

## Comparing opioid prescription rates: CDC Measures v. Prescription Monitoring Program Measures

On their website <https://www.cdc.gov/drugoverdose/maps/rxrate-maps.html>, the Centers for Disease Control and Prevention present data on prescription opioids for the years 2006-2017. These rates can be drilled down to the state and county level. The Washington State Department of Health has created opioid data dashboards at the levels of Accountable Communities of Health and counties, reachable through <https://www.doh.wa.gov/DataandStatisticalReports/HealthDataVisualization>. In addition, the PMP program has created a set of opioid County Profiles (produced only for 2014), located at <https://www.doh.wa.gov/ForPublicHealthandHealthcareProviders/HealthcareProfessionsandFacilities/PrescriptionMonitoringProgramPMP/CountyProfiles>.

With this variety of sources of opioid prescription data in the nation, states, and counties, it is natural to attempt to compare the results for a specified geography across the datasets. When doing so, however, the observed values often differ appreciably, resulting in confusion and perhaps a low level of confidence as to what the measures are actually measuring. Explanations for these differences are addressed in this document.

General characteristics of the three datasets are best presented in tabular form. Particularly important factors in these comparisons are underlined:

	<b>CDC Maps</b>	<b>DOH Dashboards</b>	<b>DOH County Profiles</b>
<b>Time period</b>	<u>Annual, 2006-2017</u>	<u>Quarterly, 2012-2018Q2</u>	<u>Annual, 2014 only</u>
<b>Dataset description</b>	Retail opioid prescriptions, <u>per 100 persons</u> in specified locale's population	<u>Patients</u> with opioid prescriptions, <u>per 1,000 persons</u> in specified locale's population	Opioid prescriptions and patients with prescriptions, <u>per 1,000 persons</u> in specified locale's population
<b>Adjustment</b>	None	By age, optionally by gender	By age and gender
<b>Source of data</b>	Sample of retail <u>pharmacies, excluding mail order pharmacies</u>	Retail <u>prescriptions reported</u> to Washington PMP, including mail order, VA, IHS, and tribal pharmacies	Retail <u>prescriptions reported</u> to Washington PMP, including mail order, VA, IHS, and tribal pharmacies
<b>Geographic localization</b>	Based on state/county in which <u>pharmacy is located</u>	Based on state/county in which the <u>patient resides</u>	Based on state/county in which the <u>patient resides</u>
<b>Definition of opioids</b>	<u>Exclude cough/cold formulations</u> , methadone maintenance treatment. Handling of buprenorphine is unclear.	FDA Schedules II-V. Exclude methadone maintenance treatment and buprenorphine.	FDA Schedules II-V. Exclude methadone maintenance treatment.

More detailed descriptions of the collection, preparation, and analytic approach used in the Prescription Monitoring Program may be found under [Introduction and Background](#) and [Appendix](#) on the DOH County Profiles webpage.

The measures displayed in the CDC maps and the DOH Dashboards are not at all comparable. CDC is looking at the total number of prescriptions, whereas the DOH Dashboards report on the number of unique individuals with prescriptions. As demonstrated by the legend of the CDC’s national map, it is quite possible – even common – for there to be more opioid prescriptions than persons in a specified geography. There are two potential reasons for this observation. First, an appreciable number of persons fill multiple opioid prescriptions in a year. Second, the county (or state, for that matter) in which a prescription is filled is not necessarily where the prescription’s recipient resides. For example, residents of surrounding counties, in Washington or Idaho, might be treated by providers in Spokane County and fill their prescriptions near the provider’s office rather than near home.

In contrast, the DOH Dashboards report on the individuals residing in a specified geography who fill prescriptions for an opioid, irrespective of where the prescription was written or filled, and irrespective of how many prescriptions that individual obtains in the specified time period.

The 2014 County Profiles display both prescription- and person-level results, and are thus semi-comparable to both the DOH Dashboards and the CDC maps. Those comparisons are not exact, due to the non-equivalent data collection methods, opioid definitions, and the like, but they are certainly more comparable than the DOH Dashboards and CDC Prescribing Rate Maps are to one another.

To illustrate, consider the three forms of Spokane County results for 2014 (see Table 3 of the [Spokane County Profile](#)):

	<b>CDC Maps</b>	<b>DOH Dashboards</b>	<b>DOH County Profiles</b>
<b>Time period</b>	Annual, 2014	Quarterly, 2014Q1-2014Q4	Annual, 2014
<b>Dataset description</b>	Retail opioid prescriptions, per 100 persons in county population	Patients with opioid prescriptions, per 1,000 persons in county population	Opioid prescriptions and patients with prescriptions, per 1,000 persons in county population
<b>Reported total prescriptions in Spokane County</b>	92.5 per 100 persons	----	1,036.3 per 1,000 persons, age-gender adjusted
<b>Reported unique recipients of prescriptions in Spokane County</b>	----	2014Q1 = 108.1 2014Q2 = 106.3 2014Q3 = 110.2 2014Q4 = 118.9 (all are per 1,000 persons, age-adjusted)	267.9 per 1,000 persons, age-gender adjusted

With respect to total prescriptions, note that the denominators for the CDC maps and the County Profiles differ by a factor of 10. Furthermore, not only are the CDC counts based on sales rather than patients, they also exclude cough/cold medications (nearly all of which are listed under Schedule V) and prescriptions from mail order pharmacies. CDC’s procedures for dealing with Veterans Administration, Indian Health Service, and tribal pharmacies are not delineated. The CDC counts are not adjusted for county demographics.

In contrast, the County Profiles and DOH Dashboards both a) count prescriptions filled by residents of the specified county, b) include prescriptions from mail order, VA, IHS, and tribal pharmacies, and c) are adjusted for both age and gender.

The DOH Dashboards and County Profiles share definitions of prescriptions, opioids, and persons. By far the largest difference between them, however, is in their timeframes – by quarters versus annual. There is no way to directly compare quarterly and annual rates; some portion of each quarter’s recipients of opioid prescriptions also received opioids in other quarters, and are therefore not counted again in the annual rate.

In summary, the devil is in the details! Unless and until everyone identically defines what they report and how they report it, the problem of comparing apples and oranges will continue plaguing researchers and analysts.