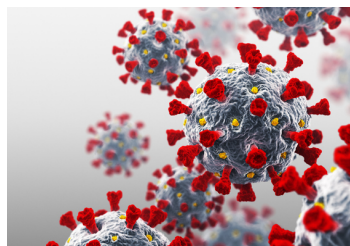


Covid-19 "Vital Signs"

Issue # 286

February 17, 2021



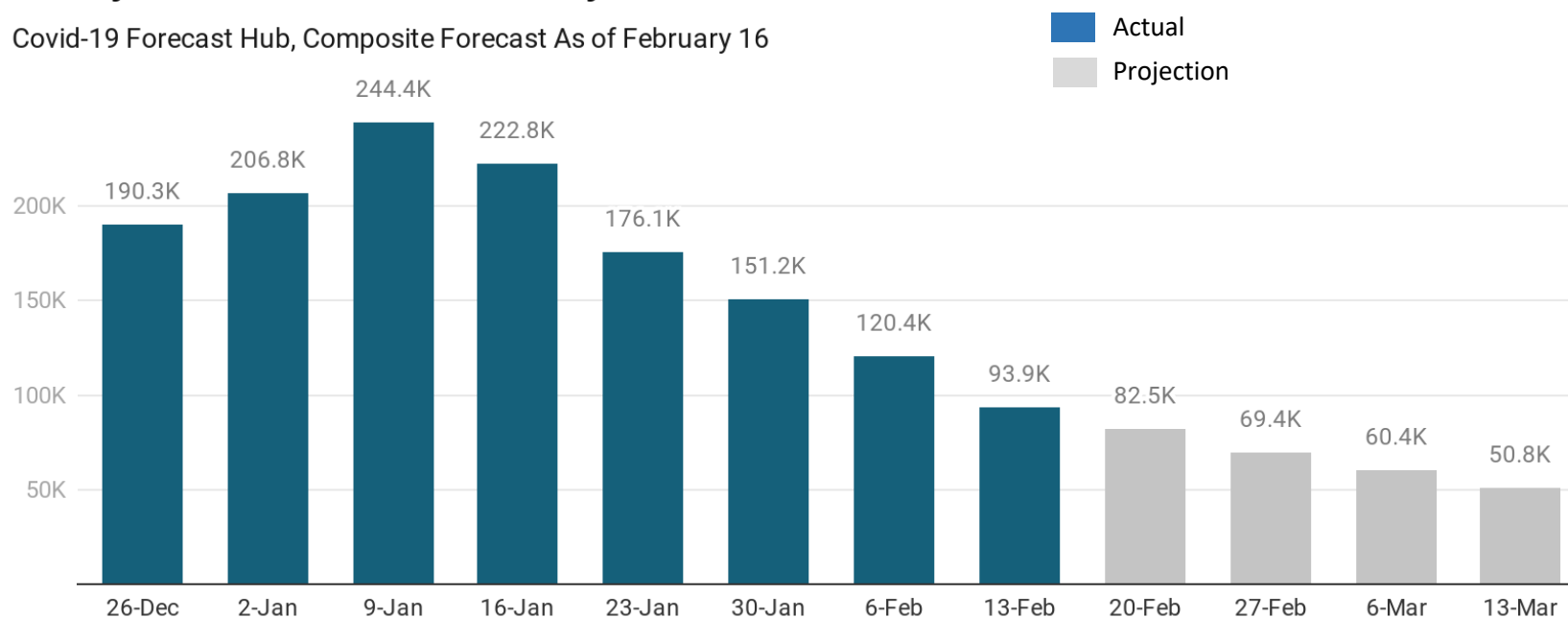
Covid-19 "Vital Signs"

Covid-19 Cases: Ensemble Forecast

*Projected new cases drop each week during the four-week forecast period.
By mid-March, projected new cases plummet by 80% from the peak just two months earlier.*

Newly-Detected Cases Per Day

Covid-19 Forecast Hub, Composite Forecast As of February 16



For the week ending on the date shown

Chart: Health Industry Advisor LLC • Source: Covid-19 Forecast Hub • Created with Datawrapper

<https://viz.covid19forecasthub.org>

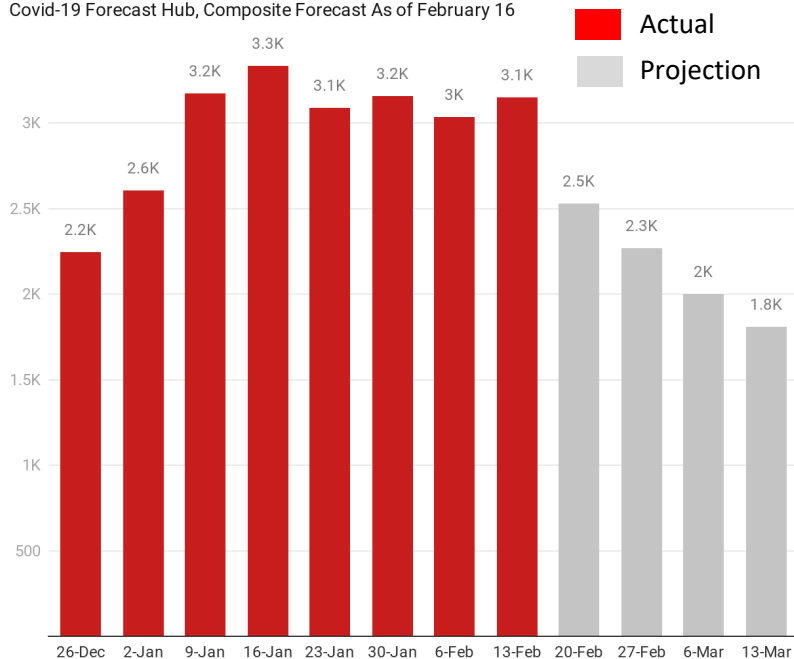
Covid-19 "Vital Signs"

Death Projections – Ensemble Forecast

Projected daily deaths fall each week of the forecast period; By mid-March, experts predict deaths will be half what they were in mid-January. Cumulative deaths with Covid-19 surpass 500k this week.

Newly-Reported Deaths Per Day

Covid-19 Forecast Hub, Composite Forecast As of February 16

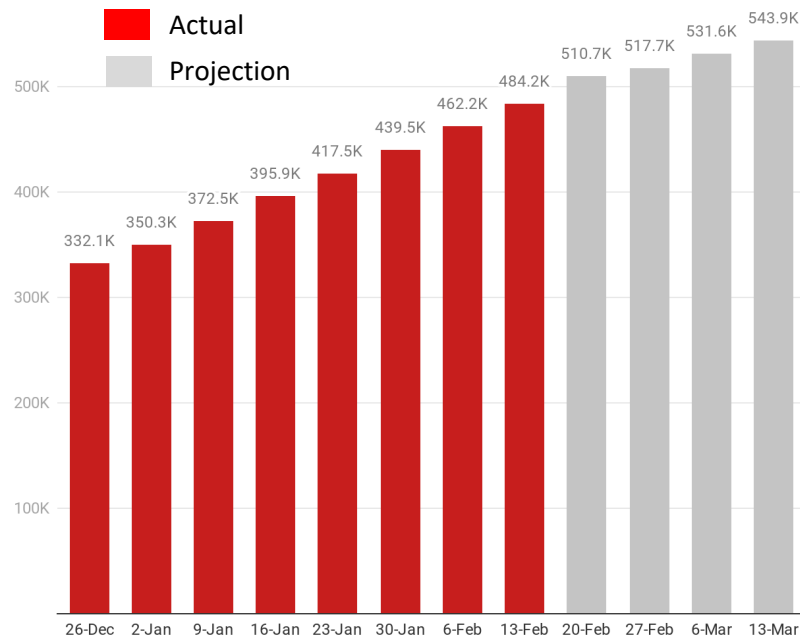


For the week ending on the date shown

Chart: Health Industry Advisor LLC • Source: Covid-19 Forecast Hub • Created with Datawrapper

Cumulative Deaths

Covid-19 Forecast Hub, Composite Forecast As of February 16



For the week ending on the date shown

Chart: Health Industry Advisor LLC • Source: Covid-19 Forecast Hub • Created with Datawrapper

<https://viz.covid19forecasthub.org>

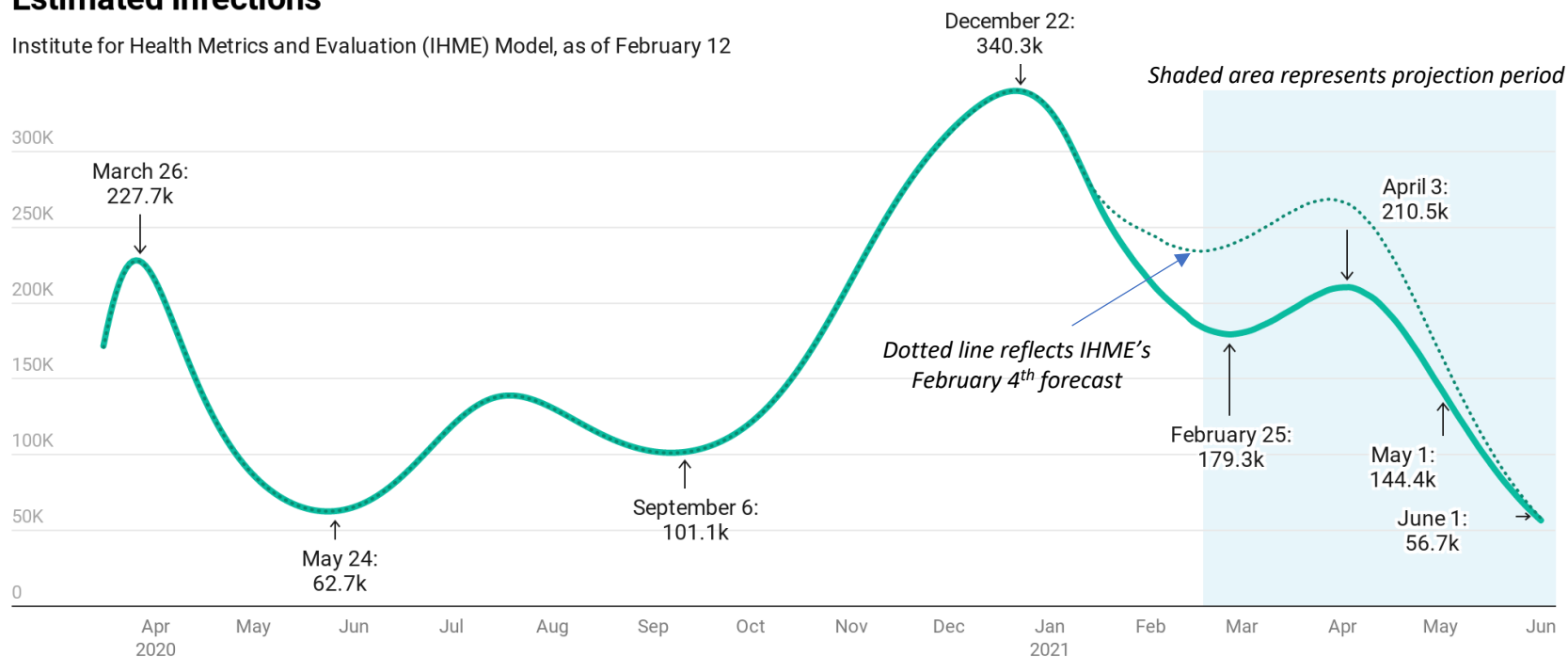
Covid-19 "Vital Signs"

Estimated Infections IHME Projection

On February 12, IHME updated its estimated infection forecast. The update forecast lowered the infection estimate by 20-25% through the end of March.

Estimated Infections

Institute for Health Metrics and Evaluation (IHME) Model, as of February 12



Dashed line reflects February 4 forecast

Chart: Health Industry Advisor LLC • Source: IHME • Created with Datawrapper

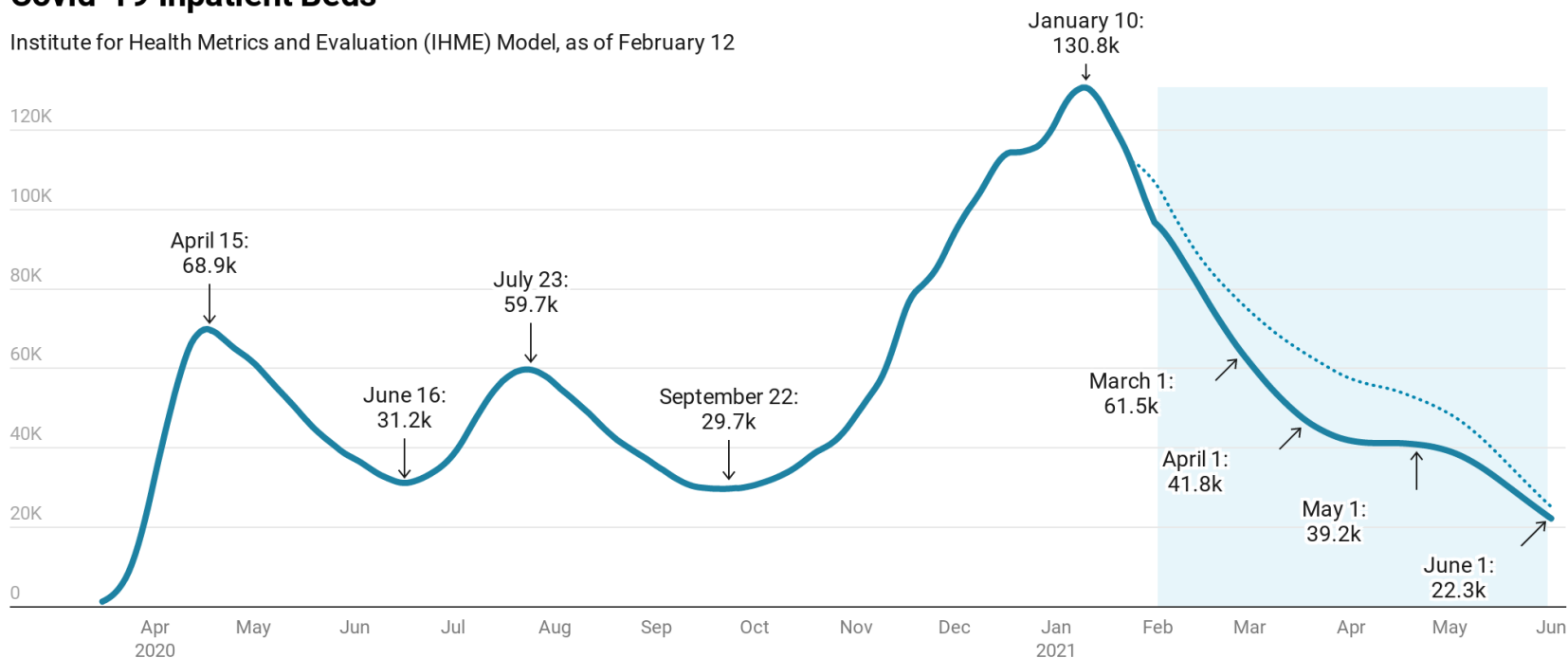
Covid-19 "Vital Signs"

Covid-19 Inpatients – IHME Projections

Like its infection estimate, IHME lowered its Covid-19 hospitalization forecast from its February 4th projection. By May 1, daily census may be lower than all except brief periods in mid-June and mid-September; by June 1, census could be as low as it has been since the pandemic began.

Covid-19 Inpatient Beds

Institute for Health Metrics and Evaluation (IHME) Model, as of February 12



Dashed line reflects February 4th forecast

Chart: Health Industry Advisor LLC • Source: IHME • Created with Datawrapper

Covid-19 "Vital Signs"

Deaths With Covid-19: IHME Projection

Deaths with Covid-19 fell sharply last week from recent highs. IHME predicts deaths will continue falling through the end of May. By that point projected deaths are as low as any point during the pandemic.

Covid-19 Deaths

Institute for Health Metrics and Evaluation, As of February 12



Dashed line reflects February 4th forecast

Chart: Health Industry Advisor LLC • Source: IHME • Created with Datawrapper

Covid-19 Immunity Scenarios

We modeled several scenarios, in order to understand the impact of various crucial assumptions on population immunity.

Baseline

1

- Two vaccines: Pfizer/BioNTech and Moderna
- 100M doses of each
- 1 million doses administered daily
- No consideration of natural immunity
- 35% vaccine hesitancy/resistance
- 2-week lag from infection or vaccination to immunity

New Variants

4

- Increased transmission (infections rise 20% faster)
- Reduced vaccine efficacy (20%)
- Degraded natural immunity (20%)

Current Projection

3

- JNJ vaccine: 100M single doses
- Increase to 1.8 million doses administered daily
- Explicit consideration of natural immunity (based on current Gu estimate)

New Vaccines

5

- New vaccines: AstraZeneca and Novavax
- 100 million doses of each
- Commensurate increase in rate of vaccinations

Biden Covid-19 Plan

2

- Additional 100M doses of each Pfizer/BioNTech and Moderna Vaccines
- Increase to 1.2 million doses administered daily

Vaccine Hesitancy

6

- 50% vaccine hesitancy

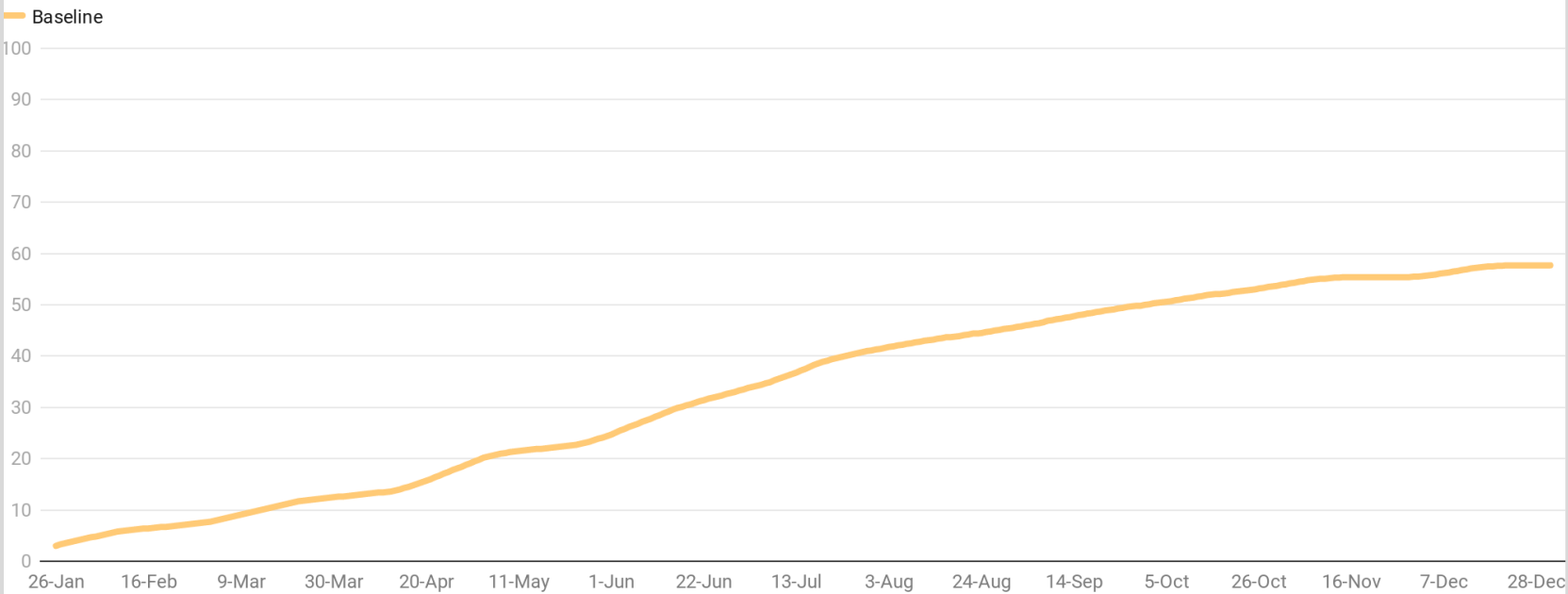


Covid-19 - Baseline Immunity Scenario

Without natural immunity, vaccine hesitancy keeps us from reaching 60% immunity

Immunity Projections

HIA Model, Updated February 14



Current Projection Based on 300M Pfizer, & Moderna doses and 100M JNJ doses; accelerated vaccinations

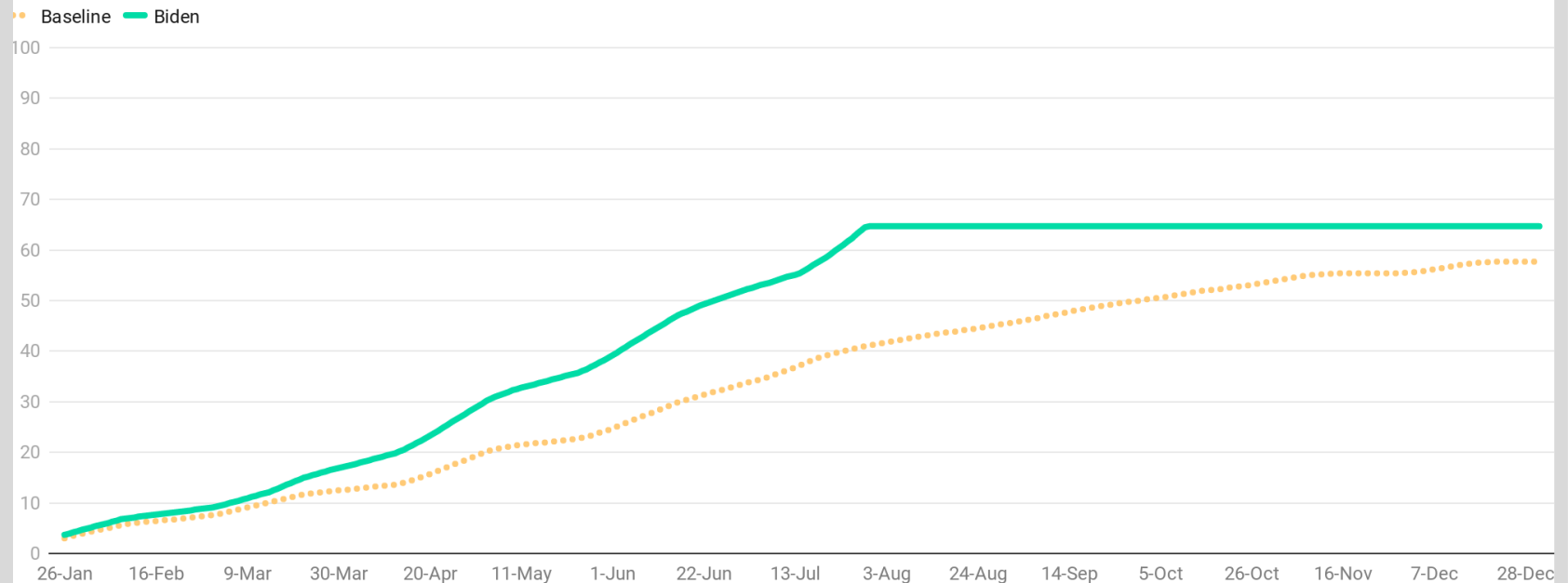
Chart: Health Industry Advisor LLC • Created with Datawrapper

Covid-19 – Biden Plan Immunity Scenario

President Biden's plan pushes us over 60% immunity by the end of June. However, without acknowledging natural immunity, vaccine hesitancy caps us at 65% immunity.

Immunity Projections

HIA Model, Updated February 14



Current Projection Based on 300M Pfizer, & Moderna doses and 100M JNJ doses; accelerated vaccinations

Chart: Health Industry Advisor LLC • Created with Datawrapper

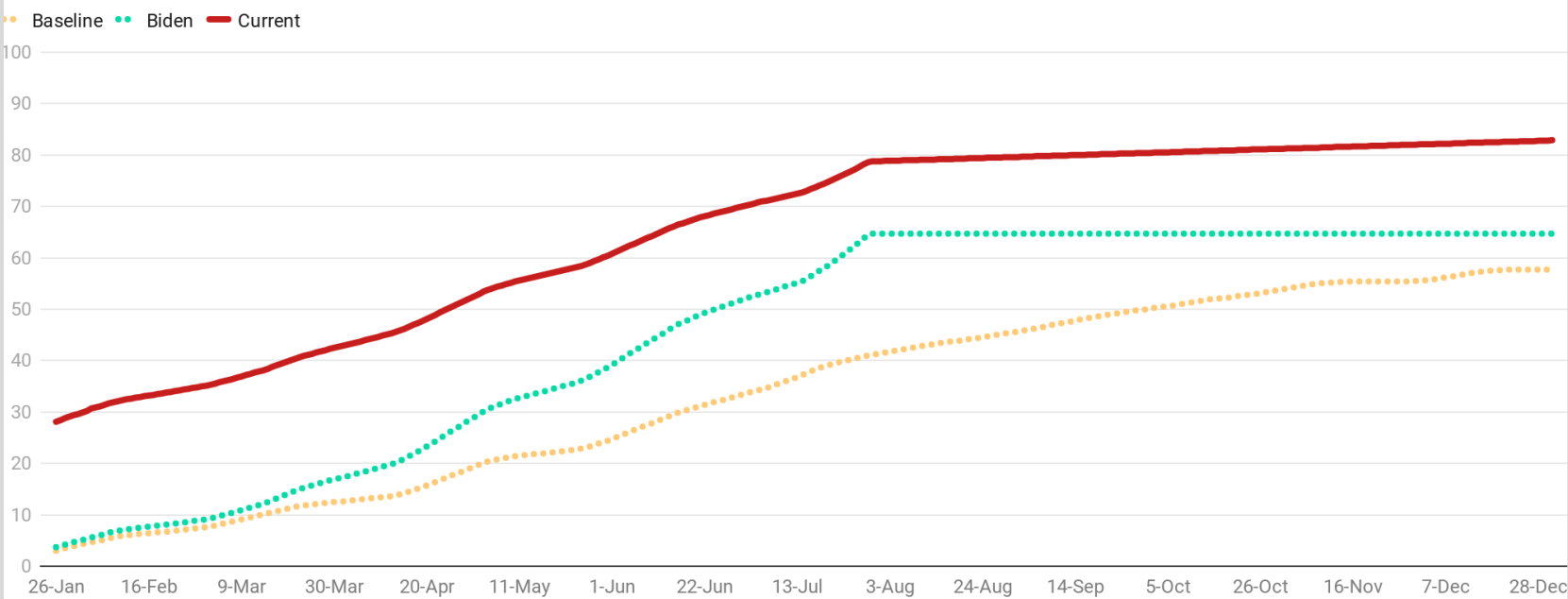


Covid-19 – Current Projection Scenario

Natural immunity, along with the JNJ vaccine, produces 60% immunity by May 30 and nearly 70% by the end of June.

Immunity Projections

HIA Model, Updated February 14



Current Projection Based on 300M Pfizer, & Moderna doses and 100M JNJ doses; accelerated vaccinations

Chart: Health Industry Advisor LLC • Created with Datawrapper

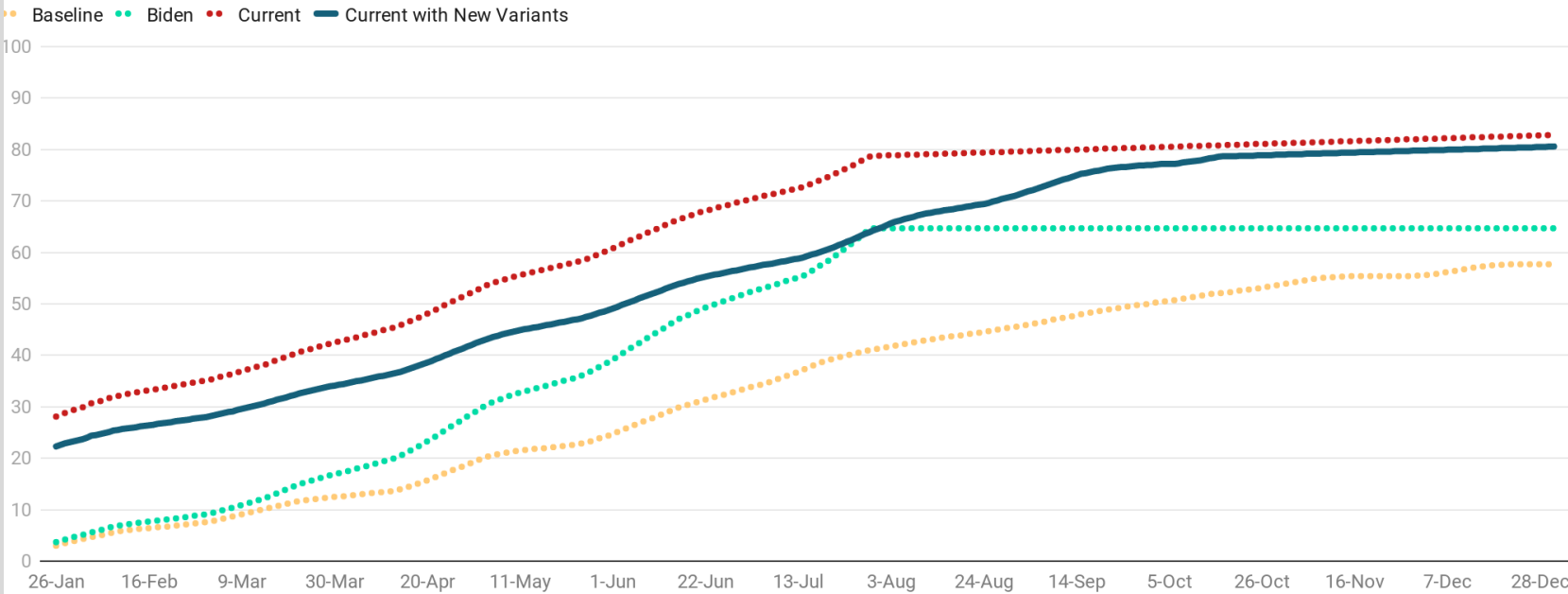


Covid-19 – New Variants Scenario

New variants delay reaching 60% immunity until mid-July and 70% until late-August.

Immunity Projections

HIA Model, Updated February 14



Current Projection Based on 300M Pfizer, & Moderna doses and 100M JNJ doses; accelerated vaccinations

Chart: Health Industry Advisor LLC • Created with Datawrapper

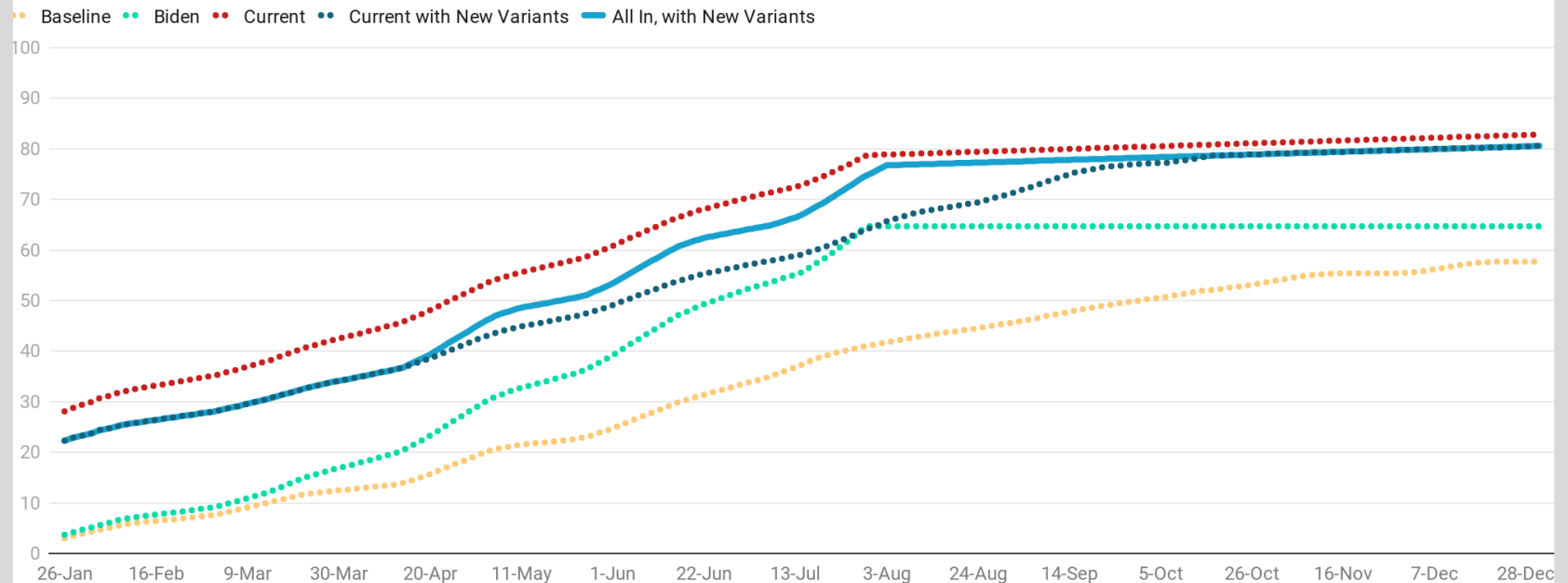


Covid-19 – New Vaccines

New vaccines mitigate the delays in reaching immunity thresholds caused by new variants; we reach 60% immunity by mid-June and 70% by mid-July.

Immunity Projections

HIA Model, Updated February 14



Current Projection Based on 300M Pfizer, & Moderna doses and 100M JNJ doses; accelerated vaccinations

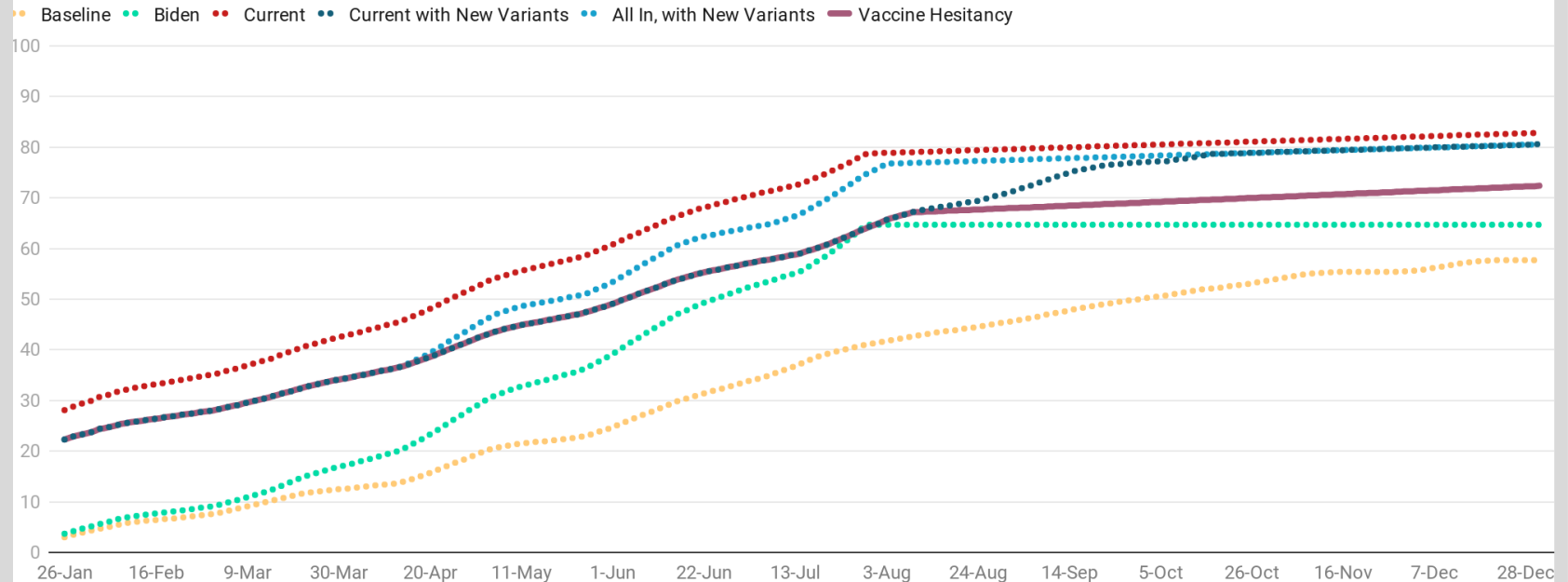
Chart: Health Industry Advisor LLC • Created with Datawrapper

Covid-19 – Vaccine Hesitancy Scenario

Vaccine hesitancy delays reaching 60% immunity until mid-July. Progress slows in late-July and 70% immunity is not reached until the Fall

Immunity Projections

HIA Model, Updated February 14



Current Projection Based on 300M Pfizer, & Moderna doses and 100M JNJ doses; accelerated vaccinations

Chart: Health Industry Advisor LLC • Created with Datawrapper

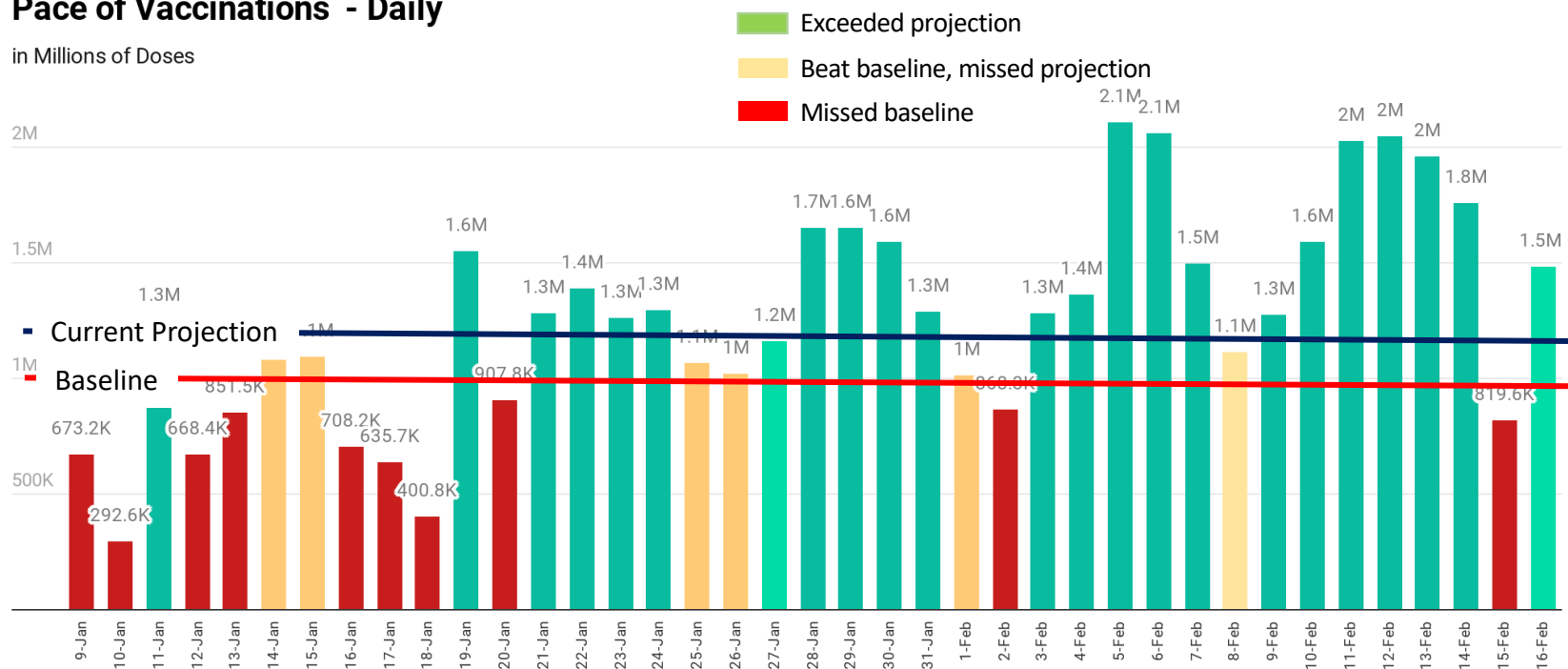
Covid-19 "Vital Signs"

Pace of Vaccinations

The US jabbed more than 1.3 million citizens seven of the past eight days, falling short only on the President's Day holiday. Vaccinations surpassed our Current Projection on twelve of the past fourteen days.

Pace of Vaccinations - Daily

in Millions of Doses



Baseline: 100 Million Doses in 100 Days Current Projection: Ramped-Up Vaccinations; Additional 100M Pfizer and Moderna doses; and JNJ vaccine available on 3/1

Chart: Health Industry Advisor LLC • Source: Bloomberg • Created with Datawrapper

“Current projection” is from Health Industry Advisor’s vaccination model, reflecting recent developments: increase pace of vaccinations; increase in Pfizer and Moderna doses to 300 million each; and anticipated availability of JNJ vaccine

Vaccine Tracking

To date, the US has administered 56 million doses, with 15.4 million people jabbed twice.

Vaccination Progress

Most Recent Four Weeks

First Doses Second Doses

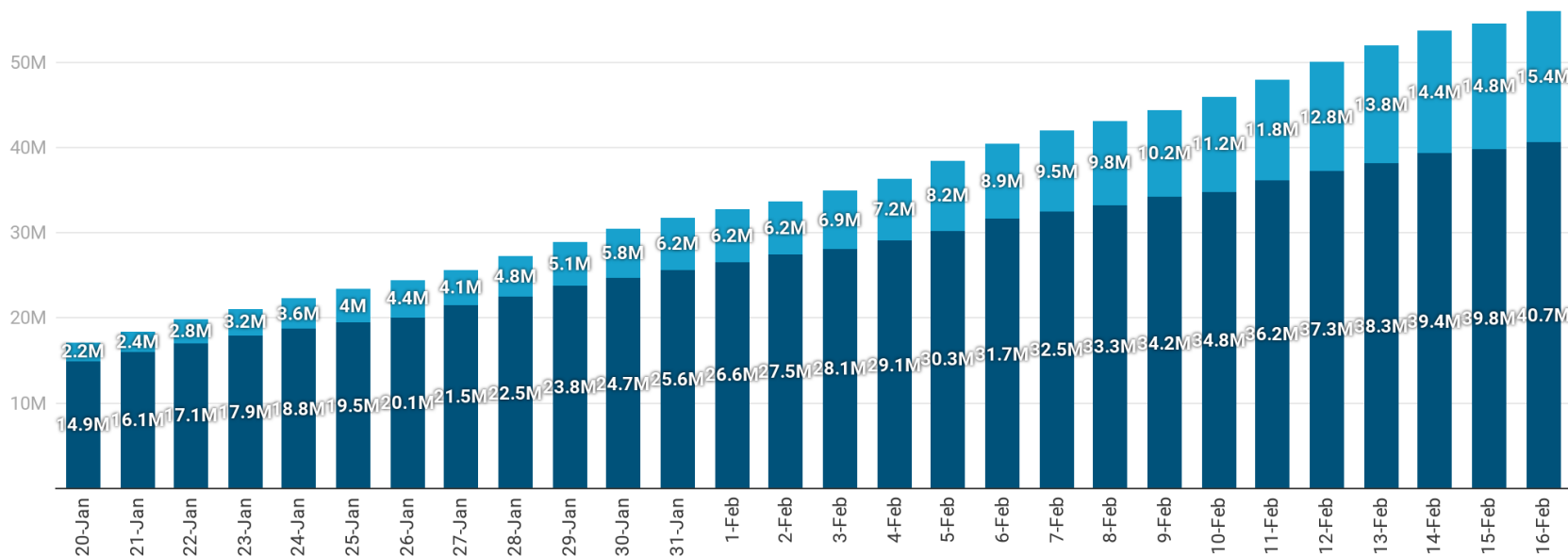


Chart: Health Industry Advisor LLC • Source: CDC, Bloomberg • Created with Datawrapper

Vaccine data from: [Centers for Disease Control and Prevention](https://www.cdc.gov/vaccines/imz/downloads/#vaccine-tracker) and [Bloomberg Vaccine Tracker](https://www.bloomberg.com/health/vaccine-tracker/)



Vaccines Distributed v. Unused

The US is delivering more shots to arms now than any point since launching the effort.

% of Doses Distributed & % Unused - Cumulative

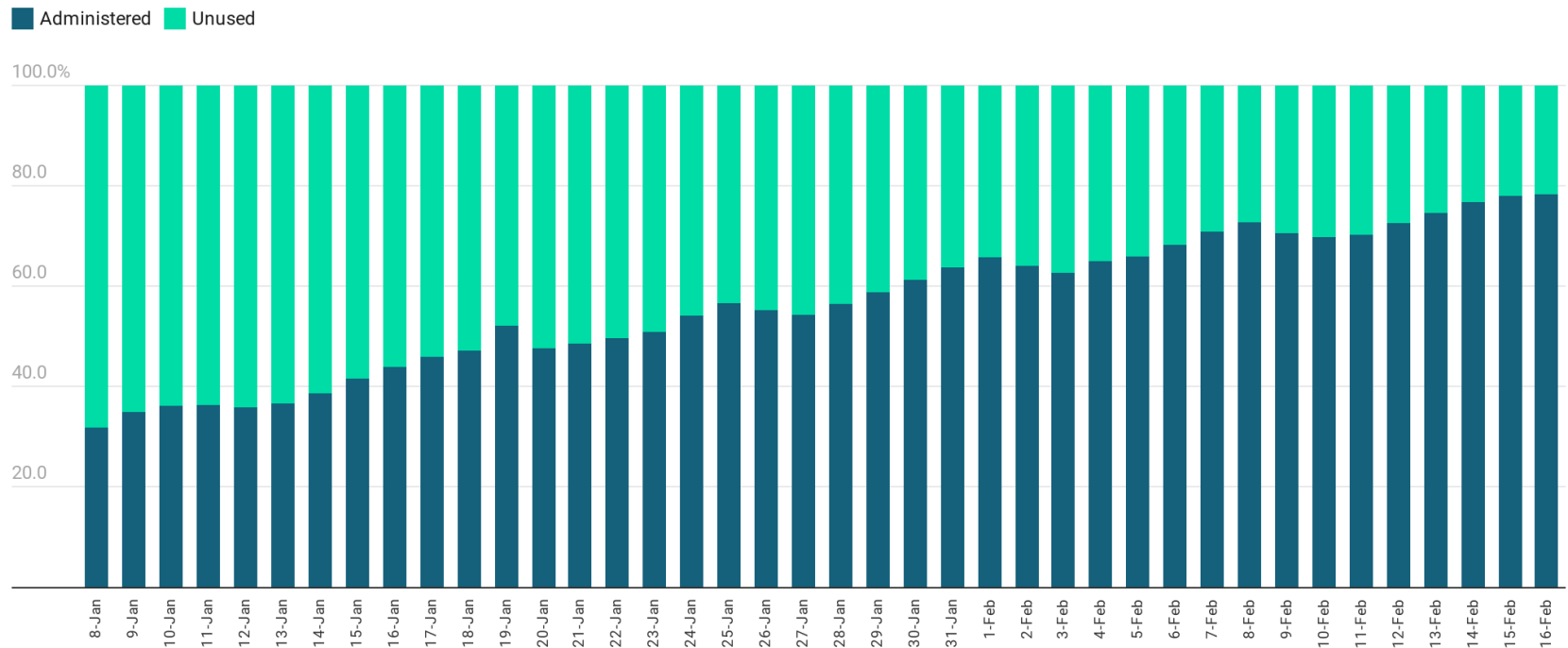


Chart: Health Industry Advisor LLC • Source: Bloomberg • Created with Datawrapper

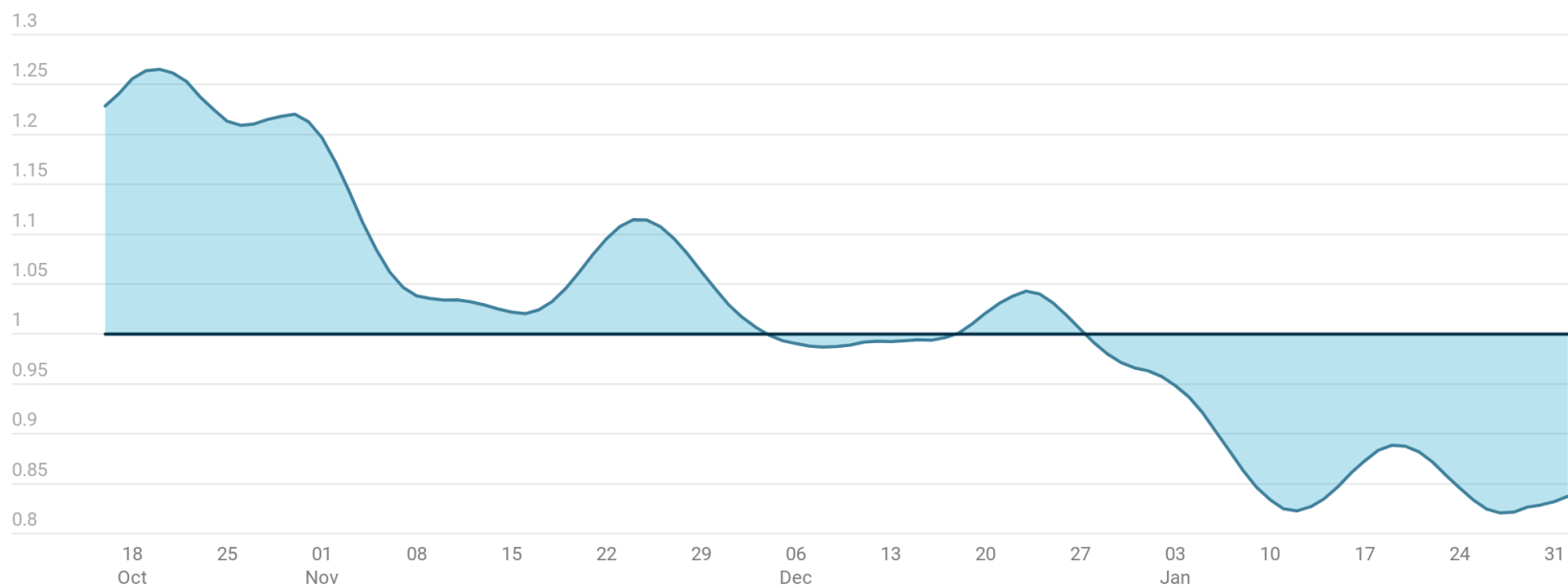
Reproduction Rate (R_t) – Gu* Model

Gu's R_t estimate signals a prolonged slowdown in infection spread.

Reproduction Rate (R_t) - US

*Youyang Gu: Covid-19projections.com

Youyang Gu Estimate, October 16, 2020 - February 1, 2021



R_t is an estimate of how many additional people a single person will infect

Chart: Health Industry Advisor LLC • Source: Youyang Gu • Created with Datawrapper

Covid-19 "Vital Signs"

Newly Detected Cases / Million - US

Newly detected cases (7-day average) are freefalling from a January 11th peak.

Newly-Detected Cases / Million - US

7-Day Moving Average



Chart: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

Covid-19 “Vital Signs”

Estimated Daily Infections & New Case Rates

Estimated new infections and reported cases are plunging in the US. This model suggests that the infection prevalence in the US is now 35.4%; Gu estimates it to be 27.6%.

Estimated Daily Infections v. Detected Cases

Gu & Yale/Harvard Schools of Public Health Models

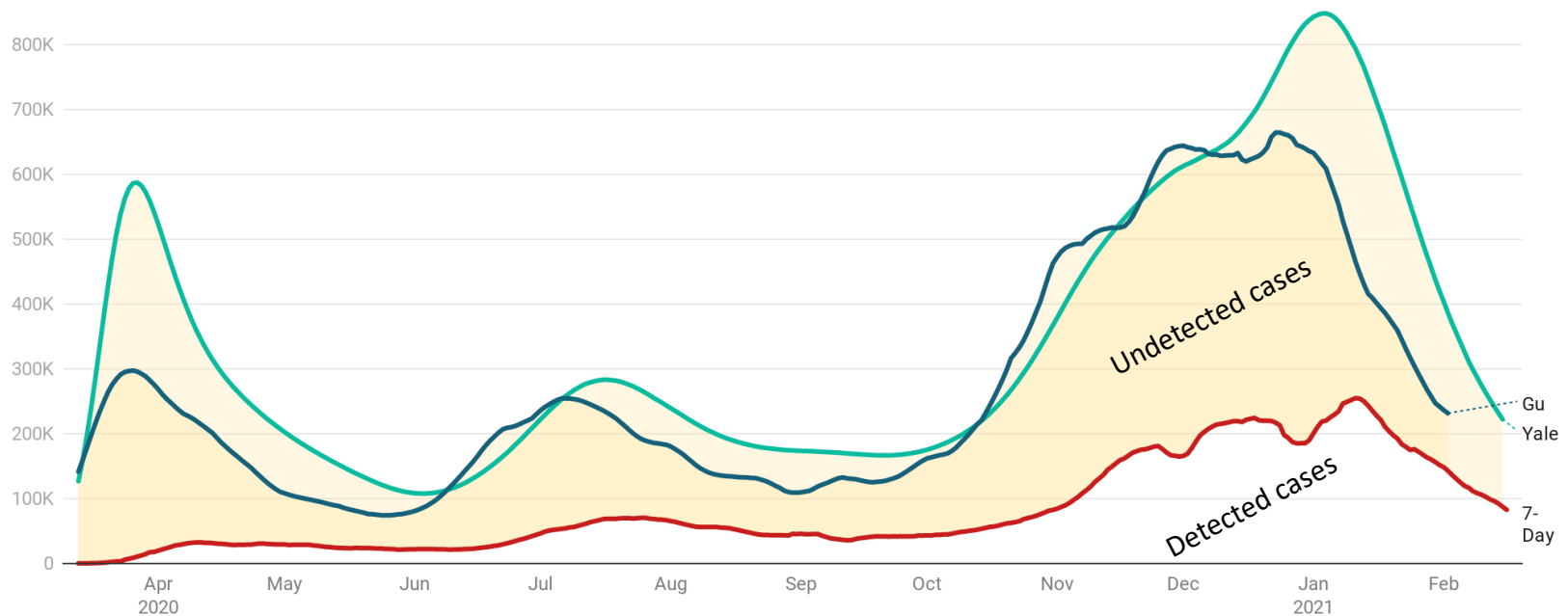


Chart: Health Industry Advisor LLC • Source: Youyang Gu, Yale School of Public Health • Created with Datawrapper

Two models:

- Youyang Gu: <https://covid19-projections.com>, lags by two weeks
- Yale School of Public Health: <https://covidestim.org>

Newly Detected Cases Per Day

Worldwide and in the US, 7-day new case rates dropped during each of the past three weeks.

Newly Detected Cases Per Day

As of February 16

United States Outside the US

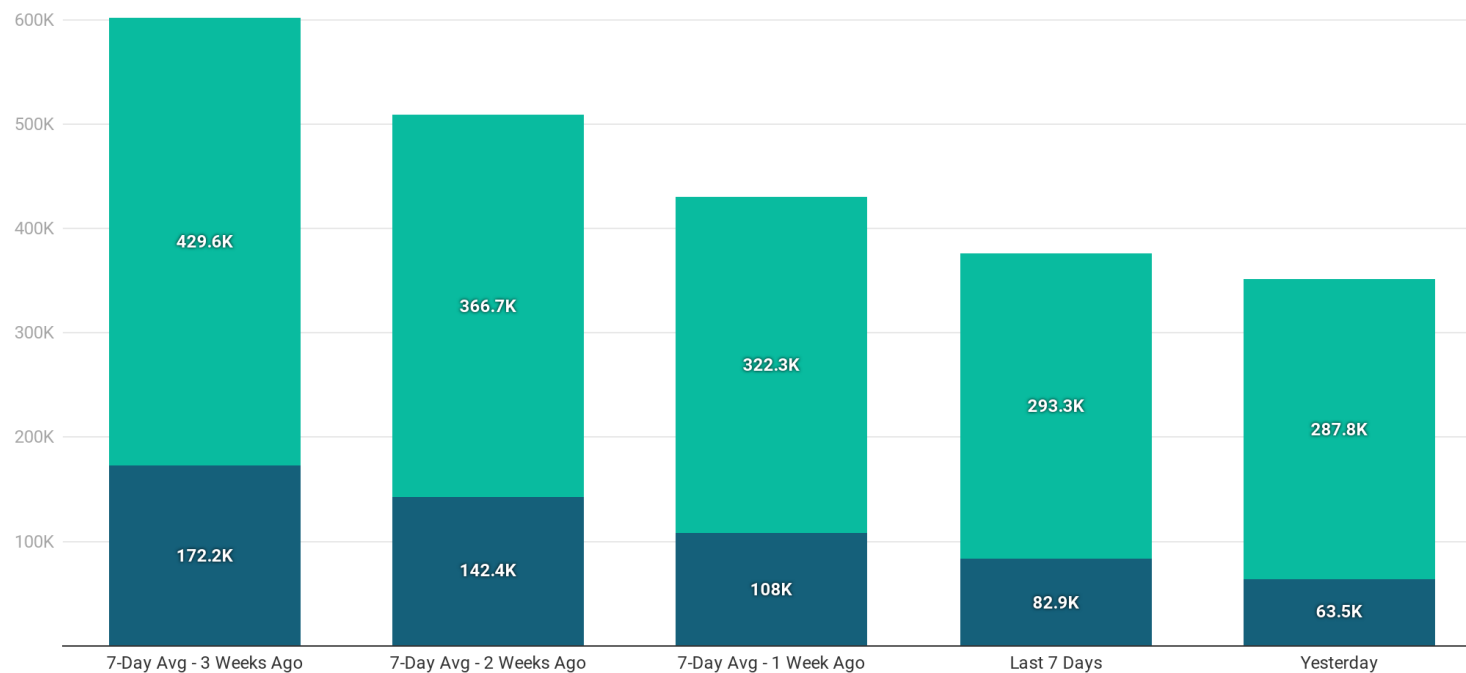


Chart: Health Industry Advisor LLC • Source: worldometers.info • Created with Datawrapper

Covid-19 "Vital Signs"

Covid-19 Hospitalizations

Covid-19 hospitalizations plunged over the past month, with 68,000 fewer patients yesterday than on January 6 (51%). ICU and ventilator days declined each of the past three weeks.

Hospitalized Covid-19 Patients

Compared to Same Day, Prior Weeks, As of February 16

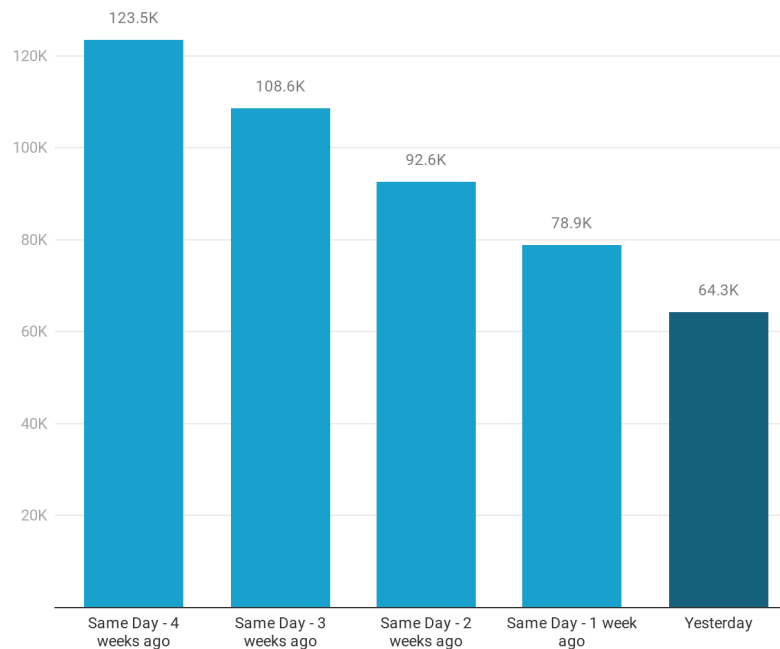


Chart: Health Industry Advisor LLC • Source: The Atlantic • Created with Datawrapper

Covid-19 Patients in the ICU

Compared to Same Day, Prior Weeks, As of February 16

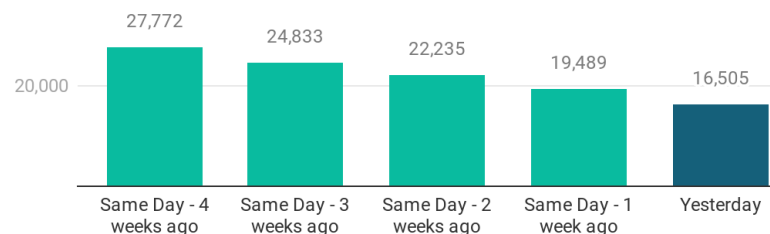


Chart: Health Industry Advisor LLC • Source: The Atlantic • Created with Datawrapper

Covid-19 Patients on Ventilators

Compared to Same Day, Prior Weeks, As of February 16

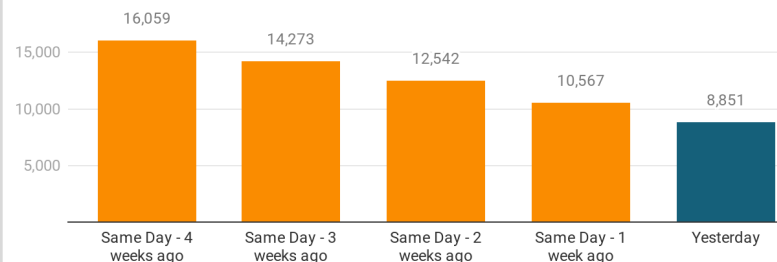


Chart: Health Industry Advisor LLC • Source: The Atlantic • Created with Datawrapper

Covid-19 "Vital Signs"

Testing (US)

Test volume continues sliding, as fewer people seem to be concerned about recent exposure. The test-positive rate improved over the three preceding weeks, reinforcing the belief that actual infections are waning.

Tests / Million / Day (US)

As of February 16

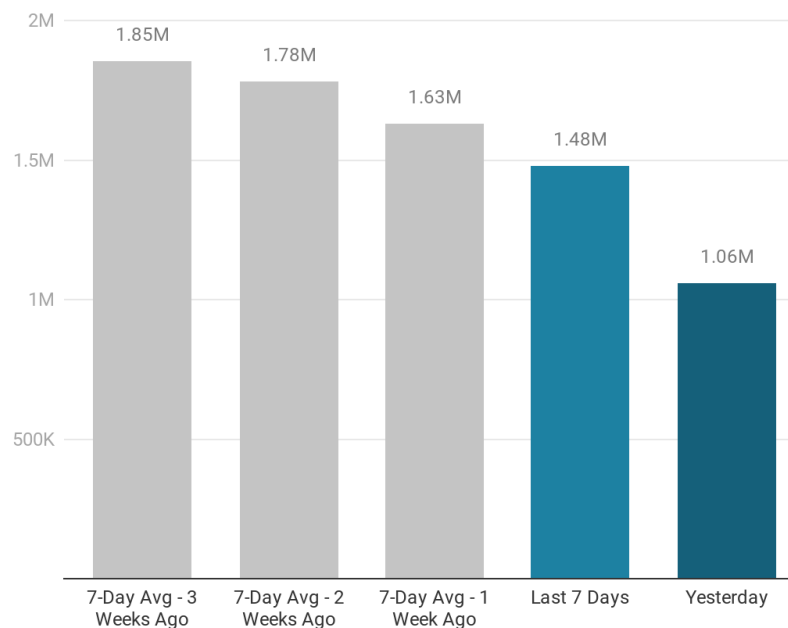


Chart: Health Industry Advisor LLC • Source: The Atlantic • Created with Datawrapper

Test-Positivity Rate

As of February 16

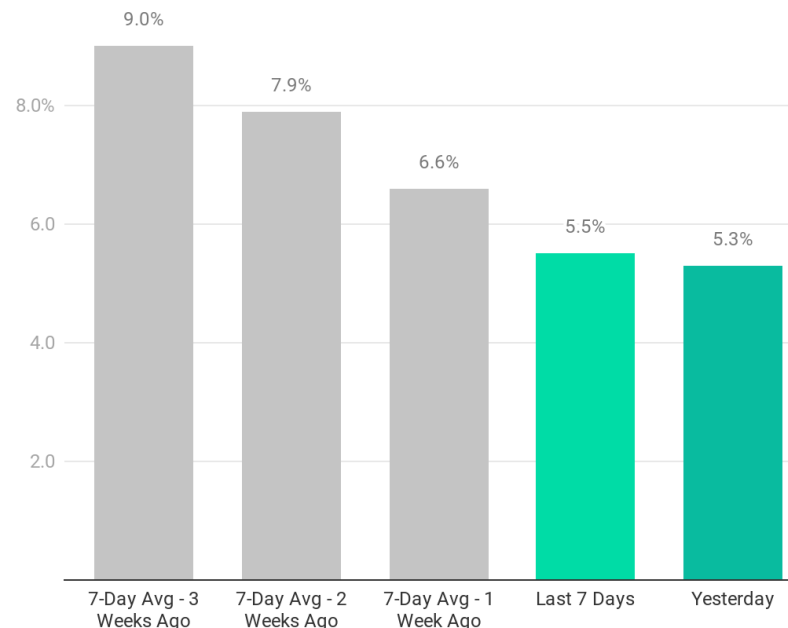


Chart: Health Industry Advisor LLC • Source: The Atlantic • Created with Datawrapper

Covid-19 "Vital Signs"

Deaths Reported With Coronavirus

The 7-day average death rate fell each of the past three weeks. 30% fewer people succumbed to Covid-19 last week than three weeks earlier.

Daily Deaths Reported With Coronavirus

As of February 16

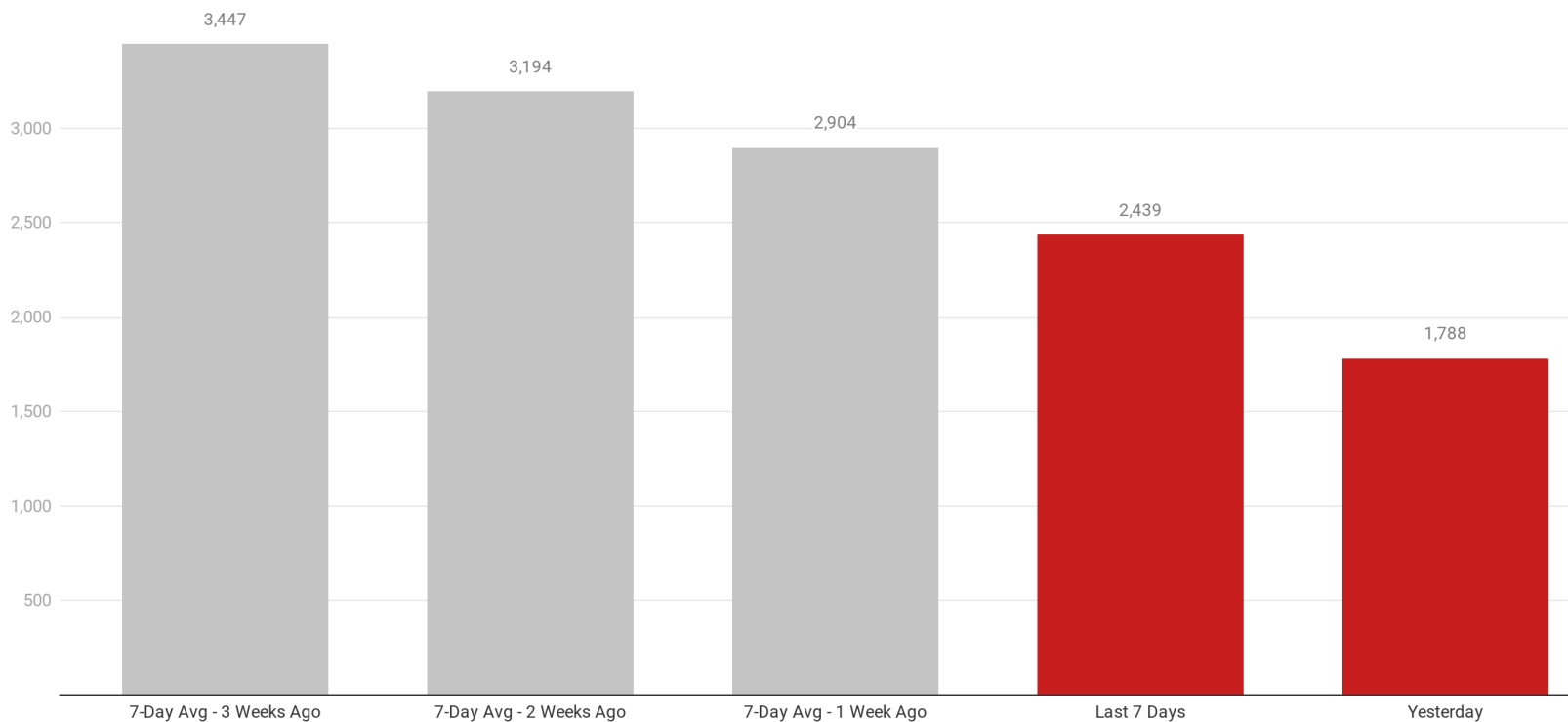


Chart: Health Industry Advisor LLC • Source: The Atlantic • Created with Datawrapper

Sources

The following data sources are accessed on a daily or weekly basis

- The Atlantic's Covid Tracking Project: <https://covidtracking.com>
- Worldometers.info: <https://www.worldometers.info/coronavirus/>
- Centers for Disease Control and Prevention, National, Regional, and State Level Outpatient Illness and Viral Surveillance <https://gis.cdc.gov/grasp/fluview/fluportaldashboard.html>
- Centers for Disease Control and Prevention, COVID-19 Laboratory-Confirmed Hospitalizations https://gis.cdc.gov/grasp/COVIDNet/COVID19_5.html
- Centers for Disease Control and Prevention, COVID Data Tracker <https://www.cdc.gov/covid-data-tracker/index.html#mobility>
- Centers for Disease Control and Prevention, Vaccines, <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/index.html>
- Institute for Health Metrics and Evaluation, COVID-19 estimate downloads <http://www.healthdata.org/covid/data-downloads>
- New York Times, Covid-19 data <https://github.com/nytimes/covid-19-data>
- COVID-19 Data Repository by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University <https://github.com/CSSEGISandData/COVID-19>
- COVID-19 Projections Using Machine Learning, <https://covid19-projections.com>
- Covid-19 Forecast Hub, <https://viz.covid19forecasthub.org>
- Oliver Wyman Pandemic Navigator, <https://pandemicnavigator.oliverwyman.com/forecast?mode=country®ion=United%20States&panel=mortality>
- [Rt.live](https://rt.live)
- Yale School of Public Health & Harvard TH Chan School of Public Health, <https://covidestim.org>
- Bloomberg Vaccine Trackers, <https://www.bloomberg.com/graphics/covid-vaccine-tracker-global-distribution/?sref=Z0b6TmHW>