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Original Research Article

Mahila Arogya Samitis: a community interface for reducing out-of-pocket expenditure and strengthening public-sector uptake in non-communicable disease management

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ABSTRACT

Background: Recurring out-of-pocket expenditure (OOPE) for managing non-communicable diseases (NCD) such as diabetes mellitus (DM) and hypertension (HT) is a reality for poorer households in India. The OOPE is primarily driven by reliance on the fee-for-service private healthcare sector in the absence of reliable public sector provisioning. SATHI's community intervention project focuses on activating Mahila Arogya Samitis (MAS) as a community-level interface to support the management of NCDs through the public health system.
Methods: This action-research data is generated through routine programmatic monitoring in which identified patients were tracked at baseline (November 2024) and across three monitoring cycles (July 2025, November 2025, and March 2026), recording the source of treatment (Private vs. 'Government+' (government+ trust+ other NGOs+ generic sources)).
Results: The private sector's share of treatment fell by roughly 32-40 percentage points between baseline and Cycle 3 (DM 86.8% to 48.3%; HT 80.3% to 48.0%; both conditions 76.0% to 44.2%), with a corresponding rise in patients seeking treatment from the public health system. In total, the migration to the public health system led to savings of approximately ₹6,57,675 over nine months for the combined cohort.
Conclusions: Empowered MAS triggered migration of NCD patients from the private to the public health system through three interrelated functions: information facilitation, trust transfer to the public health system, and reliable feedback between communities and the public system. Scaling participatory forums like MAS is a useful strategy to reduce OOPE and contribute to the elusive goal of household financial protection from health expenditures.

Keywords: Community interface, Financial protection, Mahila Arogya Samiti, Non-communicable diseases, Out-of-pocket expenses, Urban slums

INTRODUCTION

Families in India pay a huge out-of-pocket (OOPE) cost for healthcare services- to the tune of about 47% of total cost of which about 70% is spent on medicines alone.[1,2] This is a huge financial burden on poorer households in rural and urban areas alike. And despite an increasing government investment in public healthcare system rising OOPE force families into financial impoverishment. About 60 million families are pushed into healthcare linked debt each year.[3,4]

The treatment of chronic conditions such as diabetes and hypertension incurs a significant recurring monthly cost for families and individuals. India, in recent years, is witnessing an alarming increase in non-communicable diseases (NCD), especially in urban areas.[5,6] This surge is increasing an economic burden on households due to their disproportionate dependence on private healthcare system.[1,7,8] The costs of care for NCDs like diabetes and hypertension vary widely between the sources of care-public or private facilities. While public facility care is highly subsidized or free, the mean private care OOPE

ranges from ₹25,000 to ₹35,000 annually without hospitalization, with comorbidities significantly increasing the expenses.[9]

Public primary-care institutions for NCD screening and medication exist in most areas, which claim to provide free or heavily subsidised treatment. However, a majority of patients continue to seek treatment from private sector due to many reasons.[10,11] Mahila Arogya Samiti (MAS) members have identified key gaps that compel patients to "buy" treatment from the private health sector rather than receiving it free or at a subsidised rate in the public health facility, including lack of information (patients not knowing what is freely available or where), trust and legitimacy deficits (perceptions of public facility quality or reliability), navigation barriers, and uneven availability of medicines in the public facility.[12]

Closing these gaps requires an interface mechanism that operates at the community level, informs and empowers patients, builds confidence in public provision, and works as a credible feedback mechanism by feeding community experience back into the system. This paper argues that MAS, women's health collectives promoted under the National Urban Health Mission, as a community platform for participation in health can serve precisely as this interface.[13] Drawing on action-research data from the SATHI's community intervention project in Pune, empowering and activating MAS as a state-mandated urban participatory platform on health documents a measurable migration of diabetes and hypertension patients from private to public sources of treatment over four time points. The analyses also estimate the associated reduction in household medication expenditure and interpret how MAS can improve institutional mechanisms for community empowerment and community-led health.

MAS were conceived as community-based units of 8-20 local women for every 50-100 urban-poor households, intended to act as a demand-generating link between the primary health centre and the community and to take action on the social determinants of health.[13] MAS model implemented in Chhattisgarh has been instrumental in improvements in health services access, nutrition, gender-based violence, and water and sanitation. This they achieved through community oversight over services, community consensus, and collective negotiating skills while dealing with system officials.[14] A realist evaluation of the model has demonstrated how MAS as a collective bring change.[15]

Building on the community-based monitoring and planning (CBMP) tradition in Maharashtra, this paper frames MAS as a community interface that performs three interlinked functions:

Information brokerage and interface mechanism: MAS members carry concrete, locally credible "actionable" information into households. For example, they provide information on which medical conditions can be managed for free, at which public facility, on which days, and what the patient is entitled to in terms of treatment, diagnostics, and medicines. This reduces the information deficit that defaults patients to private providers.

Trust and legitimacy transfer: There is certainly a deeply entrenched distrust within the community about the public health system, and the reasons are historical, largely emblematic of crumbling urban public health infrastructure. Women in the community see MAS members, who are all women, as embedded peers rather than external officials, and hence MAS members' endorsement of public health facilities as dependable sources of quality treatment transfers legitimacy to public facilities. However, trust is also contingent on the continued availability of medicines and services in the public health facility.

Feedback loop, transparency, and accountability: By highlighting key gaps in supply and service quality back to the public health system, the core logic of community-based monitoring, MAS helps improve public-side responsiveness, which in turn helps retain patients and prevent them from remigrating to private healthcare.[16]

In this framing, a shift in where patients obtain chronic disease treatment, from private to public health institutions, is a concrete outcome of these mechanisms operating in tandem. These patterns are consistent with the broader Maharashtra experience of "reclaiming" and enhancing the publicness of health services through participatory accountability and recent reflections on the fragility and political contingency of such gains.[17,18]

Conceptual framework: MAS as a community interface

The MAS converts a passive top-down model of public healthcare delivery into community-led active bottom-up units through: 1) Decentralised institutional mechanism-health governance moves from centralised clinics to urban slum lanes, 2) Community empowerment- MAS catapults women from the marginalised communities to socio-political leaders, 3) Community-led health and accountability: MAS transforms community members from passive beneficiaries to active monitors of health services, 4) Addressing the foundational causes of illness: community-led approaches help address the social determinants of health, 5) Trust-building structured dialogues, shared local oversight, and two-way feedback loops bridge gaps between healthcare providers and communities.

The intervention: NCD identification and management

One of the key components of this intervention project included community-level identification, counselling and continued treatment of two high-prevalence NCDs, diabetes mellitus (DM) and hypertension (HT), with activated MAS as a key community interface and

mobilisation strategy. In operation terms, it entails trained MAS members supporting active case-findings (screening and referral of suspected and known patients), counselling on the availability of free public treatment, need-based accompaniment to public facilities, follow-up to encourage continuity of care, and periodic recording of each identified patient's current source of treatment.

METHODS

Design and data character

This analysis is primarily based on community intervention linked action-research data. This was not a controlled trial. While recognising the inherent limitations of this for validity, the value of this data lies in documenting real-world change in care-seeking under a participatory intervention. At best, the design could be described as a prospective tracking of an open cohort of identified NCD patients across four time points: a baseline (November 2024), followed by three monitoring cycles in July 2025 (Cycle 1), November 2025 (Cycle 2), and March 2026 (Cycle 3). As a longitudinal analysis, it relies on periodic measures to assess the impact of the intervention. The same cohort was assessed for constant variables across different time points to track changes, identify trends, and analyze trajectories over time.

Baseline data collection was a house listing activity to conduct a situational analysis of the intervention urban areas. One of the challenges in tracking the urban vulnerable communities is its floating nature owing to seasonal migration in search of work and unpredictable working hours; in effect, the denominator is variable. Baseline data collection also helped SATHI establish a rapport with the community members, which greatly enhanced the subsequent data collection, as is evident in the tables below. Hence, the indicators were compared across the cycles of data collection. Behavioral shifts are gradual, and comparing a 12-month data provides better accuracy by removing short-term fluctuations and revealing true trends. Hence, the outcomes of OOPE and treatment adherence were compared between Cycle 1 and Cycle 3.

Patients were classified at each time point by source of treatment into three categories: a private source of prescription/medication; a "Government+" source (government facilities together with allied public or publicly-subsidised channels); or no current treatment. A separate "both NCDs" group captured patients with coexisting diabetes and hypertension, who carry a higher medication burden and are therefore of particular interest for OOPE.

Treatment adherence, taking medications as prescribed and regularly, is vital for managing NCDs in stabilizing conditions and preventing emergencies. In each cycle, patients were asked whether they followed the treatment regimen regularly. The rate of change in treatment adherence was calculated at the cohort and individual levels and stratified for the source of treatment.

The MAS maintains monthly meeting reports. We extracted data regarding the frequency of the meetings, member attendance, community health and social issues raised and discussed, solutions implemented, and issues resolved. These reports provide insights into the operational dynamics of the MAS. The data from these reports were triangulated with the quantitative findings.

Cohort definition and the changing denominator

The cohort for this analysis was open rather than closed, as this was an ongoing intervention project. The total number of tracked patients increased between baseline and Cycle 1 (e.g., DM 446 to 516; HT 766 to 808; both conditions 129 to 271) because active community case-finding continued to identify new patients after baseline. This increase in patients is a feature of active intervention, where continued community-based screening for DM and HT resulted in increased identification. Consequently, proportions (the share of patients on each source) were treated as the primary outcome because they are more interpretable than raw counts when the base population is growing. Absolute counts are reported alongside for transparency. Raw numbers were used to estimate the monthly savings after transitioning from private to public care between Cycle 1 and Cycle 3.

Measures

To ascertain the source of treatment, MAS members followed up with each identified patient and recorded them as private, Government+ (treatment obtained from government facilities together with allied public or publicly-subsidised privatised sources mostly through public-private partnerships), or no treatment.

Cost savings were calculated by comparing the total amount spent by patients on buying medicines in Cycle 1 and Cycle 3. Savings were estimated rather than directly tracked at the household level. The per-person monthly savings calculation is based on the net number of patients who moved from private to public sourcing; the nine-month figure projects the monthly reduction across the observation window (July 2025-March 2026).

Statistical analysis

The percentage of tracked patients on each source was computed for each condition at each time point, and the change from baseline to Cycle 3 was summarised. The private-to-public sourcing transition is recorded as an absolute count and a percentage-point change. To prevent double counting, the combined cohort figure is calculated net of the co-morbid group. Monthly decrease, per-

person monthly savings, and predicted nine-month savings are counted as cost outcomes.

RESULTS

Diabetes mellitus

Among the patients with diabetes, by Cycle 3, the private sourcing of treatment fell from 86.8% at baseline to 48.3%. The Government+ share almost doubled from 12.6% to 26.6%. In absolute terms, patients on a private source declined from 387 to 247, even as the total tracked population grew (Table 1).

Hypertension

For hypertension, the percentage of patients accessing treatment from the private health sector fell from 80.3% at baseline to 48.0% by Cycle 3, with Government+ rising from 19.1% to 28.5%. In absolute terms, the private count dropped from 615 to 388 against a growing denominator (Table 2).

Table 1: Change in treatment source in patients diagnosed with diabetes mellitus.

Cycle	Total, N	Private source of Rx	Government+ source of Rx	No treatment	% Private	% Govt+
Baseline (November 2024)	446	387	56	3	86.8	12.6
Cycle 1 (July 2025)	516	306	95	0	59.3	18.4
Cycle 2 (November 2025)	511	276	130	1	54.0	25.4
Cycle 3 (March 2026)	511	247	136	0	48.3	26.6

Table 2: Change in treatment source in patients diagnosed with hypertension.

Cycle	Total, N	Private source of Rx	Government+ source of Rx	No treatment	% Private	% Govt+
Baseline (November 2024)	766	615	146	3	80.3	19.1
Cycle 1 (July 2025)	808	470	200	15	58.2	24.8
Cycle 2 (November 2025)	808	400	216	8	49.5	26.7
Cycle 3 (March 2026)	808	388	230	11	48.0	28.5

Patients with both conditions

Patients with both diabetes and hypertension conditions with a significant medication burden showed the largest proportional shift toward public sourcing, with the private share falling from 76.0% to 44.2% and Government+ rising from 21.7% to 36.1% (Table 3).

Summary of migration

Across all three groups, the private share of treatment sourcing from baseline and Cycle 3 dropped by 32-40%, with a corresponding increase in public-source uptake. The Government+ share did not increase by the full amount of the private fall because the total tracked population also grew over the period (newly identified patients entering the cohort, some initially untreated or on private care), and a small, fluctuating "no treatment" group is present in the hypertension data. We also tracked cases that transitioned from private to public sources across cycles (Table 4).

Reduction in household medication expenditure

The migration from private to public sourcing translates into a reduction in household private medication outlay. Compared with Cycle 1, the modelled monthly reduction in private-source cost and its projection over the nine-month window are shown in Table 5.

Under these assumptions, the combined cohort saved approximately ₹73,075 per month in private medication outlay, equivalent to approximately ₹830 per person per month and ₹6,57,675 over nine months. The single-condition projections were approximately ₹2,90,025 (DM), ₹5,74,380 (HT), and ₹2,15,730 (both conditions) over the same window.

Table 3: Change in treatment source in patients diagnosed with hypertension.

Cycle	Total, N	Private source of Rx	Government+ source of Rx	No treatment	% Private	% Govt+
Baseline (November 2024)	129	98	28	0	76.0	21.7
Cycle 1 (July 2025)	271	160	74	0	59.0	27.3
Cycle 2 (November 2025)	269	128	91	0	47.6	33.8
Cycle 3 (March 2026)	269	119	97	0	44.2	36.1

Increased adherence to treatment

Treatment adherence consistently increased across all conditions: diabetes, hypertension, and comorbid cases. The improvement in rates was mainly driven by higher adherence rates in public care settings coinciding with a comparable decline in private care settings between Cycle 1 and Cycle 3 (Table 6).

Table 4: Summary of migration from private to public source of care.

Condition	Cycle	Private source (N)	Cycle	Government+ source (N)
Diabetes (DM)	1	306	3	49
Hypertension (HT)	1	470	3	79
Both NCDs	1	160	3	40

Table 5: Savings in out-of-pocket expenses monthly.

Condition	Private cost, Cycle 1 (₹/month)	Private cost, Cycle 3 (₹/month)	Monthly reduction (₹)	Saving per person/month (₹)	Saving over 9 months (₹)
Diabetes (DM)	1,70,665	1,38,440	32,225	657.7	2,90,025
Hypertension (HT)	1,96,680	1,32,860	63,820	807.8	5,74,380
Both NCDs	81,640	57,670	23,970	599.3	2,15,730
Combined (net)*	-	-	73,075	830.4	6,57,675

*The combined figure is computed net of the co-morbid ("both") group to avoid double-counting, on the assumption that patients with both conditions are also represented within the DM and HT figures. See Section 6.4

Table 6: Change in rates of treatment adherence.

	Total, %	Private source, %	Government+ source, %
Diabetes (DM)			
Cycle 1 (July 2025)	33.2	76.0	24.0
Cycle 3 (March 2026)	71.5	63.3	36.7
Hypertension			
Cycle 1 (July 2025)	45.5	67.5	32.5
Cycle 3 (March 2026)	73.6	62.3	37.7
Both NCDs			
Cycle 1 (July 2025)	45.2	65.0	35.0
Cycle 3 (March 2026)	72.5	53.8	46.2

DISCUSSION

The migration as a signature of the interface

If MAS optimally functions as a forum for information-brokerage, trust-transfer, and feedback interface, it creates favourable conditions for a consistent, cross-condition shift of patients from private to public sources. The largest shift occurred among patients with both conditions, who have the most to gain financially from switching and the most frequent contact with the health system, and for whom the value of accompaniment and reliable information is therefore highest.

Financial protection, not abstract "savings"

The analysis should be read more as a reduction in OOPE and improved financial protection than as money "saved" in the aggregate: the cost of medication is transferred from direct payment by patients for medicines to the public system. This distinction is important as disproportionately poorer ones for whom chronic medication is a regressive recurring economic burden retain income they would otherwise have spent on medication. This is consistent with evidence that supply-side public sector strengthening, rather than demand-side insurance alone, is associated with reductions in OOPE.[2,19]

Decreasing OOPE drives adherence

Lowering OOPE eliminates/minimizes financial barriers for patients, which reduces the chances of their skipping doses or rationing medications to afford basic needs.

Consistent medicine intake significantly lowers the chances of disease-related complications and emergency visits/hospitalizations. When patients do not have to compromise on essentials such as food, housing, or utilities, their overall health improves, which supports their chronic disease management.[20,21]

Mechanism and the limits of attribution

The temporal association between MAS activation and migration from private to public health systems does not

by itself establish causation. Given the design of the MAS activation program, a realist reading probing which mechanisms, in which contexts, lead to these outcomes is more appropriate than a direct impact claim.[22] The fact that consistent migration was seen from the private to public health system in diverse intervention areas, that migration became stronger over successive cycles, and that the greatest migration was seen among those with the highest burden suggests that the MAS could have been a key mechanism to bring in this change.

A note on the combined savings figure

The combined monthly saving of ₹73,075 is derived by netting out the co-morbid group: (₹32,225 + ₹63,820) - ₹23,970. This is correct only if patients with both conditions are already counted within the diabetes and hypertension figures, so that subtraction removes double counting. If the "both" group is instead a wholly separate cohort, the combined monthly savings should be the sum of the three (₹1,20,015), not the netted figure. The dataset documentation should explicitly state which is the case; the headline-combined figure depends entirely on this point and is the most likely focus of reviewer scrutiny.

MAS minutes

Social determinants of health (SDoH) profoundly impact NCD care; structural inequities influence the quality of care patients receive. Living in adverse socioeconomic conditions increases the body's allostatic load, which can exacerbate NCDs. MAS has been instrumental in addressing these SDoH factors by empowering vulnerable women to take collective action on health and social issues in their areas. Analysis of the minutes-of-meetings of MAS highlights recorded complaints and resolutions regarding the cleaning of blocked drains and chambers, regular supply of drinking water, fixing of street lights, regular garbage collection, water logging on streets, and approach road conditions in different MAS areas.

Besides community-level improvements, the reports also recorded patient-level initiatives that demonstrated that the MAS provided holistic, life-changing support for chronic conditions, such as; a) providing relief to a critically ill patient by enrolling a 54-year-old paralyzed hypertensive in the UPHC to receive free, accessible care; b) building trust and ensuring free and accessible care in the public health system for a young mother diagnosed with hypertension and diabetes; c. securing medications for the vulnerable by registering an elderly and neglected couple into the government NCD portal to receive free medications; and d) care navigation for a 65-year diabetic patient needing cataract surgery through UPHC enrolment and free care.[23]

Implications for scaling

SATHI's intervention over the year has moved a third or more of NCD patients toward public sourcing; besides increased identification and monitoring, this warrants MAS also being seen as an explicit OOPE-reduction strategy, not just as a participatory platform to deal with maternal and child health issues. Scaling, however, would largely depend on reliable and continued medication supply, and migration from private to public is sustainable only if public facilities can absorb additional patients, or the gains will reverse.

One of the key limitations of this analysis is the lack of a clear control group; therefore, the observed migration toward public sector care cannot be solely attributed to the activated and empowered Mahila Arogya Samitis (MAS). Anecdotally, there is no evidence of supply-side improvements over the same period; in fact, during the intervention period, there have been multiple reports of the non-availability of antidiabetic and antihypertensive medicines in the public health system. In certain instances, MAS members have worked as advocates and pressure groups to ensure that medicines are made available in the public health institutions. The evidence demonstrates a temporal association strongly aligned with the proposed mechanism, rather than proof of causation.

As analysis primarily is based on an open and shifting cohort and growing denominators across successive cycles as additional patients were identified, paired comparisons were difficult: the data partly track the same individuals over time and partly recount a population that was still in the process of being accounted for. Expressing findings as proportions mitigates this difficulty but does not fully resolve it. Third, the source of treatment and adherence to treatment was self-reported, and was reported to MAS members who are themselves part of the intervention. This introduces the potential for recall and social-desirability bias, plausibly operating in the direction of over-reporting public-sector uptake.

Fourth, the cost savings is not real spending data collected through household-expenditure but an estimate modelled over an assumption based on current average cost of diabetes and hypertension medicines. The per-person cost represents an average applied to an observed change in headcount, rather than a figure derived from a household-expenditure survey. The nine-month estimate further assumes that the monthly reduction holds linearly over the period, an assumption that may not obtain in practice. Fifth, the study captures no clinical outcomes. The data reflect a change in the source and cost of treatment, but not improvements in glycaemic or blood-pressure control or in continuity of care. Whether migration to the public sector maintains or improves clinical outcomes remains the central unanswered question.

Finally, the findings derive from specific intervention sites and may not generalise directly to other contexts. There may additionally be selection in which patients MAS were able to follow up consistently across all

cycles, further bounding the transferability of these results.

Strengths that emphasize the evidence-based approach for application of results to real-world problems include real-time tracking of individuals. By measuring the same cohort/groups of individuals over time we can observe their change trajectories in real time. Temporality is another strength. Although longitudinal studies are not the best designs to establish causality, tracking individuals provides stronger evidence for causality than data collected at one point in time. With regard to recall bias, data is collected about the participants' present experiences rather than past which tends to be more accurate. Continuous participation builds trust and rapport which improves data quality and allows for better evaluation of intervention over time through community engagement. Longitudinal studies allow for observing changes, even subtle ones, over multiple waves of data collection establishing trends in outcomes. Supporting data, including qualitative data such as monthly MAS meetings' minutes, SATHI field worker reports, and patient narratives, not only support the findings but also help examine processes, life transitions, and changes in lived experiences over time. They explain the 'why' and 'how' of the changes.

CONCLUSION

Within an action-research design, the project data document a consistent migration of diabetes and hypertension patients from private to public sources of treatment following MAS activation, alongside a meaningful reduction in household private medication expenditure. Interpreted through the lens of MAS as a community interface- brokering information, transferring trust to public facilities, and feeding community experience back into the system- the pattern suggests that participatory forums can operationalise public-system strengthening at the last mile and contribute directly to financial protection for households managing chronic disease. The findings are associational rather than causal, and their durability depends on the public system's capacity to absorb the patients it gains; both are priorities for the next phase of research and programming. The trends strongly suggest the potential value of MAS as an OOPE-reduction strategy, but replication in other urban settings would strengthen the case for wider policy adoption.

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