OHSU COVID Forecast
Edition: 3/25/2021

Peter Graven, PhD; Office of Advanced Analytics, BIAA, ITG
Key Outcomes
Hospitalized Patients

Census levels have remained constant for the second consecutive week.

As of 3/22/2021, the census was 116.

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

Slight upticks in census in regions 5 and 6. Other regions remain flat or decreasing.

Source: https://public.tableau.com/profile/oregon.health.authority.covid.19#!/vizhome/OregonCOVID-19HospitalCapacity/BedAvailabilitybyRegion
Oregon Hospital Capacity

As of 3/16, of the 523 occupied ICU beds, 16 (3%) are filled with COVID patients.

Source: https://public.tableau.com/profile/oregon.health.authority.covid.19#!/vizhome/OregonCOVID-19HospitalCapacitySummaryTables_15965754787060/HospitalizationbySeveritySummaryTable
Cases remain flat this week.

Oregon has the 2\textsuperscript{nd} lowest current rate of cases in the US and the 4\textsuperscript{th} lowest cumulative count of cases (behind HI, VT, ME).

Source: http://91-divoc.com/pages/covid-visualization/
4th Wave in Michigan

Cases, hospitalizations, and ICU are all trending upward in Michigan.

While vaccine levels are typical, variant levels are higher than rest of US at 39%.

4\textsuperscript{th} Wave in Europe

Most countries in Europe are having distinct increases in cases.

The chart below shows a sharp increase in variant in Europe, exceeding 60% of tested samples.

Source: https://carlsonschool.umn.edu/mili-misrc-covid19-tracking-project
Hospitalization Rate

For the most recent week of complete data, hospitalization rate is 4.6%.

So far the hospitalization rate (as measured per number of cases) has not come down due to vaccinations.

This rate is expected to come down as vaccinations remove persons of high risk from pool of infected.

Test positivity is remaining low.

The rate is now at 3.5% for week beginning 3/21.

Total Tests

Testing volume is up slightly in most recent full week of data.

Statewide Forecast
Vaccine Rates by Age

Older age groups are starting to have disproportionately higher vaccination rates.

As of 3/20, below are percentages that have received first dose:
80 and over: 65%
70-80: 58%
60-70: 32%

Note: Projected percentages were mistakenly reported last week. This week contains only actual estimates.

Phase 1B Group 6 begins 3/29 and includes lower age groups with health conditions or other exposure risks.

A new “Fast” scenario has been developed which reaches a higher per week vaccination rate based on expected increases in supply.

The “Slow” scenario reflects a slower administration of available vaccine.

Note: Pace in both scenarios is expected to slow when 50% of population is reached.

Long Term Model-Variant Share

The variant share assumptions are shown in the chart. The actuals sit between the fast and slow growth assumptions.

The most recent estimate is about 13% in Oregon.

The B117 variant is assumed to be 32% more transmissible than the main strain. That increases the R from 3.08 to 4.02.

Source: Projections by OHSU, Actuals from OHSU Lab Results, https://nextstrain.org/groups/spheres/ncov/oregon?c=pangolin_lineage&f_division=Oregon,
A decline in effectiveness is apparent in recent data. Cases are expected to increase in coming weeks.

The Fatigue w/o RLF scenario (yellow dots) has been modified to show what happens if risk levels are not engaged during increased case rates.

Note: The estimated intervention effectiveness includes increased transmissibility due to the variant. Thus, if the estimated R is the same but the variant has increased it will mean the intervention effectiveness, shown in the chart, has increased.
Long Term Model - Scenarios

Scenarios:

- **Variant**
  - a) Fast (ie. UK)
  - b) Slow (ie. Germany)

Fatigue:

- a) Fatigue w/RLF (Risk Levels Framework)
  - b) Fatigue w/o policy response

Vaccine:

- a) Fast (up to 248k per week by 4/27)
- b) Slow (up to 160k per week by 5/18)
The Primary Scenario is:

- Fast variant (UK path)
- Fatigue cycle (w/Risk Level Framework (RLF))
- Fast vaccine (220k per week by 4/27)
Long Term Model-Herd Chart

As of 3/23, the estimated population proportions are:
Susceptible: 74%
Vaccinated: 13%
Infected: 11%
Vaccinated & Infected: 2%

Projection uses primary scenario.

Source: OHSU COVID Forecast Model
While census levels are not expected to spike as high due to the vaccination of high risk individuals, the number of cases is expected to approach 1k per day.

Note: This chart uses the primary scenario.
Review of Leading Indicators
Leading Indicators Comparison

Leading indicators continue to be at pre-fall surge levels.

It is unclear how much of this movement is due to vaccinated people as opposed to potentially susceptible population.

COVID Symptoms

Oregon symptoms remain low.

Other neighbor states are showing signs of potential increase.

Source: https://covidcast.cmu.edu/
Screening calls for COVID remain low.

Source: OHSU COVID Connected Care Center Data, Screening calls make up ~50% of total calls at the center.
Policy Issues
Vaccine Administration

Oregon has provided first dose to 24.5% of population as of 3/24. Oregon ranks 36th in the US by this metric.

Source: https://covid.cdc.gov/covid-data-tracker/#vaccinations
Oregon Risk Levels

No change in map from last week.

The average risk level moved down slightly for the week ending 3/20

Movement:
Lower to Moderate (3)
Moderate to Lower (4)
High to Moderate (2)
High to Extreme (1)
Extreme to High (1)

Risk Level Forecast

This chart shows the case forecast (which is inferred from the model calibrated to census) in terms of new cases per week per 100k. This metric is used by the state to assess the risk level of the county.

Note: This chart is based on the primary scenario.

Helix is estimating the B.1.1.7 strain is increasing quickly across the US. As of 3/17, it represents 43 percent of tested samples.

This represents extremely fast growth.

IHME is using much higher estimates of the prevalence of the variant in the US. The map shows an estimate of 25-49% for Oregon.

While these estimates cannot be independently verified, it provides an alternative estimate more consistent with the “fast” growth path of the variant.

Figure 7. Percent of circulating SARS-CoV-2 for 3 primary variants on March 15, 2021.
A. Percent B.1.1.7 variant

Variants in OR

Multiple sources of information about variant prevalence.
1) ~12% via OHSU Lab
2) 7 percent via Next Strain
3) ~0.3-3.8 percent via CDC
4) 0 samples via Helix (certain states may be under/over represented)
5) 25-49% assumption used by IHME

For modeling purposes the OHSU lab value is used.
Appendix
Previous Forecasts

Source: Primary scenario for each week is used (Fast Variant, Fatigue w/RLF, Fast Vaccine)
The OHA projection using IDM modeling shows scenarios of continued decrease versus an increase in the transmission rate.

**Figure 5:** Observed hospitalized cases for Oregon and projections under two scenarios. Black dots show observed daily counts, while grey region is the model-based 95% confidence interval. The green line shows daily hospitalized cases projected if the transmission level estimated for February 24 (Re = 0.83) persists, while the red line shows projected hospitalized cases assuming Re increases to 1.1 after March 2 (shaded areas: 2.5th-97.5th percentile ranges).

IHME Forecast

Source: OHSU COVID Forecast Model
Long Term Model: Population w/First Dose

This is the schedule used by the model for the percent of population w/first dose by week and age group.

Source: OHSU COVID Forecast Model
Long Term Model-Specs

Key Assumptions
1) Vaccine schedule follow “slow” schedule with prioritized age groups
2) Vaccine acceptance rate (75%)
3) Lagged affect on protection (2 weeks until vaccinated have protection)
4) Efficacy of vaccine (54% at first dose, 95% after second dose at 24 days)
5) Fear and Fatigue cycle of intervention effectiveness estimated with sinusoidal function (approx. 12 weeks due to severity of fall surge)
6) Ascertainment rate- True infected are estimated to be 3.5 times larger than cases.
7) Variant is 32% more transmissible and follows “fast” virus share schedule

Source: OHSU COVID Forecast Model