

# COVID-19 Breakthrough Report

Oregon's Weekly Surveillance Summary



## Weekly Vaccine Breakthrough Case Report - February 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.<sup>1</sup> 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.<sup>2</sup> 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. 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 approximately one-third of recent 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.<sup>3</sup> 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.

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<sup>1</sup> 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.

<sup>2</sup> 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>

<sup>3</sup> 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 January 23–January 29, there were 44,421 cases of COVID-19. 28,990 (65.3%) were unvaccinated and 15,431 (34.7%) were vaccine breakthrough cases. Of all vaccine breakthrough cases, 4,852 (31.4%) were fully vaccinated and boosted. The median age of all vaccine breakthrough cases was 48 years. 128 (0.8%) breakthrough cases were residents of care facilities, senior living communities or other congregate living settings. 2123 (13.8%) cases were 65 or older. There were 1223 (7.9%) 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 | Breakthrough cases | Percent breakthrough case |
|------------------|-------------|--------------------|---------------------------|
| 2021-12-25       | 6,961       | 3,235              | 46.5                      |
| 2022-01-01       | 15,229      | 6,513              | 42.8                      |
| 2022-01-08       | 45,314      | 15,856             | 35.0                      |
| 2022-01-15       | 55,584      | 13,282             | 23.9                      |
| 2022-01-22       | 56,988      | 18,285             | 32.1                      |
| 2022-01-29       | 44,421      | 15,431             | 34.7                      |

### Cumulative summary

Overall, there have been 123,740 vaccine breakthrough cases identified in Oregon. Of all vaccine breakthrough cases, 21,458 (17.3%) were fully vaccinated and boosted at the time of infection. The median age of breakthrough cases is 41 years (range: 5-106). 2,174 (1.8%) breakthrough cases were residents of care facilities, senior living communities or other congregate living settings. 20,230 (16.3%) cases were 65 or older. There have been a total of 7,478 (6%) cases aged 12-17.

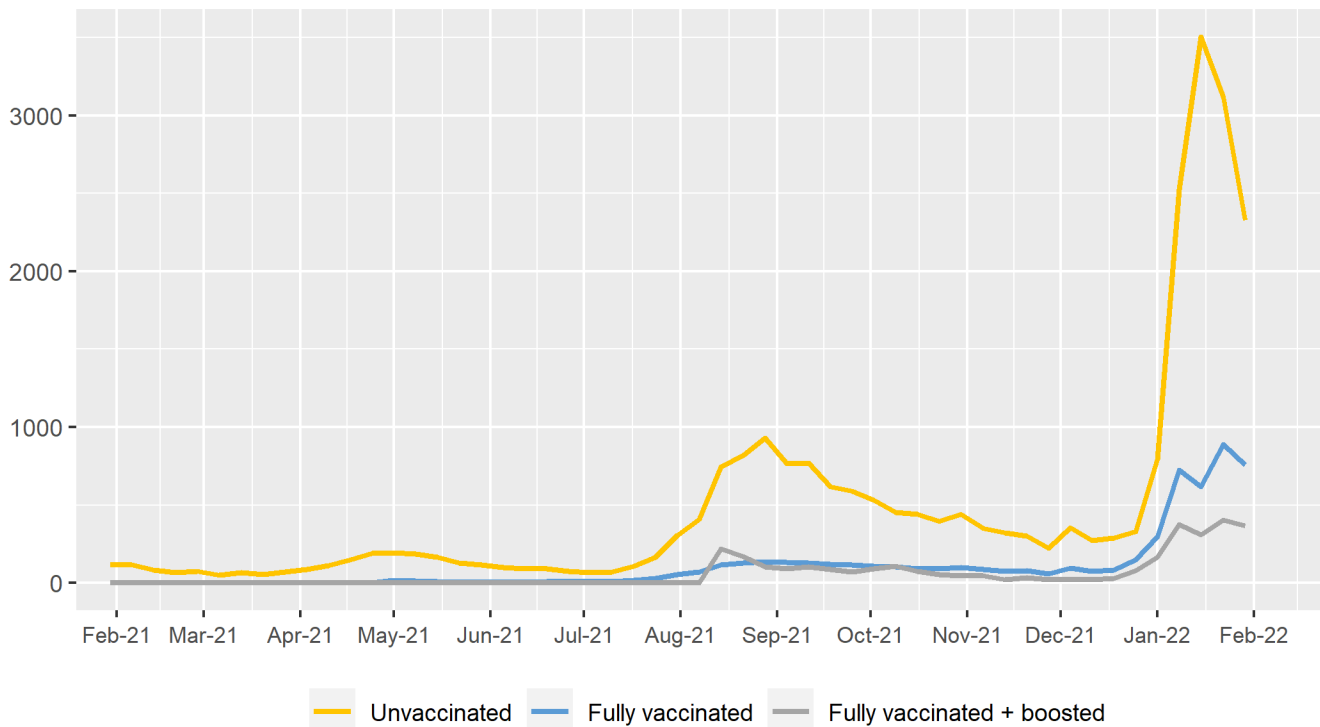
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Cases of COVID-19 are much more common in unvaccinated<sup>4</sup> individuals than in vaccinated individuals (Figure 1). The rate of COVID-19 cases among unvaccinated individuals in the most recent week was more than 3.1 times the rate of COVID-19 cases among those who are fully vaccinated and 6.4 times the rate of COVID-19 cases among those who are fully vaccinated and boosted. 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.

**Figure 1. Incident COVID-19 cases per 100,000 per week in adults, 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

<sup>4</sup> 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.

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manufacturer and severity. Relatively few breakthrough cases have been hospitalized, and even fewer have died (Figure 2).<sup>5</sup>

**Table 2. COVID-19 Breakthrough cases by vaccine manufacturer and severity<sup>6</sup>**

| Vaccine manufacturer      | Primary series completed | Cases  | Hospitalizations | Deaths | Cases per 100,000 vaccinated |
|---------------------------|--------------------------|--------|------------------|--------|------------------------------|
| Pfizer                    | 1,623,785                | 68,664 | 1,560            | 405    | 4,228.6                      |
| Moderna                   | 962,259                  | 35,226 | 1,022            | 217    | 3,660.8                      |
| Johnson & Johnson/Janssen | 241,926                  | 12,069 | 500              | 104    | 4,988.7                      |

Individuals who are fully vaccinated and boosted have an even lower risk of severe illness and death.<sup>7</sup> 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.

<sup>5</sup> 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.

<sup>6</sup> 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.

<sup>7</sup> <https://covid.cdc.gov/covid-data-tracker/#covidnet-hospitalizations-vaccination>.

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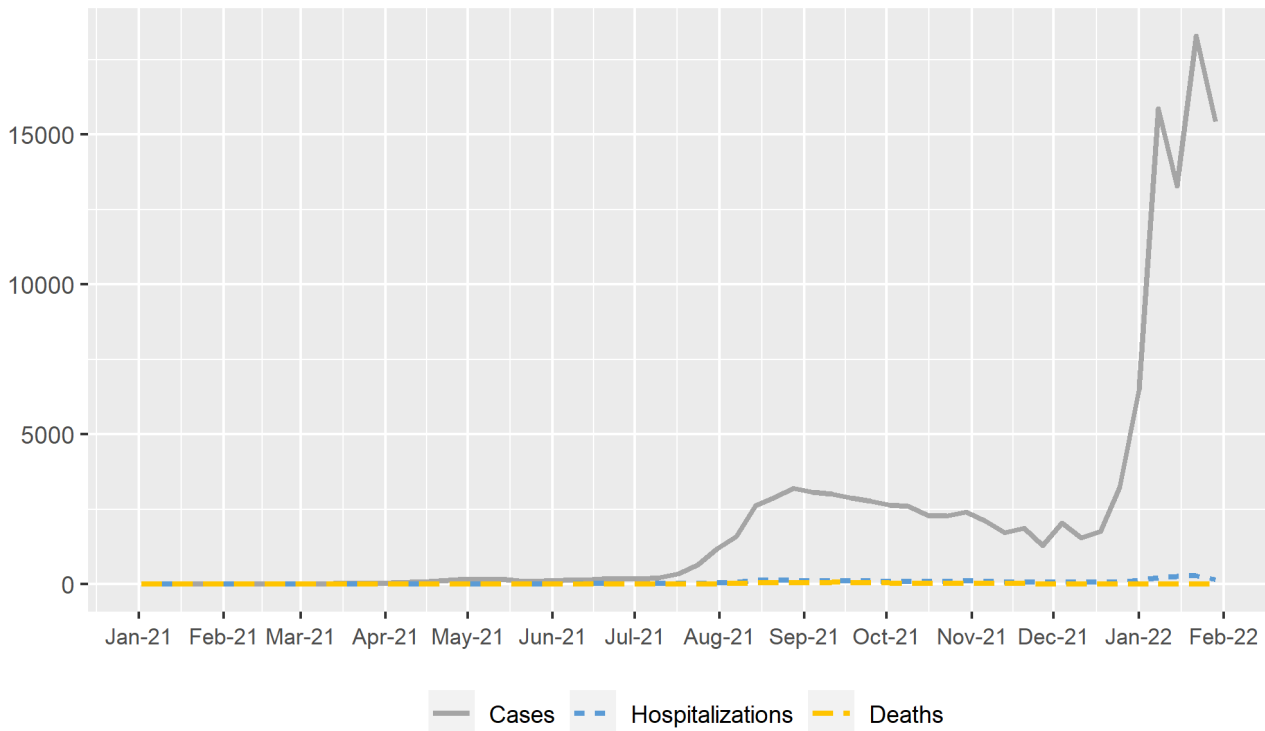
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**Table 3. COVID-19 breakthrough cases in adults, by vaccination status and severity**

| Case type                  | Cases   | Hospitalizations | Deaths |
|----------------------------|---------|------------------|--------|
| Fully vaccinated + boosted | 21,074  | 323              | 28     |
| Fully vaccinated           | 95,073  | 3,037            | 755    |
| Unvaccinated               | 409,995 | 20,939           | 5,338  |

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



To date, 2.7% of all known breakthrough cases have been hospitalized (n=3,387), and only 0.6% have died (n=783).<sup>8</sup> The median age of the people who have died is 81 (range: 29-103). It is important to

<sup>8</sup> 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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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.

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

| <b>Age group</b> | <b>Breakthrough cases</b> | <b>Breakthrough hospitalizations</b> | <b>Breakthrough deaths</b> |
|------------------|---------------------------|--------------------------------------|----------------------------|
| 0-9              | 60                        | 1                                    | 0                          |
| 10-19            | 11,151                    | 26                                   | 0                          |
| 20-29            | 22,545                    | 112                                  | 1                          |
| 30-39            | 23,837                    | 163                                  | 3                          |
| 40-49            | 21,157                    | 180                                  | 11                         |
| 50-59            | 17,395                    | 355                                  | 30                         |
| 60-69            | 13,708                    | 715                                  | 115                        |
| 70-79            | 8,782                     | 877                                  | 203                        |
| 80+              | 5,105                     | 958                                  | 420                        |
| Total            | 123,740                   | 3,387                                | 783                        |

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**Table 5. COVID-19 breakthrough case severity by race<sup>9</sup>**

| <b>Race</b>                   | <b>Cases</b>   | <b>Hospitalizations</b> | <b>Deaths</b> |
|-------------------------------|----------------|-------------------------|---------------|
| > 1 race                      | 972            | 25                      | 2             |
| American Indian/Alaska Native | 1,650          | 42                      | 7             |
| Asian                         | 3,960          | 78                      | 15            |
| Black                         | 2,566          | 90                      | 16            |
| Not Available                 | 34,973         | 448                     | 166           |
| Other                         | 11,161         | 208                     | 64            |
| Pacific Islander              | 193            | 6                       | 1             |
| White                         | 68,265         | 2,490                   | 512           |
| <b>Total</b>                  | <b>123,740</b> | <b>3,387</b>            | <b>783</b>    |

**Table 6. COVID-19 breakthrough case severity by ethnicity**

| <b>Ethnicity</b> | <b>Cases</b>   | <b>Hospitalizations</b> | <b>Deaths</b> |
|------------------|----------------|-------------------------|---------------|
| Hispanic         | 11,419         | 174                     | 17            |
| Not Hispanic     | 64,476         | 2,261                   | 435           |
| Unknown          | 47,845         | 952                     | 331           |
| <b>Total</b>     | <b>123,740</b> | <b>3,387</b>            | <b>783</b>    |

<sup>9</sup> 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 increased over time and appears to have stabilized. This trend is likely multifactorial and may be associated with the proportion of the population which has received a booster dose and reduced disease severity associated with infection caused by the Omicron variant.

**Table 7. COVID-19 deaths by month, by breakthrough case status<sup>10</sup>**

| Month          | Total COVID-19 deaths | Vaccine breakthrough deaths | Percent vaccine breakthrough deaths |
|----------------|-----------------------|-----------------------------|-------------------------------------|
| March 2021     | 126                   | 4                           | 3.2                                 |
| April 2021     | 121                   | 6                           | 5.0                                 |
| May 2021       | 219                   | 19                          | 8.7                                 |
| June 2021      | 115                   | 15                          | 13.0                                |
| July 2021      | 94                    | 16                          | 17.0                                |
| August 2021    | 593                   | 132                         | 22.3                                |
| September 2021 | 913                   | 195                         | 21.4                                |
| October 2021   | 644                   | 176                         | 27.3                                |
| November 2021  | 398                   | 93                          | 23.4                                |
| December 2021  | 279                   | 62                          | 22.2                                |
| January 2022   | 222                   | 64                          | 28.8                                |

<sup>10</sup> 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 concern<sup>11</sup>**

Overall, approximately 6.4% 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) | 373   |
| Delta (B.1.617.2)   | 2,186 |

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

| Subtype                   | 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    |

<sup>11</sup> 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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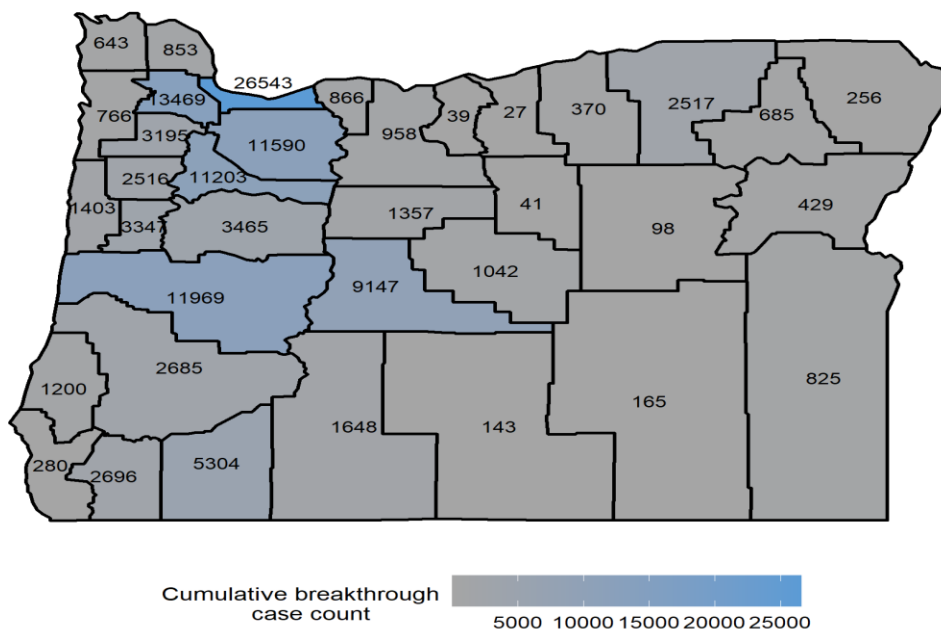
## Breakthrough cases by county

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 January 23 and January 29. 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<sup>12</sup>**



<sup>12</sup> 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 residence<sup>13</sup>

| County     | Cumulative cases | Cases in previous week |
|------------|------------------|------------------------|
| Baker      | 429              | 61                     |
| Benton     | 3347             | 510                    |
| Clackamas  | 11590            | 1249                   |
| Clatsop    | 643              | 89                     |
| Columbia   | 853              | 90                     |
| Coos       | 1200             | 126                    |
| Crook      | 1042             | 149                    |
| Curry      | 280              | 38                     |
| Deschutes  | 9147             | 1068                   |
| Douglas    | 2685             | 399                    |
| Gilliam    | 27               | 1-9                    |
| Grant      | 98               | 1-9                    |
| Harney     | 165              | 40                     |
| Hood River | 866              | 107                    |
| Jackson    | 5304             | 855                    |
| Jefferson  | 1357             | 272                    |
| Josephine  | 2696             | 346                    |
| Klamath    | 1648             | 317                    |

<sup>13</sup> 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       | 143              | 23                     |
| Lane       | 11969            | 1379                   |
| Lincoln    | 1403             | 194                    |
| Linn       | 3465             | 521                    |
| Malheur    | 825              | 158                    |
| Marion     | 11203            | 1650                   |
| Morrow     | 370              | 63                     |
| Multnomah  | 26543            | 2099                   |
| Polk       | 2516             | 394                    |
| Sherman    | 39               | 1-9                    |
| Tillamook  | 766              | 89                     |
| Umatilla   | 2517             | 339                    |
| Union      | 685              | 132                    |
| Wallowa    | 256              | 42                     |
| Wasco      | 958              | 184                    |
| Washington | 13469            | 1937                   |
| Wheeler    | 41               | 10                     |
| Yamhill    | 3195             | 486                    |