

Adherence to antihypertensive medications is associated with significant reductions in health care use, including emergency department visits and inpatient admissions, lower overall medical costs, and improvements in work productivity

BACKGROUND

- Hypertension affects nearly half of US adults yet remains inadequately controlled in over three-quarters of these cases.
- This study aimed to assess the association between adherence to antihypertensive medications and total medical costs, health care use, and productivity-related outcomes.

METHODS

- Administrative commercial claims linked with employer-provided payroll databases from 2019 were used to examine both medical costs and productivity-related costs associated with medication adherence.
- We conducted cross-sectional analyses using MarketScan databases, which included individuals aged 18 to 64 years with noncapitated health insurance plans in 2019.
- Adherence was defined as $\geq 80\%$ medication possession ratio for prescribed antihypertensive medications.
- We used a **generalized linear model** to estimate total medical costs, a **negative binomial model** to estimate health care use (emergency department visits and inpatient admissions), an **exponential hurdle model** to estimate productivity-related outcomes (number of sick absences, short-term disability, long-term disability), and a 2-part model to estimate productivity-related costs in 2019 US dollars.
- All models were adjusted for age, sex, urbanicity, census region, and comorbidities.
- We reported average marginal effects for outcomes related to antihypertensive medication adherence.

RESULTS

- Among 379 503 individuals with hypertension in 2019, 54.4% adhered to antihypertensives.
- Per person, antihypertensive medication adherence was associated with \$1441 lower total medical costs, \$11 lower sick absence costs, \$291 lower short-term disability costs, and \$69 lower long-term disability costs.
- Per 1000 individuals, medication adherence was associated with lower health care use, including 200 fewer emergency department visits and 90 fewer inpatient admissions, and productivity-related outcomes, including 20 fewer sick absence days and 442 fewer short-term disability days.

DISCUSSION

- In our study, we used administrative commercial claims linked with employer-provided payroll databases, a novel approach that allowed us to examine both medical costs and productivity-related costs associated with medication adherence.
- Adherence to antihypertensives was consistently associated with lower total medical costs, reduced health care use, and improved productivity-related outcomes.

Limitations:

- Although we conducted a sensitivity analysis using **the propensity score overlap weighting method**, with all results remaining consistent, due to the limited information available in the claims database, we were unable to include other potential confounding factors such as individuals' education level, income, race, and poverty level.
- The cross-sectional nature of our study may not capture longer-term effects of medication adherence.

Table 1. Outcomes associated with adherence to antihypertensives in 2019

	Total Medical Costs, \$ (per person)	Emergency Department Visits (per 1,000 persons)	Inpatient Admissions (per 1,000 persons)	Number of Sick Absences (per 1,000 persons)	Number of Short-Term Disabilities (per 1,000 persons)
Medication non-adherence	19,210 (18,643 - 19,778)	456 (451 - 462)	210 (199 - 220)	308 (300 - 316)	4,514 (4,414 - 4,615)
Medication adherence	17,770 (17,238 - 18,301)	256 (253 - 260)	120 (114 - 126)	288 (281 - 295)	4,072 (3,978 - 4,166)
Difference	-1,441 (-1,709 - -1,172)	-200 (-206 - -194)	-89.6 (-95.5 - -83.7)	-19.8 (-28.0 - -11.6)	-442 (-548 - -335)
Observation	379,503	379,503	379,503	54,608	328,073

Note: Boldface denotes statistical significance at the $p < 0.05$ level. We reported the average marginal effects with a 95% confidence interval.

Table 2. Sensitivity Analysis of Outcomes Associated with Adherence to Antihypertensives in 2019 Using a Propensity Score-Based Overlap-Weighting Model

	Total Medical Costs, \$ (per person)	Emergency Department Visits (per 1,000 persons)	Inpatient Admissions (per 1,000 persons)	Number of Sick Absences (per 1,000 persons)	Number of Short-Term Disabilities (per 1,000 persons)
Medication non-adherence	18,696 (18,290 - 19,103)	433 (428 - 439)	190 (182 - 199)	308 (299 - 317)	4,530 (4,431 - 4,629)
Medication adherence	17,318 (16,938 - 17,698)	264 (261 - 268)	108 (103 - 113)	289 (281 - 297)	4,087 (3,994 - 4,180)
Difference	-1,378 (-1,628 - -1,128)	-169 (-175 - -163)	-82 (-87 - -77)	-19 (-28 - -11)	-443 (-550 - -336)
Observation	379,503	379,503	379,503	54,608	328,073

Note: We applied the overlap weighting method, calculating weights derived from logistic regression, with adherence to antihypertensives as the outcome. A



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