

# Medication Adherence Patterns Differ by Drug Type and Payer

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## Key Findings:

- Primary adherence (prescription filled within 30 days) was lowest for self-pay patients and highest for commercially insured and Medicare Advantage patients for statins, antihypertensives, and diabetes medications.
- Secondary adherence (ongoing medication possession) was also lowest for self-pay patients, and highest among those with Medicare or Medicare Advantage.
- Across all insurance classifications, primary and secondary adherence for diabetes medications were slightly lower than that of adherence for statins or antihypertensives.

Medication adherence, both initial and sustained, remains a critical driver of chronic disease outcomes and payer quality metrics. Programs such as Medicare Star Ratings and the Pharmacy Quality Alliance (PQA) adherence measures track medication-taking behavior in some medication groups, including statins, diabetes medications, and antihypertensives.<sup>1,2</sup> According to the U.S. Centers for Disease Control and Prevention (CDC), factors such as complex medication regimens, medication costs, and side effects can influence medication adherence.<sup>3</sup> This study evaluates differences in adherence patterns across insurance types and drug groups.

We analyzed a random sampling of medication orders and dispenses for 5 million patients that occurred between January 1, 2022, and July 1, 2025, across key drug groups: antihypertensives for patients with hypertension, statins for those with hyperlipidemia, and diabetes therapies for those with type 2 diabetes. For primary adherence, we calculated the proportion of patients who had the medication dispensed within 30 days of the order. For secondary adherence, we used the mean possession ratio (MPR), which is the number of days the dispensed medication should last divided by the number of days in the follow-up period (up to one year). Patients with multiple insurance types were counted in all applicable buckets.

Commercially insured and Medicare Advantage patients demonstrated the highest primary adherence across all medication groups studied, while self-pay patients showed consistently lower rates, as seen in Figure 1. Specifically, commercially insured patients had the medication dispensed within 30 days 85% of the time for statins, 85% of the time for antihypertensives, and 78% of the time for diabetes medications. Adherence was slightly lower among Medicare Advantage, Medicaid, and Medicare patients. Self-pay patients had the medication dispensed within 30 days 68% of the time for statins, 66% of the time for antihypertensives, and 63% of the time for diabetes medications.

## Primary Medication Adherence Rates

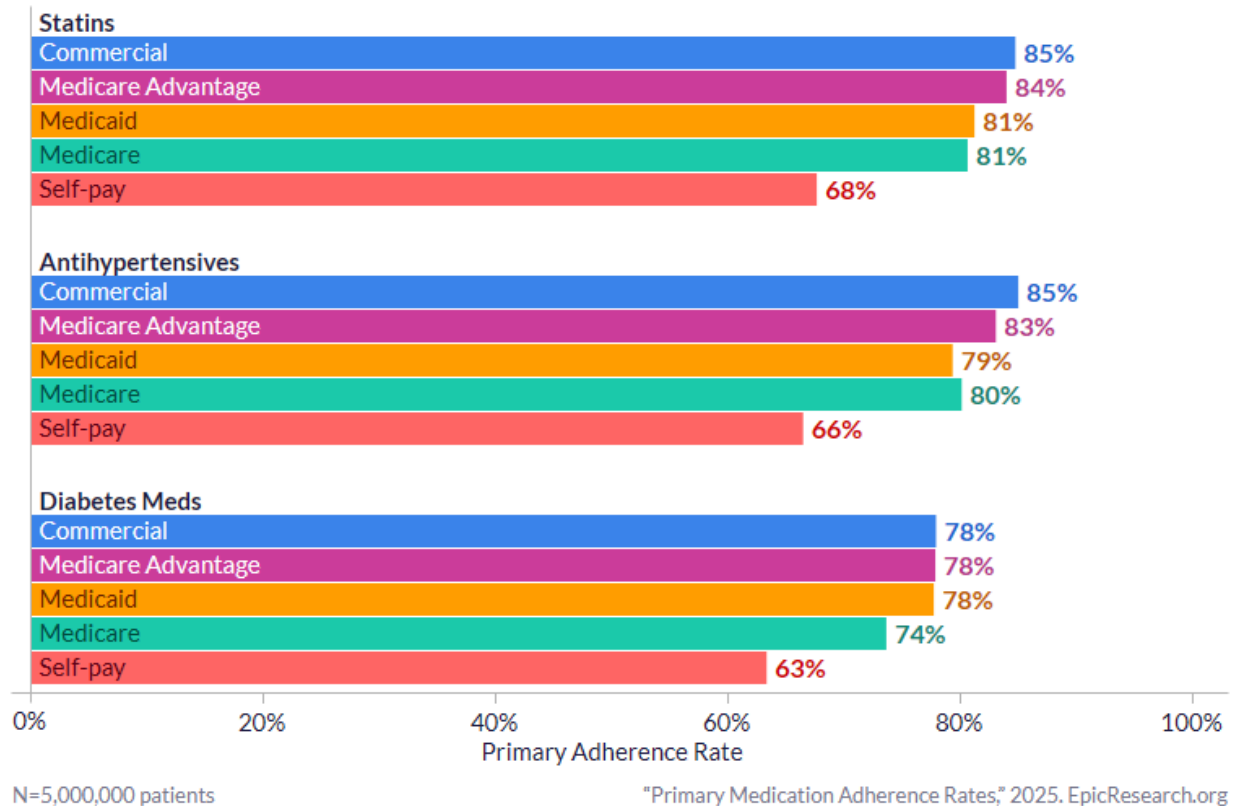


Figure 1. Primary medication adherence rates by insurance and medication group.

Next, we evaluated secondary adherence among patients who received at least two dispenses. Medicare and Medicare Advantage patients achieved secondary adherence rates around 88% for statins and antihypertensives and 82% for diabetes medications, reflecting strong persistence once treatment began. In contrast, self-pay patients averaged 74% for statins, 76% for antihypertensives, and 66% for diabetes medications.

## Secondary Medication Adherence Rates

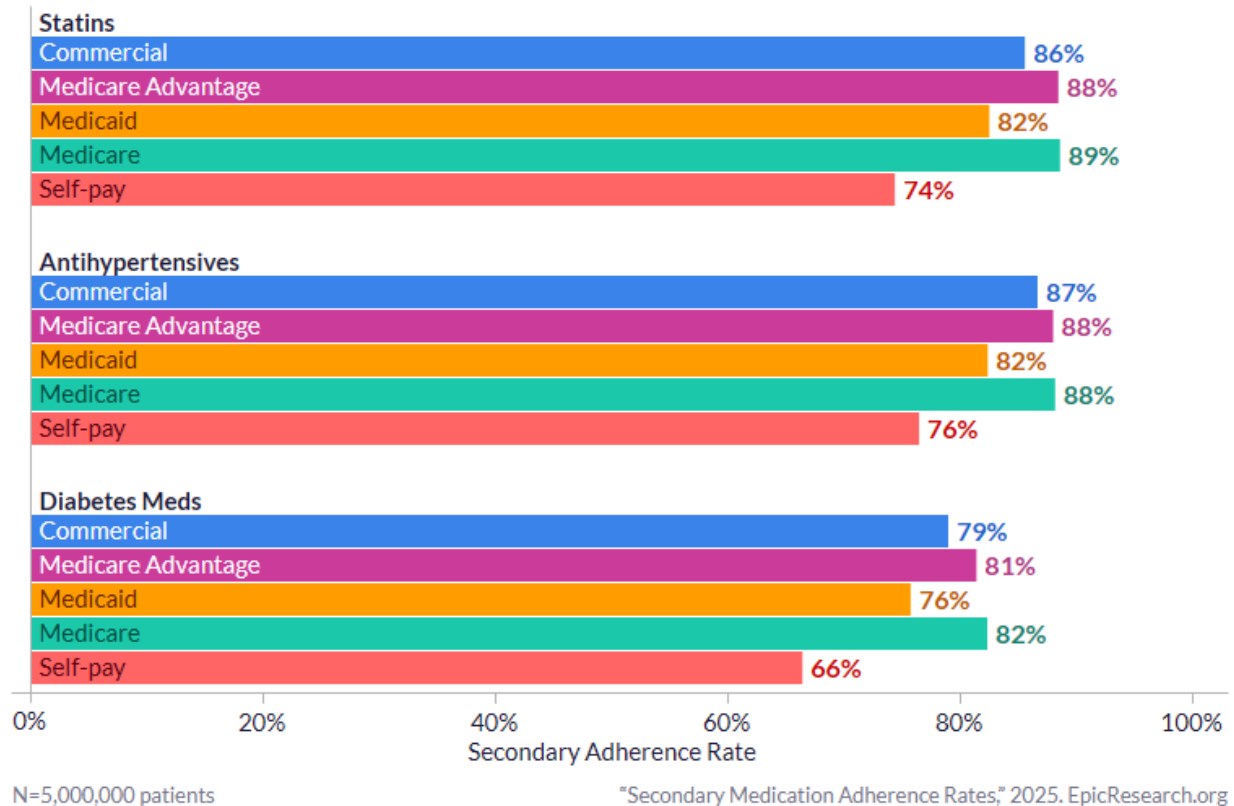


Figure 2. Secondary medication adherence rates by insurance and medication group.

These data come from Cosmos, a dataset created in collaboration with a community of Epic health systems representing more than 300 million patient records from 1,800 hospitals and more than 41,000 clinics from all 50 U.S. states, Canada, Lebanon, and Saudi Arabia. This study was completed by two teams that worked independently, each composed of a clinician and research scientists. The two teams came to similar conclusions. Graphics by Brian Olson.

## References

1. 2024 Medicare Advantage and Part D Star Ratings. Centers for Medicare & Medicaid Services. October 13, 2023. <https://www.cms.gov/newsroom/fact-sheets/2024-medicare-advantage-and-part-d-star-ratings>. Accessed October 17, 2025.
2. PQA Adherence Measures. Pharmacy Quality Alliance. 5/2025. <https://www.pqaalliance.org/adherence-measures>. Accessed October 17, 2025.
3. Neiman AB, Ruppar T, Ho M, et al. CDC grand rounds: Improving medication adherence for chronic disease management - innovations and opportunities. MMWR Morb Mortal Wkly Rep. 2017;66(45):1248-1251. doi:10.15585/mmwr.mm6645a2

## Data Definitions

| Term                        | Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Study period                | Medication dispenses between 1/1/2022 and 7/1/2025                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Study population: inclusion | <p><b>Primary adherence:</b></p> <ul style="list-style-type: none"> <li>• Patient with a prescription for an <b>exposure medication</b>, taking the first if there were multiple</li> <li>• At least one medication dispense of any medication prior to the <b>exposure medication</b></li> <li>• A dispense query covering the prescription date and the 30 days following</li> <li>• No dispenses of the same simple generic medication within three years prior to the <b>exposure medication</b></li> </ul> <p><b>Secondary adherence:</b></p> <ul style="list-style-type: none"> <li>• At least one dispense of an <b>exposure medication</b> within the <b>study period</b>, taking the first within the group if there were multiple</li> <li>• Patients must have at least one more dispense of the same <b>exposure medication</b> within three years before or after the inclusion dispense</li> <li>• Patients must have a qualifying <b>censoring encounter</b></li> <li>• Patients must have a dispense query covering the full time between the qualifying dispense and the <b>censoring encounter</b></li> </ul> <p><b>Primary and secondary adherence:</b></p> <ul style="list-style-type: none"> <li>• For <b>statin</b> exposure, the patient must be diagnosed with hyperlipidemia (a billing, encounter, or problem list diagnosis with ICD-10-CM code E78.2*-E78.5*)</li> <li>• For <b>diabetes treatment</b> exposure, the patient must be diagnosed with type 2 diabetes (a billing, encounter, or problem list diagnosis with ICD-10-CM code E11*)</li> <li>• For <b>antihypertensive</b> exposure, the patient must be diagnosed with hypertension (a billing, encounter, or problem list diagnosis with ICD-10-CM code I10-I15*)</li> </ul> |
| Outcomes                    | <p><b>Primary adherence</b></p> <p><b>Secondary adherence</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Exposure medication         | A prescription for a <b>statin, diabetes medication, or antihypertensive</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Primary Adherence           | Binary variable indicating whether the patient had a dispense for an exposure medication within 30 days of the prescription                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Secondary Adherence         | <p>Numerator: Sum of days supplied of all dispenses within the same <b>exposure medication</b> category. Days supplied were capped at the <b>censoring encounter</b>.</p> <p>Denominator: Time between qualifying dispense and the <b>censoring encounter</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Statin                      | A medication with a simple generic name of atorvastatin, fluvastatin, lovastatin, pitavastatin, pravastatin, rosuvastatin, or simvastatin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Diabetes medication         | A medication with a simple generic name of metformin, chlorpropamide, glimepiride, glipizide, glyburide, tolazamide, tolbutamide, pioglitazone, rosiglitazone, alogliptin, linagliptin, saxagliptin, sitagliptin, albiglutide, dulaglutide, tirzepatide, exenatide, liraglutide, lixisenatide, semaglutide, nateglinide, repaglinide, canagliflozin, dapagliflozin, empagliflozin, or ertugliflozin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

|                                     |                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Antihypertensive</b>             | A medication with a simple generic name of aliskiren, azilsartan, candesartan, eprosartan, irbesartan, losartan, olmesartan, telmisartan, valsartan, benazepril, captopril, enalapril, fosinopril, lisinopril, moexipril, perindopril, quinapril, ramipril, or trandolapril                                       |
| <b>Censoring encounter</b>          | The latest of any of the following encounter types between 180 and 365 days after the first dispense: Emergency, Office Visit, Well Child, Follow-up, Telemedicine, Urgent Care, Walk-in, Routine Prenatal, Postpartum Visit, Fetal Care Consult.<br>This is used for the <b>secondary adherence</b> calculation. |
| <b>International considerations</b> | Dispenses are only included from U.S.-based pharmacies, so the study analyzes healthcare performed in the U.S.                                                                                                                                                                                                    |
| <b>Limitations</b>                  | Cosmos has only encounter insurance; coverage used for the medication was not included.<br>Patients with multiple insurance types were included in multiple groups.                                                                                                                                               |

**Table 1. Primary Medication Adherence Rates**

| Medication Group    | Insurance          | Rate   |
|---------------------|--------------------|--------|
| Statins             | Commercial         | 84.73% |
|                     | Medicare Advantage | 83.97% |
|                     | Medicaid           | 81.21% |
|                     | Medicare           | 80.62% |
|                     | Self-pay           | 67.64% |
| Antihypertensives   | Commercial         | 84.98% |
|                     | Medicare Advantage | 83.05% |
|                     | Medicaid           | 79.33% |
|                     | Medicare           | 80.11% |
|                     | Self-pay           | 66.46% |
| Diabetes Medication | Commercial         | 77.90% |
|                     | Medicare Advantage | 77.84% |
|                     | Medicaid           | 77.71% |
|                     | Medicare           | 73.62% |
|                     | Self-pay           | 63.32% |

**Table 2. Secondary Medication Adherence Rates**

| Medication Group  | Insurance          | Rate   |
|-------------------|--------------------|--------|
| Statins           | Commercial         | 85.55% |
|                   | Medicare Advantage | 88.43% |
|                   | Medicaid           | 82.49% |
|                   | Medicare           | 88.57% |
|                   | Self-pay           | 74.36% |
| Antihypertensives | Commercial         | 86.64% |
|                   | Medicare Advantage | 87.98% |

|                     |                    |        |
|---------------------|--------------------|--------|
|                     | Medicaid           | 82.35% |
|                     | Medicare           | 88.15% |
|                     | Self-pay           | 76.44% |
| Diabetes Medication | Commercial         | 78.95% |
|                     | Medicare Advantage | 81.38% |
|                     | Medicaid           | 75.72% |
|                     | Medicare           | 82.31% |
|                     | Self-pay           | 66.40% |