

# DATA SOURCES AND METHODS – AOC CONTINUUM

The **Areas of Concern Continuum** is used to describe communities as they progress through stages of the epidemic. There are 7 possible AOC classifications based on current and recent history of case and testing data for the location:

## Low Burden Community

**Purpose:** Identify communities with minimal activity.

**Definition:**

- <10 new cases per 100k population in the last week

## Moderate Burden Community

**Purpose:** Identify communities with moderate disease activity.

**Definition:**

- Has **NOT** been identified as a Hotspot, Sustained Hotspot, or High Burden—Resolving within the last 2 weeks  
AND
- Does not meet the definition for an Emerging Hotspot, Hotspot, Sustained Hotspot, or High Burden—Resolving  
AND
- Does not meet the definition for being a Low Burden Community

## Emerging Hotspot

**Purpose:** Generate early and reliable signals of communities with emerging increases in disease burden that have a high likelihood for becoming a hotspot in the next 1-7 days.

**Method:**

Decision tree model that leverages the following features, trained based on prior data:

**Cases**

- Total cases in the last week
- Total cases per 100k population in the last week
- New cases in the last week minus new cases the previous week
- Ratio of total cases in last 7 days to total cases in last 30 days

**Testing**

- Number of tests last week
- Difference in percent positive tests in last 7 days from last 21 days

## Hotspot

**Purpose:** Identify communities that have reached a threshold of disease activity considered as being of high burden.

**Definition:**

- >100 new cases per 100k population OR >500 new cases in the past week  
AND
- Number of days in downward case trajectory\*  $\leq 7$  days  
AND
- >50 cases during past week  
AND
- Conditions must hold for at least 3 of the previous 5 days

## Sustained Hotspot

**Purpose:** Identify communities that have had a high sustained case burden and are at potentially higher risk for experiencing healthcare resource limitations.

**Definition:**

- Either Hotspot for at least 7 preceding days or already a Sustained Hotspot on previous day  
AND
- >200 new cases per 100k population OR >1,000 new cases in the past two weeks  
AND
- Daily incidence rate >15 new cases per 100k population for 8 or more of the last 14 days OR test positivity >10% over last 14 days  
AND
- >100 cases during the last two weeks  
AND
- Conditions must hold for at least 3 of the previous 5 days

**Data Sources:** CDC Aggregate County Data; Unified Testing Dataset; US Census 2019

## High Burden - Resolving

**Purpose:** Identify communities that were recently identified as hotspots and are now improving.

**Definition:**

- Identified as a Hotspot or Sustained Hotspot within the last 2 weeks  
AND
- Not currently a Emerging Hotspot, Hotspot, or Sustained Hotspot  
AND
- >100 new cases per 100k population OR >500 new cases in last week  
AND
- Number of days in downward trajectory\*  $\geq 7$   
AND
- >50 cases during last week OR both  $\geq 10$  cases in last week and >10% test positivity in last week

## Moderate Burden - Resolving

**Purpose:** Identify communities that have a moderate level of burden, but are demonstrating improvement.

**Definition:**

- Identified as a Hotspot, Sustained Hotspot, or High Burden—Resolving within the last 2 weeks  
AND
- Does not meet the definition for an Emerging Hotspot, Hotspot, Sustained Hotspot, or High Burden—Resolving  
AND
- Does not meet the definition for being a Low Burden Community

**\*Number of Days in Downward Case Trajectory:** This field is calculated using a CDC algorithm that first fits a smooth spline curve to daily case counts, and then counts the number of days that curve has been decreasing or at a low level. More specifically, the computation is based on a cubic spline fit of the 7-day rolling average of cases. The number of days decreasing (in downward trajectory) is calculated by summing the number of consecutive days of decline or near-zero incidence. A day is considered part of a downward trajectory if it (i) was previously at elevated incidence (had a two-week incidence greater than 10 cases per 100k population), and (ii) meets one of the following three conditions: (a) had a negative slope, OR (b) was in a low-incidence plateau (two-week incidence  $\leq 10$  cases per 100k population and a slope  $\geq 0$  to  $< 0.1$  new cases per 100k population based on a 7-day moving average), OR (c) had less than 5 cases in the past 2 weeks.