

COVID-19 Breakthrough Report

Oregon's Weekly Surveillance Summary



Weekly Vaccine Breakthrough Case Report - March 3, 2022

Background

Data for the weekly breakthrough case report will include data through the most recent Sunday and the report will be published on Thursdays.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 Vaccine breakthrough cases that result in hospitalization or death are reported to Centers for Disease Control and Prevention (CDC).

This report includes only those vaccine breakthrough cases which 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. As case counts have increased dramatically during the Omicron surge, our database has been unable to match the entire volume of reported cases. At the same time, case investigation has pivoted to an opt-in model in which public health no longer actively reaches out to cases outside of high-risk congregate settings. Therefore, the vaccination status of some cases remains unknown. Oregon Health Authority (OHA) is working towards alternative methods to identify vaccination status for all reported cases in a timely manner.

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 Therefore, the true number of vaccine breakthrough cases is unknown. The number of vaccine breakthrough cases must be interpreted within the context of the more than 2.8 million people in Oregon who have completed a primary COVID-19 vaccine series and the more than 1.5 million people in Oregon who have received a booster dose.

¹ The weekly 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*.

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COVID-19 cases by vaccination status

Weekly summary

During the week of February 20–February 26, there were 5,589 cases of COVID-19 reported to public health. Of these, 2,950 (52.8%) were unvaccinated, 2,632 (47.1%) were vaccine breakthrough cases, and 7 (0.1%) had an unknown vaccination status. Of all vaccine breakthrough cases, 1,119 (42.5%) were fully vaccinated and boosted. The median age of all vaccine breakthrough cases was 54 years. There were 22 (0.8%) breakthrough cases among residents of care facilities, senior living communities or other congregate living settings. There were 651 (24.7%) cases in persons 65 or older. There were 110 (4.2%) cases aged 12-17.

OHA publishes the most up-to-date information about cases from the most recently completed MMWR week. 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 six weeks.

Table 1. COVID-19 cases by vaccine breakthrough status over the previous 6 weeks

MMWR week ending	Total cases	Cases with known vaccination status	Percent of cases with known vaccination status	Breakthrough cases	Percent breakthrough cases
2022-01-22	56,965	56,945	100.0	28,933	50.8
2022-01-29	44,394	44,359	99.9	21,995	49.6
2022-02-05	29,405	29,311	99.7	14,271	48.7
2022-02-12	18,068	18,028	99.8	8,825	49.0
2022-02-19	9,876	9,861	99.8	4,626	46.9
2022-02-26	5,589	5,582	99.9	2,632	47.2

Cumulative summary

Overall, there have been 192,934 vaccine breakthrough cases identified in Oregon. Of all vaccine breakthrough cases, 44,109 (22.9%) were fully vaccinated and boosted at the time of infection. The median age of breakthrough cases is 41 years (range: 5-108). There were 2,597 (1.3%) breakthrough

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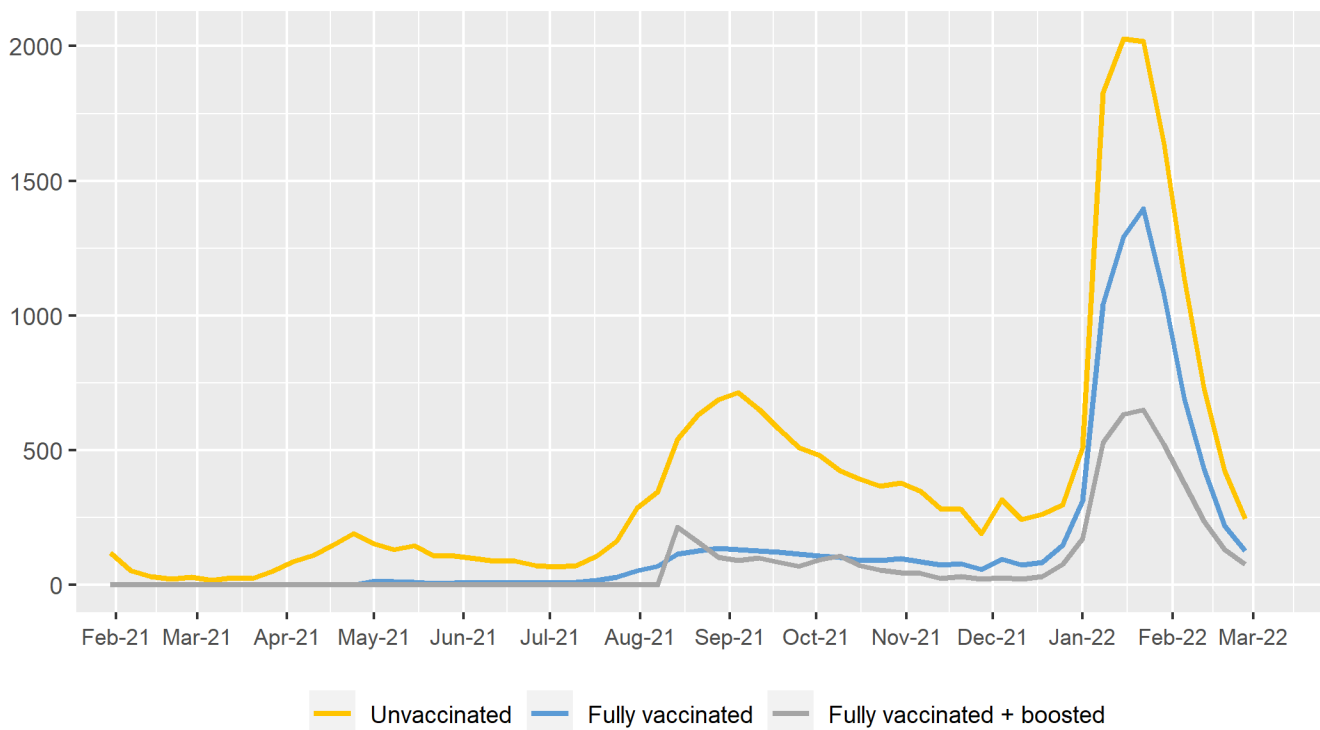
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cases among residents of care facilities, senior living communities or other congregate living settings. 29,575 (15.3%) cases were 65 or older. There have been a total of 12,986 (6.7%) cases aged 12-17.

Cases of COVID-19 are much more common in unvaccinated⁴ individuals than in vaccinated individuals (Figure 1). The rate of COVID-19 cases among unvaccinated individuals in the most recent week was approximately twice the rate of COVID-19 cases among those who are fully vaccinated and 3 times the rate of COVID-19 cases among those who are fully vaccinated and boosted. [Community Levels of COVID-19](#) remain high throughout much of the state. 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.

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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	1,652,655	114,302	2,380	531	6,916.3
Moderna	968,579	59,709	1,599	316	6,164.6
Johnson & Johnson/Janssen	243,916	18,887	708	134	7,743.2

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.

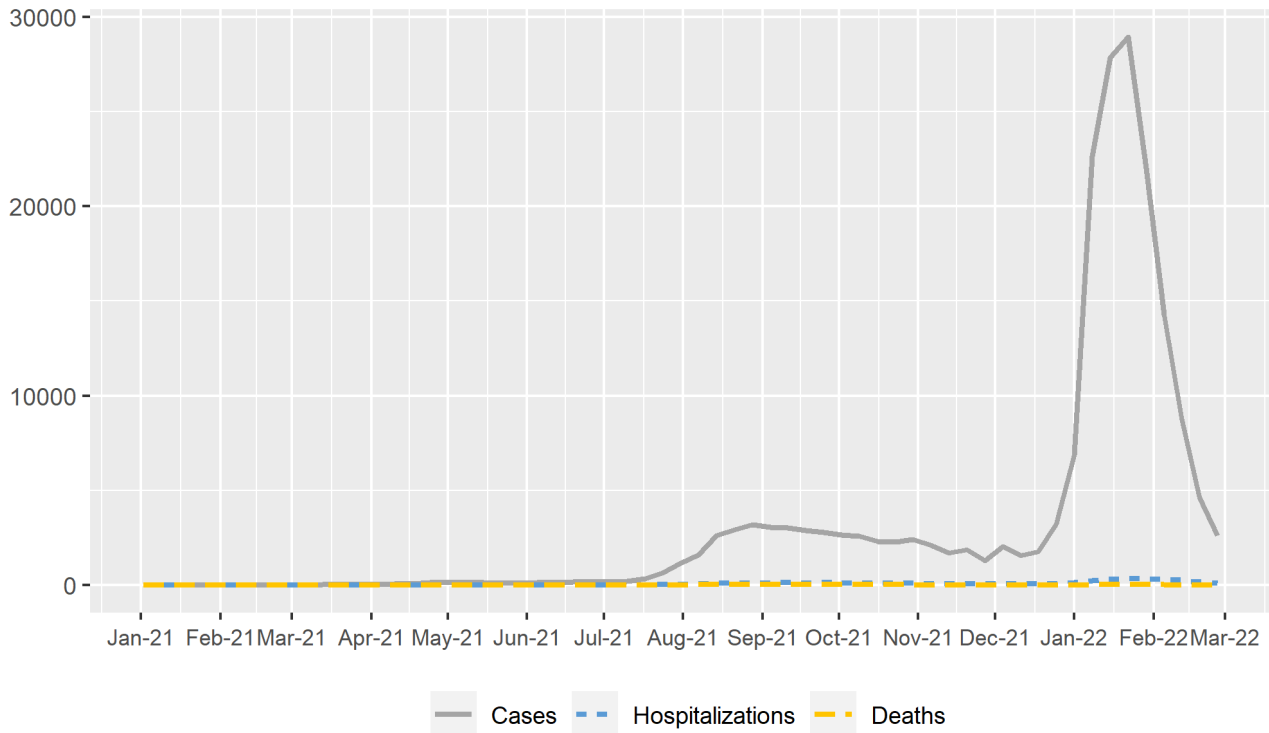
⁷ Table 2 provides the number of cases per 100,000 vaccinated individuals by primary series vaccine manufacturer. Because this figure does not account for the time that each person has been fully vaccinated, it is not a true rate and should not be interpreted as such.

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



Individuals who are fully vaccinated and boosted have an even lower 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>.

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Table 3. COVID-19 breakthrough cases in adults, by vaccination status and severity since January 2021⁹

Case type	Cases	Hospitalizations	Deaths
Fully vaccinated + boosted	43,244	717	83
Fully vaccinated	136,451	3,936	898
Unvaccinated	255,624	14,225	3,450

To date, 2.4% of all known breakthrough cases have been hospitalized (n=4,692), and only 0.5% have died (n=981).¹⁰ The median age of the people who have died is 80 (range: 23-104). 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. Both the risk of hospitalization and death increase 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.

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

Age group	Breakthrough cases	Breakthrough hospitalizations	Breakthrough deaths
0-9	151	1	0
10-19	19,020	43	0
20-29	35,751	185	2
30-39	37,281	258	5
40-49	33,175	270	13
50-59	26,882	500	41
60-69	20,407	986	147
70-79	12,705	1,185	265
80+	7,562	1,264	508
Total	192,934	4,692	981

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Table 5. COVID-19 breakthrough case severity by race¹¹

Race	Breakthrough cases	Breakthrough hospitalizations	Breakthrough deaths
> 1 race	1,330	32	2
American Indian/Alaska Native	2,467	66	8
Asian	6,547	113	19
Black	3,935	122	21
Not Available	56,379	610	203
Other	18,366	323	80
Pacific Islander	245	6	1
White	103,665	3,420	647
Total	192,934	4,692	981

Table 6. COVID-19 breakthrough case severity by ethnicity

Ethnicity	Breakthrough cases	Breakthrough hospitalizations	Breakthrough deaths
Hispanic	19,067	278	25
Not Hispanic	99,525	3,115	558
Unknown	74,342	1,299	398
Total	192,934	4,692	981

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 identify as "Other" race also self-identify as Hispanic or Latino.

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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 received a booster dose.

Table 7. COVID-19 deaths by month, by breakthrough case status¹²

Month	Total COVID-19 deaths	Breakthrough deaths	Percent breakthrough deaths
March 2021	125	4	3.2
April 2021	121	6	5.0
May 2021	222	19	8.6
June 2021	116	15	12.9
July 2021	95	16	16.8
August 2021	599	134	22.4
September 2021	918	197	21.5
October 2021	645	175	27.1
November 2021	398	93	23.4
December 2021	333	80	24.0
January 2022	412	139	33.7
February 2022	263	103	39.2

¹² Data in Table 7 will be updated monthly and will reflect cases from the previous month.

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COVID-19 variants

Table 8. COVID-19 breakthrough cases associated with variants of concern¹³

Overall, approximately 6.2% of positive molecular specimens in Oregon have been sequenced. Omicron is currently the dominant variant circulating in Oregon. At this time, 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)	1,454
Delta (B.1.617.2)	2,360

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

¹³ 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.

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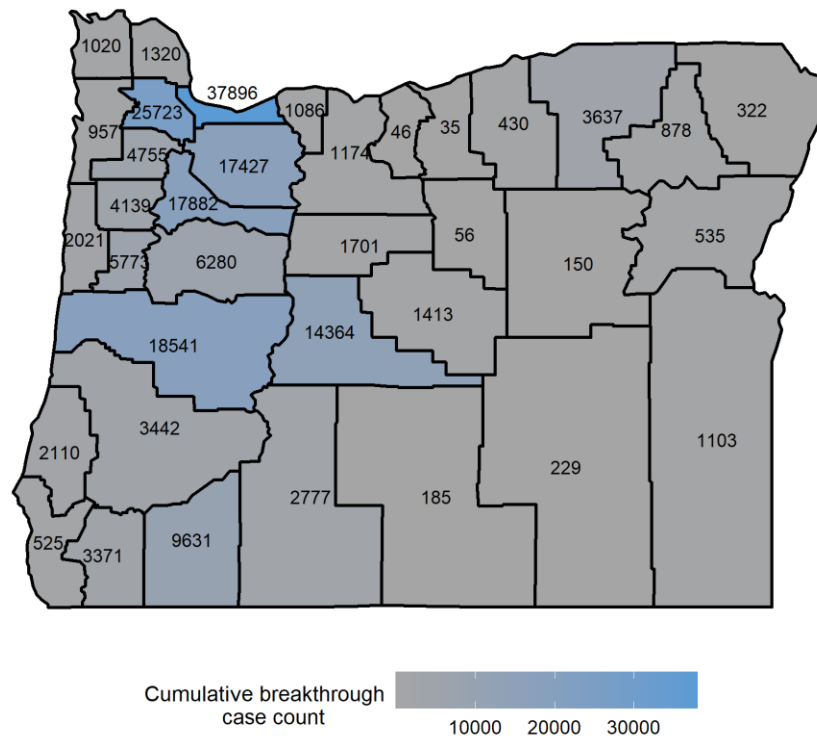
Breakthrough cases by county

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 weekly data. The “Cases in previous week” column references the number of vaccine breakthrough cases newly reported between February 20 and February 26. This count may not reflect the full number of vaccine breakthrough cases that occurred during this time, as breakthrough case ascertainment can lag by several weeks.

Figure 3. Map of COVID-19 breakthrough case cumulative counts, by county of residence¹⁴



¹⁴ Counties that have a total of fewer than 10 cases will appear grey without a data label.

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Table 10. COVID-19 breakthrough cases by county of residence¹⁵

County	Cumulative cases	Cases in previous week
Baker	535	1-9
Benton	5773	89
Clackamas	17427	203
Clatsop	1020	17
Columbia	1320	19
Coos	2110	38
Crook	1413	19
Curry	525	20
Deschutes	14364	144
Douglas	3442	61
Gilliam	35	1-9
Grant	150	1-9
Harney	229	1-9
Hood River	1086	15
Jackson	9631	172
Jefferson	1701	17
Josephine	3371	63
Klamath	2777	29

¹⁵ Counties that have a total of fewer than 10 cases will be reported as 1-9 cases.

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County	Cumulative cases	Cases in previous week
Lake	185	10
Lane	18541	246
Lincoln	2021	43
Linn	6280	82
Malheur	1103	18
Marion	17882	199
Morrow	430	0
Multnomah	37896	517
Polk	4139	59
Sherman	46	1-9
Tillamook	957	20
Umatilla	3637	32
Union	878	16
Wallowa	322	1-9
Wasco	1174	21
Washington	25723	373
Wheeler	56	0
Yamhill	4755	69