Greater Cincinnati COVID-19 Situational Awareness Dashboard: Slide Descriptions

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Hospital Demand

**Slide 2: Number of positive COVID-19 patients in Region 6 hospitals**
These data are from the Ohio Hospital Association (OHA) Resource tracker. The top frame illustrates the total number, measured over time. The height of the orange represents all COVID-19 positive patients in hospitals. The height of the purple represents the subset who are in intensive care units (ICU). The height of the green represents the subset who are on ventilators. There are then 3 panels below. The chart on the left represents the % of all patients who are hospitalized who have COVID-19. The middle chart illustrates the % of COVID-19 patients who are in the ICU. Finally, the chart on the right depicts the % of all COVID-19 positive ICU patients who are on ventilators. These data include all hospitals in Region 6, which includes 8 counties in Southwest Ohio: Hamilton, Butler, Warren, Clermont, Clinton, Brown, Highland, and Adams.

**Slide 3: Number of positive COVID-19 patients in Region 6 ICUs, Statistical Process Control (SPC) Chart**

**Slide 4: Number of positive COVID-19 patients in Region 6 hospitals, SPC Chart**
Slides 3 and 4 present the daily number of positive COVID-19 patients in ICU (slide 3) and hospital beds (slide 4) in Region 6, which includes 8 counties in Southwest Ohio: Hamilton, Butler, Warren, Clermont, Clinton, Brown, Highland, and Adams. This type of chart tracks data over time. The y-axis is the number of patients in beds and the x-axis is time measured in days. The center line in between the points is fit to the direction of the points. The gray shading represents what would be considered standard, or common variation across the fit line. These data are obtained from the Ohio Hospital Association.

**Slide 5: Number of Greater Cincinnati medical-surgical and ICU beds in use**
Slide 5 illustrates the daily number of ICU beds and medical-surgical beds in use across Greater Cincinnati. These data emerge from Ohio Hospital Association. This specifically highlights use across Southwestern Ohio (Region 6, which includes 8 counties in Southwest Ohio: Hamilton, Butler, Warren, Clermont, Clinton, Brown, Highland, and Adams). The green-orange-red-black coloration indicates staffing strain. In the green zone, hospitals/ICUs are operating at normal staffing levels. Strain increases going up through orange and red. In the black zone, there is extreme strain on staffing, more patients per healthcare worker, increased and longer shifts for staff, and more patients sharing rooms, bathrooms, and TVs.

Context of regional pandemic

**Slide 6: Incidence - Daily positive SARS-CoV-2 (virus that causes COVID-19) cases measured per 100,000 per day (7-day moving average per county)**
Slide 6 shows this value for each regional county. Data are obtained from the New York Times public feed. Cut points are defined according to expert opinion using the Massachusetts Testing, Tracing, and Supported Isolation Collaborative (https://ethics.harvard.edu/ttsi-technical-handbook). We similarly track but don’t display here the cuts used by the Centers for Disease Control & Prevention. Please note that they use a weekly incidence which is merely the count we show multiplied by 7. On a daily scale, the following depiction illustrates how they compare with one another:
Slide 7: Age group incidence - Daily positive SARS-CoV-2 (virus that causes COVID-19) cases measured per 100,000 per day (7-day moving average per county)  
Slide 7 displays the daily case incidence rate by age group. The numerator is the number of cases as identified in the Ohio Department of Health dashboard. The denominator is number of people with each age group within Hamilton County as captured in the US Census 2019 population estimates. The rate is normalized by 100,000 individuals. It uses a 7-day moving average to estimate each day’s count. Given lags in the reporting, the last several data points (depicted as dots) are preliminary counts.

Slide 8: Effective reproductive ratio ($R_{eff}$) for Hamilton County and 14 county region with incidence for corresponding geography  
$R_{eff}$ is a measure of transmission (simply, the number of cases 1 infected person will go on to infect while they are contagious. When this value is $<1$, the pandemic will decay away. When it is $>1$, the pandemic will expand. $R_{eff}$ is calculated using open-source software, data on laboratory-confirmed cases, and an estimate of the time between someone becoming infected and infecting a second person. The top panel reflects $R_{eff}$ for Hamilton County over time (left) and the 14 county region (right) inclusive of Hamilton, Butler, Warren, Clermont, Clinton, Brown, Highland, and Adams (OH), Boone, Campbell, and Kenton (KY), and Dearborn, Ripley, and Franklin (IN). Incidence over time is depicted below, mirroring that presented on Slide 6. These data are obtained from the New York Times public feed.

Slide 9: Map of $R_{eff}$ and incidence for the included 14 counties  
The map includes each county. The top number is the $R_{eff}$ and the bottom number, in parentheses, is the incidence. These data are obtained from the New York Times public feed. Counties are colored red if the calculated $R_{eff}$ is significantly above 1; blue if it is significantly below 1; yellow if the bounds cross 1.

Slide 10: $R_{eff}$ for Ohio, Kentucky, Indiana, and the US with incidence for corresponding geography  
The top panel reflects $R_{eff}$; bottom the incidence, both measures over time. These data are obtained from the New York Times public feed.

Slide 11: Number of COVID-19 deaths in Southwestern Ohio  
Slide 11 shows the daily number of COVID-19 deaths in the 8-county region Southwestern Ohio region. Each bar is the number of deaths reported each day. The line represents a 7-day moving average. These data are tracked by and drawn from Ohio Department of Health. A recent announcement by ODH suggests that verification of death data can lag up to 1-2 months. Thus, the dotted line and lightly shaded data points should be considered preliminary.

Slide 12: Percentage of test results returned positive and number of tests completed
Slide 12 shows the daily number of SARS-CoV-2 (or COVID-19) tests completed by labs from Greater Cincinnati health systems (bottom), and the percentage of tests that were positive for the virus (top). The top chart is a statistical control chart that helps us to distinguish normal variation from variation inherent to a change in the system or context of the pandemic. Open dots suggest data that may still be subject to change. Studies suggest that we should be testing enough to see a positive rate at or below 3-5%. These data are shared from The Health Collaborative’s health information exchange.

Slide 13-14: Percentage of test results returned positive and number of tests completed by age of patient
Slides 13 and 14 are set up exactly like slide 12 just now split by age group. They show the percentage of daily SARS-CoV-2 (or COVID-19) tests from Region 6 that were positive for SARS-CoV-2 for different age groups. Open dots suggest data that may still be subject to change. The bottom panels illustrate the average daily testing number by age of patient. These data are shared from The Health Collaborative’s health information exchange.

Mobility

Slide 15: Percentage change in weekday mobility in Hamilton County
Slide 15 uses data from Google to show how movement of Hamilton County residents has changed since the start of the pandemic across four different types of activity: grocery/pharmacy, residential, retail/recreation, and workplace. You can read more about these reports here.

Vaccination

Slide 16: Vaccinations started and completed over time
Slide 16 depicts the daily absolute number of vaccines started (defined as receiving 1st dose) over time in blue and the number of vaccines completed (2nd dose for Pfizer or Moderna, single dose for Johnson & Johnson) in orange. The line is the 7-day moving average of this absolute numbers. The top figure is the amalgamation of all 8 Southwestern Ohio counties and the 3 counties in Southeastern Indiana (we don’t yet have access to a similar data source for Northern Kentucky); each included county is depicted individually below. Note that the axes differ given different population sizes within each county. We can use these data to project movement toward population vaccination, a projection that will clearly change as supply increases. The sources for these data are Ohio Department of Health and the Indiana Department of Health.

Slide 17: Get Out the Vax campaign vaccination rate
Slide 17 depicts the current status of our regional Get Out the Vax campaign. The 15 county region depicted on the map on the left side of the figure have set a goal of at least starting vaccinations for 80% of all individuals eligible for vaccination (currently those 12 years and older) by July 4, 2021. The thermometer plot illustrates our current status using Department of Health data for Ohio (updated daily), Indiana (updated daily), and Kentucky (updated weekly). The numerator is the number of people who have received at least their first dose. The denominator is individuals who are 12 years or older. Importantly, this differs from the value displayed on slide 16 where the denominator is the entire population. For more information on the #GetOutTheVax campaign, please go to http://testandprotectcincy.com.

Slide 18: Cumulative vaccination by county
Slide 18 is a companion to slide 16. The top figures are the amalgamation of all counties; each is depicted individually below. Here, we look at the cumulative % of each Southwest Ohio county that has started their vaccination series (1st dose). As the state adds information on % of the population that has completed their series (i.e., 2 doses for Pfizer or Moderna vaccine; 1 dose for Johnson & Johnson), this cumulative % will show up. To achieve herd immunity, we estimate that we will need to fully vaccinate ~80% of the population, more if vaccination moves slowly. The sources for these data are the Ohio and Indiana Departments of Health. For this chart, importantly, the denominator, obtained for the US Census is total population. This differs from the regional Get out the Vax goal where the denominator is for those eligible (and not the entirety of the population).

Slide 19: Cases and vaccination
This slide includes two panels. The panel on the left is a scatter plot with data for all Hamilton County zip codes. The x-axis is the current % of the population who are vaccinated. The y-axis is the incidence of new cases in the preceding 14 days. There appears to be a downward trending line of fit (not displayed) indicative of a negative correlation (that is – the more cases occur in the zip codes with lower vaccination rates). The zip codes in the top left quadrant of the scatter plot are those with particularly high case rates and low vaccination rates. The top several are labeled on the scatter plot and the accompanying map on the right. This is a zip code choropleth map of Hamilton County. It displays cases per 100,000 population in the preceding 14 days.

Statewide patterns

**Slide 20: Ohio counties and incidence, R_{eff}, and vaccination**
Slide 20 uses data made available by ODH. Each map is split into regions and counties. The map on the left displays the daily 14-day running sum of cases per 100,000 individuals within each county. Lighter shading is indicative of lower incidence and darker shading higher incidence. The map in the middle displays R_{eff} for each county. Those counties in blue have an R_{eff} value that is significantly below 1, red significantly above 1, and yellow crossing 1. The map on the right displays the % of the population with at least a first dose of vaccination (denominator total population). Darker shades indicate lower percentage, lighter shades indicate higher percentage.

**Slide 21: Ohio counties and incidence, R_{eff}, and vaccination over time**
Slide 21 is a companion slide to 20, using the same data made available by ODH. Each component is again split into regions and counties. Counties are ordered, within regions, by population sizes (biggest on top, smallest on bottom). The panel on the left displays the daily 14-day running sum of cases per 100,000 individuals within each county. Lighter shading is indicative of lower incidence and darker shading higher incidence. The panel in the middle displays R_{eff} for each county. Those counties in blue have an R_{eff} value that is significantly below 1, red significantly above 1, and yellow crossing 1. The panel on the right displays the % of the population with at least a first dose of vaccination (denominator total population). Darker shades indicate lower percentage, lighter shades indicate higher percentage. Each panel is displayed over time is indicated by the timeline at the bottom of the page.