

# The Global Macroeconomic Burden of Non-Hepatic Non-Communicable Diseases Attributable to Hepatitis B in 2021

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## ABSTRACT

**Background:** Hepatitis B virus (HBV) infection poses a substantial public health challenge, yet the economic burden of non-hepatic non-communicable diseases (NHNCDs) caused by HBV remains unquantified. We aim to quantify macroeconomic losses of NHNCDs attributable to HBV on a global scale in 2021.

**Methods:** We systematically identified NHNCDs associated with HBV through a narrative review of meta-analyses from January 1, 2013, to May 10, 2024. Prevalence, years lived with disability (YLDs) and years of life lost (YLLs) were collected from the Global Burden of Disease Study (GBD) 2021 database. The metrics were then calculated with the population attributable fraction (PAF) approach to quantify the contribution of HBV infection to NHNCDs. Gross domestic product (GDP) data were collected from the World Bank. We estimated the global macroeconomic burden of NHNCDs attributable to HBV using a cost-of-illness approach. All results were presented in 2021 international US dollars adjusted for purchasing power parity (PPP).

**Results:** Nine NHNCDs with three categories were identified. In 2021, the HBV was estimated to be responsible for 30.20 million (10.91 to 53.48 million) prevalent cases of overall NHNCD, which accounted for 0.62 million (0.19 to 1.30 million) YLDs and 1.83 million (0.77 to 3.24 million) YLLs globally. The global total costs of overall NHNCD attributable to HBV was 103.64 billion (95% UI, 42.91 to 190.87 billion), including 1.6 billion (0.62 to 2.83 billion) in direct healthcare costs, 8.37 billion (2.52 to 17.79 billion) in productivity losses and 93.66 billion (39.77

# 9<sup>th</sup> International Conference on Modern Approach in HUMANITIES and SOCIAL SCIENCES



25-27 April 2025 | Madrid, Spain

to 170.26 billion) in premature mortality costs. Overall, the total costs represented 0.06% of global GDP (2021 US\$, PPP adjusted).

**Conclusion:** The NHNCDs attributable to HBV has caused the substantial macroeconomic losses globally. Our findings underscore the needs for comprehensive HBV health programs (e.g. enhanced diagnosis and treatment rate), and NHNCDs prevention and management strategies, to improve the quality of life and overall well-beings of population with HBV infection.

**Keywords:** Hepatitis B virus; Non-hepatic non-communicable diseases; Global macroeconomic burden