

# COVID-19 Breakthrough Report

Oregon's Weekly Surveillance Summary



## Weekly Vaccine Breakthrough Case Report - February 24, 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 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.<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 and the approximately 1.5 million people in Oregon who have received a booster dose.

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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 February 13–February 19, there were 9,873 cases of COVID-19 reported to public health. Of these, 5,787 (58.6%) were unvaccinated, 4,078 (41.3%) were vaccine breakthrough cases, and 8 (0.1%) had an unknown vaccination status. Of all vaccine breakthrough cases, 1,722 (42.2%) were fully vaccinated and boosted. The median age of all vaccine breakthrough cases was 51 years. There were 52 (1.3%) breakthrough cases among residents of care facilities, senior living communities or other congregate living settings. There were 925 (22.7%) cases in persons 65 or older. There were 212 (5.2%) 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
2022-01-15	55,560	55,530	99.9	27,741	50.0
2022-01-22	56,974	56,953	100.0	27,949	49.1
2022-01-29	44,398	44,365	99.9	20,968	47.3
2022-02-05	29,405	29,313	99.7	13,464	45.9
2022-02-12	18,050	18,031	99.9	8,796	48.8
2022-02-19	9,873	9,865	99.9	4,078	41.3

### Cumulative summary

Overall, there have been 187,020 vaccine breakthrough cases identified in Oregon. Of all vaccine breakthrough cases, 41,969 (22.4%) were fully vaccinated and boosted at the time of infection. The median age of breakthrough cases is 41 years (range: 5-108). 2,520 (1.3%) breakthrough cases were

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residents of care facilities, senior living communities or other congregate living settings. 28,488 (15.2%) cases were 65 or older. There have been a total of 12,527 (6.7%) cases aged 12-17.

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 2.5 times the rate of COVID-19 cases among those who are fully vaccinated and 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.

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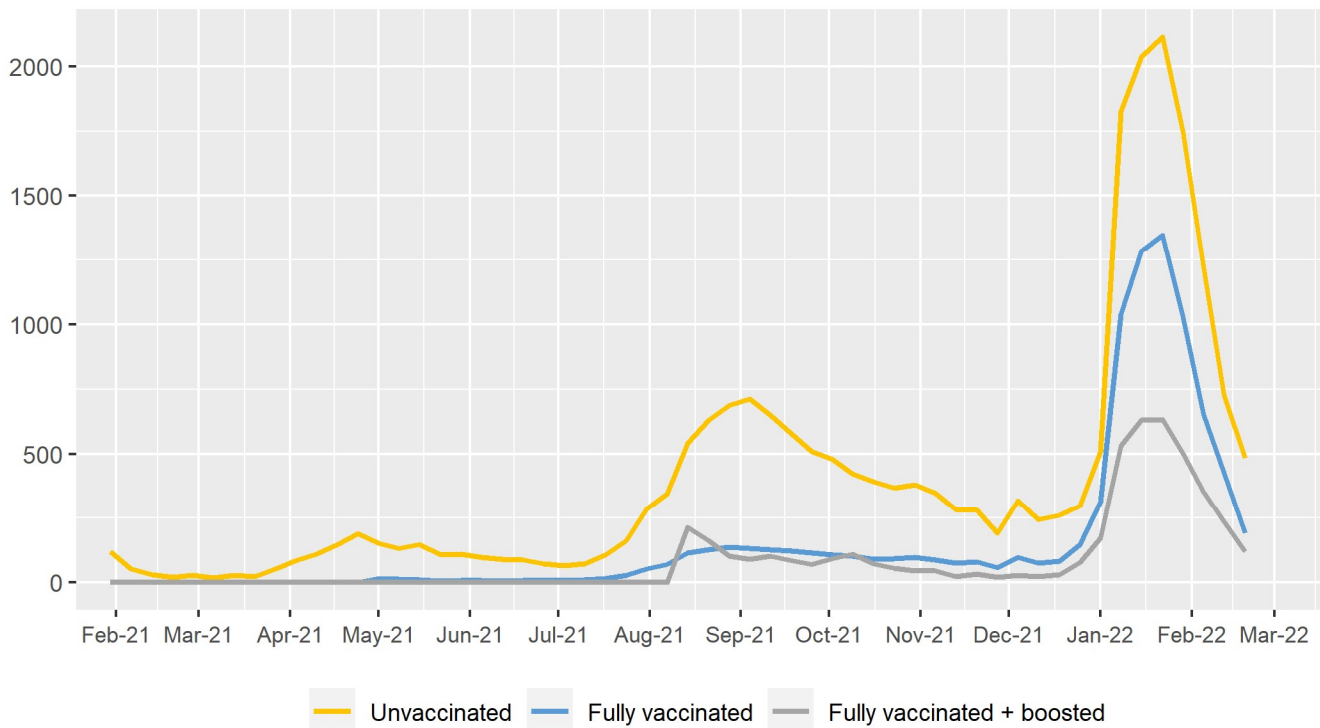
<sup>4</sup> Unvaccinated persons are defined as people who have not received an approved COVID-19 vaccine, or who have not completed a COVID-19 vaccine series.

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**Figure 1. Incident COVID-19 cases per 100,000 per week in adults, by vaccination status<sup>5</sup>**



## 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).<sup>6</sup>

<sup>5</sup> Cases with unknown vaccination status were excluded from this figure.

<sup>6</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-

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**Table 2. COVID-19 Breakthrough cases by vaccine manufacturer and severity<sup>7</sup>**

<b>Primary series vaccine manufacturer</b>	<b>Primary series completed</b>	<b>Cases</b>	<b>Hospitalizations</b>	<b>Deaths</b>	<b>Cases per 100,000 vaccinated</b>
Pfizer	1,647,041	110,827	2,285	510	6,728.9
Moderna	967,333	57,783	1,534	287	5,973.4
Johnson & Johnson/Janssen	243,492	18,383	678	128	7,549.7

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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>7</sup> 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.

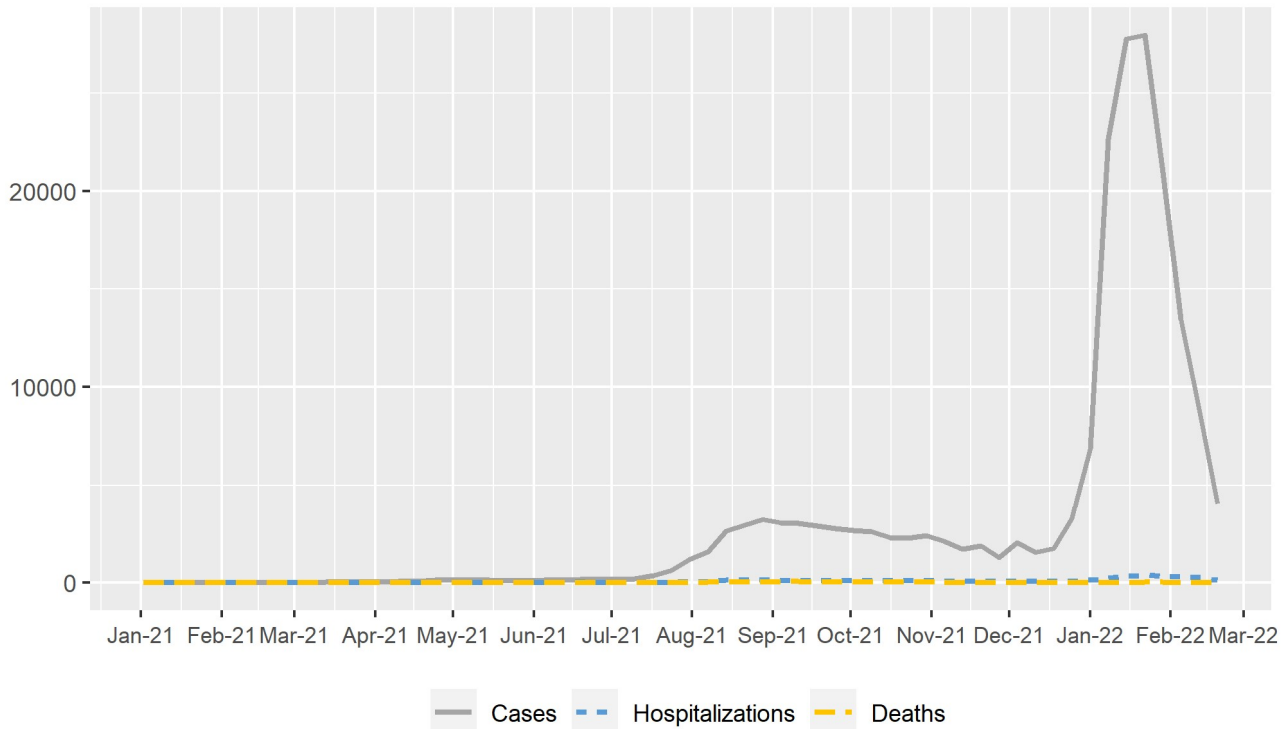
Data are provisional and subject to change.

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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.<sup>8</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>8</sup> <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 2021<sup>9</sup>**

<b>Case type</b>	<b>Cases</b>	<b>Hospitalizations</b>	<b>Deaths</b>
Fully vaccinated + boosted	41,143	666	68
Fully vaccinated	133,109	3,800	857
Unvaccinated	257,305	14,086	3,378

To date, 2.4% of all known breakthrough cases have been hospitalized (n=4,501), and only 0.5% have died (n=925).<sup>10</sup> 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.

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<sup>9</sup> 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.

<sup>10</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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Table 4. COVID-19 breakthrough cases by age group and severity

Age group	Breakthrough cases	Breakthrough hospitalizations	Breakthrough deaths
0-9	153	1	0
10-19	18,403	38	0
20-29	34,799	172	2
30-39	36,214	246	5
40-49	32,181	254	12
50-59	26,030	482	37
60-69	19,725	946	142
70-79	12,253	1,147	250
80+	7,262	1,215	477
Total	187,020	4,501	925



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Table 5. COVID-19 breakthrough case severity by race<sup>11</sup>

Race	Breakthrough cases	Breakthrough hospitalizations	Breakthrough deaths
> 1 race	1,301	31	2
American Indian/Alaska Native	2,392	65	8
Asian	6,348	110	17
Black	3,815	116	20
Not Available	54,587	580	195
Other	17,823	303	73
Pacific Islander	241	6	1
White	100,513	3,290	609
Total	187,020	4,501	925

Table 6. COVID-19 breakthrough case severity by ethnicity

Ethnicity	Breakthrough cases	Breakthrough hospitalizations	Breakthrough deaths
Hispanic	18,329	262	22
Not Hispanic	96,416	2,999	524
Unknown	72,275	1,240	379
Total	187,020	4,501	925

<sup>11</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>12</sup>**

Month	Total COVID-19 deaths	Breakthrough deaths	Percent breakthrough deaths
March 2021	126	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	597	134	22.4
September 2021	918	197	21.5
October 2021	645	175	27.1
November 2021	398	93	23.4
December 2021	332	79	23.8
January 2022	348	109	31.3

<sup>12</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>13</sup>**

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)	1,336
Delta (B.1.617.2)	2,323

**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

<sup>13</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 February 13 and February 19. 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.

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Figure 3. Map of COVID-19 breakthrough case cumulative counts, by county of residence<sup>14</sup>

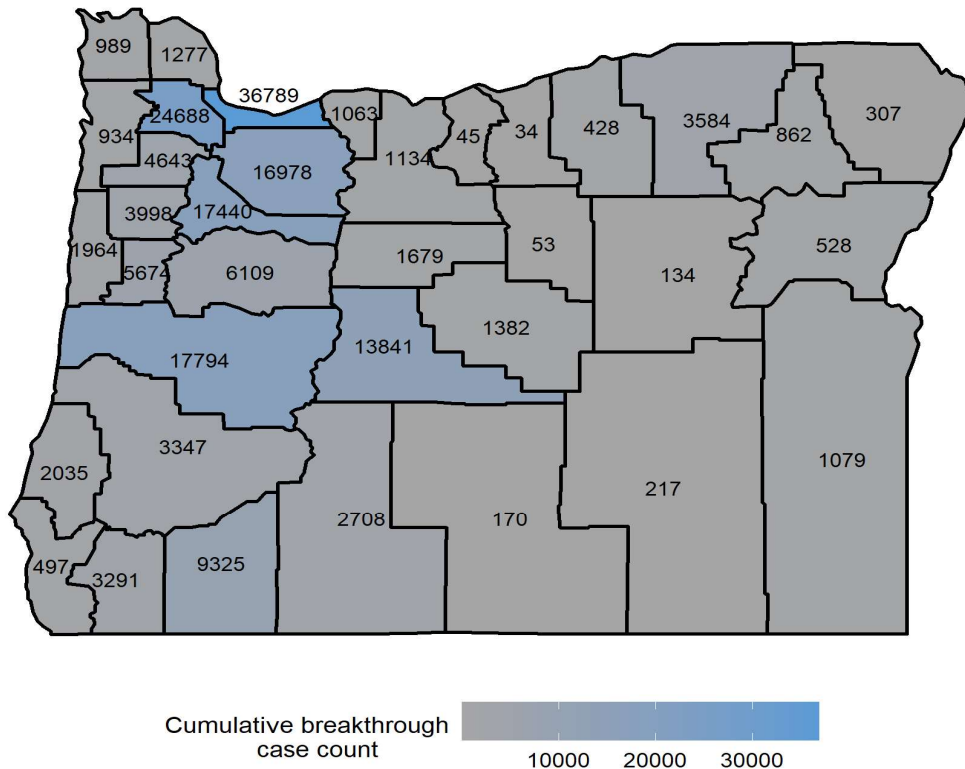


Table 10. COVID-19 breakthrough cases by county of residence<sup>15</sup>

County	Cumulative cases	Cases in previous week
Baker	528	16
Benton	5674	130
Clackamas	16978	351
Clatsop	989	28

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

<sup>15</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
Columbia	1277	24
Coos	2035	43
Crook	1382	30
Curry	497	21
Deschutes	13841	228
Douglas	3347	92
Gilliam	34	1-9
Grant	134	0
Harney	217	1-9
Hood River	1063	28
Jackson	9325	232
Jefferson	1679	23
Josephine	3291	73
Klamath	2708	69
Lake	170	1-9
Lane	17794	532
Lincoln	1964	63
Linn	6109	181
Malheur	1079	19
Marion	17440	346
Morrow	428	1-9

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<b>County</b>	<b>Cumulative cases</b>	<b>Cases in previous week</b>
Multnomah	36789	715
Polk	3998	86
Sherman	45	0
Tillamook	934	27
Umatilla	3584	41
Union	862	24
Wallowa	307	0
Wasco	1134	18
Washington	24688	534
Wheeler	53	0
Yamhill	4643	86