

## User Guide

This non-technical introduction to the *Hep C State Policy Simulator* (hereafter, the Simulator) provides an overview of the Simulator’s use, interventions, and output structure. For more details, see <http://www.hepcsimulator.org/methodology>

### Simulator Purpose

The Simulator is a tool to help state health policy makers and practitioners make decisions regarding policy, strategy, and investments related to hepatitis C. With the Simulator, you can explore the potential impact of different screening and treatment policies and cost drivers. This information helps states evaluate the short- and long-term economic and public health consequences of specific policies, as well as potential tactics (e.g., drug price negotiations) for managing hepatitis C under constrained resources. You can use it to examine effects in aggregate, or to assess the fiscal and health outcomes associated with specific policy decisions within and across select subpopulations, including state Medicaid beneficiaries and incarcerated individuals.

### Using the Simulator

Follow these steps to use the Simulator:

1. Select the state.
2. Select the intervention(s) you wish to modify (screening strategy, treatment rate, cost of hepatitis C treatment)
3. Fill in the details on the selected intervention type for each subpopulation in which you are interested. If you do not change intervention details for a specific population, the default values will be used.
4. Click/tap the “Update plots” button to generate the disease burden and cost burden (output) data.
5. Select the tab for the analysis that you wish to view: Disease Burden or Cost Burden.

Each tab provides you with detailed information corresponding to the projected burden for the selected state and intervention type. For each graph, you can uncheck boxes to leave out unnecessary information and focus on the subpopulations that are most important to you.

*See below for more information about the intervention, disease burden, and cost burden options.*

### Interventions—Input Options

For each state, the Simulator provides default values for the number of adults with chronic hepatitis C infections, hepatitis C screening strategy, annual treatment rate, treatment restrictions (if any), and cost of hepatitis C treatment with direct-acting antivirals (DAAs). However, you have the option to change these values, depending on your needs.

As a starting point, the Simulator uses recently published, state-specific estimates of the number of all adults living with hepatitis C between 2013 and 2016. Users can change the default value within a set interval by selecting “Edit” and entering a new number. The Simulator allows users to enter any number within a range (from -50% to +200% of the default value). If a value outside this range is entered, the Simulator returns a warning box that includes information on the minimum and maximum numbers allowed for that state. Users can return to the default estimate by clicking “Reset”.

The three screening strategy options are as follows:

1. **Diagnostic and risk-based:** This is equivalent to provider-driven diagnostic and risk-based testing and generally aligns with testing rates **prior to** the release of U.S. Preventive Services Task Force’s (USPSTF’s) 2013 screening recommendations for adults born between 1945 and 1965.
2. **Birth cohort (1945-1965):** This is equivalent to provider-driven diagnostic/risk-based testing **plus** one-time screening for all individuals born between 1945 and 1965, as defined in the 2013 USPSTF’s Hepatitis C Screening Recommendation.
3. **Universal:** This assumes one-time screening for all adults 18 years of age and older, **as well as** more frequent (i.e., repeat) testing for individuals at high risk for infection.

The percentage of chronically infected persons who are screened each year (i.e., screening rates) is fixed across subpopulations for the diagnostic and risk-based (1) and birth cohort (2) screening strategies.

For the universal (3) screening strategy, users have the option to adjust the annual screening rate. To do this, users should select the universal screening strategy for subpopulations of interest, and then click/tap the “Show/Hide Screening Rates” button under “Screening Strategies”. Default screening rates appear to the right of each subpopulation. Those defaults are modifiable when the universal screening strategy has been selected for a specific subpopulation.

The treatment rate refers to the percentage of all diagnosed individuals within a given subpopulation(s) who are actually treated in a given year. Users can adjust the default rates to evaluate how the access to, and availability of, treatment effect disease and cost burdens associated with hepatitis C.

The treatment restriction options are as follows:

1. **F3 and F4 only:** Only individuals with advanced liver disease (stage 3 fibrosis or worse) are eligible for treatment.
2. **F2 and above:** Only individuals with moderate-to-severe liver disease (stage 2 fibrosis or worse) are eligible for treatment.
3. **No restrictions:** All individuals, regardless of the current extent of damage to their livers (including those with stage 0 and 1 disease) are eligible for treatment.

The cost of direct-acting antiviral (DAA) treatment, in US dollars, can vary by subpopulation. The default option is \$20,000.

## Output Options

The Simulator begins to apply the input values you select in 2019 and uses them to estimate hepatitis C disease burden and cost burden for 2019-2030. You can then further manipulate the results to include or exclude specific subpopulations.

The Disease Burden tab on the Simulator summarizes the following results:

1. Overall state trends in the proportion of individuals ever infected with hepatitis C, including those who:
  - Are currently infected but not aware of their infection (i.e., undiagnosed). This group is referred to as “Infected-Unaware” in the output figures.
  - Are currently infected and aware of their infection, but have not yet been successfully treated (i.e., diagnosed). This group is referred to as “Infected-Aware” in the output figures.
  - Were previously infected but have since been cured (i.e., achieved a sustained virologic suppression, or SVR). This group is referred to as “Infected-Unaware” in the output figures
2. Trends in chronic hepatitis C infection rates for the selected state, by subpopulation (i.e., Medicaid, Medicare, privately insured, incarcerated and uninsured individuals).
3. Overall state trends in three hepatitis C-related long-term outcomes: deaths from liver disease, new cases of hepatocellular carcinoma, and new cases of decompensated cirrhosis.

The Cost Burden tab on the Simulator summarizes the following results:

1. Overall state trends in economic burden of hepatitis C, associated with the following cost drivers:
  - Hepatitis C screening (initial and confirmatory).
  - Hepatitis C treatment (includes the cost of drugs and monitoring tests).
  - Hepatitis C-associated disease management and outcomes (e.g., decompensated cirrhosis, liver cancer, and liver-related deaths).
2. Trends in hepatitis C-associated total costs for the selected state, by subpopulation (i.e., the incarcerated, Medicaid, Medicare, privately insured, and uninsured individuals).
3. One- and five-year cumulative healthcare spending on hepatitis C, by cost driver and subpopulation.

## Downloading Results

Once you have included the specific subpopulations that you need, you can download the results as slides and comma-separated values (CSV) files.

In the Download Results section, click/tap “Download Results” for a ZIP file containing the following:

1. README.txt file

2. PDF slide deck that summarizes parameter values selected, graphs and key findings generated by the Simulator under its Disease Burden and Cost Burden tabs, and additional notes to support presentation and interpretation.
3. 5 CSV files that provide estimated cost and disease burden output values by sub-population, intervention, and/or year.

### Understanding Results

The Simulator is a tool to help you understand the overall impact of various public health strategies in treating hepatitis C. It relies on a published mathematical model to generate its results. Because results include some simulation noise, users should consider the results produced by the Simulator to be approximate, rather than exact.