8). The most important preventive and therapeutic tools are vaccination for HAV and HBV and treatment for HCV (although in the latter case with issues related to its cost and to the lack of complete long-term follow-up data). The above

considerations highlight the need for a change in public health policy, especially regarding the needs of low-income and lower-middle-income countries.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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