Population level outcomes and cost-effectiveness of expanding guidance for age-based hep C testing in the U.S.  
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OBJECTIVE

To investigate population-level outcomes and cost-effectiveness of expanding guidance for age-based hep C testing in the U.S.

BACKGROUND

- Historically, the highest hep C prevalence in the U.S. has been among persons born between 1945 and 1965; however, there is rising hep C incidence among young persons who inject drugs (PWID).8
- The U.S. Centers for Disease Control and Prevention (CDC) and U.S.PSTF recommend one-time hep C testing of persons born 1945-1965, the “birth cohort,” and targeted testing of high-risk persons.4,8
- Birth cohort testing is cost-effective but may miss opportunities to identify hep C cases, especially among persons younger than the birth cohort with unreported risk factors.
- A national plan to reduce hep C prevalence in the U.S. should focus on case finding and treatment outside the “birth cohort.”

METHODS

- Simulation model of screening and treatment for hep C
- Simulated 4 strategies: 1) Standard of care—recommending one time testing for persons born between 1945 and 1965) 2) Recommendation of one time testing adults ≥40 years 3) Recommendation of one time testing adults ≥40 years 4) Recommendation of one time testing adults ≥18 years
- Modeled recommendation of one time testing as an increased probability of being tested, which resulted in variability of the number of tests given individual may receive.
- Outcomes include: proportion of cases identified, linked to care, treated, and cured; proportion of patients diagnosed with hep C prior to reaching cirrhosis, quality-adjusted life years (QALY), discounted costs from health sector perspective, incremental cost-effectiveness ratios (ICERs), and proportion of incremental costs relative to hep C infection
- All strategies assumed continued testing of hep C
- Data from national databases, clinical trials, and cohorts to inform base-case parameters for chronic hep C prevalence, the hep C continuum of care, treatment efficacy, disease progression, toxicity, QALY, and costs. Used MarketScan®, a large claims-based dataset, to estimate current hep C testing rates and calibrated those estimates to the positivity rate observed in large commercial laboratory databases
- Hep C treatment with pan-genotypic regimen (sofosbuvir/velpatasvir)
- Non-hep C mortality and healthcare costs are time-updated to reflect substance use, with higher cost and mortality in current drug users
- Sensitivity analysis performed on all parameters
- Included an alternate scenario in which we assumed it would take approximately twice the rate of hep C screening to identify the same number of hep C cases (efficient screening).

SELECTED PARAMETERS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>Reference</th>
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<tbody>
<tr>
<td>HCV antibody test cost (2016 USD)</td>
<td>$19</td>
<td>CMS 2016</td>
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<tr>
<td>HCV therapy cost (2016 USD)</td>
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BASE CASE AND SENSITIVITY ANALYSIS RESULTS

CONCLUSIONS

- Routine hep C testing among all adults in the U.S. leads to decreased liver-related mortality, earlier stage of fibrosis at diagnosis, and decreased hep C related costs and is cost-effective.
- Our findings were robust in sensitivity analyses that directly assess the impact of treatment on cost, utility, and mortality.
- Limitations arise from the limited availability of adequate national surveillance data for hep C infection and substance use disorder
- Routine testing of adults 18 years and older appears to be a reasonable national strategy to reduce the population hep C burden of hep C, and appears to provide good value for money based on typical cost-effectiveness benchmarks

REFERENCES