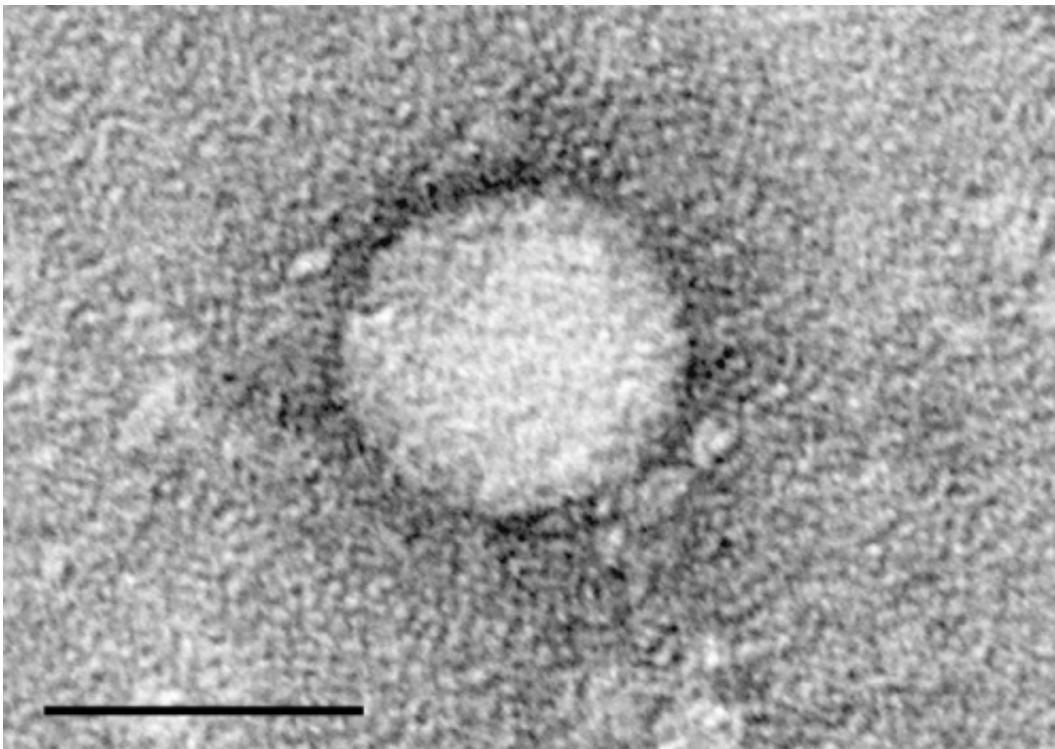


Researchers find method to prioritize treatment strategies in hepatitis C in US prisons

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Electron micrographs of hepatitis C virus purified from cell culture. Scale bar is 50 nanometers. Credit: Center for the Study of Hepatitis C, The Rockefeller University.

There are currently more than three million people in the United States with hepatitis C, a condition that can lead to serious and even deadly

liver complications. In the U.S. prison system, the prevalence of hepatitis C virus (HCV) infection is currently 10 times higher than the national average. And while new HCV treatment drugs are very effective, their high cost along with very limited healthcare budget in prisons impedes universal treatment in prisons. However, new research in the INFORMS journal *Operations Research*, has identified new protocols that could substantially decrease HCV infection in the U.S. prison system.

The study, "Prioritizing Hepatitis C Treatment in U.S. Prisons," was conducted by Turgay Ayer of the Georgia Institute of Technology, Can Zhang of Duke University, Anthony Bonifonte of Denison University, Anne C. Spaulding of Emory University, and Jagpreet Chhatwal of Harvard Medical School.

While the prevalence of HCV infection in the [general population](#) is only 1-2 percent, within the [prison](#) system the prevalence of antibodies to hepatitis C jumps to 17 percent. This is primarily due to the fact that many HCV-infected people are current or past injection drug users (IDU). Nearly 80 percent of all HCV transmissions are IDU-related transmissions, and most Americans who inject drugs have been incarcerated at some point during their lives.

Currently the biggest barrier to treating persons in prison with HCV is that while the newest medications have a higher than 95 percent cure rate (versus a 50 percent cure rate of previous treatments), the cost of treatment is outrageously high. When the new treatments were approved in 2015, their cost was \$84,000 per treatment course. Since then, the prices have come down to around \$25,000. However, even at this price, treating incarcerated persons could cost \$3.3 billion. Because the healthcare budget is very limited, only 1-13 percent of HCV-infected persons in prison receive treatment currently.

Because of the cost/budget constraints, prisons often prioritize patients

for HCV treatment. The current approach emphasizes liver stage , and often ignores other factors such as their risk of transmission, age, etc. The study's authors identified a new protocol to prioritize treatment among HCV-infected persons in the prison population to optimize the effect of HCV treatment on overall society's well-being. Their solution systematically considers factors including liver health state, remaining sentence length, propensity to inject drugs, age, disease progression over time, and reinfection rates.

"We found that by simultaneously considering health state, remaining sentence length, IDU status, and age in prioritization, decisions can lead to a significant decrease in hepatitis C-caused mortality and infections both in correctional health systems and in the community," said Ayer.

This new system offers an alternative to the current controversial patient prioritization protocol, which focuses on liver status, or the level of scarring on the patient's liver. "Ideally, prisons would be allocated enough resources to treat everyone infected," said Spaulding, a public health physician-researcher, who has been working with incarcerated persons living with HCV since 1996. "In the meantime, this algorithm is designed to maximize the public health outcome of [treatment](#)."

"Due to the simplicity in implementing prioritization policy, our work is appealing to multiple stakeholders within the U.S. prison system, including medical directors and policy makers at the prisons," continued Ayer. "Ultimately, by reducing the prevalence of hepatitis C in the prison population, we are reducing the chances of persons spreading the disease in the general population once they return to society."

More information: Turgay Ayer et al, Prioritizing Hepatitis C Treatment in U.S. Prisons, *Operations Research* (2019). [DOI: 10.1287/opre.2018.1812](https://doi.org/10.1287/opre.2018.1812)

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