Centers for Disease Control and Prevention

Center for Forecasting and Outbreak Analytics

Current Epidemic Growth Status (Based on R_t) for States and Territories

COVID-19

Influenza

Methods

Glossary

COVID-19

As of April 27, 2024, we estimate that COVID-19 infections are growing or likely growing in 2 states and territories, declining or likely declining in 24 states and territories, and are stable or uncertain in 23 states and territories.

The second figure below shows the estimated time-varying reproductive number, Rt, and uncertainty interval from March 06, 2024 through April 27, 2024 for the U.S. and for each reported state and territory. (Click on the map to view the data for a specific state or territory). Estimated values above 1 indicate epidemic growth.

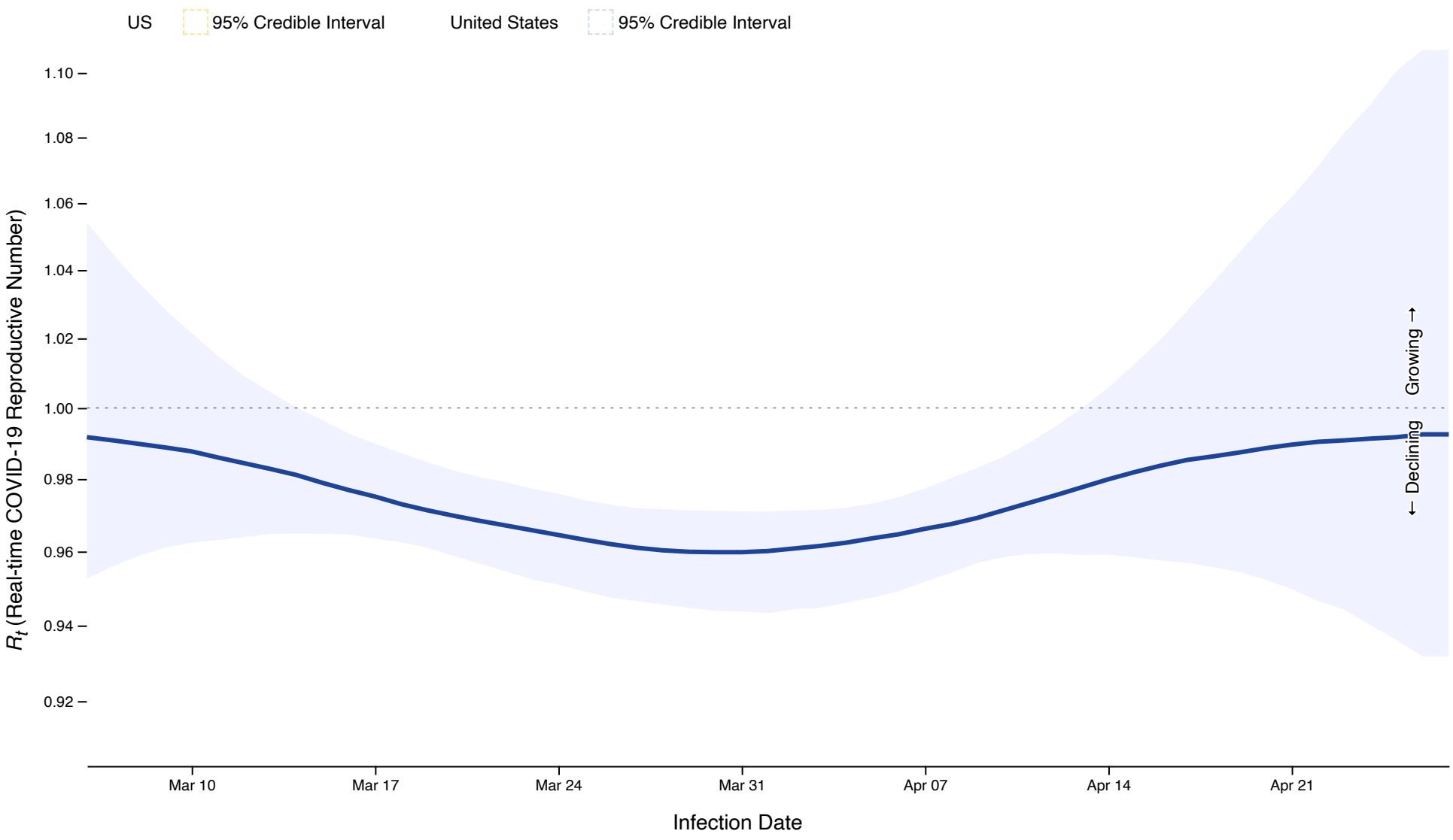
We estimate the time-varying reproductive number, R_t, a measure of transmission, based on data from incident COVID-19 hospitalizations. Epidemic status was determined by estimating the probability that R_t is greater than 1. While R_t tells us if the number of COVID-19 infections are likely growing or declining, it does not reflect the burden of COVID-19. View a summary of key data for COVID-19, influenza, and RSV.

Download Data (CSV)

Data Table

Location	Category	Probability Epidemic is Growing	Date
Alabama	Likely Declining	0.1265	2024-04-27
Alaska	Not Estimated	NA	2024-04-27
Arizona	Likely Declining	0.1425	2024-04-27
Arkansas	Stable or Uncertain	0.297	2024-04-27
California	Stable or Uncertain	0.495	2024-04-27
Colorado	Stable or Uncertain	0.347	2024-04-27
Connecticut	Likely Declining	0.1655	2024-04-27
Delaware	Likely Declining	0.2015	2024-04-27
District Of Columbia	Likely Declining	0.146	2024-04-27
Florida	Stable or Uncertain	0.6945	2024-04-27
Georgia	Likely Declining	0.1145	2024-04-27
Hawaii	Stable or Uncertain	0.6455	2024-04-27
Idaho	Stable or Uncertain	0.7145	2024-04-27
Illinois	Stable or Uncertain	0.299	2024-04-27
Indiana	Declining	0.041	2024-04-27
Iowa	Likely Declining	0.234	2024-04-27
Kansas	Stable or Uncertain	0.361	2024-04-27
Kentucky	Likely Declining	0.146	2024-04-27
Louisiana	Stable or Uncertain	0.444	2024-04-27
Maine	Stable or Uncertain	0.342	2024-04-27
Maryland	Declining	0.0955	2024-04-27
Massachusetts	Stable or Uncertain	0.2775	2024-04-27
Michigan	Declining	0.083	2024-04-27
Minnesota	Likely Declining	0.135	2024-04-27
Mississippi	Stable or Uncertain	0.315	2024-04-27
Missouri	Stable or Uncertain	0.341	2024-04-27
Montana	Likely Declining	0.152	2024-04-27
Nebraska	Stable or Uncertain	0.3255	2024-04-27
Nevada	Stable or Uncertain	0.6675	2024-04-27
New Hampshire	Stable or Uncertain	0.591	2024-04-27
New Jersey	Stable or Uncertain	0.4165	2024-04-27
New Mexico	Stable or Uncertain	0.4955	2024-04-27
New York	Likely Declining	0.1245	2024-04-27
North Carolina	Declining	0.0715	2024-04-27
North Dakota	Stable or Uncertain	0.397	2024-04-27
Ohio	Likely Declining	0.1645	2024-04-27
Oklahoma	Stable or Uncertain	0.461	2024-04-27

Location	Category	Probability Epidemic is Growing	Date
Oregon	Likely Declining	0.197	2024-04-27
Pennsylvania	Declining	0.0585	2024-04-27
Puerto Rico	Likely Growing	0.864	2024-04-27
Rhode Island	Stable or Uncertain	0.3425	2024-04-27
South Carolina	Declining	0.0675	2024-04-27
South Dakota	Likely Declining	0.2435	2024-04-27
Tennessee	Declining	0.0765	2024-04-27
Texas	Likely Growing	0.778	2024-04-27
U.S. Virgin Islands	Not Estimated	NA	2024-04-27
Utah	Likely Declining	0.1485	2024-04-27
Vermont	Not Estimated	NA	2024-04-27
Virginia	Declining	0.07	2024-04-27
Washington	Likely Declining	0.211	2024-04-27
West Virginia	Stable or Uncertain	0.4575	2024-04-27
Wisconsin	Stable or Uncertain	0.484	2024-04-27
Wyoming	Not Estimated	NA	2024-04-27



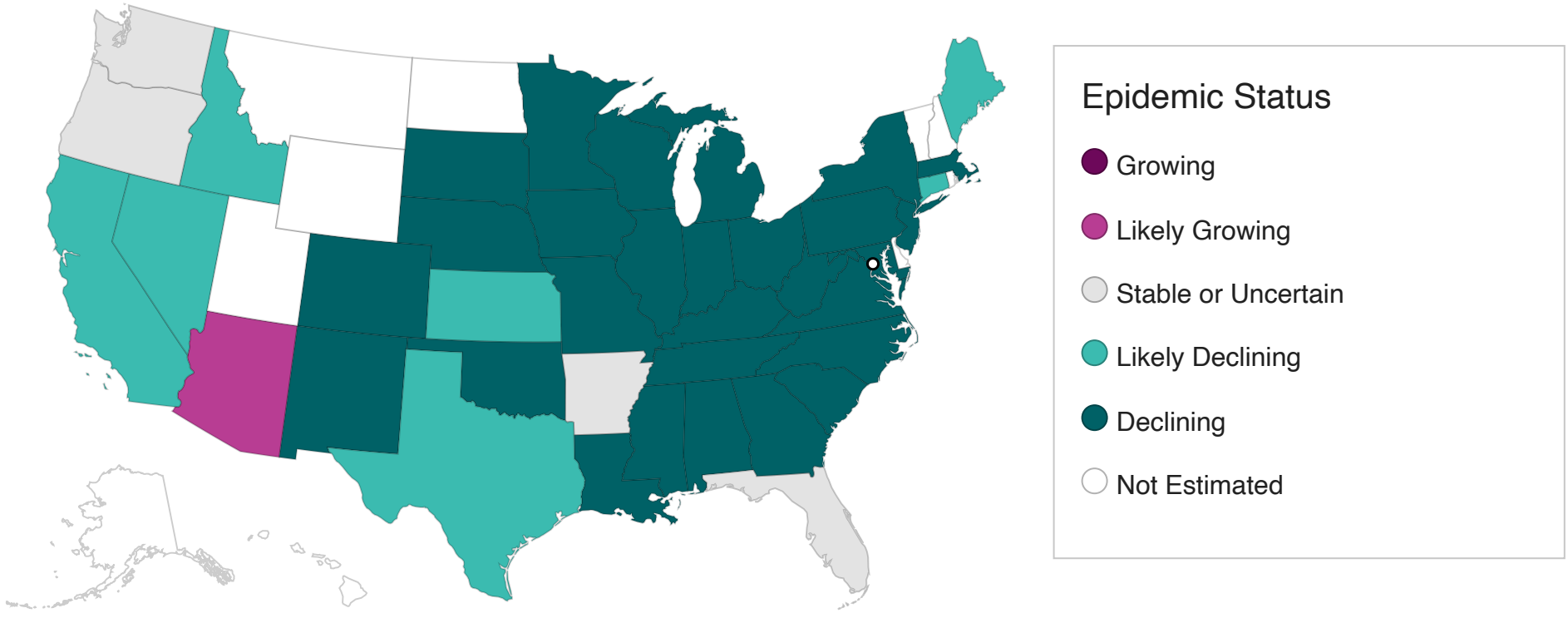
Download COVID-19 chart data (CSV)

Influenza

As of April 27, 2024, we estimate that influenza infections are growing or likely growing in 1 state or territory, declining or likely declining in 35 states and territories, and are stable or uncertain in 5 states and territories.

The second figure below shows the estimated time-varying reproductive number, Rt, and uncertainty interval from March 06, 2024 through April 27, 2024 for the U.S. and for each reported state and territory. (Click on the map to view the data for a specific state or territory). Estimated values above 1 indicate epidemic growth.

We estimate the time-varying reproductive number, R_t, a measure of transmission, based on data from incident influenza hospitalizations. Epidemic status was determined by estimating the probability that R_t is greater than 1. While R_t tells us if influenza infections are likely growing or declining, it does not reflect the burden of influenza. View a summary of key data for COVID-19, influenza, and RSV.



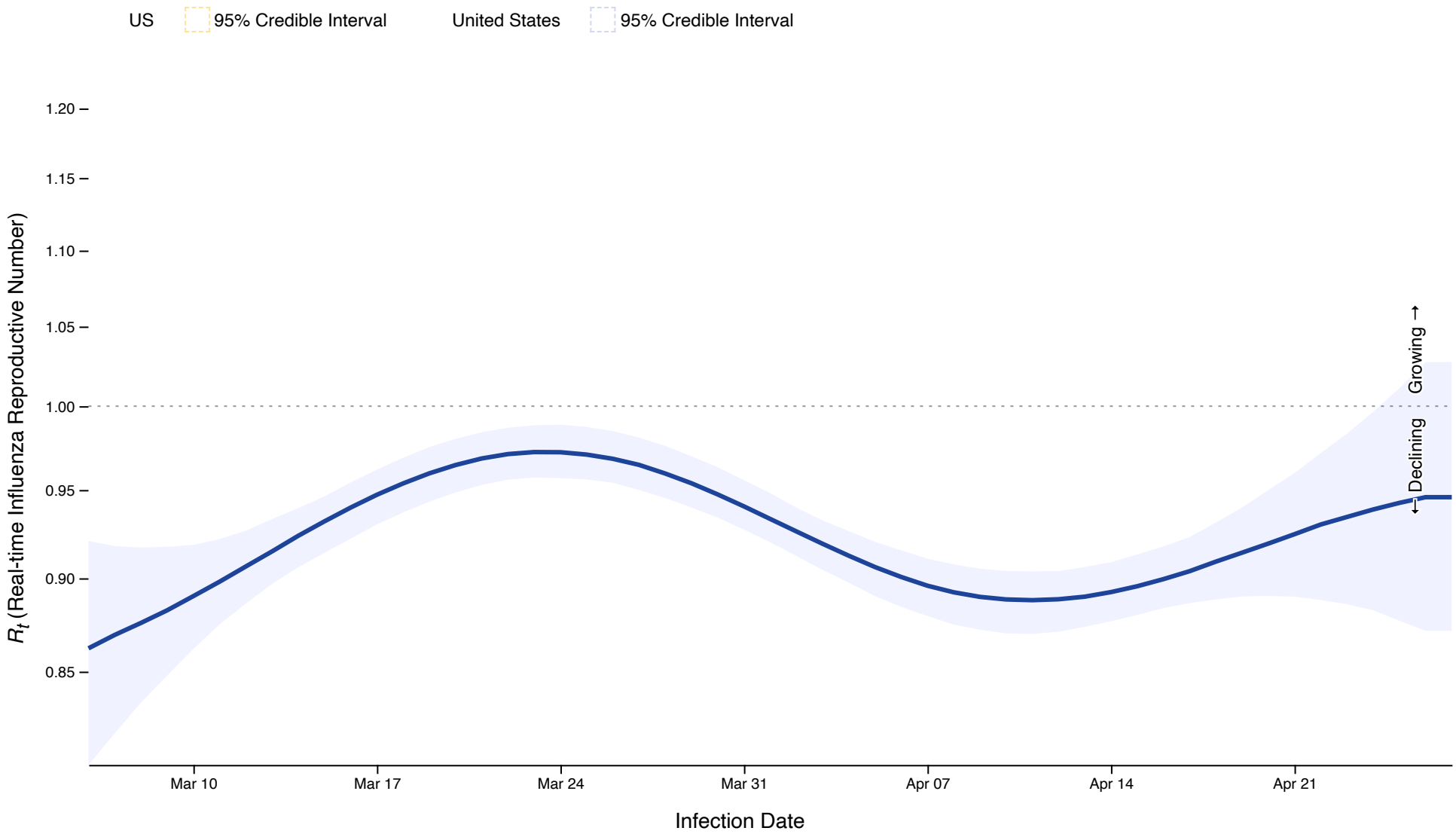
Territories PR VI

Download Data (CSV)

Data Table

Location	Category	Probability Epidemic is Growing	Date
Alabama	Declining	0.089	2024-04-27
Alaska	Not Estimated	NA	2024-04-27
Arizona	Likely Growing	0.7725	2024-04-27
Arkansas	Stable or Uncertain	0.568	2024-04-27
California	Likely Declining	0.208	2024-04-27
Colorado	Declining	0.0165	2024-04-27
Connecticut	Likely Declining	0.1885	2024-04-27
Delaware	Not Estimated	NA	2024-04-27
District Of Columbia	Not Estimated	NA	2024-04-27
Florida	Stable or Uncertain	0.362	2024-04-27
Georgia	Declining	0.0465	2024-04-27
Hawaii	Not Estimated	NA	2024-04-27
Idaho	Likely Declining	0.218	2024-04-27
Illinois	Declining	5e-4	2024-04-27
Indiana	Declining	0.013	2024-04-27
Iowa	Declining	0.002	2024-04-27
Kansas	Likely Declining	0.193	2024-04-27
Kentucky	Declining	0.005	2024-04-27
Louisiana	Declining	0.0395	2024-04-27
Maine	Likely Declining	0.1145	2024-04-27

Location	Category	Probability Epidemic is Growing	Date
Maryland	Declining	0.0065	2024-04-27
Massachusetts	Declining	0.001	2024-04-27
Michigan	Declining	0.0735	2024-04-27
Minnesota	Declining	0.0015	2024-04-27
Mississippi	Declining	0.03	2024-04-27
Missouri	Declining	0.0035	2024-04-27
Montana	Not Estimated	NA	2024-04-27
Nebraska	Declining	0.0115	2024-04-27
Nevada	Likely Declining	0.1775	2024-04-27
New Hampshire	Not Estimated	NA	2024-04-27
New Jersey	Declining	0.075	2024-04-27
New Mexico	Declining	0.074	2024-04-27
New York	Declining	0.008	2024-04-27
North Carolina	Declining	0.009	2024-04-27
North Dakota	Not Estimated	NA	2024-04-27
Ohio	Declining	0.0725	2024-04-27
Oklahoma	Declining	0.066	2024-04-27
Oregon	Stable or Uncertain	0.3965	2024-04-27
Pennsylvania	Declining	0.0095	2024-04-27
Puerto Rico	Stable or Uncertain	0.4375	2024-04-27
Rhode Island	Not Estimated	NA	2024-04-27
South Carolina	Declining	0.055	2024-04-27
South Dakota	Declining	0.0775	2024-04-27
Tennessee	Declining	0.0115	2024-04-27
Texas	Likely Declining	0.104	2024-04-27
U.S. Virgin Islands	Not Estimated	NA	2024-04-27
Utah	Not Estimated	NA	2024-04-27
Vermont	Not Estimated	NA	2024-04-27
Virginia	Declining	0.0565	2024-04-27
Washington	Stable or Uncertain	0.3975	2024-04-27
West Virginia	Declining	0.0965	2024-04-27
Wisconsin	Declining	0.0155	2024-04-27
Wyoming	Not Estimated	NA	2024-04-27



Download influenza chart data (CSV)

Interpreting R_t

- R_t is a data-driven measure of disease transmission. R_t is an estimate on date t of the average number of new infections caused by each infectious person. R_t accounts for current population susceptibility, public health interventions, and behavior.
- $R_t > 1$ indicates that infections are growing because, on average, each infected person is causing more than one new infection while $R_t < 1$ indicates that infections are declining.
- R_t can be a leading indicator of increases or decreases in cases, hospitalizations, or deaths, because transmission occurs before case confirmation, hospitalization, or death.
- The uncertainty range for each R_t estimate determines the probability that infections are growing. For example, if 75% of the uncertainty range falls above 1, then there is a 75% chance that the infections are growing in that location.
- When the data are sparse, the model used to generate R_t estimates will tend to generate estimates nearer to 1 with wide credible intervals, which reflects uncertainty in the true epidemic trend during these time periods.

- **What R_t can tell us:** R_t can tell us whether a current epidemic is growing, declining, or remaining stable, and is an additional tool to help public health practitioners prepare and respond.
- **What R_t cannot tell us:** R_t cannot tell us about the underlying *burden* of disease, just the trend of transmission. An $R_t < 1$ does not mean that transmission is low, just that infections are declining. It is useful to look at respiratory disease activity in conjunction with R_t.

Caveats and limitations

- R_t estimates are sensitive to assumptions about the generation interval distribution.
- R_t estimates may be over or underestimated if the proportion of infections that result in hospitalizations changes abruptly. These estimates can be impacted by shifts in clinical severity, increased or decreased use of clinical testing, or changes in reporting.
- While these estimates are based on a single data source (hospitalizations), studies have indicated that any resulting biases are likely minor and that this is a robust approach to estimate R_t.

Methods

R_t is defined as the average number of new infections caused by each infected person at a particular time, t. When $R_t > 1$, infections are growing, and when $R_t < 1$, infections are declining. The color categories in the maps above were determined by estimating a distribution of possible R_t values based on the observed hospitalization data and model assumptions (formally, a "credible interval"). We then calculate the proportion of that credible interval where the $R_t > 1$. Credible intervals are determined using the EpiNow2 package, which uses a Bayesian model to estimate R_t, while adjusting for delays and reporting effects.

- If >90% of the credible interval distribution of R_t >1, infections are growing
- If 76%-90% of the credible interval distribution of $R_t > 1$, infections are likely growing
- If 26%-75% of the credible interval distribution of $R_t > 1$, infections have an uncertain trend or are stable (in this case, the credible interval spans across 1, and contains a mix of values above and below 1.)
- If 10%-25% of the credible interval distribution of $R_t > 1$, infections are likely declining; this is equivalent to 75%-90% of the credible interval of $R_t \leq 1$
- If <10% of the credible interval distribution of $R_t > 1$, infections are declining; this is equivalent to >90% of the credible interval of $R_t \leq 1$
- R_t was not estimated for states and territories in the following cases: 1. fewer than 10 laboratory-confirmed COVID-19 or influenza hospital admissions were reported in each of the prior 2 weeks, 2. there were detected anomalies in reported values, and 3. the model did not pass checks for reliability.

R_t estimates are derived from daily counts of new COVID-19 or influenza hospitalizations . This blog post provides a more in-depth overview of the modeling approach used to estimate R_t, and the strategies CDC uses to validate the accuracy of estimates.

To estimate R_t, we fit Bayesian models to the data using the R packages EpiNow2 , epinowcast , or using Stan models developed by the CDC Center for Forecasting and Outbreak Analytics. Following best practices , these models adjust for lags from infection to observation, incomplete observation of recent infection events, and day-of-week reporting effects, in addition to uncertainty from all these adjustments.

Glossary of terms

- **Generation interval:** the interval between the infection times of an infector-infectee pair; i.e. the difference in the time when an individual (Person j) is infected by an infector (Person i) and the time when this infector (Person i) was infected.
- **Leading indicator:** a variable that provides an early indication of future trends in an outbreak, e.g., R_t, as this metric estimates the number of infections caused by one infected person in near real-time.
- **Lagging indicator:** a variable that provides a lagged indication of future trends in an outbreak, e.g., COVID-19 deaths, as this outcome happens after cases have occurred.

Last Reviewed: May 3, 2024