OHSU COVID Forecast
Edition: 9/9/2021

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Key Outcomes
As of 9/8/2021, the statewide census was 1,138.

Source: https://public.tableau.com/profile/oregon.health.authority.covid.19#!/vizhome/OregonCOVID-19HospitalCapacitySummaryTables_15965754787060/HospitalizationbySeveritySummaryTable
Regional Hospital Census

Regions 5 and 3 are showing decreases.

Regions 6, 7, and 9 are flat.

Regions 1 and 2 are showing slight increases.

Source: https://public.tableau.com/profile/oregon.health.authority.covid.19#!/vizhome/OregonCOVID-19HospitalCapacity/BedAvailabilitybyRegion
Hospital Census by US Region

The South and West are showing accelerating increase.

The Midwest is showing minor increases in hospital census.

The Northeast is showing slight increase at very low levels.
As of 9/8, 50% of occupied ICU beds are filled with COVID patients.

Note: Percentages over 100% occur if the COVID counts are more than total beds minus available beds.
Oregon Hospital Capacity

This chart shows that while, there are some beds listed as “available”, they are likely not truly available since COVID patients are crowding out Other patients in the last month.

These data are based on HOSCAP reports.

Source: https://public.tableau.com/profile/oregon.health.authority.covid.19#!/vizhome/OregonCOVID-19HospitalCapacitySummaryTables_15965754787060/HospitalizationbySeveritySummaryTable
New Cases per Capita

Case rates are showing continued signs of leveling in the last week.

Oregon dropped to 24th in the number of new cases per day.

Source: http://91-divoc.com/pages/covid-visualization/
Cases by Vaccination Status

As of 9/2, the ratio of cases for unvaccinated to vaccinated is approximately 7:1.

Admits by Vaccination Status

As of 9/2, breakthrough hospitalizations and deaths remain very rare among breakthrough cases.

Hospitalization Rate

For the most recent week (8/15-8/21) of complete data, the hospitalization rate is 4.4%.

This represents a return to previous rates of hospitalization.

Source: https://public.tableau.com/profile/oregon.health.authority.covid.19#!/vizhome/OregonHealthAuthorityCOVID-19SummaryTable_15889676399110/OregonsEpiCurveSummaryTable
Test positivity dipped slightly this week.

The most recent complete week (8/29/21-9/4/2021) had a test positivity of 11.1%.

Total Tests

Testing has peaked at levels similar to fall/winter surge.

Review of Leading Indicators
Leading Indicators Comparison

Several metrics of activity are decreasing or are flat in Oregon.

While still above previous pandemic levels, the change may represent changes in behavior to avoid COVID.

Source: SDI from: https://data.covid.umd.edu/
DEX from https://github.com/COVIDExposureIndices/, Google mobility reports from https://www.google.com/covid19/mobility/
Higher Risk Behaviors

In Oregon, there are continued moderate declines in time w/others, restaurant and large events indoors since 8/13.

Note:
- Estimated percentage of respondents who went to an “indoor market, grocery store, or pharmacy” in the past 24 hours.
- Estimated percentage of respondents who went to an indoor “bar, restaurant, or cafe” in the past 24 hours.
- Estimated percentage of respondents who “spent time indoors with someone who isn’t currently staying with you” in the past 24 hours.
- Estimated percentage of respondents who “attended an indoor event with more than 10 people” in the past 24 hours.

Source: https://covidcast.cmu.edu/
As of 9/7, mask wearing has increased to 84% in Oregon.

Note:
Estimated percentage of people who wore a mask for most or all of the time while in public in the past 7 days; those not in public in the past 7 days are not counted.

Source: https://covidcast.cmu.edu/
Symptoms appear to have flattened in last week in Oregon. The level is slightly above previous peak and is consistent with widespread transmission. “Symptoms” refer to community reports of COVID-like symptoms through Facebook surveys.

Source: https://covidcast.cmu.edu/
Statewide Forecast
"Fast" scenario assumes some increased vaccine rates due to attention from current surge. It also assume 5-11 become eligible in late fall.

"Slow" scenario show previous pattern of declining vaccine providing little boost to immunity levels.

The fast uptick in delta variant is shown by a kink in the overall R0 of the circulating virus.

The “Fast” scenario assumes delta variant has an R0 of 8.0.

The “Slow” scenario assume R0=6.5

Source: Actuals from https://outbreak.info/location-reports?loc=USA_US-OR, Projections by Simulation by OHSU
“Recent” Scenario represents maintaining our current performance.
“Moderated” shows what happens with a lower amount of intervention effectiveness.

Note: The fear and fatigue cycle is shifted upwards to account for the increased transmissibility of the virus.
The forecast shows a general decrease in census levels over 2-3 months.

The primary scenario is:
- “Moderated” intervention effect
- Slow Variant (Delta $R_0=6.5$)
- High hospitalization rate for Delta (2X original)
- Vaccine efficacy=95%

Source: OHSU COVID Forecast Model
Scenarios:

1) Moderated behavior/policy,
   Slow Variant, High Delta Hosp Rate, Fast Vaccine

2) Fear/Fatigue behavior/policy,
   Slow Variant, High Delta Hosp Rate, Fast Vaccine

3) Fall Shift behavior/policy, Slow Variant, High Delta Hosp Rate, Fast Vaccine
Previous forecasts can help assess accuracy of the model.
As of 9/8, the estimated population proportions are:
Susceptible: 27%
Vaccinated: 44%
Infected: 20%
Vaccinated & Infected: 9%

Projection uses primary scenario.

Source: OHSU COVID Forecast Model
Policy Issues
Oregon has given a first dose to 64.9% of population (not just eligible).

This rate ranks 19th in the US.
Pediatric hospitalization rate remains elevated but steady. Other states have had rates up to 7 times higher than Oregon which has approximately 0.2 new admissions per 100k kids per day.

Source: https://covid.cdc.gov/covid-data-tracker/#new-hospital-admissions
Pediatric Hospitalizations

Shown are the pediatric hospitalization rates for selected states.

Currently, Oregon is experiencing about 0.2 hospitalizations per 100k.

Note: The scales are different in each chart.

Source: https://covid.cdc.gov/covid-data-tracker/#new-hospital-admissions
Pediatric Hospitalizations

Per NYTimes analysis, the states with lower vaccination rates are driving the surge in pediatric hospitalizations.

Notably, however, Florida has a higher vaccination rate than Oregon and high pediatric hospitalization rates.

Appendix
The most recent forecast was issued on 9/2.

This model shows the potential for reduction to mask wearing.
CDC forecasts show an upcoming peak.

Source: https://covid.cdc.gov/covid-data-tracker/#forecasting_weeklycases
As of 9/2, the IHME model shows a recent peak in infections.

**Projections and scenarios**

We produce three scenarios when projecting COVID-19. The *reference scenario* is our forecast of what we think is most likely to happen:

- Vaccines are distributed at the expected pace. Brand- and variant-specific vaccine efficacy is updated using the latest available information from peer-reviewed publications and other reports.
- Future mask use is the mean of mask use over the last 7 days.
- Mobility increases as vaccine coverage increases.
- Governments adapt their response by re-imposing social distancing mandates for 6 weeks whenever daily deaths reach 8 per million, unless a location has already spent at least 7 of the last 14 days with daily deaths above this rate, and not yet re-imposed social distancing mandates. In this case, the reference scenario assumes that mandates are re-imposed when daily deaths reach 15 per million.
- Variants Alpha, Beta, Gamma, and Delta continue to spread regionally and globally from locations with sufficient transmission.

The *worse scenario* modifies the reference scenario assumption in four ways:

- 100% of vaccinated individuals stop using masks.
- Mobility increases in all locations to 25% above the pre-pandemic winter baseline, irrespective of vaccine coverage.
- Governments are more reluctant to re-impose social distancing mandates, waiting until the daily death rate reaches 15 per million, unless a location has already spent at least 7 of the last 14 days with daily deaths above this rate, and not yet re-imposed social distancing mandates. In this case, the reference scenario assumes that mandates are re-imposed when daily deaths reach 38 per million. In either case, we assume social distancing mandates remain in effect for 6 weeks.
- Variants Alpha, Beta, Gamma, and Delta spread between locations twice as fast when compared with our reference scenario.

The *universal masks scenario* makes all the same assumptions as the reference scenario but assumes all locations reach 95% mask use within 7 days.

Death Projections

The data show the number of deaths per day from the model.

The estimates are based on looking at expected hospital admissions (that would generate the census forecasted) and then assuming a relationship between all COVID deaths (not just of hospitalized) and COVID hospital admissions.

Based on recent data the ratio of hospitalizations to deaths is 5.5. A 21-day lag is applied from presumed infection date until death.

Actual data is based on weekly counts of death from OHA.

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