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Out-of-pocket expenditure among patients with hypertension and diabetes mellitus residing in Rewa city

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Abstract

Background: Non-communicable diseases such as hypertension (HTN) and diabetes mellitus (DM) are rising globally. In India, out-of-pocket expenditure (OOPE) accounts for 39.4–47.1% of total health spending, often leading to household impoverishment. This study assesses the economic burden and determinants of OOPE for HTN and DM in an urban field practice area. **Methods:** A community-based cross-sectional study was conducted among 180 adults (Mean age: 58.62 ± 16.34 years). Data on direct medical, non-medical, and indirect costs were collected using pre-tested, semi-structured questionnaires. Socioeconomic status was classified using the updated BG Prasad Scale. Statistical associations were tested using Chi-square analysis. **Results:** The total median OOPE was highest for participants with concomitant conditions (₹1550), followed by DM only (₹1250) and HTN only (₹450). The prevalence of catastrophic health expenditure, defined at the 40% non-food capacity-to-pay threshold, was 38.3% (n = 69). Medication costs were the primary drivers of expenditure across all disease groups. Private facility utilization was the strongest independent predictor of incurring OOPE ($P < 0.001$). Literacy ($P < 0.001$), age ≤50 years ($P = 0.014$), and being married ($P = 0.007$) were also significantly associated with the presence of spending. Approximately 12.4% of participants resorted to distress financing through borrowing money or selling assets. **Conclusion:** Chronic disease management imposes a substantial financial strain on urban households, driven largely by medication costs and private sector reliance. Policy interventions must focus on strengthening public primary care and expanding access to affordable generic drugs through initiatives like Janaushadhi Kendras to prevent health-related impoverishment.

Keywords: Diabetes mellitus, Healthcare expenditure, Hypertension, Non-communicable diseases, Out-of-pocket expenditure

1. Introduction

Out-of-pocket expenditure (OOPE) on healthcare represents a significant challenge in India, affecting the financial stability and health outcomes of households, particularly among vulnerable populations. Achieving Universal Health Coverage (UHC) is a commonly recognized target of health systems worldwide to ensure that populations can access quality health services without financial hardship.[1] OOPE on healthcare are payments made by the individual at the point of receiving healthcare services or goods. Household health expenditures constitute both direct expenditures (OOPE) and indirect expenditures (prepayments as health insurance contributions or premiums). This indicates the dependence of households on their own income/savings to meet healthcare expenditures. It reflects the burden of health expenses that households bear.[2] According to the National Health Accounts 2024 report, the OOPE as a percentage of total health expenditure (THE) was 39.4% (₹3,56,254 crores) in India and 43.3% (₹14,781 crores) in Madhya Pradesh. Over the years, household's OOPE burden has decreased from a high of 69.4% of THE in 2004–2005 to 39.4% in 2021–2022 a good sign of progress indeed.[3]

Non-communicable diseases (NCDs) have slowly become a major cause of both morbidity and mortality. They account for 43 million deaths each year, equivalent to 75% of all deaths globally. The major ones are cardiovascular diseases, hypertension (HTN), cancers, chronic respiratory diseases, and diabetes.[4] The chronic nature of NCDs and the resultant economic burden on households of NCD patients in the form of OOPE can cause impoverishment in all societies.[5] The proportion of cost incurred out of total health care cost is higher for NCD care than for communicable diseases. They have a major impact on healthcare costs, productivity, and economic growth of individuals as well as the country.[6]

Ayushman Bharat is a scheme by the Government of India to protect the poor and vulnerable populations from OOPE.[7] Despite the availability of social security schemes such as Ayushman Bharat (Pradhan Mantri Jan Arogya Yojana), Ayushman Bharat Health Infrastructure Mission, Central Government Health Scheme, Employment State Insurance Scheme, and schemes such as Pradhan Mantri Bhartiya Janaushadhi Pariyojana (PMBJP) providing healthcare benefits, a high proportion of Indian households are incurring OOPE.[8] Catastrophic Health Expenditure (CHE) pushes millions into poverty every year. Reducing OOPE and CHE helps in attaining Sustainable Development Goals 1 and 3.8.[9,10] Hence, the present study was undertaken to assess the OOPE among patients with HTN and diabetes mellitus (DM) residing in the urban field practice area of a medical college due to the limited availability of local data regarding the financial burden of these chronic diseases. The present study aims to estimate the OOPE among patients with HTN and/or DM residing in the urban field practice area.

1.1. Study objective

To estimate OOPE, assess CHE, and identify determinants of OOPE among patients with HTN and/or DM residing in the urban field practice area.

2. Materials and Methods

2.1. Study design

Cross-sectional study design.

2.2. Study area

The study was conducted in the urban field practice attached to the Department of Community Medicine of the Medical College.

2.3. Study population

Known cases of HTN and/or DM residing in the urban field practice area.

2.4. Study duration

The study was conducted for a period of 3 months from March 2026 to May 2026.

2.5. Inclusion criteria

1. Individuals aged 18 years and above
2. Diagnosed cases of HTN and/or DM
3. Residents of the Urban field practice area
4. Individuals willing to participate in the study.

2.6. Exclusion criteria

1. Seriously ill individuals unable to respond
2. Pregnant women with gestational HTN or gestational diabetes.

2.7. Sample size

According to a previous study by Mehta *et al*.,[11] the mean OOPE was ₹370.54 ± 237.10. Using the formula $n = \frac{4(SD)^2}{d^2}$, with allowable error taken as 10% of the mean and adding a 10% non-response rate, the calculated sample size was 180 participants.

2.8. Sampling technique

A list of known hypertensive and diabetic patients was obtained from the Urban Health Training Centre. Eligible participants were selected using systematic random sampling. House-to-house visits were conducted to achieve the sample size of 180 participants.

2.9. Study tool

Data were collected using a pre-tested, semi-structured questionnaire consisting of:

- Sociodemographic details
- Disease profile
- Direct medical expenditure
- Direct non-medical expenditure
- Indirect expenditure
- Coping mechanisms
- Impact on household
- Awareness and utilization.

2.10. Data collection procedure

After obtaining informed consent from the participants, data were collected through face-to-face interviews using the study questionnaire. Participants were asked to recall expenditure incurred during the previous 1 month for outpatient care related to HTN and/or DM. Confidentiality and privacy of participants were maintained throughout the study.

2.11. Statistical analysis

Collected data was entered in Microsoft Excel and analyzed using the Statistical Package for the Social Sciences version 25. Descriptive statistics such as median, interquartile range (IQR), frequency, and percentage were used. Differences in expenditure across disease groups were assessed using the Kruskal–Wallis test. Chi-square test was applied to assess the association between categorical variables. $P < 0.05$ was considered statistically significant.

2.12. Operational definitions

1. OOPE: OOPE was defined as the direct payments made by individuals to healthcare providers at the point of service. This includes direct medical costs (consultations, medications, and laboratory investigations), direct non-medical costs (traveling and food), and indirect costs (loss of wages for the patient or caretaker).[2]

2. OOPE absent versus OOPE present: To identify determinants of spending, participants were classified into two groups based on their total monthly expenditure. OOPE was considered "Absent" if the total expenditure was ₹10 or less. This cutoff accounts for the baseline cost of an outpatient department (OPD) registration slip at government facilities, representing patients who received fully subsidized care (including medications and diagnostics) and incurred no travel costs. OOPE was considered "Present" if the total expenditure exceeded ₹10.[12]
3. CHE: CHE was defined using the "capacity-to-pay" framework. Expenditure was considered catastrophic if the household's total out-of-pocket health spending exceeded 40% of its monthly non-food expenditure. This threshold accounts for the subsistence needs of urban households before assessing the economic impact of chronic disease management.[11,13]
4. Recall period: A standard 30-day recall period was employed for all outpatient visits to ensure data reliability and to minimize recall bias.[2,12]

3. Results

Table 1 shows the sociodemographic profile of the 180 study participants, who had a mean age of 59.35 ± 13.79 years. The majority of the study population was older than 50 years (65.6%), and females represented 61.3% of the total sample. Educational attainment varied, with 79.4% of participants being literate and 20.6% reporting illiteracy. Socioeconomic stratification using the BG Prasad Scale revealed that 50.6% of the households belonged to the lower socioeconomic strata, specifically Classes IV and V. Multimorbidity was common in this population, as 42.2% of individuals managed both HTN and diabetes, whereas 38.2% and 19.6% suffered from HTN or diabetes alone, respectively.

The magnitude of monthly OOPE is detailed in Table 2 and depicted in Figure 1. The total median monthly OOPE was highest for participants with concomitant conditions (₹1550; IQR: 1100–2100), followed by those with DM only (₹1250; IQR: 900–1600) and HTN only (₹450; IQR: 300–650). This spending pattern reinforces the "diabetes premium" observed in recent community-based research in North India.

Table 3 and Figure 2 present the disaggregated median costs and statistical comparisons across the three disease groups. The Kruskal–Wallis H-test confirmed statistically significant differences ($P < 0.05$) across every expenditure category, including consultations, medications, laboratory investigations, traveling, and loss of wages. Medications constituted the largest share of the medical bill for all groups, particularly for multi-morbid patients (₹780) and those with diabetes (₹550). Direct non-medical costs like traveling and indirect costs from wage loss remained relatively low, likely reflecting the localized nature of the urban field practice area.

The prevalence of CHE is reported in Table 4 and Figure 3, utilizing the 40% non-food capacity-to-pay threshold. The overall prevalence of CHE in the study population was 38.3%, mirroring recent community-based findings. Participants managing both conditions faced the highest risk of financial catastrophe at 55.3%, followed by the diabetes-only group at 51.4%. In contrast, only 13.0% of participants with HTN only incurred catastrophic spending.

Table 5 shows the determinants associated with the presence of OOPE among the study participants. Of the 180 participants, 143 (79.4%) incurred OOPE, whereas 37 (20.6%) did not. A statistically significant association was observed between the place of treatment and OOPE, with participants seeking care from private facilities more likely to incur OOPE than those attending government facilities (98.9% vs. 58.1%, $\chi^2 = 45.77$, $*P* < 0.001$). Literacy status was also significantly associated with OOPE, as a higher proportion of literate participants incurred OOPE compared with illiterate participants (84.0% vs. 61.1%, $\chi^2 = 9.26$, $*P* = 0.002$). No statistically significant association was found between OOPE and marital status ($\chi^2 = 1.47$, $*P* = 0.225$), age group ($\chi^2 = 2.11$, $*P* = 0.146$), or socioeconomic status ($\chi^2 = 1.47$, $*P* = 0.224$).

Table 1: Sociodemographic characteristics of study participants (*n*=180)

Variables	Frequency	Percentage
Age group		
≤50 years	62	34.4
>50 years	118	65.6
(Mean±SD)	59.35±13.79	
Gender		
Male	70	38.7
Female	110	61.3
Education		
Illiterate	37	20.6
Up to primary	5	2.8
Up to middle	45	25.0
Up to matric	29	16.1
Higher secondary/certificate	29	16.1
Graduate and above	35	19.4
Marital status		
Married	172	95.6
Unmarried	8	4.4
Socioeconomic status		
Class I (Upper)	17	9.4
Class II (Upper middle)	36	20.0
Class III (Middle–lower middle)	36	20.0
Class IV (Upper lower)	43	23.9
Class V (Lower)	48	26.7
Disease distribution		
HTN only	69	38.2
DM only	35	19.6
Both (Concomitant HTN+DM)	76	42.2

SD: Standard deviation, HTN: Hypertension, DM: Diabetes mellitus

Table 2: Magnitude of median monthly OOPE for HTN and diabetes

Disease condition	Median monthly OOPE (₹)	IQR
HTN only	₹450	₹300–650
DM only	₹1250	₹900–₹1600
Both (HTN+DM)	₹1550	₹1110–₹2100

OOPE: Out-of-pocket expenditure, IQR: Interquartile range, HTN: Hypertension, DM: Diabetes mellitus

Table 6 details the coping strategies of 133 participants. Most (55.90%) received money from family members, followed by salaries (33.50%) and pensions (28.20%). Distress financing through borrowing occurred in 12.40% of cases. Minimal reliance was placed on health insurance (3.50%), personal savings (1.20%), or asset sales (1.20%). These results indicate a significant dependency on informal social networks for medical expenses.

4. Discussion

The present study highlights the substantial economic burden associated with the long-term management of HTN and DM in an urban population. Among the 180 study participants, 42.2% had both HTN and

Table 3: Breakdown of median (IQR) OOPE components across participants (Monthly)

Component	HTN (n=69)	DM (35)	Both (HTN+DM) (76)	*P*-value†
Direct medical costs				
Consultation	₹150 (80–230)	₹250 (150–400)	₹280 (150–450)	<0.001*
Medication	₹110 (0–220)	₹550 (300–1000)	₹780 (450–1300)	<0.001*
Lab investigations	₹110 (50–180)	₹340 (180–600)	₹410 (200–800)	<0.001*
Direct non-medical costs				
Traveling	₹40 (10–80)	₹65 (20–130)	₹70 (20–150)	0.002*
Indirect costs				
Loss of wages	₹0 (0–40)	₹15 (0–80)	₹10 (0–90)	0.028*
Total median OOPE	₹450 (300–650)	₹1250 (900–1600)	₹1550 (1100–2100)	<0.001*

OOPE: Out-of-pocket expenditure, IQR: Interquartile range, HTN: Hypertension, DM: Diabetes mellitus. †Kruskal–Wallis H-test. **P*<0.05 is considered statistically significant

Table 4: Prevalence of CHE

Group	Number of participants (180)	Incurring CHE (69)	Percentage within group
HTN only	69	9	13.0
DM only	35	18	51.4
Both (HTN+DM)	76	42	55.3
Total	180	69	38.3

HTN: Hypertension, DM: Diabetes mellitus, CHE: Catastrophic Health Expenditure

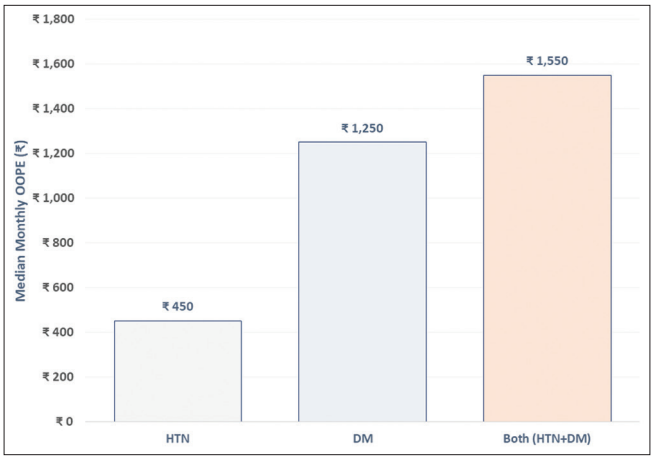


Figure 1: Median monthly out-of-pocket expenditure by disease status

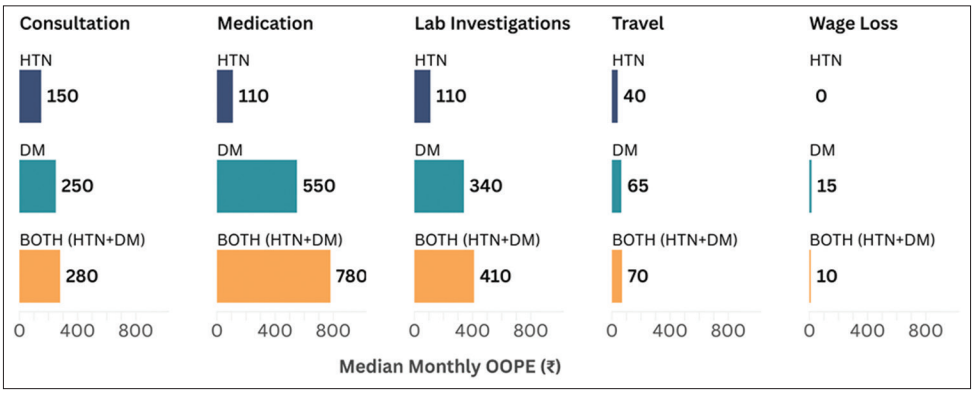


Figure 2: Component-wise median monthly out-of-pocket expenditure by disease status

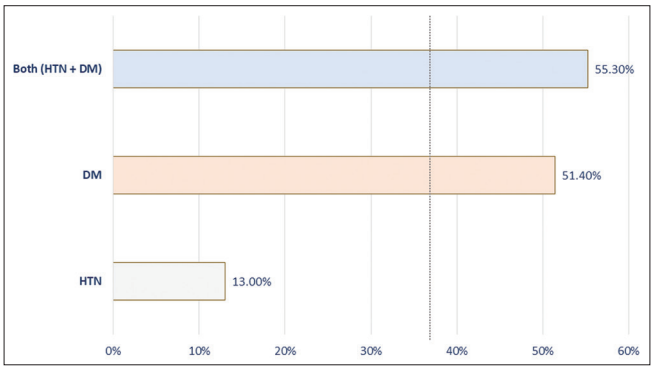


Figure 3: Prevalence of catastrophic health expenditure according to disease status. The dashed vertical line indicates the overall prevalence of catastrophic health expenditure among study participants (38.3%)

Table 5: Determinants of OOPE presence among participants (*n*=180)

Variable	OOPE present (*n*=143)	OOPE absent (*n*=37)	Total (*n*)	χ^2	*P*-value
Marital status					
Married	138	34	172	1.47	0.225
Unmarried	5	3	8		
Place of treatment					
Private facility	93	1	94	45.77	<0.001*
Government facility	50	36	86		
Literacy status					
Literate (Primary to Graduate)	121	23	144	9.26	0.002*
Illiterate	22	14	36		
Age group					
≤50 years	53	9	62	2.11	0.146
>50 years	90	28	118		
Socioeconomic status					
Middle and Above (Class I–III)	74	15	89	1.47	0.224
Lower (Class IV–V)	69	22	91		

OOPE: Out-of-pocket expenditure. *P<0.05 is considered statistically significant

Table 6: Financial coping mechanisms for outpatient visits (*n*=133) (multiple-responses)

Coping mechanism	Frequency	Percentage
Money provided by family members	74	55.90
Utilization of salary	45	33.50
Pension	37	28.20
Borrowed money (distress financing)	16	12.40
Health insurance	5	3.50
Personal savings	2	1.20
Selling of assets	2	1.20

DM, 38.2% had HTN alone, and 19.6% had DM alone. More than three-fifths (65.6%) of participants were aged above 50 years, and the majority (61.3%) were females. These findings show the growing burden of chronic NCDs among older adults and emphasize the importance of evaluating their financial consequences at the household level.

The study demonstrated a significant difference in OOPE across disease categories. The median monthly OOPE was highest among participants with both HTN and DM (₹1550 [IQR: ₹1100–₹2100]), followed by DM alone (₹1250 [IQR: ₹900–₹1600]) and HTN alone (₹450 [IQR: ₹300–₹650]). The difference in total expenditure between the three groups was statistically significant ($P < 0.001$). These findings indicate that the coexistence of multiple chronic conditions substantially increases healthcare expenditure. Similar observations have been reported by Prathyusha *et al*.,[12] who documented a median monthly expenditure of approximately ₹1500 among diabetic patients residing in urban slums, whereas Archana *et al*.[14] reported higher OOPE among diabetic patients compared with hypertensive patients in a rural field practice area. The greater expenditure observed among diabetic and comorbid patients may be attributed to higher medication requirements, regular monitoring, and more frequent healthcare visits.

A particularly important finding of the present study was the high prevalence of CHE. Overall, 38.3% of participants experienced CHE. The burden was markedly higher among participants with both HTN and DM, among whom 55.3% incurred catastrophic expenditure, followed by 51.4% among diabetic patients and 13.0% among hypertensive patients. These findings suggest that diabetes, either alone or in combination with HTN, substantially increases the risk of financial hardship. The prevalence observed in the present study is comparable to that reported by Prathyusha *et al*.,[12] who found catastrophic expenditure among nearly two-fifths of diabetic households. Verma *et al*.[5] similarly reported that NCDs contribute substantially to household economic burden and can adversely affect financial stability. Such high levels of CHE represent a major challenge to achieving UHC and Sustainable Development Goal target 3.8.[9,10]

Analysis of expenditure components revealed that direct medical costs constituted the largest share of OOPE. Medication expenditure increased substantially across disease groups, from a median of ₹110 among hypertensive patients to ₹550 among diabetic patients and ₹780 among participants with both conditions ($P < 0.001$). Laboratory investigation costs similarly increased from ₹110 among hypertensive patients to ₹340 among diabetic patients and ₹410 among comorbid patients ($P < 0.001$). Consultation expenses were also significantly higher among diabetic and comorbid patients ($P < 0.001$). These findings are consistent with Mehta *et al*.,[11] who identified medicines and diagnostic investigations as the major contributors to OOPE among patients with HTN and diabetes. Kamath *et al*.,[1] in their systematic review of OOPE in India, likewise reported that medicines constitute the largest component of healthcare expenditure among patients with chronic diseases. Dependence on private pharmacies due to inadequate availability of medicines in public health facilities may further increase expenditure.

Although direct medical expenditure accounted for the majority of costs, direct non-medical and indirect costs also contributed to the overall economic burden. Median travel expenditure increased from ₹40 among hypertensive patients to ₹70 among patients with both diseases ($P = 0.002$). Loss of wages also differed significantly across disease groups ($P = 0.028$), although the absolute amounts were relatively low. Mathew and Olickal[15] similarly observed that travel expenditure remains an important contributor to OOPE among patients with chronic diseases. The comparatively lower indirect costs observed in the present study may be explained by the availability of healthcare services within the urban field practice area, thereby reducing travel time and work absenteeism.

The place of treatment emerged as the strongest determinant of OOPE. Nearly all participants seeking care from private healthcare facilities (98.9%) incurred OOPE, compared with only 58.1% of those utilizing government healthcare facilities ($P < 0.001$). This finding indicates the financial protection offered by publicly funded health services in reducing the economic burden of chronic disease management. Similar findings have been reported by Mathew and Olickal,[15] who observed substantially higher healthcare expenditure among individuals receiving treatment from private healthcare facilities. Likewise, Kamath *et al*.[1] identified private-sector healthcare utilization as a major contributor to OOPE in India.

Literacy status was significantly associated with OOPE, with a higher proportion of literate participants incurring healthcare expenditure than illiterate participants (84.0% vs. 61.1%, $P = 0.002$). This finding may indicate differences in healthcare-seeking behavior, awareness of available treatment options, and utilization of health services among literate individuals. No significant association was observed between OOPE and marital status, age group, or socioeconomic status, suggesting that these characteristics did not independently influence the occurrence of OOPE in the study population.

With regard to coping mechanisms, financial support from family members was the most common strategy, reported by 55.9% of participants, followed by utilization of salary (33.5%) and pension (28.2%). Notably, 12.4% of participants reported borrowing money to meet healthcare expenses, whereas a small proportion reported selling assets. Similar coping strategies have been documented by Archana *et al*.[14] and Kamath *et al*.[1] Reliance on borrowing and other distress-financing mechanisms reflects the continuing vulnerability of households facing recurring healthcare expenditures and indicates that existing financial protection measures remain inadequate for many families.

4.1. Limitations

The cross-sectional design limits causal inference. Expenditure data were self-reported and may be subject to recall bias. The 30-day recall period may underestimate infrequent expenditures. Findings may not be generalizable beyond similar urban field practice settings.

5. Conclusion

Patients managing HTN and diabetes in urban areas encounter a substantial economic burden, as OOPE remains the primary mode of healthcare financing. The total median monthly expenditure is highest for individuals with concomitant conditions at ₹1550, whereas diabetes management costs (₹1250) are significantly higher than those for HTN (₹450), a pattern that confirms the "diabetes premium" observed in other community settings. Medication costs represent the leading driver of medical bills, which is consistent with national trends where pharmaceuticals account for a major portion of current health spending. Furthermore, the utilization of private facilities results in exponentially higher costs compared to public care and serves as the strongest predictor of financial strain. This economic pressure pushes 38.3% of households into CHE, forcing many families to resort to distress financing methods such as borrowing or selling assets. While the public sector provides a crucial safety net, many patients still opt for expensive private providers due to perceived quality or long wait times at government centers. Consequently, policy interventions must focus on ensuring the availability of free generic drugs and expanding insurance coverage to include recurring outpatient needs to provide adequate financial protection for the urban poor.

5.1. Recommendations

The findings of the present study have important policy implications. Given that medication costs represented the largest component of expenditure and that private healthcare utilization was strongly associated with OOPE, efforts should focus on strengthening chronic disease services under the National Program for Prevention and Control of NCDs, ensuring uninterrupted availability of essential medicines and diagnostics in public facilities, and expanding access to affordable generic medicines through the PMBJP. Strengthening financial protection mechanisms for outpatient chronic disease care may substantially reduce OOPE and CHE among vulnerable households.

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