# COVID-19 Metric Specifications for Community Collaboration

As stakeholders work to address the COVID-19 outbreak, it's critical that they have accurate, complete data to make informed decisions. In collaboration with the healthcare organizations that use Epic software, we've created the following standard metrics to provide that data. These metrics were specifically designed to assist stakeholders in tracking the spread of the virus, better plan capacity, and monitor testing and screening.

## Testing and Screening

Presumptive Positive Tests
Encounters with a Presumptive Positive Test
Total Tests
Pending Tests
Screening Rate

## Hospital Capacity

ICU Admissions Started
Open ICU Beds
Open Non-ICU Acute Beds
Active Ventilator Episodes
Total Ventilators
Available Ventilators
Ventilator Utilization

## COVID-19 Capacity

Number of Admissions
ICU Occupied Beds
Avg Length of Stay
Avg ICU Length of Stay
Current Admissions
Current Admissions w/Vents
Ventilator Hours
ICU Admissions Started

To prevent others from needing to reinvent the wheel, we're publishing these detailed metric specifications to help other EHR vendors and data analysts who might want to use them to inform their own data collection efforts. Already, over 15,000 sites are tracking data according to these specifications. These sites can produce data on demand (in Excel or CSV format), at the discretion of the healthcare organization, for combination with data from other sources.

We'll continue to add to and update these metrics based on feedback from the healthcare and standards community. Feedback and recommendations can be sent to COVID-19-Reporting@epic.com.

You can find definitions of key terms as well as a revision history at the end of this document.

# COVID-19 Presumptive Positive Tests

## Description

This metric counts the number of patients who were documented with a presumptive positive result for a COVID-19 test during the reporting period.

**Age groups**: The number of patients documented with a presumptive positive COVID-19 test can be stratified into the following age groups:

- 0-3 years
- 4-18 years
- 19-44 years
- 45-54 years
- 55-64 years
- 65-74 years
- 75-84 years
- 85+ years
- All ages

## Example

Consider a patient with COVID-19 symptoms who has an office visit to be tested on March 23. The patient is seen in office, and the healthcare provider places an order for the COVID-19 test. Later, the test indicates a presumptive positive result, and the healthcare provider documents the result in the system. The patient is included in the metric because:

- The metric is showing data from a reporting period that includes March 23, which is the date the COVID-19 test was ordered.
- The healthcare provider enters presumptive positive as the patient's COVID-19 test result.

## Definitions

**Metric Result:** Single number

**Initial population:** All patients who had any type of visit or were admitted during the reporting period.

**Numerator:** The number of COVID-19 patients during the reporting period with a presumptive positive COVID-19 test result in the given age group.

**Denominator:** N/A

**Exclusions:** A patient with only a home health visit is excluded.

**Date:** Tests are counted on the date they were ordered.

**Attribution:** Tests are attributed to the location of the site of the visit or admission they were ordered in.

# COVID-19 Encounters with a Presumptive Positive Test

## Description

This metric calculates the percentage of all visits and admissions during the reporting period in which a patient was identified as a presumptive positive COVID-19 test. This metric is intended to track the trend in healthcare resources being dedicated to treating COVID-19.

**Age groups**: The number of patients documented with a presumptive positive COVID-19 test can be stratified into the following age groups:

- 0-3 years
- 4-18 years
- 19-44 years
- 45-54 years
- 55-64 years
- 65-74 years
- 75-84 years
- 85+ years
- All ages

## Example

Consider a patient with COVID-19 symptoms who has an office visit to be tested on March 23. The patient is seen in office, and the healthcare provider places an order for the COVID-19 test. Later, the test indicates a presumptive positive result that's documented in the system. The patient is included in the metric because:

- The metric is showing data from a reporting period that includes March 23, which is the date the COVID-19 test was ordered.
- The healthcare provider enters presumptive positive as the patient's COVID-19 test result.

## Definitions

**Metric Result:** Percentage

**Initial population:** All patients who had any type of visit, including telehealth, or were admitted during the reporting period.

**Numerator:** The number of COVID-19 tests during the reporting period with a presumptive positive COVID-19 test result in the given age group. Note that these patients do not need to have an encounter in the denominator to be included in the numerator—this metric is designed as an estimate for overall resource tracking.

**Denominator:** All visits and admissions during the reporting period.

**Exclusions:** Home health visits, visits that were canceled, and visits where the patient either did not show up or left without being seen are excluded.

**Date:** Tests are counted on the date they were ordered.

**Attribution:** Tests are attributed to the location of the site of the visit or admission they were ordered in.

# COVID-19 Total Tests

## Description

This metric counts the number of COVID-19 tests ordered during the reporting period. If an order consists of multiple samples or multiple results, it is counted as a single test. Multiple orders for the same patient on the same day are also counted as a single test.

## Example

Consider a patient with COVID-19 symptoms who has an office visit to be tested on March 23. The patient is seen in office, and the healthcare provider places an order for the COVID-19 test. The test includes two samples from the patient, which are sent to the lab to be processed. Later, the results are returned and documented in the patient's chart as negative.

The test is included in the metric because:

- The metric is showing data from a reporting period that includes March 23, which is the date the COVID-19 test was ordered.
- The test is counted as a single test because the samples are for the same patient on the same day, even though two samples were taken.

## Definitions

**Metric Result:** Single number

**Initial population:** All patients who had any type of visit, including telehealth, or were admitted during the reporting period.

**Numerator:** The number of COVID-19 tests during the reporting period.

**Denominator:** N/A

**Exclusions:** Subsequent tests for the same patient on the same day are not counted as additional tests.

**Date:** Tests are counted on the date they were ordered.

**Attribution:** Tests are attributed to the location of the site of the visit or admission they were ordered in.

# COVID-19 Pending Tests

## Description

This metric counts the number of COVID-19 tests ordered during the reporting period for which a final test result has not been recorded. If an order consists of multiple samples or multiple results, it is counted as a single test. Multiple orders for the same patient on the same day are also counted as a single test.

## Example

Consider a patient with COVID-19 symptoms who has an office visit to be tested on March 23. The patient is seen in office, and the healthcare provider places an order for the COVID-19 test. The test includes two samples from the patient, which are sent to the lab to be processed. Lab staff have not yet entered a final result for these samples.

The test is included because:

- The metric is showing data from a reporting period that includes March 23, which is the date the COVID-19 test was ordered.
- The patient is counted as a single test because the samples are for the same patient on the same day, even though they had two samples taken.
- The patient's samples have not yet been resulted, so they are considered pending.

## Definitions

**Metric Result:** Single number

**Initial population:** All patients who had any type of visit, including telehealth, or were admitted during the reporting period.

**Numerator:** The number of COVID-19 tests during the reporting period for which a final result has not been recorded.

**Denominator:** N/A

**Exclusions:** Subsequent tests for the same patient on the same day are not counted as additional tests.

**Date:** Tests are counted on the date they were ordered.

**Attribution:** Tests are attributed to the location of the site of the visit or admission they were ordered in.

# COVID-19 Screening Rate

## Description

This metric calculates the percentage of patient care contacts during the reporting period for which the patient was screened for communicable disease on the day of the contact.

## Example

Consider a patient with COVID-19 symptoms who has a telehealth visit with a provider on March 23. The provider asks the patient the following questions and records the answers in the patient's chart:

- Have you been in contact with someone who is sick?
- Have you been in contact with someone who had a presumptive positive test for COVID-19?
- What symptoms of a communicable disease are you experiencing?

The patient is included in the metric because:

- The metric is showing data from a reporting period that includes March 23, which is the date of the patient's telehealth visit.
- The patient's healthcare provider recorded the patient's responses to at least one of the screening questions in the chart.

## Definitions

**Metric Result:** Percentage

**Initial population:** All patients who had any type of visit, including telehealth, or were admitted during the reporting period.

**Numerator:** The number of patients who have a response for at least one question related to COVID-19 communicable disease screening on the day of the visit or admission.

**Denominator:** The number of patients who had one of the following during the reporting range: a face to face visit (a visit where the patient met with a healthcare provider in person), a telephone visit, a telehealth visit, or a hospital admission.

**Exclusions:** Visits that were canceled and visits where the patient either did not show up or left without being seen are excluded.

**Date:** Communicable disease screening is counted on the day it occurs.

**Attribution:** Patients are attributed to the location of the site of the provider who saw the patient.

# ICU Admissions Started

## Description

This metric counts the number of ICU admissions that started during the reporting period, regardless of whether the patient has a COVID-19 presumptive positive test.

## Example

Consider a patient that is admitted to the ICU department on March 23. The patient is included in the metric because the admission date is within the reporting period and the department is defined as an ICU.

## Definitions

**Metric Result:** Single number

**Initial population:** All patients who were admitted during the reporting period.

**Numerator:** The number of ICU admissions that were started during the reporting period.

**Denominator:** N/A

**Date:** Admissions are counted on the date they were started.

**Attribution:** Admissions are attributed to the location of the site at which the patient was hospitalized.

# Open ICU Beds

## Description

This metric counts the number of open ICU beds at the point of reporting. Individual healthcare organizations define which departments are for intensive and non-intensive acute care.

## Example

An organization has 100 beds in ICU departments. 25 patients are currently admitted to those departments. In addition, 10 beds in those departments are either unavailable or blocked. This metric shows 65 available beds.

## Definitions

**Metric Result:** Single number

**Initial population:** N/A

**Numerator:** The number of beds in ICU departments minus the number of unavailable or blocked beds, minus the number of patients in ICU beds.

**Denominator:** N/A

**Exclusions:** N/A

**Attribution:** Beds are attributed to the location of the site at which the patient was hospitalized.

# Open Non-ICU Acute Beds

## Description

This metric counts the number of open non-intensive, acute care beds at the point of reporting. Individual healthcare organizations define which departments are for intensive and non-intensive acute care.

## Example

An organization has 100 beds in departments they've defined as providing non-intensive care. 25 patients are currently admitted to those departments. In addition, 10 beds in those departments are either unavailable or blocked. This metric shows 65 available beds.

## Definitions

**Metric Result:** Single number

**Initial population:** N/A

**Numerator:** The number of non-intensive, acute beds minus the number of unavailable or blocked beds, minus the number of patients in non-intensive, acute beds.

**Denominator:** N/A

**Exclusions:** N/A

**Attribution:** Beds are attributed to the location of the site at which the patient was hospitalized.

# ICU Active Ventilator Episodes

## Description

This metric counts the number of episodes (instances) of ventilator usage in ICUs during the reporting period.

## Example

An admitted patient is placed on a ventilator, which is documented. The patient is still on the ventilator when the metric is calculated, so the episode is counted.

The patient is taken off the ventilator shortly after midnight the next day. The ventilator episode is also counted for that day regardless of the amount of time spent on the ventilator.

## Definitions

**Metric Result:** Single number

**Initial population:** All patients who were admitted during the reporting period.

**Numerator:** The number of episodes (instances) of ventilator usage patients in the ICU. Note that a single patient can have multiple episodes of ventilator usage over the course of an admission.

**Denominator:** N/A

**Exclusions:** Only active ventilators are counted, so a patient is no longer included in the metric after the patient is documented as no longer using the ventilator.

**Attribution:** Ventilator episodes are attributed to the location of the site at which the patient was hospitalized.

# ICU Total Ventilators

## Description

This metric counts the number of ventilators available for use in ICUs at the point of reporting. Individual healthcare organizations manually specify how many ventilators they have.

## Definitions

**Metric Result:** Single number

**Initial population:** N/A

**Numerator:** The number of ventilators specified by the organization. Ventilator counts are supplied for each location.

**Denominator:** N/A

**Exclusions:** N/A

**Attribution:** Ventilators are attributed to the location of the site where they're manually specified as located.

# ICU Ventilators Available

## Description

This metric counts the number of ventilators not currently in use in ICUs at the point of reporting.

## Example

An organization has specified they have 50 total ventilators in intensive care units, and nurses have documented ventilator use on 35 patients. This metric shows 15 available ventilators.

## Definitions

**Metric Result:** Single number

**Initial population:** N/A

**Numerator:** The difference between the ICU Total Ventilators and ICU Active Ventilator Episodes metrics.

**Denominator:** N/A

**Exclusions:** N/A

**Attribution:** Ventilators are attributed to the location of the site where they're manually specified as located.

# ICU Ventilator Utilization

## Description

This metric calculates the percentage of ventilators currently in use in intensive care units at the point of reporting.

## Example

An organization has specified they have 50 total ventilators in intensive care units, and nurses have documented ventilator usage on 35 patients. This metric shows 70%.

## Definitions

**Metric Result:** Percentage

**Initial population:** N/A

**Numerator:** The number of active ventilator episodes specified in the ICU Active Ventilator Episodes metric.

**Denominator:** The total number of ventilators specified in the ICU Total Ventilators metric.

**Exclusions:** N/A

**Attribution:** Ventilators are attributed to the location of the site where they're manually specified as located.

# COVID-19 Admissions

## Description

This metric counts the number of COVID-19-positive patients with admissions during the reporting period.

## Example

Consider a patient that is admitted on March 23 and tested positive for a COVID-19 test that took place on March 20.

The patient is included in the metric because:

- The metric is showing data from a reporting period that includes March 23, which is the date the COVID-19 test was ordered.
- The patient has a documented presumptive positive COVID-19 test result from within the 14 days prior to admission.

## Definitions

**Metric Result:** Single number

**Initial population:** All patients who were admitted during the reporting period. Patients who are still in the hospital at the time the metric is calculated are included in this measure.

**Numerator:** The number of COVID-19-positive patient admissions during the reporting period.

**Denominator:** N/A

**Exclusions:** N/A

**Date:** Admissions are counted on the date the patient was admitted.

**Attribution:** Admissions are attributed to the location of the site at which the patient was hospitalized.

# COVID-19 Occupied ICU Beds

## Description

This metric counts the number of ICU beds occupied by COVID-19-positive patients at the point of reporting. Individual healthcare organizations define which beds are for intensive and non-intensive acute care.

## Example

Consider a patient with a documented infection status of COVID-19 who occupies a bed in the ICU at a given time.

The bed occupied by the patient is included in the metric because:

- The bed is occupied at the point of reporting and located in a department defined as an ICU.
- The healthcare provider of the patient occupying the bed has documented an infection status for the patient that indicates a COVID-19 infection.

## Definitions

**Metric Result**: Single number

**Initial population**: All patients who were admitted at the point of reporting.

**Numerator**: The number of beds in ICU departments occupied by a COVID-19-positive patient at the point of reporting.

**Denominator**: N/A

**Exclusions**: N/A

**Attribution**: Beds are attributed to the location of the site at which the patient was hospitalized.

# COVID-19 Average Length of Stay

## Description

This metric calculates the average number of days COVID-19-positive patients spent in an inpatient setting (including the ICU) before being discharged during the reporting period.

## Example

Consider two patients with documented COVID-19 infections that are admitted to the hospital. One patient is admitted on March 23 and is discharged on March 27, and the other is admitted on March 23 and discharged on March 29. Since there are two stays—one which lasted 4 days and another that lasted 6 days—that ended during the reporting period, the average length of stay is 5 days.

## Definitions

**Metric Result**: Single number

**Initial population**: All patients who were discharged during the reporting period.

**Numerator**: The number of days COVID-19-positive patients who were discharged during the reporting period spent in an inpatient setting (including the ICU).

**Denominator**: The number of ICU admissions for COVID-19-positive patients who were discharged during the reporting period.

**Exclusions**: Active admissions and time spent on leave of absence are excluded.

**Date:** Days are counted from the admission date to the discharge date, including same-day discharges.

**Attribution**: Admissions are attributed to the location of the site at which the patient was hospitalized.

# COVID-19 Average Length of ICU Stay

## Description

This metric calculates the average number of days that COVID-19-positive patients were admitted to the ICU during the reporting period.

## Example

Consider two patients with presumptive positive tests for COVID-19 that are admitted to the ICU department. One patient is admitted on March 23 and is discharged on March 27, and the other is admitted on March 23 and discharged on March 29. Since there are two stays—one which lasted 4 days and another that lasted 6 days—that ended during the reporting period, the average length of stay is 5 days.

## Definitions

**Metric Result:** Single number

**Initial population:** All patients who were discharged during the reporting period.

**Numerator:** The number of days COVID-19-positive patients who were discharged during the reporting period spent in the ICU.

**Denominator:** The number of ICU admissions for COVID-19-positive patients who were discharged during the reporting period.

**Exclusions:** Active admissions and time spent on leave of absence are excluded from this metric.

**Date:** Days are counted from the admission date to the discharge date, including same-day discharges.

**Attribution:** Admissions are attributed to the location of the site at which the patient was hospitalized.

# Currently Admitted COVID-19 Patients

## Description

This metric counts the number of COVID-19-positive patients currently admitted at the point of reporting.

## Example

A patient with COVID-19 symptoms is admitted to the hospital. The patient's COVID-19 test result comes back positive, so the patient is included in this metric at the point of reporting.

## Definitions

**Metric Result:** Single number

**Initial population:** All patients who were admitted at the point of reporting.

**Numerator:** The number of currently admitted COVID-19-positive patients.

**Denominator:** N/A

**Exclusions:** Patients on leave of absence are excluded.

**Attribution:** Patients are attributed to the location of the site at which the patient was hospitalized.

# Currently Admitted COVID-19 Patients on Ventilators

## Description

This metric counts the number of COVID-19-positive patients who are currently admitted and on a ventilator at the point of reporting.

## Example

A patient with a presumptive positive COVID-19 test is admitted to the ICU. It's documented that the patient is on a ventilator. The patient is still on the ventilator when the metric is calculated, so the patient is counted.

## Definitions

**Metric Result:** Single number

**Initial population:** All patients who were admitted at the point of reporting.

**Numerator:** The number of currently admitted COVID-19-positive patients who are also on a ventilator.

**Denominator:** N/A

**Exclusions:** Only active ventilators are counted, so a patient is no longer included in the metric after the patient is documented as no longer using the ventilator. Additionally, patients on leave of absence are excluded.

**Attribution:** Patients are attributed to the location of the site at which the patient was hospitalized.

# COVID-19 Ventilator Hours

## Description

This metric calculates the average time, in hours, to two decimal points, that admitted COVID-19-positive patients were on ventilators during the reporting period.

## Example

Two patients with presumptive positive COVID-19 tests are admitted and on ventilators. It is documented when each patient is put on a ventilator and when each patient is taken off. One patient was on the ventilator for two hours, and the other for an hour and 45 minutes. When the report is run for that day, the daily average of hours is 1.88.

## Definitions

**Metric Result:** Single number

**Initial population:** All patients who were admitted during the reporting period.

**Numerator:** The total number of hours that patients in the denominator spent on a ventilator during the reporting period.

**Denominator:** All COVID-19-positive patients who were admitted and on a ventilator at some point during the reporting period.

**Exclusions:** N/A

**Attribution:** Patients are attributed to the location of the site at which the patient was hospitalized.

# COVID-19 ICU Admissions

## Description

This metric counts the number of ICU admissions for COVID-19-positive patients that started during the reporting period.

## Example

Consider a patient with a presumptive positive test for COVID-19 that is admitted to the ICU department on March 23. The patient is included in the metric because:

- The admission date is within the reporting period.
- The patient has a presumptive positive COVID-19 test.
- The department is defined as an ICU.

## Definitions

**Metric Result:** Single number

**Initial population:** All patients who were admitted during the reporting period.

**Numerator:** The number of ICU admissions for COVID-19-positive patients that started during the reporting period.

**Denominator:** N/A

**Date:** Admissions are counted on the date they were started.

**Attribution:** Admissions are attributed to the location of the site at which the patient was hospitalized.

# Key Terms

## COVID-19 communicable disease screening

Individual healthcare organizations define what represents a COVID-19 disease screening in their systems. Healthcare providers conduct the screening.

Screening typically consists of questions where the patient:

- Answers Yes or No to questions about whether they have been in contact with someone who is sick.
- Answers Yes or No to questions about whether they have been in contact with anyone who has been tested as presumptive positive for COVID-19.
- Describes any symptoms of a communicable disease that they have.

## COVID-19-positive patient

This term represents a patient that has either or both of the following:

- A documented COVID-19 infection in the patient's chart. The infection can have been documented any time in the 14 days prior to the patient's admission and does not need to be active.
- A presumptive positive COVID-19 test (refer below for the definition of this term).

## COVID-19 test

Individual healthcare organizations define what represents a COVID-19 test in their systems. This is typically a test mapped to LOINC code 94309-2 [SARS coronavirus 2 RNA [Presence] in Unspecified specimen by NAA with probe detection]. Healthcare providers then place orders for these tests in the system.

## ICU admissions

Individual healthcare organizations define what represents an ICU admission in their systems. Typically, this is an admission in a department defined as an ICU, or an admission in a bed defined as an ICU bed in a non-ICU department.

## Location

All data for these metrics is aggregated at the ZIP code level. The location is the ZIP code that corresponds to the physical location of the related healthcare site.

## Open bed

An open bed is any unoccupied, unblocked, and available bed. Beds can be blocked or unavailable for many reasons, such as if a room has multiple beds and one of the beds is occupied by a patient who needs to be isolated or has another need for privacy. A bed might also be unavailable after a patient is discharged but the bed still needs to be cleaned.

## Presumptive positive COVID-19 test

Individual healthcare organizations define what represents a COVID-19 test in their systems. A presumptive positive COVID-19 test is one where a healthcare provider entered the result as positive. Since tests and results aren't built

uniformly across systems, organizations determine what lab result components and values constitute a positive test.

## Reporting period

The reporting period is the timeframe for which the report containing the metrics is run.

# Revision History

- 3/25: Initial publication
- 3/26: Added COVID-19 Capacity metrics