COVID-19 Breakthrough Report

Oregon's Weekly Surveillance Summary

Breakthrough case report - January 13, 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 CDC.

This report includes only those vaccine breakthrough cases which are reported to public health following a positive test result. Many vaccine breakthrough cases are believed to experience no symptoms or minimal symptoms.[3] These cases are unlikely to undergo testing for COVID-19 and be reported to public health. Therefore, the true number of vaccine breakthrough cases is unknown. The number of vaccine breakthrough cases must be interpreted within the context of approximately 2.8 million people in Oregon who have completed a primary COVID-19 vaccine series.

COVID-19 cases in vaccinated and unvaccinated people

Weekly summary

During the week of January 2–January 8, there were 45,334 cases of COVID-19. 33,363 (73.6%) were unvaccinated and 11,971 (26.4%) were vaccine breakthrough cases. The median age of breakthrough cases was 36 years. 45 (0.4%) breakthrough cases were residents of care facilities, senior living communities or other congregate living settings. 1198 (10%) cases were 65 or older. There were 985 (8.2%) cases aged 12-17.

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[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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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	Breakthrough cases	Percent breakthrough case
2021-12-04	6,473	2,053	31.7
2021-12-11	4,971	1,555	31.3
2021-12-18	5,371	1,748	32.5
2021-12-25	6,962	3,150	45.2
2022-01-01	15,233	6,419	42.1
2022-01-08	45,334	11,971	26.4

Cumulative summary

Overall, there have been 72,683 vaccine breakthrough cases identified in Oregon. The median age of breakthrough cases is 44 years (range: 5-106). 1,820 (2.5%) breakthrough cases were residents of care facilities, senior living communities or other congregate living settings. 14,093 (19.4%) cases were 65 or older. There have been a total of 3,003 (4.1%) cases aged 12-17. Breakthrough cases have been reported in all 36 counties.

Cases of COVID-19 are much more common in unvaccinated[4] individuals than in vaccinated individuals (Figure 1). The rate of COVID-19 cases among unvaccinated individuals in the most recent week was more than 5 times the rate of COVID-19 cases among those who are fully vaccinated. Community spread is extreme throughout the state. As COVID-19 cases have increased across Oregon, vaccine breakthrough cases have also increased, but at a much lower rate than in the unvaccinated. Vaccination, including boosting, remains the most effective tool to reduce the spread of COVID-19.
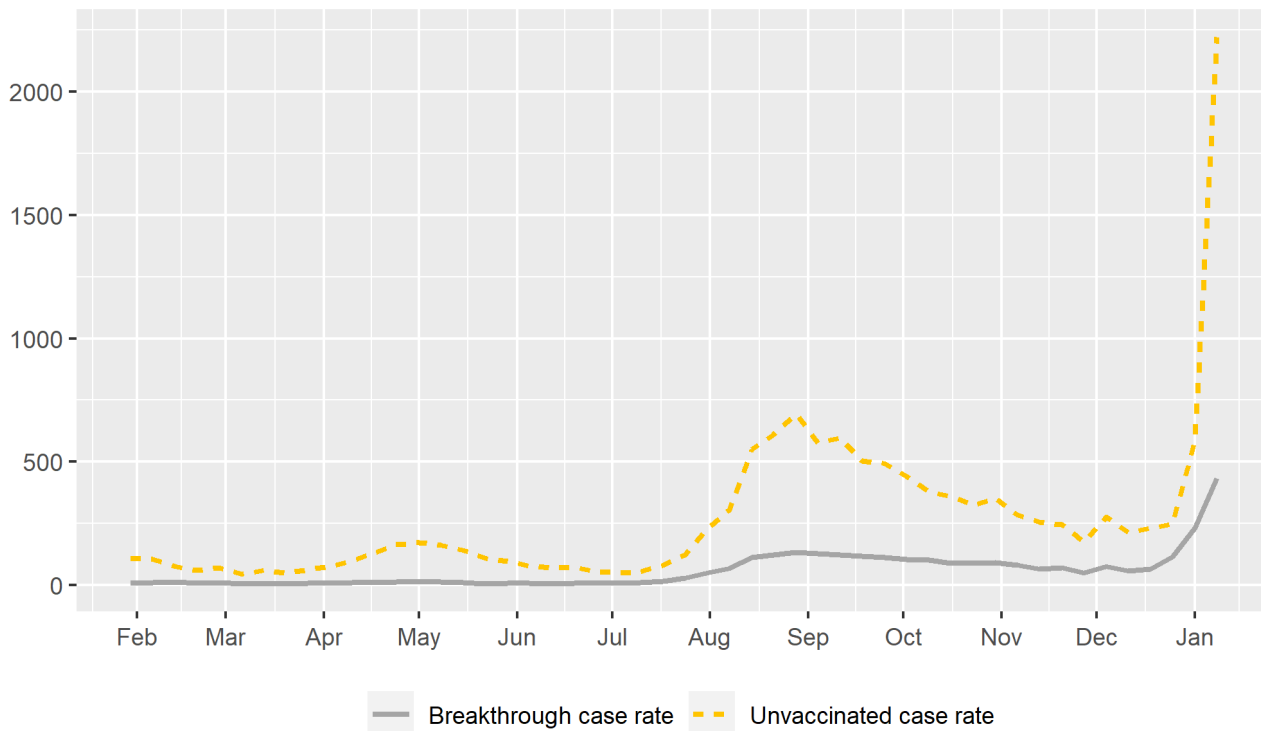
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[4] Unvaccinated persons are defined as people who have not received an approved COVID-19 vaccine, or who have not completed a COVID-19 vaccine series.

Data are provisional and subject to change.   2

Figure 1. COVID-19 cases per 100,000 per week, by vaccination status

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).[5]

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[5] 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.
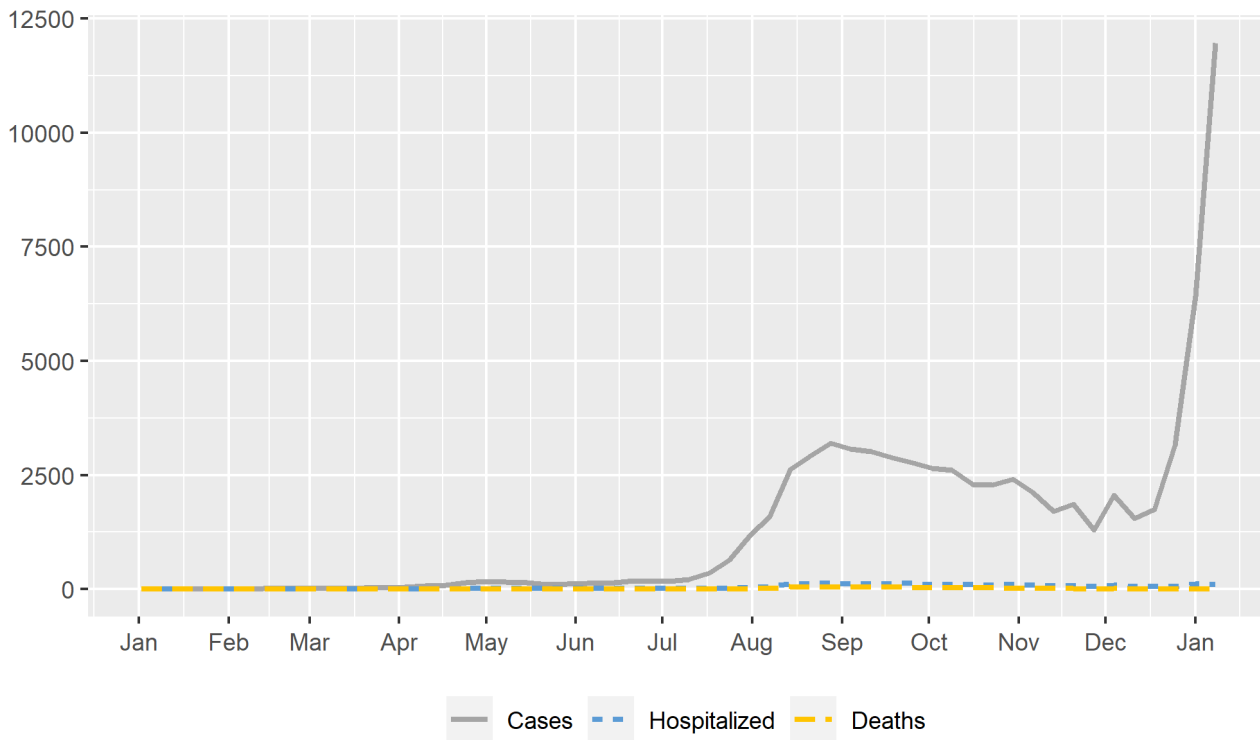
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Table 2. COVID-19 Breakthrough cases by vaccine manufacturer and severity[6]

Vaccine manufacturer	Primary series completed	Cases	Hospitalizations	Deaths	Cases per 100,000 vaccinated
Pfizer	1,596,627	39,208	1,152	359	2,455.7
Moderna	955,549	19,861	742	189	2,078.5
Johnson & Johnson/Janssen	239,399	7,812	373	93	3,263.2

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

[6] Table 2 provides the number of cases per 100,000 vaccinated individuals by 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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To date, 3.5% of all known breakthrough cases have been hospitalized (n=2,543), and only 1% have died (n=695).[7] The median age of the people who have died is 81 (range: 29-103). 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 3, 4 and 5 provide detailed vaccine breakthrough severity data by age, race and ethnicity. Both the risk of hospitalization and death increase with age.

Table 3. COVID-19 breakthrough cases by age group and severity

Age group	Breakthrough cases	Breakthrough hospitalizations	Breakthrough deaths
0-9	14	0	0
10-19	4,842	16	0
20-29	12,679	70	1
30-39	13,519	93	2
40-49	12,233	130	10
50-59	10,613	256	26
60-69	8,947	524	104
70-79	6,134	683	182
80+	3,702	771	370
Total	72,683	2,543	695

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[7] 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 case severity by race[8]

Race	Cases	Hospitalizations	Deaths
> 1 race	650	20	2
American Indian/Alaska Native	948	34	7
Asian	2,171	51	15
Black	1,424	62	15
Not Available	18,306	341	150
Other	5,730	159	58
Pacific Islander	138	5	1
White	43,316	1,871	447
Total	72,683	2,543	695

Table 5. COVID-19 breakthrough case severity by ethnicity

Ethnicity	Cases	Hospitalizations	Deaths
Hispanic	5,722	116	15
Not Hispanic	39,057	1,663	379
Unknown	27,904	764	301
Total	72,683	2,543	695

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[8] 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.

Table 6 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 increased over time and appears to have stabilized. This trend is likely multifactorial and may be associated with increased COVID-19 transmission in our communities, the proportion of the population which has received a booster dose, and reduced disease severity associated with infection caused by the Omicron variant.

Table 6. COVID-19 deaths by month, by breakthrough case status[9]

Month	Total COVID-19 deaths	Vaccine breakthrough deaths	Percent vaccine breakthrough deaths
March 2021	124	4	3.2
April 2021	119	6	5.0
May 2021	217	19	8.8
June 2021	115	15	13.0
July 2021	93	16	17.2
August 2021	589	132	22.4
September 2021	907	193	21.3
October 2021	643	175	27.2
November 2021	382	86	22.5
December 2021	188	37	19.7

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[9] Data in Table 6 will be updated monthly and will reflect cases from the previous month.

COVID-19 variants

Table 7. COVID-19 breakthrough cases associated with variants of concern[10]

Overall, approximately 7.3% 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	Cases
Omicron (B.1.1.529)	38
Delta (B.1.617.2)	2,110

Table 8. COVID-19 breakthrough cases associated with variants being monitored

Subtype	Cases
Alpha (B.1.1.7)	152
Beta (B.1.351)	17
Gamma (P.1)	63
Epsilon (B.1.427/B.1.429)	40
Iota (B.1.526)	30

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[10] As of September 29, 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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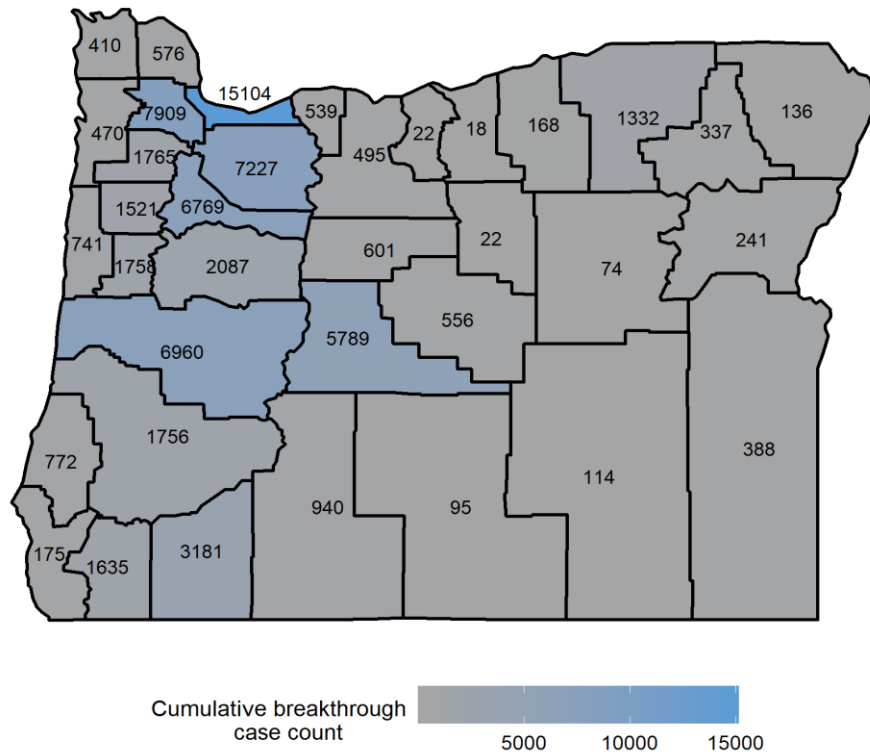
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Breakthrough cases by county

Figure 3 and Table 9 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 9 provides both cumulative and weekly data. The "Cases in previous week" column references the number of vaccine breakthrough cases newly reported between January 2 and January 8. 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 residence[11]

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

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Table 9. COVID-19 breakthrough cases by county of residence[12]

County	Cumulative cases	Cases in previous week
Baker	241	33
Benton	1758	466
Clackamas	7227	1688
Clatsop	410	64
Columbia	576	80
Coos	772	128
Crook	556	91
Curry	175	32
Deschutes	5789	886
Douglas	1756	141
Gilliam	18	1-9
Grant	74	1-9
Harney	114	1-9
Hood River	539	86
Jackson	3181	274
Jefferson	601	151
Josephine	1635	157
Klamath	940	123

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

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Lake	95	1-9
Lane	6960	751
Lincoln	741	97
Linn	2087	173
Malheur	388	43
Marion	6769	1322
Morrow	168	31
Multnomah	15104	2547
Polk	1521	253
Sherman	22	1-9
Tillamook	470	45
Umatilla	1332	250
Union	337	38
Wallowa	136	10
Wasco	495	50
Washington	7909	1528
Wheeler	22	1-9
Yamhill	1765	416

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