The Global Burden of Viral Hepatitis

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Declaration of Interest

I receive no funding of any kind from any pharmaceutical or other for-profit health-care-related company
Global prevalence of HBV and HCV

Schweizer 2015
HBsAg prevalence est.
3.61% (3.61-3.61%) –
248 million people living with HBV

Gower 2014
HCV viraemic prevalence est. 1.1%
(0.9-1.4%) –
80 million people living with HCV
Current epidemiological estimates of hepatitis B in countries of the Western Pacific Region, 2014-16

Over 90% of the HBsAg+ cases are in China, Vietnam, and Philippines

Current epidemiological estimates of hepatitis C in countries of the Western Pacific Region, 2014-16

Over 90% of the chronic hepatitis C cases are in China, Japan, and Vietnam

Source: Gower et al 2014, Schweitzer et al 2015, CDA/WHO
HIV/AIDS: 1.3 million deaths 2013, falling since 2005 (1.7m)

TB: 1.4 million deaths in 2013 (1.3m in HIV -); falling since 1990, incidence and prevalence falling since 2000

Malaria: 855,000 deaths in 2013; falling since 2004

Global Fund to fight AIDS, TB and Malaria

Viral hepatitis: 1.45 million deaths in 2013, steadily increasing (895,000 in 1990)

Figure 2. Estimated global number of deaths due to viral hepatitis, HIV, malaria and TB, 2000–2015

Comparison of Global and Western Pacific Mortality by Major Communicable Diseases, 2013*

Global Burden of Cancer 2013

- Liver cancer 3rd most common cause of cancer deaths globally; 2nd highest years of life lost
- Estimated 10% of all human cancer deaths were due to liver cancer
- Poor access to effective treatments in both developing and developed countries
  - ASIR (/100,000) 14.7 developing, 7.4 developed
  - ASDR (/100,000) 15.6 developing, 7.3 developed
Leading causes of mortality and trends, 1990 - 2013

The global burden of viral hepatitis from 1990 to 2013: findings from the Global Burden of Disease Study 2013


Summary

Background With recent improvements in vaccines and treatments against viral hepatitis, an improved understanding of the burden of viral hepatitis is needed to inform global intervention strategies. We used data from the Global Burden of Disease (GBD) Study to estimate mortality and morbidity for acute viral hepatitis, and for cirrhosis and liver cancer caused by viral hepatitis, by age, sex, and country from 1990 to 2013.

Methods We estimated mortality using natural history models for acute hepatitis infections and GBD’s cause-of-death ensemble model for cirrhosis and liver cancer. We used meta-regression to estimate total cirrhosis and total liver cancer prevalence, as well as the proportion of cirrhosis and liver cancer attributable to each cause. We then estimated cause-specific prevalence as the product of the total prevalence and the proportion attributable to a specific cause. Disability-adjusted life-years (DALYs) were calculated as the sum of years of life lost (YLLs) and years lived with disability (YLDs).

Findings Between 1990 and 2013, global viral hepatitis deaths increased from 0-89 million (95% uncertainty interval [UI] 0-86-0-94) to 1-45 million (1-38-1-54); YLLs from 31-0 million (29-6-32-6) to 41-6 million (39-1-44-7); YLDs from 0-65 million (0-45-0-89) to 0-87 million (0-61-1-18); and DALYs from 31-7 million (30-2-33-3) to 42-3 million (39-9-45-6). In 2013, viral hepatitis was the seventh (95% UI seventh to eighth) leading cause of death worldwide, compared with tenth (tenth to 12th) in 1990.

Interpretation Viral hepatitis is a leading cause of death and disability worldwide. Unlike most communicable diseases, the absolute burden and relative rank of viral hepatitis increased between 1990 and 2013. The enormous health loss attributable to viral hepatitis, and the availability of effective vaccines and treatments, suggests an important opportunity to improve public health.

Funding Bill & Melinda Gates Foundation.
Figure 3: Map of viral hepatitis-related, age-standardised mortality rate, by GBD region

The global burden of viral hepatitis from 1990 to 2013: findings from the Global Burden of Disease Study 2013

Stanaway et al 2016 Lancet
Figure 3: Map of viral hepatitis-related, age-standardised mortality rate, by GBD region

Overlaid pie charts indicate each virus type's contribution to the total hepatitis-related mortality; the size of the pie charts are proportional to the region's hepatitis-attributable mortality rate. GBD=Global Burden of Disease.

Stanaway et al 2016 Lancet
Shifting trends in the burden of liver disease

**Global**

<table>
<thead>
<tr>
<th>Year</th>
<th>HBV</th>
<th>HCV</th>
<th>HIV</th>
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<td>1990</td>
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<td>2013</td>
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**Australia**

Estimated BBV related mortality, Australia, 2013:

- **HBV** – 827 deaths
- **HCV** – 1,546 deaths
- **HIV** – 107 deaths

*Cowie EASL 2015, GBD Collaborators 2015*
In 2013, an estimated 10.09 million DALYs attributable to previous exposure to HIV, HBV and HCV via IDU, 4-fold increase since 1990

In 2013 IDU estimated to cause

- 4% of DALYs due to HIV (highest in LMIC)
- 1.1% of DALYs due to HBV
- 39.1% of DALYs due to HCV (highest in HIC)

IDU is a major contributor to the global burden of disease
### HIV and related infections in prisoners 1

Global burden of HIV, viral hepatitis, and tuberculosis in prisoners and detainees

Kate Dolan, Andrea L. Wirtz, Babak Mezaei, Martial N'Deffo-Ribah, Alison Galvani, Stuart A. Kinney, Ryan Courtney, Martin McKee, Joseph J. Amon, Lisa Maher, Margaret Hellard, Chris Beyrer, Fredrick L. Altice

- In 2014, estimated 10.2 million people incarcerated at any time
  - 3.8% have HIV (389,000 people)
  - 15.1% have HCV (1.5 million people)
  - 4.8% have HBV (492,000 people)
  - 2.8% have active TB (286,000 people)
- Most effective way of controlling these infections is to reduce the incarceration of PWID
Preliminary results – GBD 2015
Annual deaths – all ages

GBD Causes of Death Collaborators 2016
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