The impact of the out-of-pocket cost of insulin on healthcare resource utilization and all healthcare-related costs using the Medical Expenditure Panel Survey 2016-2018

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Background

- Diabetes is one of the most expensive chronic conditions in the United States. Of the antihyperglycemic medications, the cost of insulin was estimated to have increased by 110% from 2012 to 2017.
- As insulin costs increase, patient's out-of-pocket (OOP) costs also increase, leading to cost-related non-adherence, an increase in diabetes complications, and increased hospital and emergency visits.
- In 2019, Colorado became the first state to pass a law capping insulin out-of-pocket (OOP) costs at $100 per month.
- Following Colorado's lead, 22 other states have adopted similar co-pay cap laws. These state-specific caps range from $25 to $100 for a 30-day supply. [1]
- Furthermore, on August 16th, 2022, President Biden signed the Inflation Reduction Act (IRA) into law, which capped the OOP costs of insulin to $35 a month for Medicare beneficiaries.[2]
- Despite the implementation of multiple caps, there remains a dearth of quantitative evidence to understand whether differences in outcomes exist based on the OOP costs of insulin.

Objective

- To evaluate the impact of OOP costs of insulin on all-cause healthcare care resource utilization (HCRU) and all healthcare-related costs.

Methods

- **Study Design:** An observational retrospective cohort study was conducted in patients with DM taking insulin older than 18 years.
- **Data Source**: The Medical Expenditure Panel Survey (MEPS) database, a nationally representative survey for the civilian noninstitutionalized population in the US, was used for this analysis. [3]
- Three-year individual and prescription data from the MEPS 2016 to 2018 were extracted for this analysis.
- **Exposure variable**: Patients were grouped by their OOP insulin costs for the 30-day supply based on the nationwide cap on insulin of $35 per month. Two cohorts were created (<$35, >$35).
- DM diagnosis was determined by the diabetes diagnosis variable, and multum lexicon codes were used to identify patients using insulin.
- **Outcome variable:** The outcome measures of interest in this study were all-cause healthcare resource utilization (HCRU) and all healthcare-related costs.
- HCRU outcomes included the number of emergency department (ED), office-based, and outpatient visits, hospital discharges, inpatient stays, and prescription (Rx) refills.

Methods (contd.)

- All health-related costs included five categories of healthcare spending: total spending, ED spending, prescription (Rx) spending, office-based visits spending, outpatient visit spending, inpatient spending,
- All expenditures were adjusted to 2024 dollars using the Consumer Price Index.
- **Analysis**: Propensity scores were generated using a multivariate logistic regression, controlling for demographic characteristics like age, sex, race and ethnicity, family income, marital status, insurance status, and region.
- HCRU and costs were evaluated with zero-inflated negative binomial regressions and generalized linear models, respectively.
- Statistical analysis was conducted in STATA 18

Results

Characteristics	Overall (n=972)	OOP costs <$35 (n=486) N (%)	00P costs >$35 (n=486) N (%)	Standardized difference
Age				
18-30 years	22 (2)	12 (2)	10(2)	-0.017
31-45 years	76 (8)	33 (7)	43(9)	
46-65 years	388 (40)	204 (42)	184 (38)	
65 years or older	486 (50)	237 (49)	249 (51)	
Sex				
Male	499 (51)	246 (51)	253 (52)	0.029
Female	473 (49)	240 (49)	233 (48)	
Race				
White, Non-Hispanic	551 (57)	265 (55)	286 (59)	-0.003
Black, Non-Hispanic	196 (20)	112 (23)	84 (17)	
Hispanic	166 (17)	83 (16)	83 (16)	
Asian, Non-Hispanic	24 (2)	13 (3)	13 (3)	
Multiple race, Non-Hispanic	35 (4)	13 (3)	22 (5)	
Education				
Never attended school	177 (18)	99 (20)	78 (16)	0.0059
Some school	484 (50)	235 (48)	249 (51)	
Bachelors	116 (12)	48 (10)	68 (14)	
Masters/PhD	85 (9)	40 (8)	45 (9)	
Other degree	110 (11)	64 (13)	46 (9)	
Income				
Less than $25,000	303 (31)	159 (33)	144 (30)	0.019
$25,000 to <$50,000	226 (23)	105 (22)	121 (25)	
$50,000 to <$75,000	158 (16)	75 (15)	83 (17)	
$75,000 to <$100000	112 (12)	51 (10)	61 (12)	
>$100000	173 (18)	96 (20)	77 (16)	
Health Insurance				
Any Private	549 (56)	268 (55)	281 (58)	-0.05226
Public Only	377 (39)	209 (43)	168 (34)	
Uninsured	46 (5)	9 (2)	37 (8)	

Table 1. Sociodemographic characteristics of patients after Propensity score matching

- Between 2016 and 2018, 2062 patients were eligible for inclusion in the study.
- After a 1:1 propensity score matching, 972 patients were included.
- Table 1 presents the baseline characteristics of included patients.
- The average (SD) age of patients (n=972) was 63.18 (13.54) years old, and 51% were female.
- 57% were non-Hispanic white, and 57% had private insurance.
- Mean (SD) total spending of patients who had OOP <$35 was $25853.23 ($ 36562.49), whereas mean total spending for those with OOP >$35 was $30391.52 ($25853.62).
- Mean (SD) prescription spending of patients who had OOP <$35 was $7883.90 ($ 11864.54), whereas mean total spending for those with OOP >$35 was $10850.75 ($15966.05).
- Total healthcare spending (coefficient= $4869, P=0.032) and prescription spending (co-efficient= $3363, P=0.000) were higher among patients with insulin OOP >$35. (Table 2)
- There was no significant difference in spending for ED, inpatient stays, outpatient, and office-based visits.
- Additionally, there was no significant difference in the utilization of healthcare resources. (Table 3)

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Results (contd.)

Outcome	Coefficient ($)	95%CI	p Value
Total spending	4869.82	424.65-9314.99	0.032
ED spending	57.76	-165.84-291.37	0.651
Inpatient stays spending	706.33	-237067-3783.34	0.653
Office-based visits pending	-356.95	-1555.06-841.15	0.559
Outpatient visits spending	531.52	-150.12-1213.16	0.126
RX spending	3363.12	1506.83-5219.41	0.000

Table 2. Comparison of healthcare spending of patients with OOP costs <$35 and >$35

Outcome	IRR (95%CI)	p Value
No. ED visits	1.06 (0.85-1.34)	0.571
No. Hospital discharges	1.02 (0.77-1.35)	0.884
No. Inpatient stays	0.91 (0.60-1.55)	0.905
No. Office-based visits	0.91 (0.80-1.04)	0.174
No. Outpatient visits	1.23 (0.92-1.62)	0.159
No. of prescriptions refills	1.08 (0.99-1.18)	0.072

Table 3. Comparison of HCRU among patients with OOP costs <$35 compared to >$35

Conclusions

- Patients with OOP costs >$35 had higher total and prescription spending.
- However, this increased spending did not extend to other cost categories, and there is no significant difference in HCRU outcomes.
- These findings suggest that while higher OOP costs may be associated with increased utilization of specific healthcare services, it does not necessarily translate into a broader impact on overall HCRU.

References

References

1. American Diabetes Association. Insulin Cost and Affordability-State Insulin Copay Caps.2023. Accessed August 6, 2023. Available from https://diabetes.org/tools-support/insulin-affordability/state-insulin-copay-caps
2. Levitt L. The Inflation Reduction Act Is a Foot in the Door for Containing Health Care Costs. JAMA Health Forum.2022;3(8):e223575. doi:10.1001/jamahealthforum.2022.3575
3. Agency for Healthcare Research and Quality. Medical Expenditure Panel Survey (MEPS).2023. Accessed August 6, 2023.Available from https://www.ahrq.gov/data/meps.html

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