

COVID-19 Breakthrough Report

Oregon's Monthly Surveillance Summary



Monthly Vaccine Breakthrough Case Report - July 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 1.7 million people who have received a booster dose.

¹ The monthly summary, Figure 1, and Figure 2 use the date that cases are reported to Oregon Health Authority (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 Centers for Disease Control and Prevention (CDC) 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

Monthly summary

During the month of July 2022, there were 40,013 cases of COVID-19 reported to OHA. Of these, 18,622 (46.5%) were unvaccinated, 21,380 (53.4%) were vaccine breakthrough cases, and 11 (0.0%) had an unknown vaccination status. Of all vaccine breakthrough cases in July, 14,388 (67.3%) were fully vaccinated and boosted. The median age of all vaccine breakthrough cases was 55 years. There were 222 (1.0%) breakthrough cases among residents of care facilities, senior living communities or other congregate living settings. There were 6,392 (29.9%) cases in persons 65 or older. There were 522 (2.4%) 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 |
|-----------|-------------|-------------------------------------|--|--------------------|----------------------------|
| May 2022 | 44,308 | 44,289 | 100.0 | 25,071 | 56.6 |
| June 2022 | 45,809 | 45,800 | 100.0 | 27,092 | 59.2 |
| July 2022 | 40,013 | 40,002 | 100.0 | 21,380 | 53.4 |

Cumulative summary

Overall, 292,802 vaccine breakthrough cases have been identified in Oregon. Of these, 103,563 (35.4%) 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 3,793 (1.3%) breakthrough cases among residents of care facilities, senior living communities or other congregate living settings. 51,399 (17.6%) cases have been 65 or older. There have been a total of 16,891 (5.8%) cases aged 12-17.

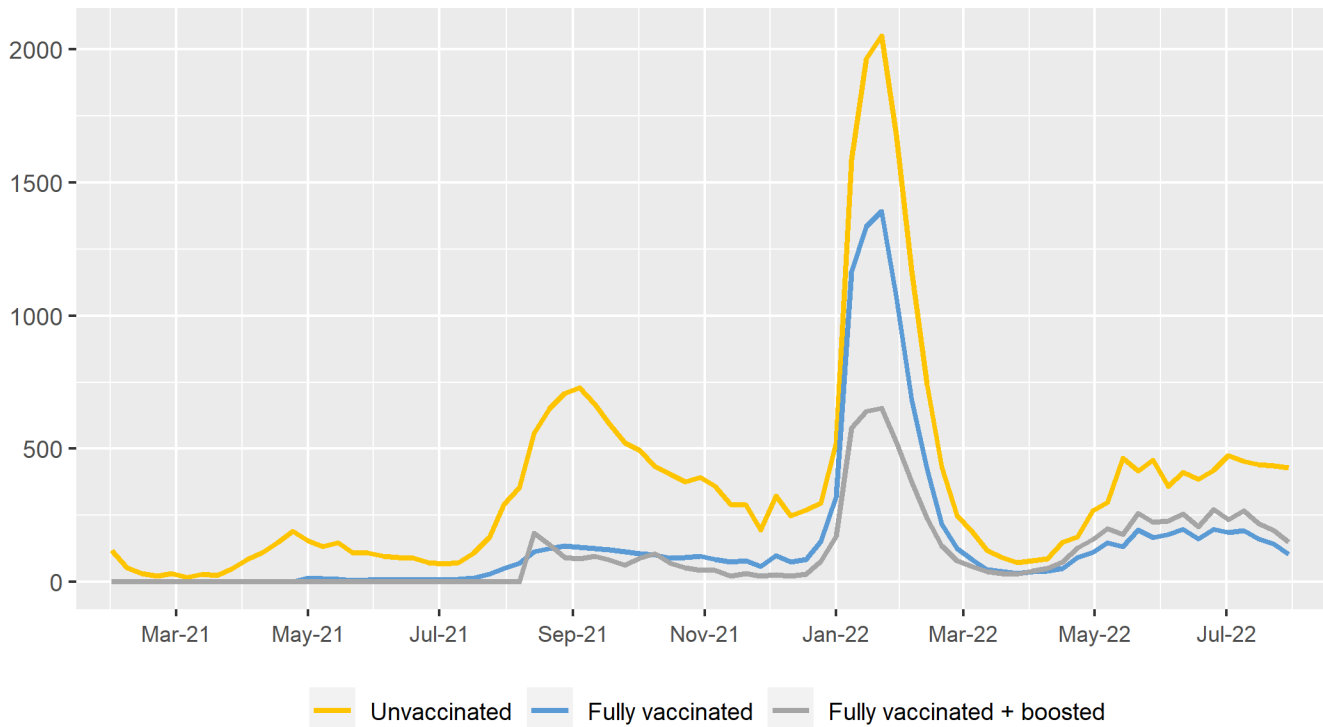
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The incidence of COVID-19 is much higher in unvaccinated⁴ individuals than in vaccinated individuals (Figure 1). The rate of COVID-19 cases among unvaccinated individuals in July was nearly three times the rate among those who were fully vaccinated and more than twice the rate among 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.

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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 | 1,704,612 | 178,004 | 3,984 | 867 | 10,442 |
| Moderna | 989,868 | 89,648 | 2,636 | 539 | 9,057 |
| Johnson & Johnson/Janssen | 247,276 | 25,031 | 1,040 | 212 | 10,123 |

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.

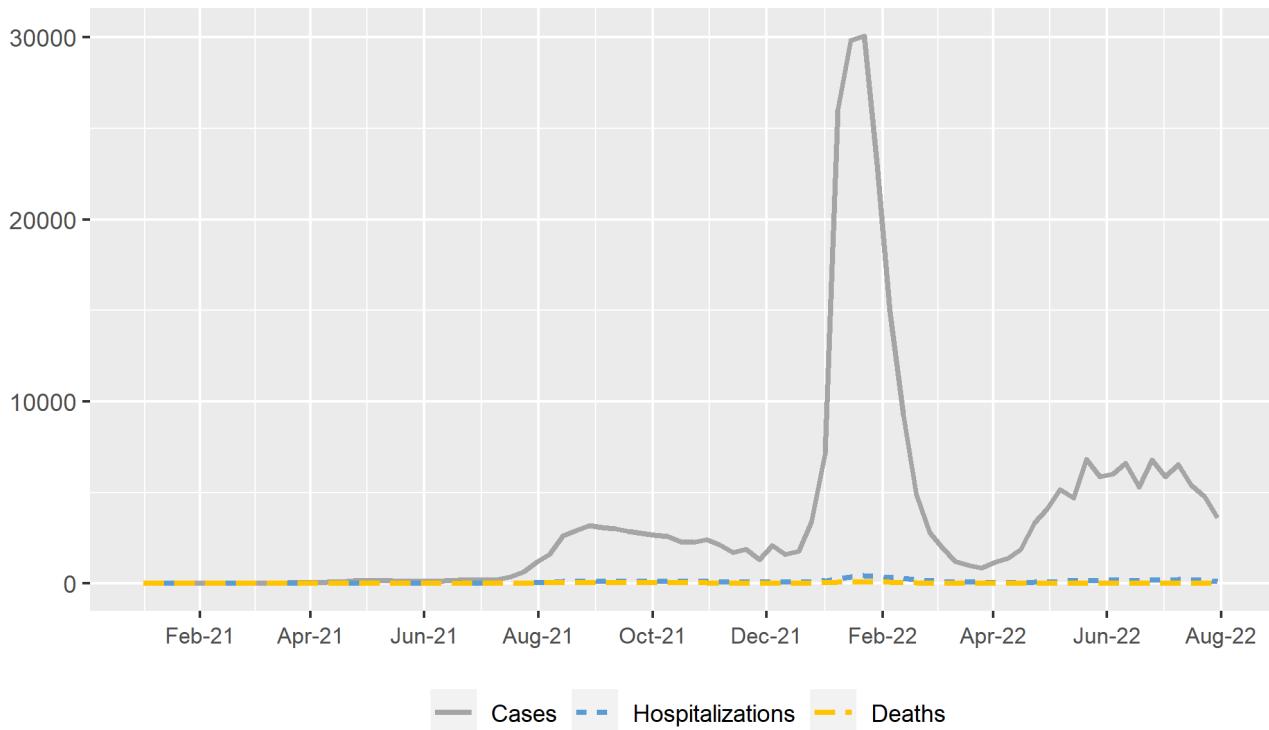
⁷ Table 2 provides the number of cases per 100,000 vaccinated individuals by primary series vaccine manufacturer. Because this figure does not account for the time that each person has been fully vaccinated, it is not a true rate and should not be interpreted as such.

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



Individuals who are fully vaccinated and boosted have 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>.

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

| Case type | Cases | Hospitalizations | Deaths |
|----------------------------|---------|------------------|--------|
| Fully vaccinated + boosted | 100,530 | 2,342 | 358 |
| Fully vaccinated | 166,544 | 5,252 | 1,260 |
| Unvaccinated | 305,101 | 16,473 | 4,269 |

To date, 2.6% of all known breakthrough cases have been hospitalized (n=7,669), and only 0.6% have died (n=1,619).¹⁰ The median age of the people who have died is 80 (range: 21-108). 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.

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Table 4. COVID-19 breakthrough cases by age group and severity¹¹

| Age group | Breakthrough cases | Breakthrough hospitalizations | Breakthrough deaths |
|-----------|--------------------|-------------------------------|---------------------|
| 0-9 | 5,827 | 10 | 0 |
| 10-19 | 27,664 | 85 | 0 |
| 20-29 | 49,836 | 326 | 5 |
| 30-39 | 53,162 | 460 | 8 |
| 40-49 | 47,547 | 464 | 24 |
| 50-59 | 40,060 | 811 | 85 |
| 60-69 | 32,525 | 1,499 | 230 |
| 70-79 | 22,601 | 1,884 | 428 |
| 80+ | 13,575 | 2,130 | 839 |
| Total | 292,802 | 7,669 | 1,619 |

¹¹ Additional breakthrough cases were identified retroactively in the 0-9 age group due to updated vaccination ascertainment methods, resulting in an increase in the cumulative total breakthrough cases in this age group compared to the June 2022 COVID-19 Breakthrough Report.

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Table 5. COVID-19 breakthrough case severity by race¹²

| Race | Breakthrough cases | Breakthrough hospitalizations | Breakthrough deaths |
|-------------------------------|--------------------|-------------------------------|---------------------|
| > 1 race | 4,555 | 50 | 5 |
| American Indian/Alaska Native | 3,524 | 100 | 12 |
| Asian | 11,807 | 218 | 30 |
| Black | 5,907 | 208 | 30 |
| Not Available | 81,193 | 893 | 350 |
| Other | 25,092 | 521 | 114 |
| Pacific Islander | 349 | 12 | 2 |
| White | 160,375 | 5,667 | 1,076 |
| Total | 292,802 | 7,669 | 1,619 |

¹² 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.

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Table 6. COVID-19 breakthrough case severity by ethnicity

| Ethnicity | Breakthrough cases | Breakthrough hospitalizations | Breakthrough deaths |
|------------------|---------------------------|--------------------------------------|----------------------------|
| Hispanic | 26,156 | 452 | 49 |
| Not Hispanic | 159,222 | 5,459 | 987 |
| Unknown | 107,424 | 1,758 | 583 |
| Total | 292,802 | 7,669 | 1,619 |

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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 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 | 123 | 6 | 4.9 |
| May 2021 | 228 | 20 | 8.8 |
| June 2021 | 120 | 16 | 13.3 |
| July 2021 | 99 | 16 | 16.2 |
| August 2021 | 610 | 134 | 22.0 |
| September 2021 | 941 | 199 | 21.1 |
| October 2021 | 661 | 175 | 26.5 |
| November 2021 | 417 | 95 | 22.8 |
| December 2021 | 351 | 87 | 24.8 |
| January 2022 | 619 | 222 | 35.9 |
| February 2022 | 651 | 254 | 39.0 |
| March 2022 | 248 | 116 | 46.8 |
| April 2022 | 89 | 32 | 36.0 |
| May 2022 | 142 | 87 | 61.3 |
| June 2022 | 162 | 83 | 51.2 |
| July 2022 | 127 | 69 | 54.3 |

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COVID-19 variants

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

Overall, approximately 6.7% 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) | 2,811 |
| Omicron (BA.1) | 194 |
| Omicron (BA.2) | 829 |
| Omicron (BA.2.12.1) | 477 |
| Omicron (BA.4) | 46 |
| Omicron (BA.5) | 90 |

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

| Subtype | Breakthrough Cases |
|------------------------------------|--------------------|
| Alpha (B.1.1.7) | 154 |
| Beta (B.1.351) | 17 |
| Gamma (P.1) | 63 |
| Delta (B.1.617.2) | 2,581 |
| Epsilon (B.1.427/B.1.429) | 40 |
| Iota (B.1.526) | 31 |
| All other variants being monitored | 7 |

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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>.

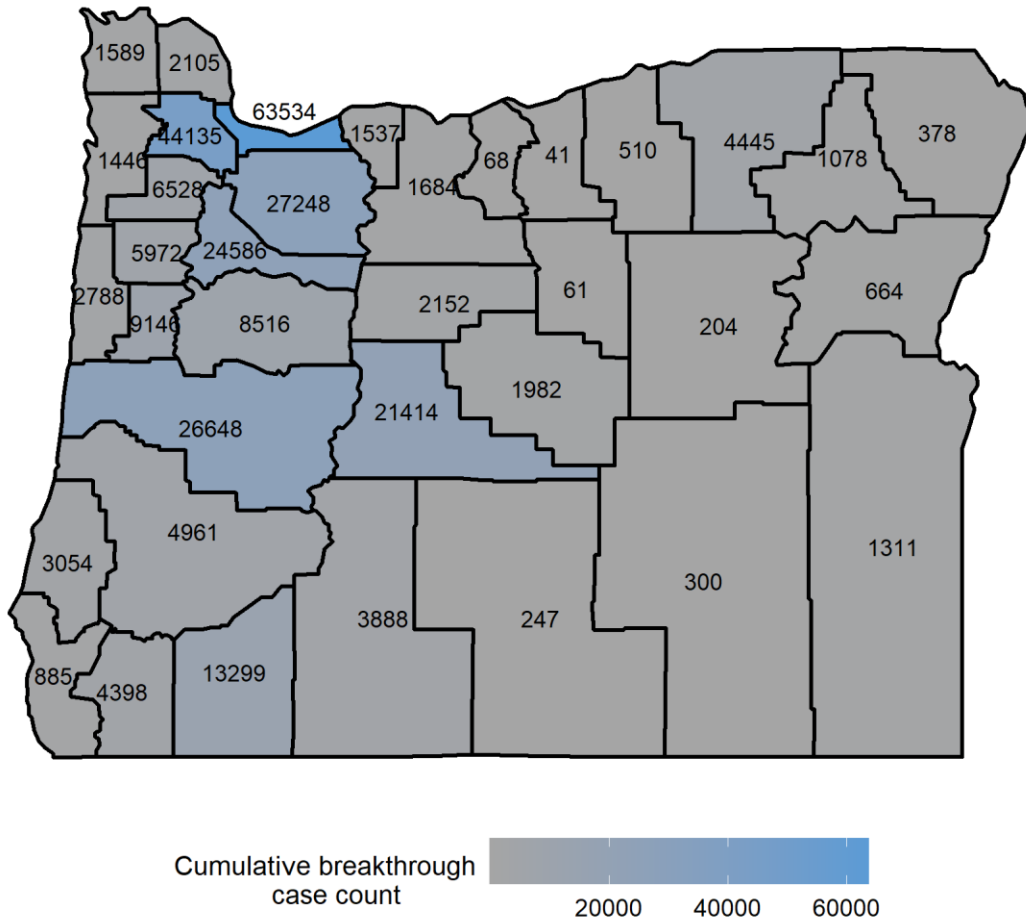
Table 10 provides both cumulative and monthly data. The “Cases in previous month” column references the number of vaccine breakthrough cases newly reported during the month of July. This count may not reflect the full number of vaccine breakthrough cases that occurred during this time, as breakthrough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

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



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Table 10. COVID-19 breakthrough cases by county of residence¹³

| County | Cumulative cases | Cases in previous month |
|------------|------------------|-------------------------|
| Baker | 664 | 38 |
| Benton | 9146 | 635 |
| Clackamas | 27248 | 1985 |
| Clatsop | 1589 | 156 |
| Columbia | 2105 | 183 |
| Coos | 3054 | 273 |
| Crook | 1982 | 159 |
| Curry | 885 | 145 |
| Deschutes | 21414 | 1526 |
| Douglas | 4961 | 531 |
| Gilliam | 41 | 1-9 |
| Grant | 204 | 19 |
| Harney | 300 | 25 |
| Hood River | 1537 | 70 |
| Jackson | 13299 | 1017 |
| Jefferson | 2152 | 120 |
| Josephine | 4398 | 303 |
| Klamath | 3888 | 394 |
| Lake | 247 | 20 |
| Lane | 26648 | 1614 |
| Lincoln | 2788 | 222 |
| Linn | 8516 | 522 |

¹³ Counties that have fewer than 10 cases are reported as 1-9 cases.

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| County | Cumulative cases | Cases in previous month |
|------------|------------------|-------------------------|
| Malheur | 1311 | 92 |
| Marion | 24586 | 1742 |
| Morrow | 510 | 26 |
| Multnomah | 63534 | 4886 |
| Polk | 5972 | 493 |
| Sherman | 68 | 1-9 |
| Tillamook | 1446 | 119 |
| Umatilla | 4445 | 315 |
| Union | 1078 | 63 |
| Wallowa | 378 | 21 |
| Wasco | 1684 | 130 |
| Washington | 44135 | 3127 |
| Wheeler | 61 | 0 |
| Yamhill | 6528 | 399 |