Background: HCV infection is a major cause of cirrhosis, hepatocellular carcinoma (HCC) and liver transplantation in the Czech Republic (CR). We examined HCV disease progression to quantify disease burden from a nationwide perspective. Methods: Using a system dynamic framework, we quantified the HCV-infected population and associated disease progression between 1950 and 2030. We modeled 36 hypothetical cohorts to define HCV incidence, prevalence, hepatic complications, and mortality. Baseline assumptions and transition probabilities were extracted from the literature.

We developed a strategy to reduce the future burden of HCV infection that included increased diagnosis and treatment, assuming available potent antivirals. Results: 1500 incident HCV infections occurred in CR in 2012. The prevalence is estimated to peak in 2023 (43600 individuals), and to decline by 1.6% by 2030 (42900 cases). However, the number of cases of compensated (n=5400) and decompensated (n=570) cirrhosis, HCC (n=290), and liver-related deaths (n=270) will peak between 2048 and 2053. A strategy was modeled where annual incidence decreased by 50% and treated cases increased by 322% in 2030 compared to 2013. Treatment eligibility increased to 90% and SVR increased to 85% (G1) and 95% (G3). Compared to the base case, this strategy decreased viremic cases by 88% with remaining 4990 infected individuals by 2030. HCV-related mortality may decrease up to 81% correlating to 2840 lives saved. Conclusions: Elimination of HCV is possible in CR with increased diagnosis and treatment, assuming available potent antivirals. This strategy will facilitate disease forecasting and the development of strategies for HCV management in CR.