The epidemiology of hepatitis C virus in Afghanistan: Systematic review and meta-analysis

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OBJECTIVE
• To characterize hepatitis C virus (HCV) epidemiology and inform public health research, policy, and programming priorities in Afghanistan.

BACKGROUND
• There is potential for achieving substantial reductions in HCV transmission due to recent innovations in HCV treatment and prevention.
• HCV epidemiology in most countries in the Middle East and North Africa (MENA) including Afghanistan is poorly understood.
• Afghanistan may be vulnerable to the transmission of blood-borne infections including HCV due to decades of armed conflicts and opium cultivation and trade.
• This study is part of the MENA HCV Epidemiology Synthesis Project; an ongoing effort to characterize HCV epidemiology and inform key public health research, policy, and programming priorities in MENA.

METHODOLOGY
• We systematically reviewed and synthesized HCV incidence and prevalence data using a comprehensive search of literature and following PRISMA guidelines (Figure 1).
• HCV prevalence among various at risk populations were estimated through meta-analyses implemented using DerSimonian-Laird random effects models with inverse variance weighting (Table 1).
• Heterogeneity across studies was assessed using several measures (Table 1).
• A detailed assessment for the quality of HCV measures (risk of bias and precision) was conducted.

Table 1. Findings of the meta-analyses for HCV prevalence measures stratified by populations’ risk of exposure in Afghanistan.

<table>
<thead>
<tr>
<th>Populations at risk</th>
<th>Studies</th>
<th>Samples</th>
<th>Prevalence</th>
<th>Effect size (HCV prevalence)</th>
<th>Heterogeneity measures</th>
<th>Prediction interval (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Populations at low risk (general population)</td>
<td>40</td>
<td>215222</td>
<td>0.9-1</td>
<td>0.6</td>
<td>0.3-0.9</td>
<td>98.4% (98.2-98.6%)</td>
</tr>
<tr>
<td>Populations at high risk (all studies were among people who inject drugs)</td>
<td>14</td>
<td>8139</td>
<td>9.5-70.0</td>
<td>32.6</td>
<td>24.5-41.3</td>
<td>97.8% (97.2-98.2%)</td>
</tr>
<tr>
<td>Populations at intermediate risk</td>
<td>16</td>
<td>6356</td>
<td>0.8-3</td>
<td>2.3</td>
<td>1.3-3.7</td>
<td>89.2% (84.1-92.7%)</td>
</tr>
</tbody>
</table>

*Q: the Cochran’s Q statistic is a measure assessing the existence of heterogeneity in effect size; r²: the estimated between-study variance in the double arcsine transformed proportions of the true effect sizes. The back-transformed r² was not calculated as the methodology to do so is not currently available; I²: a measure assessing the magnitude of between-study variation that is due to differences in effect size across studies rather than chance; Prediction interval: estimates the 95% interval in which the true effect size in a new HCV study will lie.

RESULTS
• Our search identified 1 HCV incidence and 69 HCV prevalence measures (Figure 1).
• HCV incidence was only assessed among people who inject drugs (PWID), and was reported at 66.7 per 100 person-years.
• Our meta-analyses estimated HCV prevalence at (Table 1):
  - 0.6% among the general population (range: 0-9.1%; 95% CI: 0.3-0.9%)
  - 32.6% among PWID (range: 9.5-70.0%; 95% CI: 24.5-41.3%)
  - 2.3% among populations at intermediate risk such as prisoners (range: 0.0-8.3%; 95% CI: 1.3-3.7%)
• No data was available for clinical populations at high risk such as hemodialysis, thalassemia, and hemophilia patients.
• HCV measures were of reasonable quality.

CONCLUSIONS
• HCV prevalence among the general population in Afghanistan is comparable to global levels (~1%).
• There is an immediate need for expansion of harm reduction programs among PWID and prisoners.
• Data are needed for the level of infection among key clinical populations at high risk of infection.

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