

COVID-19 Breakthrough Report

Oregon's Monthly Surveillance Summary



Monthly Vaccine Breakthrough Case Report - April 2022

Background

Monthly breakthrough case reports include data through the last day of the most recent complete calendar month and are published on the first Thursday of every month.¹ Vaccine breakthrough cases are defined as instances in which an individual tests positive for COVID-19 at least 14 days following the completion of any primary COVID-19 vaccine series.²

This report includes only those vaccine breakthrough cases that are reported to public health following a positive test result. People who have tested positive through at-home tests are not included in this report. Reported cases are automatically matched with our statewide immunization database to verify COVID-19 vaccination status.

Many vaccine breakthrough cases are believed to experience no symptoms or minimal symptoms and, therefore, are unlikely to undergo testing for COVID-19 and be reported to public health.³ For this reason, the true number of vaccine breakthrough cases is unknown. The number of reported vaccine breakthrough cases must be interpreted within the context of the more than 2.9 million people in Oregon who have completed a primary COVID-19 vaccine series and the more than 1.6 million who have received a booster dose.

¹ The Monthly summary, Figure 1, and Figure 2 use the date that cases are reported to OHA, to provide information on the most recently identified cases. All other dates in this report use specimen collection date to align with the breakthrough case definition.

² This definition is consistent with the CDC's definition, available here: <https://www.cdc.gov/vaccines/covid-19/downloads/COVID-vaccine-breakthrough-case-investigations-Protocol.pdf>.

³ Bergwerk, M., Gonen, T., Lustig, Y., Amit, S., Lipsitch, M., Cohen, C., Mandelboim, M., Gal Levin, E., Rubin, C., Indenbaum, V. and Tal, I., 2021. Covid-19 breakthrough infections in vaccinated health care workers. *New England Journal of Medicine*.

COVID-19 Breakthrough Report

Oregon's Monthly Surveillance Summary



COVID-19 cases by vaccination status

Monthly summary

During the month of April 2022, there were 18,608 cases of COVID-19 reported to OHA. Of these, 8,815 (47.4%) were unvaccinated, 9,769 (52.5%) were vaccine breakthrough cases, and 24 (0.1%) had an unknown vaccination status. Of all vaccine breakthrough cases in April, 6,142 (62.9%) were fully vaccinated and boosted. The median age of all vaccine breakthrough cases was 46 years. There were 70 (0.7%) breakthrough cases among residents of care facilities, senior living communities or other congregate living settings. There were 1904 (19.5%) cases in persons 65 or older. There were 450 (4.6%) cases aged 12-17.

OHA publishes the most up-to-date information available about cases from the most recently completed calendar month. However, not all information about a case's vaccination status may be available at the time of publication. Table 1 includes updated totals of COVID-19 cases by vaccine breakthrough status for the previous three months.

Table 1. COVID-19 cases by vaccine breakthrough status in the previous 3 months

Month	Total cases	Cases with known vaccination status	Percent of cases with known vaccination status	Breakthrough cases	Percent breakthrough cases
February 2022	56,078	55,928	99.7	27,024	48.3
March 2022	10,668	10,649	99.8	4,873	45.8
April 2022	18,608	18,584	99.9	9,769	52.6

Cumulative summary

Overall, 207,952 vaccine breakthrough cases have been identified in Oregon. Of these, 52,998 (25.5%) were fully vaccinated and boosted at the time of infection. The median age of breakthrough cases is 41 years (range: 5-108). There have been 2,852 (1.4%) breakthrough cases among residents of care facilities, senior living communities or other congregate living settings. 32,860 (15.8%) cases have been 65 or older. There have been a total of 13,647 (6.6%) cases aged 12-17.

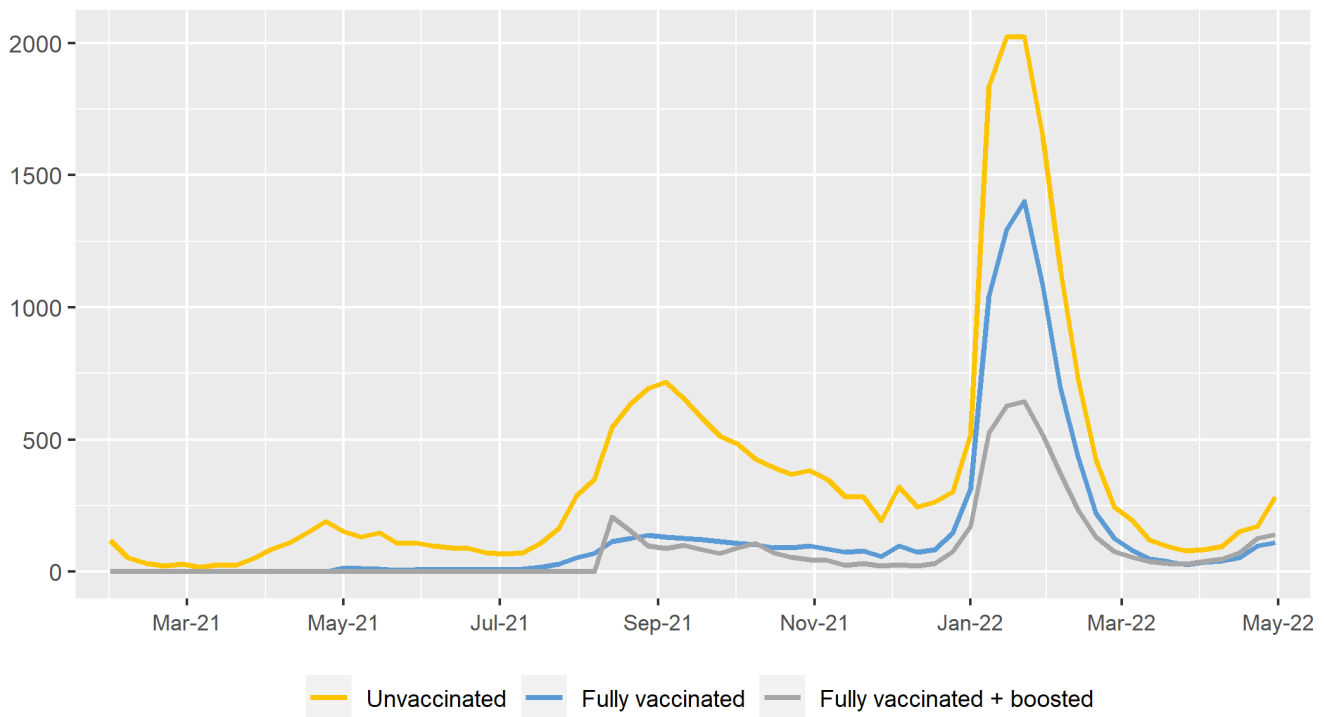
COVID-19 Breakthrough Report

Oregon's Monthly Surveillance Summary



The incidence of COVID-19 is much higher in unvaccinated⁴ individuals than in vaccinated individuals (Figure 1). The rate of COVID-19 cases among unvaccinated individuals in April was more than 2 times the rate among those who were fully vaccinated and those who were fully vaccinated and boosted. COVID-19 continues to circulate throughout Oregon. Vaccination, including boosting, remains the most effective tool to reduce the spread of COVID-19.

Figure 1. Incident COVID-19 cases per 100,000 per week in adults, by vaccination status⁵



⁴ Unvaccinated persons are defined as people who have not received an approved COVID-19 vaccine, or who have not completed a COVID-19 vaccine series.

⁵ Cases with unknown vaccination status were excluded from this figure.

COVID-19 Breakthrough Report

Oregon's Monthly Surveillance Summary



Vaccine breakthrough cases and severity

The Pfizer, Moderna and Johnson & Johnson COVID-19 vaccines are all highly effective at preventing severe COVID-19 illness and death. Table 2 includes totals of breakthrough cases by vaccine manufacturer and severity. Relatively few breakthrough cases have been hospitalized, and even fewer have died (Figure 2).⁶

Table 2. COVID-19 Breakthrough cases by vaccine manufacturer and severity⁷

Primary series vaccine manufacturer	Primary series completed	Cases	Hospitalizations	Deaths	Cases per 100,000 vaccinated
Pfizer	1,679,680	123,679	2,716	692	7,363.2
Moderna	977,814	64,285	1,833	423	6,574.4
Johnson & Johnson/Janssen	245,914	19,942	786	184	8,109.3

⁶ A death is considered to be related to COVID-19 in any of the following circumstances: a) death of a confirmed or probable COVID-19 case within 60 days of the earliest available date among exposure to a confirmed case, onset of symptoms, or date of specimen collection for the first positive test; b) death from any cause in a hospitalized person during admission or in the 60 days following discharge AND a COVID-19-positive laboratory diagnostic test at any time since 14 days prior to hospitalization; or c) death of someone with a COVID-19-specific ICD-10 code listed as a primary or contributing cause of death on a death certificate, regardless of the dates of diagnosis or death.

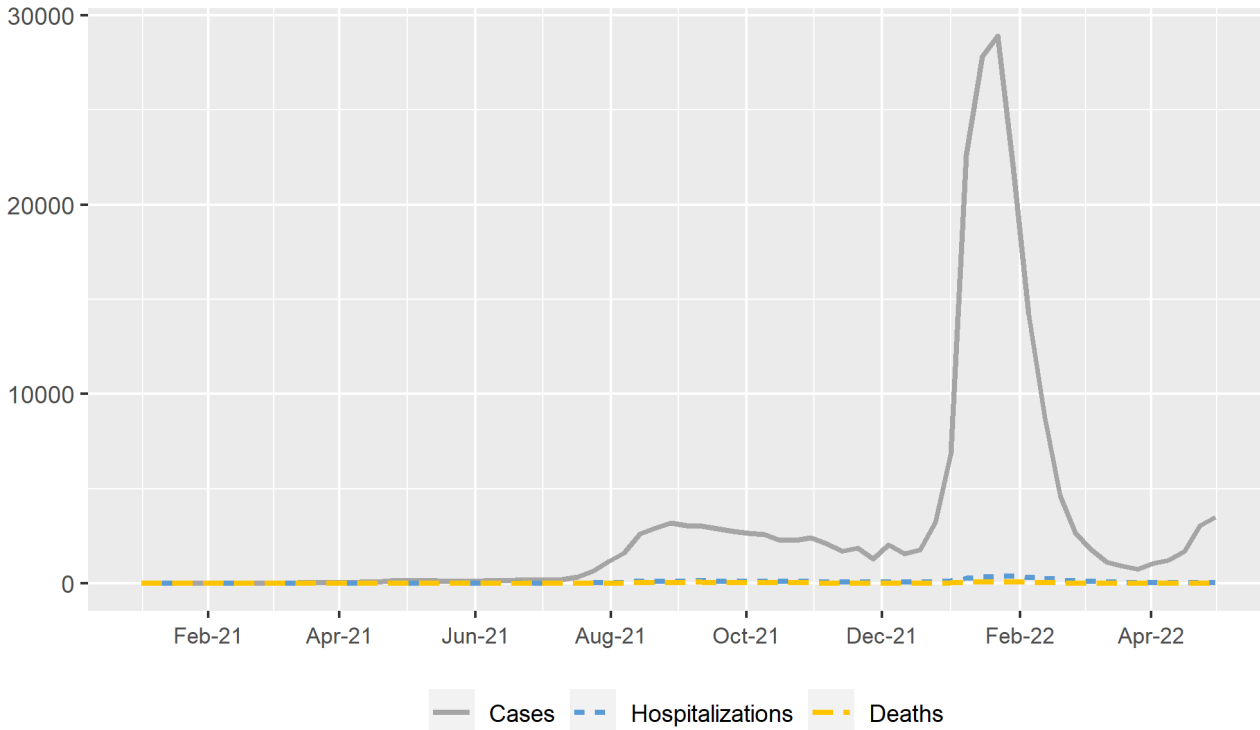
⁷ Table 2 provides the number of cases per 100,000 vaccinated individuals by primary series vaccine manufacturer. Because this figure does not account for the time that each person has been fully vaccinated, it is not a true rate and should not be interpreted as such.

COVID-19 Breakthrough Report

Oregon's Monthly Surveillance Summary



Figure 2. COVID-19 breakthrough cases, hospitalizations and deaths, by week



Individuals who are fully vaccinated and boosted have the lowest risk of severe illness and death.⁸ Table 3 shows the total number of cases, hospitalizations, and deaths by vaccination status. An individual is considered fully vaccinated and boosted if they received an additional dose of any COVID-19 vaccine at least 5 months after completing a Pfizer or Moderna primary series or at least 2 months after completing a Johnson & Johnson initial dose. If a person has completed a primary series but has not received a valid booster at the time of infection, the individual is categorized as fully vaccinated.

⁸ <https://covid.cdc.gov/covid-data-tracker/#covidnet-hospitalizations-vaccination>.

COVID-19 Breakthrough Report

Oregon's Monthly Surveillance Summary



Table 3. COVID-19 cases in adults, by vaccination status and severity⁹

Case type	Cases	Hospitalizations	Deaths
Fully vaccinated + boosted	51,967	983	195
Fully vaccinated	142,050	4,308	1,104
Unvaccinated	265,452	15,047	3,979

To date, 2.6% of all known breakthrough cases have been hospitalized (n=5,342), and only 0.6% have died (n=1299).¹⁰ The median age of the people who have died is 80 (range: 23-108). It is important to note that not all vaccine breakthrough cases are reported to public health, which may cause the proportions in the following section to appear higher than in reality. These figures are not vaccine breakthrough hospitalization or death rates and should not be interpreted as such.

Tables 4, 5 and 6 provide detailed vaccine breakthrough severity data by age, race and ethnicity. The risk of both hospitalization and death increases with age.

⁹ Cases with unknown vaccination status are excluded from this table. This table also excludes unvaccinated cases prior to January 1, 2021. Based on vaccine rollout in Oregon, this approximates the first date that a breakthrough case could have occurred.

¹⁰ Cumulative deaths reported here reflect all breakthrough cases known to have died since January 1, 2021. There may be a lag of several weeks between when an individual dies and when their death appears in this report. Increases in cumulative deaths between this and subsequent reports should not be interpreted as individuals who have died within the past week.

COVID-19 Breakthrough Report

Oregon's Monthly Surveillance Summary



Table 4. COVID-19 breakthrough cases by age group and severity

Age group	Breakthrough cases	Breakthrough hospitalizations	Breakthrough deaths
0-9	165	1	0
10-19	20,020	59	0
20-29	38,309	211	2
30-39	40,069	314	7
40-49	35,565	322	17
50-59	28,917	572	64
60-69	22,234	1,101	197
70-79	14,182	1,332	343
80+	8,490	1,430	669
Total	207,952	5,342	1,299

COVID-19 Breakthrough Report

Oregon's Monthly Surveillance Summary



Table 5. COVID-19 breakthrough case severity by race¹¹

Race	Breakthrough cases	Breakthrough hospitalizations	Breakthrough deaths
> 1 race	2,455	41	3
American Indian/Alaska Native	2,706	75	10
Asian	7,294	135	25
Black	4,182	144	24
Not Available	60,001	617	277
Other	19,362	372	99
Pacific Islander	266	7	1
White	111,686	3,951	860
Total	207,952	5,342	1,299

¹¹ During the case investigation, people are asked to self-report their race, ethnicity, tribal affiliation, country of origin or ancestry. As of October 2021, 42,423 (80.8%) of the 52,483 persons who identified as "Other" race also self-identified as Hispanic or Latino.

COVID-19 Breakthrough Report

Oregon's Monthly Surveillance Summary



Table 6. COVID-19 breakthrough case severity by ethnicity

Ethnicity	Breakthrough cases	Breakthrough hospitalizations	Breakthrough deaths
Hispanic	20,050	335	41
Not Hispanic	109,040	3,677	790
Unknown	78,862	1,330	468
Total	207,952	5,342	1,299

COVID-19 Breakthrough Report

Oregon's Monthly Surveillance Summary



Table 7 provides the proportion of vaccine breakthrough cases who have died with COVID-19. Approximately 80% of vaccine breakthrough deaths have occurred in patients 70 years and older. The proportion of vaccine breakthrough cases who have died with COVID-19 has increased over time. This trend is expected as the proportion of the population which is fully vaccinated increases and may also be associated with waning immunity and the proportion of the population which has not received a booster dose.

Table 7. COVID-19 deaths by month, by breakthrough case status

Month	Total COVID-19 deaths	Breakthrough deaths	Percent breakthrough deaths
April 2021	121	6	5.0
May 2021	223	19	8.5
June 2021	117	15	12.8
July 2021	97	16	16.5
August 2021	604	134	22.2
September 2021	929	196	21.1
October 2021	657	175	26.6
November 2021	404	93	23.0
December 2021	340	80	23.5
January 2022	598	208	34.8
February 2022	621	236	38.0
March 2022	223	103	46.2
April 2022	41	13	31.7

COVID-19 Breakthrough Report

Oregon's Monthly Surveillance Summary



COVID-19 variants

Table 8. COVID-19 breakthrough cases associated with variants of concern¹²

Overall, approximately 6.9% of positive molecular specimens in Oregon have been sequenced. Omicron is currently the dominant variant circulating in Oregon. Vaccine breakthrough cases appear to reflect the variants circulating in the community. Additional information on variants can be found here:

<https://public.tableau.com/app/profile/oregon.health.authority.covid.19/viz/GISAIDVariantDashboardUpdated/OregonVariantDashboard>.

Subtype	Breakthrough Cases
Omicron (B.1.1.529)	2,411
Delta (B.1.617.2)	2,531

Table 9. COVID-19 breakthrough cases associated with variants being monitored

Subtype	Breakthrough Cases
Alpha (B.1.1.7)	153
Beta (B.1.351)	17
Gamma (P.1)	63
Epsilon (B.1.427/B.1.429)	40
Iota (B.1.526)	30

¹² As of September 29, 2021, OHA will align with CDC's classification of SARS-CoV-2 variants. Variant classification scheme defines four classes of SARS-CoV-2 variants: variants of concern, variants of interest, variants being monitored and variants of high consequence.

COVID-19 Breakthrough Report

Oregon's Monthly Surveillance Summary



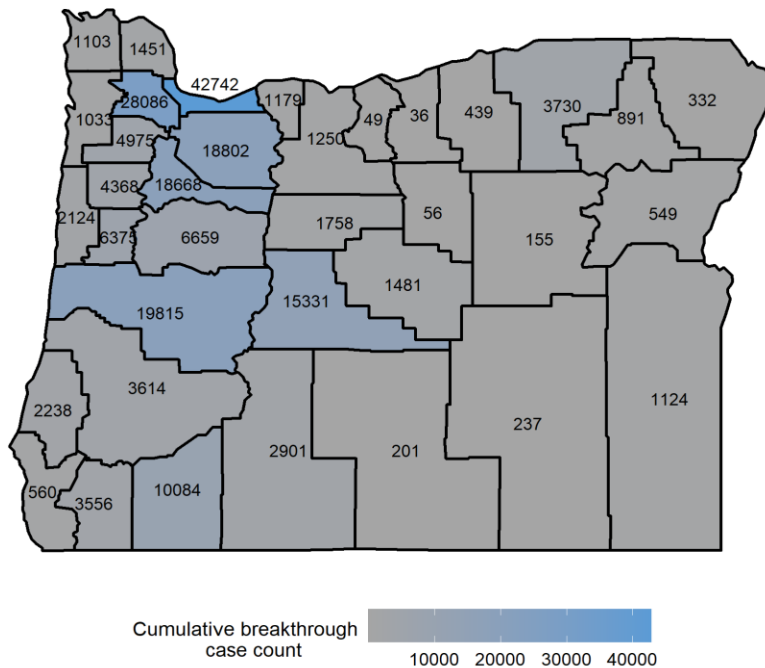
Breakthrough cases by county

Figure 3 and Table 10 show breakthrough cases by county. In general, cumulative breakthrough case counts correspond with the population size of each county. Additional information on cumulative cases can be found here:

<https://public.tableau.com/app/profile/oregon.health.authority.covid.19/viz/OregonCOVID-19TestingandOutcomesbyCounty/OregonsCOVID-19TestingandOutcomesbyCounty>.

Table 10 provides both cumulative and monthly data. The “Cases in previous month” column references the number of vaccine breakthrough cases newly reported during the month of April. This count may not reflect the full number of vaccine breakthrough cases that occurred during this time, as breakthrough case ascertainment may lag up to several weeks.

Figure 3. Map of COVID-19 breakthrough case cumulative counts, by county of residence¹³



¹³ Counties that have a total of fewer than 10 cases will appear grey without a data label.

COVID-19 Breakthrough Report

Oregon's Monthly Surveillance Summary



Table 10. COVID-19 breakthrough cases by county of residence¹⁴

County	Cumulative cases	Cases in previous month
Baker	549	1-9
Benton	6375	427
Clackamas	18802	956
Clatsop	1103	47
Columbia	1451	73
Coos	2238	46
Crook	1481	28
Curry	560	1-9
Deschutes	15331	565
Douglas	3614	53
Gilliam	36	1-9
Grant	155	1-9
Harney	237	1-9
Hood River	1179	35
Jackson	10084	218
Jefferson	1758	20
Josephine	3556	62
Klamath	2901	53

¹⁴ Counties that have a total of fewer than 10 cases will be reported as 1-9 cases.

COVID-19 Breakthrough Report

Oregon's Monthly Surveillance Summary



County	Cumulative cases	Cases in previous month
Lake	201	1-9
Lane	19815	664
Lincoln	2124	50
Linn	6659	247
Malheur	1124	11
Marion	18668	483
Morrow	439	1-9
Multnomah	42742	3556
Polk	4368	140
Sherman	49	1-9
Tillamook	1033	43
Umatilla	3730	42
Union	891	1-9
Wallowa	332	1-9
Wasco	1250	28
Washington	28086	1754
Wheeler	56	0
Yamhill	4975	122