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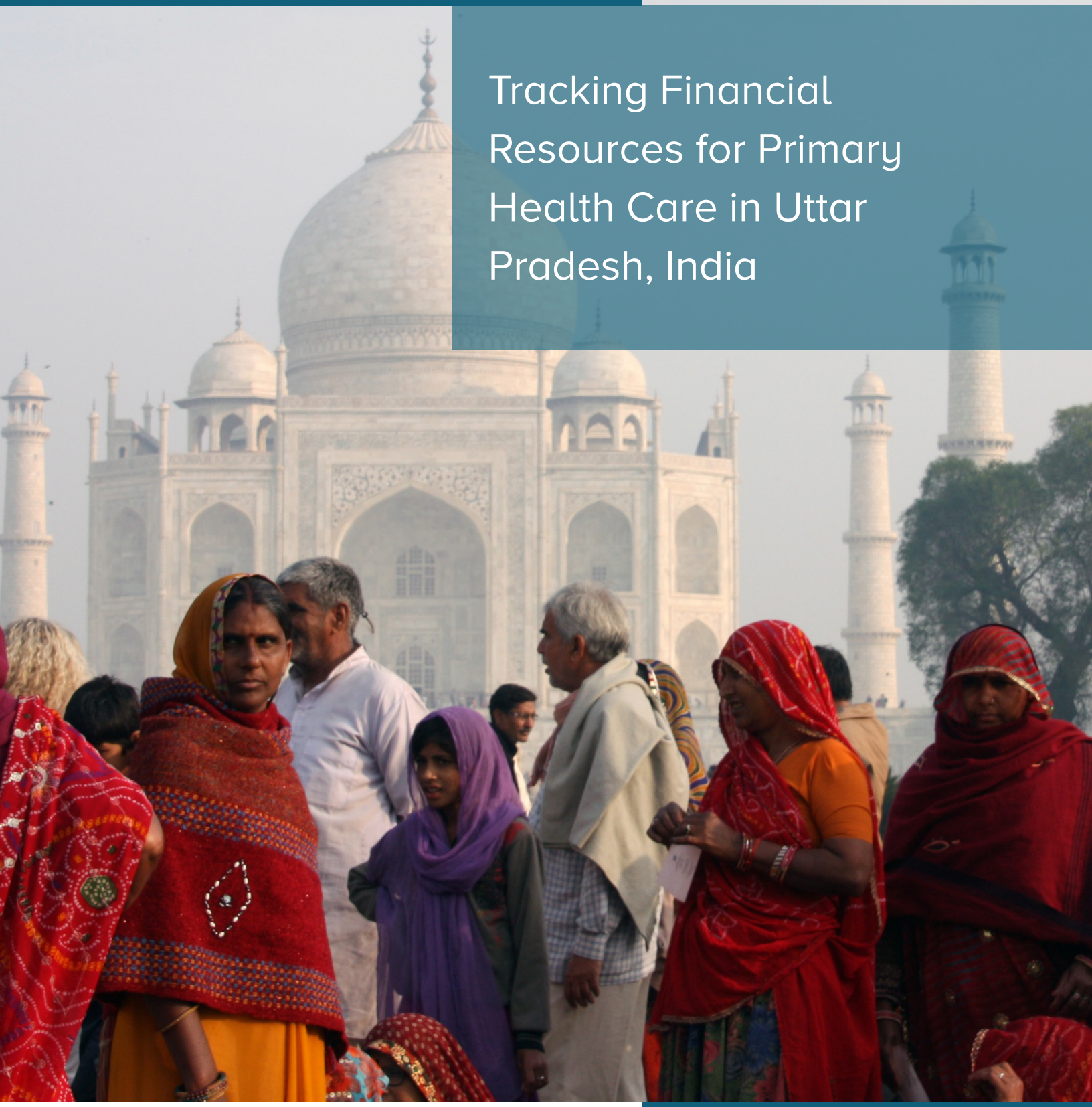
Tracking Financial Resources for Primary Health Care in Uttar Pradesh, India



Peter Berman, Manjiri Bhawalkar, Rajesh Jha

A report of the Resource Tracking and Management Project

Harvard T.H. Chan School of Public Health

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HARVARD T.H. CHAN
SCHOOL OF PUBLIC HEALTH

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Abbreviations

AHS	Annual Health Survey
ANC	Ante Natal Care
BCC	Behavior Change Communication
CHC	Community Health Center
DHS	District Health Society
DoMH&FW	Department of Medical, Health & Family Welfare
DPMU	District Program Management Unit
FMR	Financial Management Report (under NHM)
GDP	Gross Domestic Product
GoI	Government of India
GoUP	Government of Uttar Pradesh
GPCE	Government Primary Care Expenditure
GSDP	Gross State Domestic Product
HMIS	Health Management Information System
IEC	Information, Education, Communication
IUCD	Intra Uterine Contraceptive Device
JSY	Janani Suraksha Yojana
NHM	National Health Mission
NHSRC	National Health Systems Resource Center
NRHM	National Rural Health Mission (now NHM)
PHC	Primary Health Center
PRI	Panchayati Raj Institution
RKS	Rogi Kalyan Samity
RMNCH+A	Reproductive, Maternal, Newborn, Child, and Adolescent Health
RoP	Record of Proceedings
SHS	State Health Society
SIFPSA	State Innovations in Family Planning Services Project Agency
SPIP	State Project Implementation Plan (of NHM)
SPMU	State Program Management Unit
TGHE	Total Government Health Expenditure
UP	Uttar Pradesh
UPSACS	Uttar Pradesh State AIDS Control Society
VHSNC	Village Health, Sanitation and Nutrition Committee

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Tracking Financial Resources for Primary Health Care in Uttar Pradesh

1. Introduction

The performance of a country's health system is determined by a number of factors, including those related to system financing. Improvement in health of the population, financial risk protection and citizen satisfaction are three main goals often used to assess health system performance (Roberts et al., 2003). Developing strategies to meet those goals, enabling mid-course correction, and measuring health system performance rely on availability of sound data. To play an effective stewardship role in providing healthcare to its citizens, government needs evidence of how well health resources are managed (Powell-Jackson and Mills, 2007). Health resource tracking can be an integral part of governments' efforts to strengthen the health system.

The post-2015 development (Sustainable Development Goals) agenda includes a renewed focus on Universal Health Coverage and more emphasis clearly on system-strengthening approach. Primary care, including preventive services and maternal and child health, forms the backbone of a cost-effective health system. Health resource tracking can be applied to government financing of primary health care as one contribution to strengthening health systems.

Concept and purpose

The Harvard T.H. Chan School of Public Health has carried out research to help improve understanding and performance of the financing of primary health care in Ethiopia and India with support from the Bill and Melinda Gates Foundation. In India, research included both national analysis and a specific focus on Uttar Pradesh and Bihar. Based on an initial rapid assessment (Berman et al., 2013) and consultation with India's Ministry of Health and Family Welfare and the Gates Foundation's India Country Office, research activities focused on the following questions: what is the total resource envelope for primary care (including state and central contributions); whether allocation of public resources for primary care activities is well aligned with resources needed; whether there is adequate utilization of the allocated funds; and whether primary care spending is purchasing the right mix of inputs to assure delivery of maximum outputs.

Scope of the study

The scope of this report is limited to only the public sector financing of health in the state of Uttar Pradesh, and does not include private sector or household expenditures on health. Two other reports, one on Bihar, and one at the national level, have also been produced in this series.

This study analyzes budget allocation and expenditure data for seven years (from financial years 2008-09 to 2014-15). The scope included government health financing through the budget/treasury route (funds pooled by the state from general taxation) and through central and state government support for health channeled through government-linked societies. Both channels of funding were routed through different mechanisms linked to the Department of Medical, Health and Family Welfare, Government of Uttar Pradesh (DoMH&FW). The study does not look at government health spending through other government departments.

Analysis at the state level is based on the consolidated financial and output data for the entire state of Uttar Pradesh. In consultation with the DoMH&FW, we also included eight districts from the state and all the 117 blocks in the eight selected districts. The districts are Bareilly, Ghaziabad, Gorakhpur, Hardoi, Jaunpur, Sant Kabir Nagar, Shahjahanpur and Unnao. Districts were selected based on the following parameters:

- at least four of the districts were selected from the 25 high priority districts[1] and four non-high priority districts;
- mix of 'good performing', 'promising', 'low performing' and 'very low performing' districts based on the grading done by the state in the Health Management Information System (HMIS) Dashboard for 2013-14 using performance against Reproductive, Maternal, Newborn, Child, and Adolescent Health (RMNCH+A) indicators (NRHM-UP); and
- reasonable geographical spread to the extent possible.

Table 1: Study districts

Study districts	Grading based on RMNCH+A indicators (HMIS Dashboard 2013-14)	High priority district of the Department
Ghaziabad	Good performing	No
Bareilly	Promising	Yes
Shahjahanpur	Low performing	Yes
Unnao	Low performing	No
Gorakhpur	Very low performing	No
Hardoi	Very low performing	Yes
Jaunpur	Very low performing	No
Sant Kabir Nagar	Very low performing	Yes

Key research questions

The study looked at compositional changes in allocation and expenditure patterns across different levels of health care delivery with special focus on primary care and across cost inputs (human resource, operational costs, drugs and pharmaceuticals and capital projects).

The study addressed the following specific questions:

a. What is the total government health allocation and expenditure in Uttar Pradesh and how is it distributed across cost categories, across time and across different grants within the DoMH&FW?

b. What are the sources of financing for government spending through different channels of funding and what are their shares in the total?

c. What is the trend of expenditure versus budget/allocation across time?

d. What is the Total Government Health Expenditure (TGHE) as a percentage of the total government expenditure? What is the trend across time? How does it vary for National Health Mission (NHM) and Treasury?

e. What is the total expenditure on primary care as a share of the TGHE?

f. What is the priority accorded to the health sector vis-à-vis other social sectors as per budget allocations by the state government?

[1] These are 25 Gates Foundation focus intervention districts in Uttar Pradesh

g. What is the per capita state public health expenditure over time?

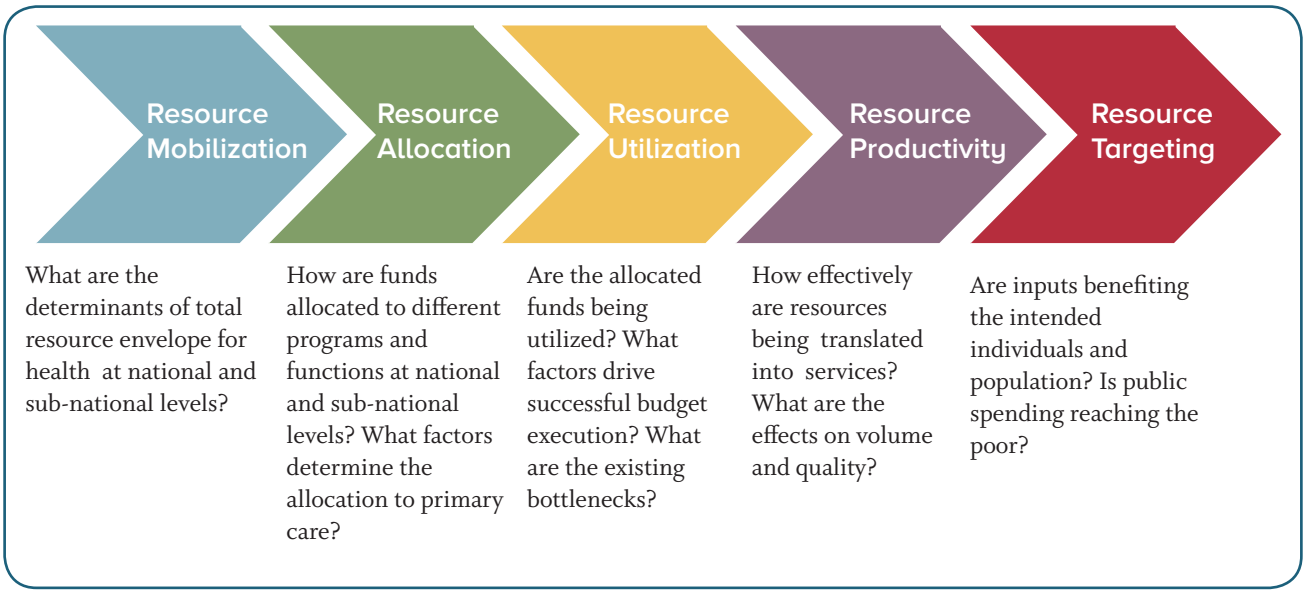
h. Over time how much is the government spending on drugs and pharmaceuticals?

i. How efficiently are the funds utilized overall? Are there any differences in budget utilization between the Treasury and society routes? What are the factors that facilitate or inhibit utilization of funds?

Resource tracking and management framework

The study uses the Resource Tracking and Management (RTM) framework presented in Figure 1 below, which was developed as a part of the rapid assessment conducted by the team as a basis of this work.

Figure 1: Health Resource Tracking and Management Framework



This report presents the results on the first 4 stages of the RTM framework.

Organization of the report

Following the introduction of the study and its objectives, we include a brief description of the health sector in UP. In the third and fourth sections we discuss the methodology in detail and give an overview of the budgeting flows and process employed in UP. The results from each stage of the RTM framework are highlighted in section 5, followed by a conclusion and recommendations based on the results.

2. Health sector in Uttar Pradesh

The health sector in Uttar Pradesh suffers from a history of resource and performance shortfalls, which result in weak outcomes for its citizens. These shortfalls can be observed both at the policy level and at the service delivery level. The system is characterized by unequal access to health care, high inequity, poor quality health care services, and insufficient public spending resulting in high out-of -pocket expenditures (World Bank, 2011). Weak government health systems affect the poor most, and, it is estimated that in a recent year 8 percent of households in UP fell below the poverty line due to health-related out-of-pocket expenditures (World Bank 2011). UP is an Empowered Action Group (EAG) state, which qualifies it for additional central subsidies. It experienced a 2.4 times increase in its health budget between 2008-09 and 2014-15 in nominal terms. Yet, the state remains one of the lowest performing states even among its EAG peers. The persistent challenge in UP is that inadequate institutional capacity and management systems of the state's Health Department limit its ability to have the full benefit of these inputs (World Bank, 2011).

Demographic overview

Uttar Pradesh has a population of 19.9 crores (Census, 2011) which is greater than the population of Brazil. If UP were a country, it would be the fifth most populous country in the world (World Atlas, 2015). It is the most populous state in India, constituting approximately 16.5 percent of the country's total population. On several of the demographic indicators, Uttar Pradesh performs below the national averages.

Table 2: Demographic profile of Uttar Pradesh

No.	Indicators		Uttar Pradesh	India
1	Population (in crores)	Total	19.98	121.09
		Rural	77.7%	68.9%
		Between 0-14 years	33.7%	29.5%
		Between 15-59 years	59.5%	62.5%
		Aged 60 & above	6.8%	8%
2	Population Density		829	382
3	Sex Rato		878	909
4	Decadal Growth Rate		20.23	17.7
5	Total Fertility Rate	Total	3.1	2.3
		Rural	3.3	2.5
		Urban	2.5	1.8
6	Effective Literacy Rate (aged 7 years & above)	Total	69.72%	74.04%
		Female	59.26%	65.46%
		Male	79.24%	82.14%
7	Crude Birth Rate		27.2	21.4
8	Crude Death Rate		7.7	7

Source: Census 2011, Government of India

Healthcare delivery network

Uttar Pradesh (UP) has a vast network of health care service delivery in the public sector. The state is divided into 18 administrative divisions, 75 districts and 106,704 revenue villages. Despite an increase in the number of health care facilities, UP still faces a severe shortage in service delivery capacity relative to need. Based on the GoI norms of facilities to population, UP needs a third more of sub-centers and primary health care centers and community health centers than what it has today. (Ministry of Health & Family Welfare, 2014).

Table 3: Health facilities for primary & secondary care in UP

Health Facility	Numbers*	Shortfall**
Sub-centers (SC)	20,521	34%
Primary Health Centers (PHC)	3,497	33%
Community Health Centers (CHC)	773	40%
District Hospitals	160	
Mobile Medical Units	133	

* as of March 31, 2015 ** Based on 2011 Census
Source: Rural Health Statistics 2015, MOHFW, GOI

This extent of shortage of the physical infrastructure, despite the infusion of funds under the National Rural Health Mission (NRHM) from 2005 (which in 2013-14 became the National Health Mission - NHM), is severely compromising the access to quality health care services in the state.

Human resources in health

Another important supply side barrier to health care delivery is human resources for health. The paucity of health personnel at all levels exacerbates the impact of shortage of facilities. The state government has not been able to overcome the persistent challenge of shortages in human resources for health. The lack of sufficient numbers of health workers along with high rates of absenteeism has a direct impact on demand for health services (James et al., 2006). Table 4 below illustrates the extent of shortfall for some of the critical cadres in the state's public health system relative to government norms.

Table 4: Human resources for health in UP (as of March 31, 2015)

No.	Cadres of Human Resources	Required	Sanctioned	In-position	Vacant	Shortfall	% in-position
		(R)	(S)	(P)	(S-P)	(R-P)	(P/R)
1	Health worker (female)/ Auxuliary Nurse Midwife (ANM) at SC	20,521	23,580	20,265	3,315	256	99%
2	Health worker (female)/ ANM at SC & PHCs	24,018	27,334	23,731	3,603	287	99%
3	Health worker (male) at SC	20,521	9,080	3,152	5,928	17,369	15%
4	Health Assistants (female)/ Lady Health Volunteer (LHV) at PHCs	3,497	3,781	1,916	1,865	1,581	55%
5	Health Assistant (male) at PHCs	3,497	5,757	954	4,803	2,543	27%
6	Allopathic doctors at PHCs	3,497	4,509	2,209	2,300	1,288	63%
7	Surgeons at CHCs	773	529	112	417	661	14%
8	Obstetricians & gynecologists at CHCs	773	524	115	409	658	15%
9	Physicians at CHCs	773	523	103	420	670	13%
10	Pediatricians at CHCs	773	523	154	369	619	20%
11	Total specialists at CHCs	3,092	2,099	484	1,615	2,608	16%
12	Radiographers at CHCs	773	230	82	148	691	11%
13	Pharmacists at PHCs & CHCs	4,270	2,952	2,883	69	1,387	68%
14	Laboratory Technicians at PHCs & CHCs	4,270	1,331	963	368	3,307	23%
15	Nursing Staff at PHCs & CHCs	8,908	4,497	4,412	85	4,496	50%

Source: Rural Health Statistics, MoHFW, GOI, 2015

A major source of inefficiency in use of funds for salaries is the excessive absenteeism of medical providers, which constitutes a form of leakage of health-sector resources and weakens the relationship between health spending and outcomes (Gauthier, 2007). Other studies have validated these findings, which found that doctors posted at remote facilities and at facilities with poor infrastructure and equipment were absent at significantly higher rates, as were those with longer commutes (Muralidharan et al., 2011). From past studies in UP, it is clear that for increased public investment in health to translate into improved health outcomes, ensuring better accountability of front line provider attendance is critical in UP.

Health sector performance in Uttar Pradesh

While some output indicators have changed little over the last 5 years, for few others there has been a significant improvement in the same time period. Institutional delivery has recorded more than 25 percent increase in 2014-15 since 2010-11. For the same period there is a 61 percent reduction in the percentage of newborns weighing less than 2.5 kilograms to the total newborns weighed at birth.

Table 5: Selected indicators of UP health sector outputs over time

No.	Output Indicators	2010-11	2011-12	2012-13	2013-14	2014-15
1	Percentage of women who received 3 ANC check-ups to total ANC registrations	73.9	77.7	73.1	69.9	69.3
2	Percentage of mothers paid JSY incentive for home deliveries to total reported home deliveries	7.2	5.2	4.5	5.4	2.5
3	Percentage of institutional delivery to total reported delivery	58.4	61.7	62.8	71.4	73.3
4	Percentage of institutional delivery to total ANC registrations	46.1	45.7	40.9	42.2	45.2
5	Percentage of women receiving post partum check-up within 48 hours of delivery to total reported deliveries	52.3	61.1	56.9	58.7	56.5
6	Percentage of new norn having weight less than 2.5 kg to new borns weighed at birth	30.4	29.1	28.3	17.8	11.8
7	Percentage of newborns breastfed within one hour of birth to total live births	66.9	69.7	70.5	84.1	87.4
8	Percentage of new borns visited within 24 hours of home delivery to total reported home deliveries	55	57.2	61.6	58.3	53
9	Percentage of male sterilization to total sterilization	2.2	3.5	2.2	3.1	4.1
10	Percentage of IUCD insertions to all family planning methods	79	80.3	81.6	80.2	80.3

Source: HMIS Standard Reports from 2010-11 to 2014-1, https://nrhm-mis.nic.in/hmisreports/frmstandard_reports.aspx accessed on 26 April 2015

Analysis of data from Annual Health Survey (AHS) 2012-13 across the 8 Empowered Action Group (EAG) states reveals that UP fairs very poorly among them in most indicators (Table 6). Given the size of its population, Uttar Pradesh holds the key to improvements in India's national public health goals.

Table 6: Performance against select health indicators in EAG states: a comparative overview

No.	Indicators	Bihar	Chhatisgarh	Jharkhand	Madhya Pradesh	Odisha	Rajasthan	Uttar Pradesh	Uttarakhand
1	Total fertility rate	3.5	2.7	2.7	3	2.2	2.9	3.3	2.1
2	Current usage of any method of family planning	41.2	60.7	57.5	63.2	62.4	70.2	59	62.7
3	Share of sterilisation in any modern method of family planning								
	Female	84.1%	86.5%	76.7%	82%	70.8%	76%	48.9%	50.8%
	Male	0.8%	1.9%	1.1%	2%	0.6%	1%	0.8%	2.4%
4	Women receiving full ante natal check up	7.8%	22.5%	13.6%	16.2%	27.8%	9.5%	6.8%	17.1%
5	Institutional delivery	55.4%	39.5%	46.2%	82.6%	80.8%	78%	56.7%	58.3%
6	Mothers who availed financial assistance under JSY	40.9%	34%	23.9%	72.9%	70.3%	59.5%	36.4%	33.8%
7	Pregnancy resulting in abortion	4.5%	1.4%	5.4%	3.2%	6.7%	3.3%	7.1%	6.5%
8	Mothers not receiving any post natal care	19.4%	22%	26.1%	14.1%	12.1%	16.8%	17.9%	30.1%
9	Percentage of new born checked within 24 hours of birth	61.9%	65.9%	64.8%	79.1%	81.7%	76.3%	77.7%	62.9%
10	Fully immunized children (12-23 months)	69.9%	74.9%	69.9%	66.4%	68.8%	74.2%	52.7%	79.6%
11	Children (6-35 months) given Vitamin A dose	56.2%	68.3%	58.6%	58.1%	68.6%	74.2%	40.8%	57.1%
12	Percentage of children breastfed within 1 hour of birth	37%	66.3%	43.3%	66.8%	78.7%	54.1%	39.4%	65.1%
13	Crude Birth Rate	26.1	23.2	23	24.5	19.6	24.1	24.8	18
14	Crude Death Rate	6.8	7.3	5.7	7.7	8.1	6.4	8.3	6.4
15	Under-5 Mortality Rate	70	60	51	83	75	74	90	48
16	Maternal Mortality Ratio (MMR)	274	244	245	227	230	208	258	165
17	Infant Motality Rate (IMR)	49	46	36	62	56	55	68	40
18	Neo-Natal Mortality Rate (NNMR)	32	32	23	42	37	37	49	28

Source: Annual Health Survey, 2012-13, Government of India

Full antenatal checkup is only 6.8 percent in Uttar Pradesh as compared to 27.8 percent in Odisha. Institutional delivery in Uttar Pradesh is 56.7 percent in contrast to a high of 82.6 percent in Madhya Pradesh, though much better than Chhattisgarh (39.5 percent). Only 36.4 percent of the pregnant women in Uttar Pradesh availed financial benefits under the JSY, the flagship scheme of the Government of India, as compared to 72.9 percent in Madhya Pradesh. Uttar Pradesh has the highest IMR (68), highest NNMR (49) and the second highest MMR (258) among the EAG states. A review of other indicators over time (Table 6) reveals that UP health indicators, despite their poor performance compared to other EAG states, are in fact gradually improving over time.

Some of the improvements in the key impact indicators over time in UP are worth noting. See Table 7 below.

Table 7: UP health sector performance against key impact indicators over time

No.	Impact Indicators	2010-11	2011-12	2012-13
1	Crude Birth Rate	26	25	25
2	Crude Death Rate	9	8	8
3	Infant Mortality Rate	71	70	68
4	Neo-natal Mortality Rate	50	50	49
5	Under-5 Mortality Rate	94	92	90
6	Maternal Mortality Ratio	345	300	258

Source: Annual Health Survey Bulletin, 2010-11, 2011-12, 2012-13, Registrar General of India

The most significant impact has been on the reduction of MMR from 345 in 2010-2011 to 258 in 2012-13. However, the systematic gaps, inadequate resources and their inefficient utilization continue to persist.

A brief comparative overview of the eight study districts is included in Annex 1.

3. Methodology

Overview of the approach

The study was primarily based on secondary data (budget, allocations and expenditure, outputs) in addition to some qualitative analysis. It was conducted in collaboration with local partner - Offbeat Innovations Management, and implemented in close coordination with the DoMH&FW, GoUP.

Sources of funds in the public sector in UP

There are two sources from which government resources flow into the health sector in Uttar Pradesh. Primary source is the state government, which provides allocations out of own revenue receipts (tax revenue, non-tax revenue and a devolved share of union taxes and duties). The second source is the central assistance provided by the Government of India. Table 8 presents the sources of funds for health through different routes.

Table 8: Total sources & routes of funds for health from State and Center

Source	Treasury Route	Society Route	Notes
State	(1) State's health budget (Includes funds from central revenue sharing)	(4) State share of NHM budget	(1) State Health Budget (SHB): Budget from the state government allocated for health out of the revenues collected through general taxation. (2) This is that part of NHM approved budget that is transferred by the GoI directly to the State Treasury. (3) This is center's contribution to the health sector budget in UP under the heald of different Centrally Sponsored Schemes (non-NHM) (4) This is the state contribution of 15% and then 25% of the approved NHM budget transferred from the state treasury to the State Health Society. (5) This is the GoI contribution to the NHM budget which is transferred by the GoI directly to the State Health Society.* (6) Budget for HIV prevention and control program transferred by the GoI directly to the UP State AIDS Control Society. * From financial year 2014-15, all central transfers are now routed through the Treasury
Center (GOI)	(2) NHM Funds for Infrastructure & Maintenance	(5) GoI share of NHM budget	
	(3) Other Centrally Sponsored Schemes	(6) National AIDS Control Program	

Data organization

For the treasury route: State level budget and expenditure data and district level allocation and expenditure data were organized by year against the 45 expenditure object codes used in the DoH&FW budget books and listed in the Budget Manual of the UP Government (Ministry of Finance, 2011). *For the NHM route*: All state level budget, funds available (opening balance) and expenditure data, as available in the Financial Management Reports and audited balance sheets of NHM, were organized year-wise. Block level productivity analysis was conducted for 2012-13 and 2013-14, as NHM HMIS data prior to 2012 is not perceived as reliable.

Methodological approach for data analysis

State and district financial data was disaggregated into levels of care (primary, secondary, tertiary, medical education and administration) based on the categories used by the National Health Systems Resource Center in the Budget Tracking Toolkit (NHSRC). The objects of expenditure in the State Budget were classified into the five cost input categories: 'Human Resources', 'Operating Expenses', 'Capital Projects', 'Drugs & Pharmaceuticals' and 'Others'. (Annex 2).

To ensure uniform cost category-wise analysis across budget sources, we categorized the NHM expenditure data into the same five cost categories (Annex 3). A series of assumptions and estimations were made for data interpretation and analysis:

Assumptions related to classification of treasury financial data into levels of care: The Budget Tracking Toolkit of the NHSRC was used for classifying budgets and expenditure into levels of care. Since budget codes are not uniform across states, wherever there was a conflict between category to be assigned to a particular budget code as per the NHSRC toolkit and the description of the budget line, we used the state's budget line description to assign the level of care. For the purpose of this study, CHC was considered as a primary care facility.

Assumptions related to classification of NHM financial data into levels of care: Apart from the expenditure types listed below which are classified as secondary and administrative, while undertaking analysis by levels of care, all other expenses under the NHM were classified as primary care.

a. Expenses classified as secondary care include: annual maintenance grant for hospitals at the district level and above, corpus grant to District Hospitals and Sub-divisional hospitals.

b. Expenses classified as 'administration' include repair / renovation of state, regional and district warehouses, fuel for basic ambulances and advanced life support ambulances at the state level, operational cost for basic life support and advance life support ambulances, operational cost for call center, maintenance of *UP ambulance seva* vehicles, computer consumables / administrative expenses, review of registers, printing of new registers/ forms, generators for facilities above CHC level, bio-medical waste management where the budget line specified district and above, cleaning / housekeeping / laundry where the budget line indicated district and above, all expenses related to drug warehouses at different levels, fuel for generators, machinery and equipment for the district hospital.

Definitions of health facilities and budget terms

Table 9 lists the definitions used in classifying different types of government health facilities.

Table 9: Type of health facilities as per population norms

Type of Health Facility	Population Norms	Basic Features
Sub Centre	Village Level: 5,000 population in plain areas and for every 3,000 population in hilly/tribal/desert areas.	Staffed by one male multipurpose worker (MPW/M) and one female multipurpose worker (MPW/F) or ANM.
Primary Health Centre	Block Level: 30,000 populations in plain areas and 20,000 in hilly, tribal, or difficult areas.	With 4-6 indoor/observation beds, it is staffed by a Medical Officer and acts as a referral unit for 6 sub-centers and refers out cases to higher order public hospitals.
Community Health Centre	Block Level: 4 PHCs are included under each CHC thus catering to a population of approximately 80,000 in tribal/hilly areas and a population of 120,000 in the plains.	30-bedded hospital providing specialist care in medicine, obstetrics and gynecology, surgery and paediatrics with the help of regular appointed medical experts. It is the first referral unit for the PHCs falling under its area.
31-100 bedded hospital	Subdivision Hospital: It caters to about 5-6 lakh (0.5-0.6 million) people. Depending upon the size of a sub-division, a sub-divisional hospital can be 31 to 50 or 51 to 100 bedded.	It has an important role to play as First Referral Units for PHCs and CHCs in providing emergency obstetrics care and neonatal care. It fills the gap between the block level hospitals and the district hospitals.
101- 200 bedded hospital 201-300 bedded hospital 301-500 bedded hospital	District Hospital: Every district is expected to have a district hospital linked with the public hospitals/ health centres down below the district such as sub-district/sub-divisional hospitals, CHCs, PHCs and SCs.	District hospitals are an essential component of the district health system and function as secondary level of health care that provides curative, preventive and promotive health care services to the people in the district.

Source: MoHFW, Government of India

- **What are 'Budget Estimates', 'Revised Estimates' and 'Actuals'[2,3]?**

'*Budget Estimates*' - Budget Estimate is the initial planned spending amount announced before the beginning of the fiscal year. It is based on advance estimates of receipts and expenditure of a financial year.

'*Revised Estimate*' - Revised Estimate is a revision to the Budget Estimate issued approximately in the 3rd quarter of the fiscal year reflecting adjustments in revenue estimates and spending estimates.

'*Actual*' expenditures are the final audited amounts spent under different heads and may exceed (or fall short of) the Revised Estimates. Since the Actual expenditure can only be assessed once the financial year is over and final accounts have been prepared and audited, the Actual expenditures presented in the budget papers are for the earlier financial year.

[2] Budget Manual, Budget Division, Department of Economic Affairs, Ministry of Finance, Government of India, 2010

[3] How to Read the Union Budget, PRS Legislative Research, Center for Policy Research, 2010

- **Fund flow routes: - Treasury and Society**

Treasury Route: Refers to the flow of all funds, including funds from the state government (own tax revenue) and the central government grants, which are routed through and spent directly out of the State Treasury.

Society Route: Refers to the flow of funds, including funds from the state government and the central government grants that are routed through and spent directly out of the State Health Society (SHS). The state treasury has little oversight of society route spending, as SHS accounts do not fall under the purview of routine audits of the Comptroller and Auditor General of the Government of India.

Limitations

1. *Limitations in financial data related to treasury funds*

   Health expenditure incurred by departments other than DoMH&FW is not included in the study. For treasury financial data we included only the budget and expenditure line items assigned under the following Major Codes: 2210, 2211, 4210 and 4211 under the DoMH&FW (Grants 31 to 36). Major Codes of 2210 under Grants of other Departments like Grant 76 of the Department of Labor and Grant 83 of the Department of Social Welfare have not been included in the study.

2. *Limitations in financial data related to NHM funds*

   The financial management system under the NHM is structured differently from the treasury funds, using program-specific categories. The FMR (Financial Management Report), which forms the basis of detailed financial reporting at all levels for NHM, and the audited balance sheets of NHM are structured program-wise, making it difficult to disaggregate budget and expenditure data into different cost or input categories. The mapping of the FMR to cost categories is limited to only two financial years 2013-14 and 2014-15. This was not possible for previous years due to concerns related to the quality and consistency of data in the FMR.

3. The productivity analysis was done at the block level instead of at facility level. Data at facility level was not available to conduct a more robust analysis. Results of productivity analysis are based on HMIS data, which is widely viewed as having limited reliability.

4. Limitations of the HMIS data – UP HMIS data for the study years are inconsistent and unreliable. This is evident from triangulation of results against some of the key indicators in the HMIS. Moreover, there were differences in figures received from the district offices and those available on the NHM website of the Government of India. This was reportedly due to different districts starting to report in online HMIS system at different times. More recently, concerted efforts are reportedly being made to develop the capacity and systems for recording and reporting credible HMIS data.

In the expenditure analysis, Revised Estimates (RE) have been used for 2014-15. For all other years, expenditures are Actual expenditure figures.

4. Budgeting and fund flow processes

Process of budgeting and allocations under the treasury route

Government of UP's budget manual describes in detail the process of preparing budgets. During September – October each year, the health department asks for budget estimates from the districts and relevant Directors and Additional Directors for the upcoming financial year. These budget estimates are usually prepared based on the current expenditure trend and adding 10 percent - 15 percent increase in different budget lines. Officials at the state level review and consolidate the figures to arrive at the total budget estimate. The Department of Finance, in consultation with the DoMH&FW, finalizes the budget estimate. Once the budget is approved, allocations are made on a quarterly basis through on-line treasury management system and necessary updates are sent to the concerned Drawing and Disbursing Officers and Department heads. Discussions at the state and district levels reveal that an incremental approach to budgeting is used for the treasury route.

Planning and budgeting under the NHM

The process of planning under NHM takes about five to six months. Based on the overall resource envelope communicated by the Government of India to the state, the state determines the resource envelope for each district along with guidelines for district-level planning. Using the prescribed format, the District Program Management Unit (DPMU) prepares its plans and budgets based on detailed inputs from each block. Consultation workshops are held at the state level with the district teams to review, negotiate and finalize the plan of action and the budgets. The finalized District Plans are sent to the state with the approval of the respective District Health Societies (DHS). At the state-level all district plans are consolidated and the SPIP (State Project Implementation Plan) and the budget are prepared. The Executive Committee and the Governing Board of the State Health Society (SHS) approves the SPIP after which it is shared with the NHM unit of the GoI. After detailed review, a coordination meeting is held between the GoI and the state NHM team for final presentation, discussions and approval. Unless there are reasons beyond the reasonable control of the officials at the GoI level, the Record of Proceedings (ROP) is sent by GoI to the states around July each year communicating the approval decision and related details.

Fund channels and flow under the NHM

Center to State: Until 2014-15, the central funding of NHM used to flow to the states through two channels. Most of the central support was routed directly to the SHS and a small portion of the approved budget, earmarked for Infrastructure and Maintenance component, was directly transferred to the state through the treasury route. As a part of streamlining channels of funding and ensuring greater oversight by the state, the GoI changed its policy and 2014-15 onwards all central support goes directly to the treasury account of the state from where funds earmarked for the SHS is transferred by the state to the SHS. Discussions with officials at the state level reveal that though in principle they agree with the rationale for the shift in fund flow through the treasury, they are experiencing increased administrative burden and management time required to follow up with the treasury for release of funds to the SHS. This concern was also reflected by the 93rd Parliamentary Standing Committee for the Department of Health and Family Welfare of GoI, which reported significant delays in onward transfer of central funds from the state treasuries to the Societies across states (GoI, 2016).

From the SHS funds flow to the DHS and to other implementing agencies at the state level executing different parts of the SPIP. From the DHS funds then flow to the block program management units, health facilities, village committees and other implementing agencies.

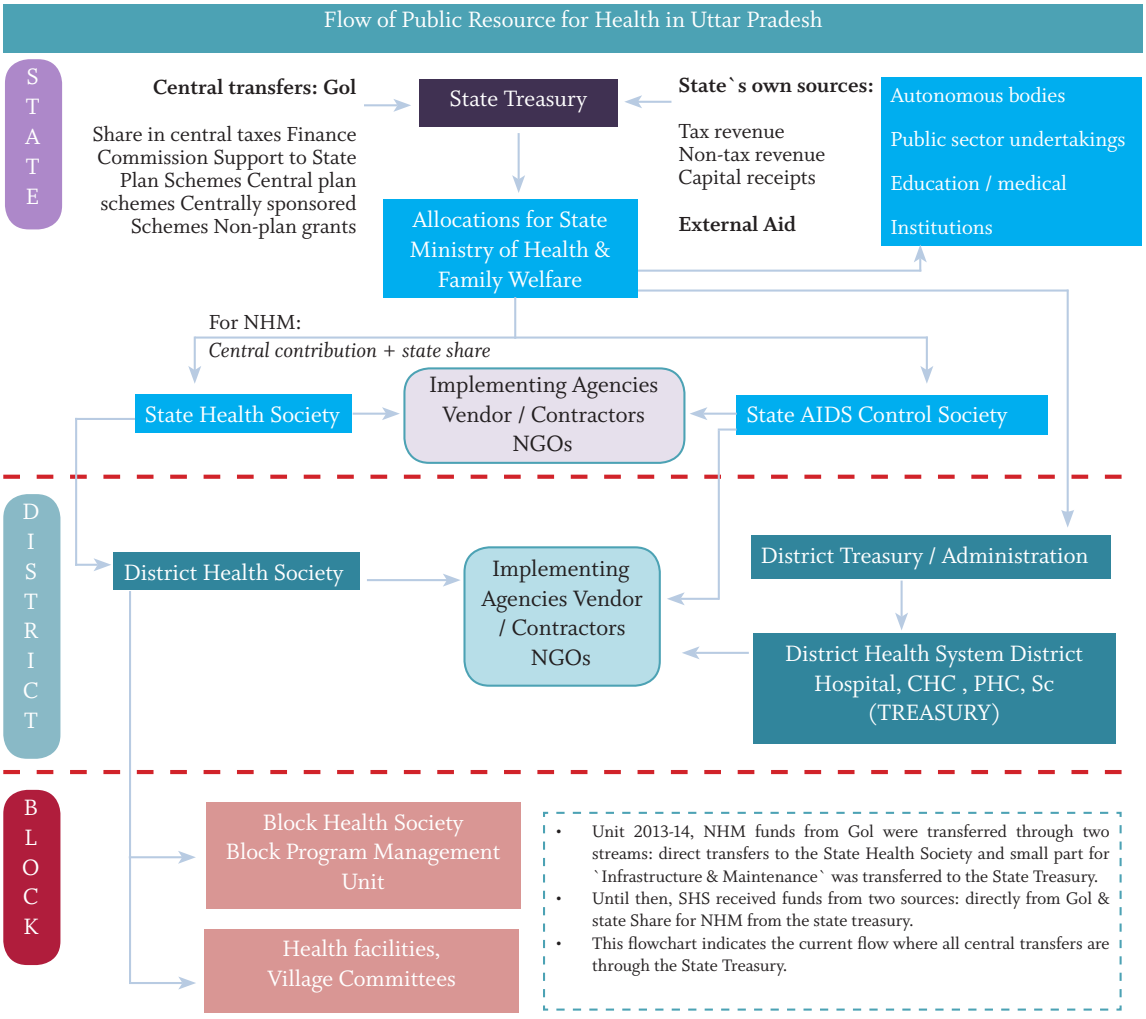
Fund transfers under NHM

After approval of ROP, the GOI transfers 75 percent of the approved budget amount as the first installment after adjusting opening balances and committed expenditure. To be eligible for this transfer states have to submit provisional utilization certificates from the previous year and the FMR up to the previous month of fund transfer. Following this, on submission of the final audited utilization certificate of the previous year and the audit report, the remaining 25 percent is transferred by the center to the states.

After introduction of accounting software in 2013-14, program-specific bank accounts at the district and block levels have been merged into a single bank account. After the state receives the approval of the SPIP from GoI, based on the detailed plan of action and budget for the districts, the state transfers funds to each program based on its pre-approved budgets and opening balances. Shortfalls are transferred in the later months as and when funds are available after reviewing the district level expenditure up until the previous month.

The flow of resources for health in UP is presented in Figure 2 below:

Figure 2: Flow of public resources for health in UP



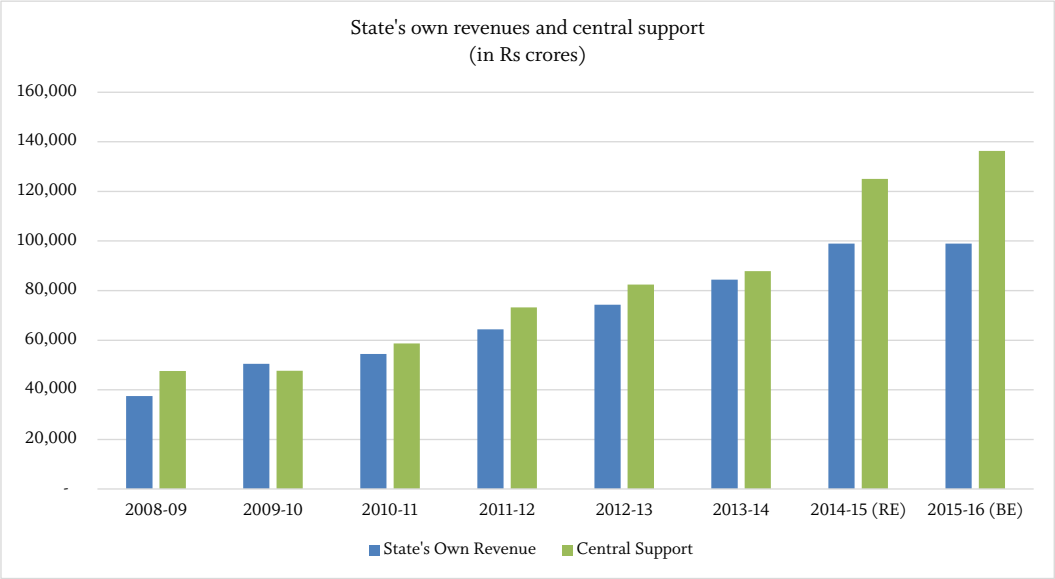
5. Results

Resource mobilization – trends and analysis

Fiscal space within UP

UP has experienced steady macro-economic growth, and the Gross State Domestic Product (GSDP) has grown at an average rate of 14 percent in the past 6 years. The GSDP is estimated at Rs. 976,300 crores at current prices[4] in 2014-15 (Rs. 492,384 crores at 2004-05 constant prices). However, its strong population growth rate mitigates the impact of the macro-economic growth. As seen in the Figure 3 below, both the state's capacity to generate its own revenue (tax and non-tax revenue) and central government's support increased about 2.6 times in the same time period.

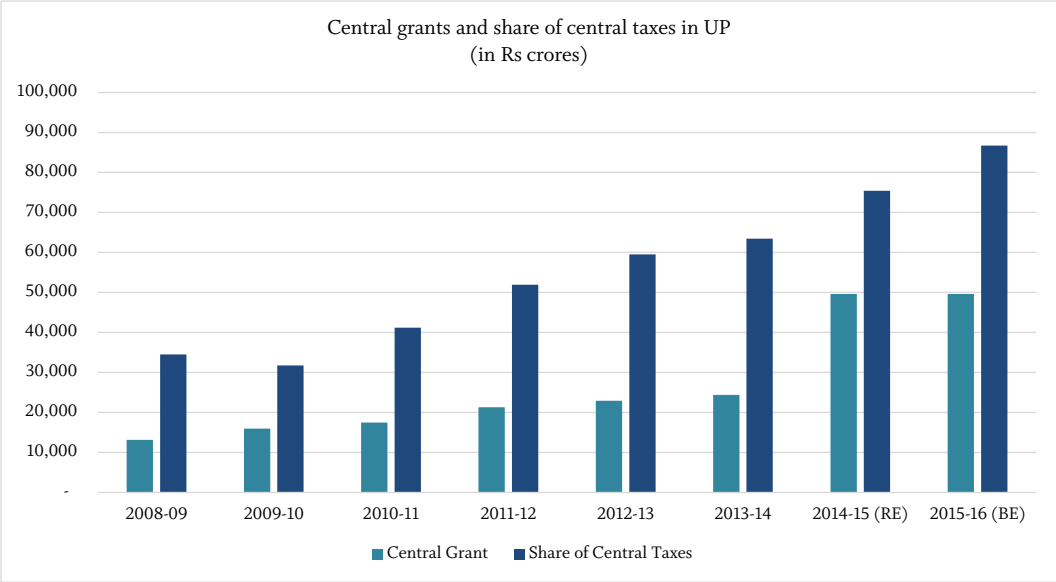
Figure 3: Growth in state's own revenue and central support over time.



The mix of central support, however, has changed following the 14th Finance Commission (FC) recommendations, in 2015-16 the central transfers (BE) in the form of grants have plateaued at Rs. 49,599 crores (no growth since 2014-15); however, the increase in transfer of central taxes directly to UP is up by 15 percent (see Figure 4: Distribution of central grants and share of central taxes in UP). These are based on 2015-16 budget estimates. Either way, the macro-economic picture looks promising.

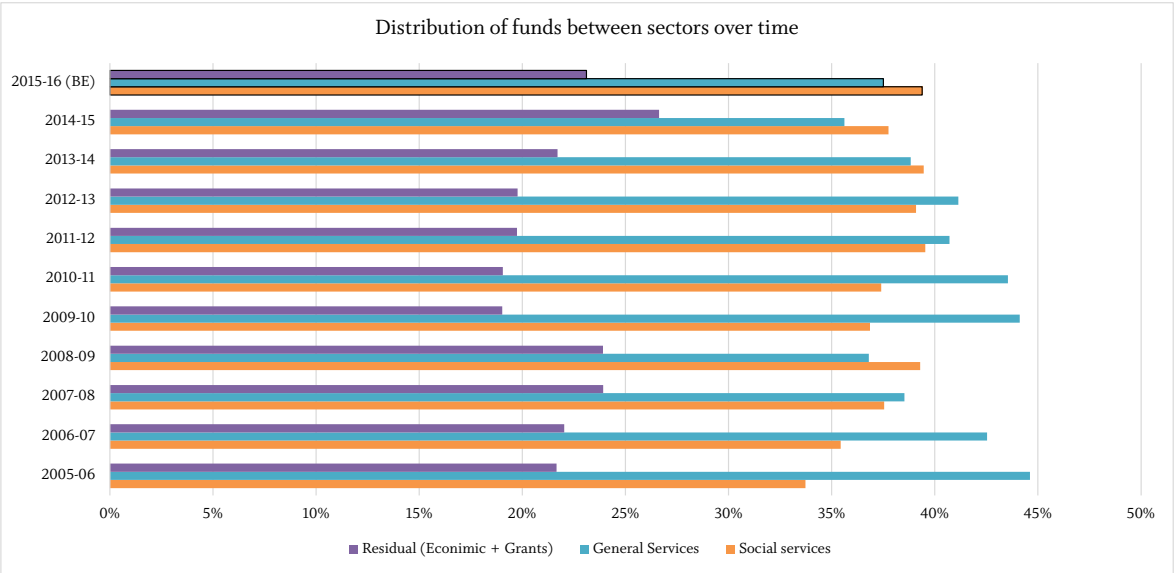
[4] Directorate of Economics and Statistics – Government of Uttar Pradesh (http://updes.up.nic.in)

Figure 4: Distribution of central grants and share of central taxes in UP



Following the 14th FC recommendation and the fiscal devolution, the central government has little room to augment its investment in social sectors and now puts the onus on the states to invest in the health sector. Some of the less developed states like Chhattisgarh, Jharkhand, Madhya Pradesh and Rajasthan have prioritized their social sectors, but for many others, including Uttar Pradesh, the levels of investment in health has remained unchanged (Kapur et al., 2016). A closer look at one year (2015-16) since the FC recommendation in 2014, which allows states more discretion over their spending, reveal that in UP the spending between general and social services remains at the same level as in 2013-14, implying that it has neither deprioritized or emphasized social sectors following the fiscal devolution. See Figure 5.

Figure 5: Distribution of funds between sectors over time



Note: FY 2015-16 are Budget Estimates, whereas for all other years, the values are Revised Estimates.

While the investment in social sectors has remained at the same level, historically, UP has not prioritized health among its social sectors. For the last seven years, the investment in the education sector as a percentage of Total State Budget has ranged between 11-16 percent, compared to health, which has never exceeded 5 percent during the same period.

Total health budget by sources

The Government of Uttar Pradesh (GoUP), with substantial GoI assistance, has more than doubled its budget for the health sector in nominal terms between 2008-2009 and 2014-2015 to Rs. 15,432 crores. The average state contribution to health over the seven years is 73 percent, with the state contributing 80 percent, in 2014-15.

Long before the establishment of the NRHM in 2005, UP was included in the Empowered Action Group of States for strengthening governance and monitoring systems, population stabilization and bringing about systemic reforms to reduce inter-state disparities with seven other low performance states[5]. This status qualified it for higher amount of direct central government subsidies to health. The UP health budget is now about 1.6 percent of its GSDP. The central contribution has fluctuated between 20 and 35 percent of the Total Government Health Budget (TGHB), with the state taking more responsibility since the last two years. See Table 10.

Table 10: Total government health budget by source (in nominal Rs. crores)

Source	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
State government	4,904	5,720	5,950	6,177	7,344	8,143	12,346
Central government	1,624	2,623	2,435	2,244	3,959	2,949	3,086
Total Government Health Budget (TGHB)	6,528	8,343	8,384	8,421	11,303	11,092	15,432
Center's share in TGHB	25%	31%	29%	27%	35%	27%	20%

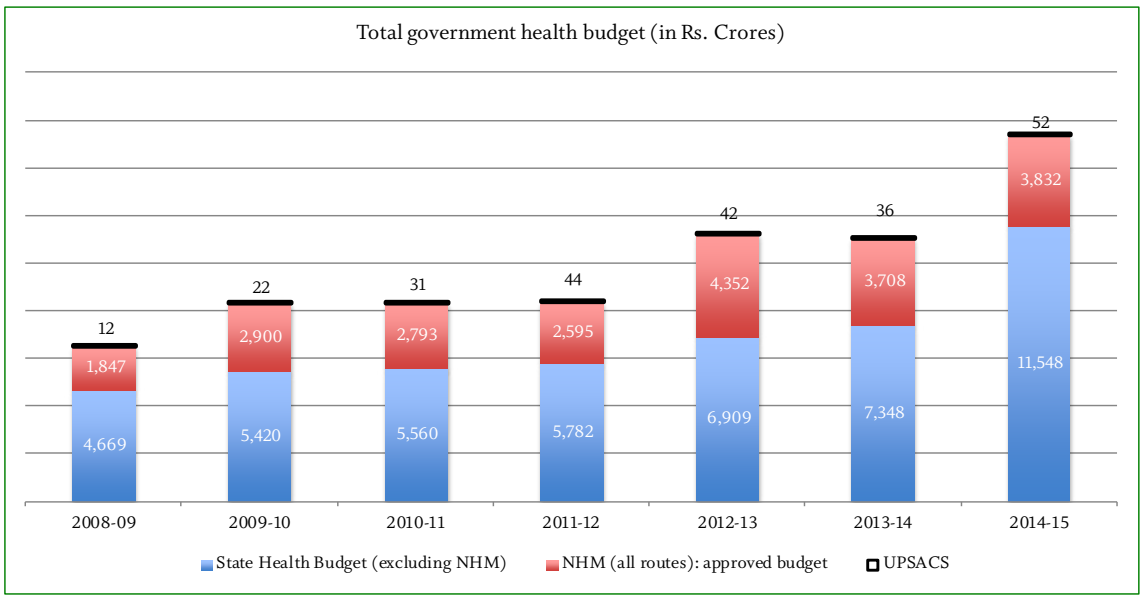
Source: Detailed Demand for Grant, UP; NHM audit reports, NHM Record of Proceedings
State government health budget includes central government revenue transfers

Government health budget routes

Government health funds are routed through two channels. The "treasury route" channels funds through states own DoMH&FW. This pays for most of the recurrent costs such as human resources, and most of the secondary and tertiary care expenditures. The "society route" has existed for some years, but different vertical program specific societies were consolidated under State and District Health Societies starting in 2005 with the launch of the NRHM. It was designed to streamline or simplify the flow of funds under NRHM by by-passing the state treasuries and affording some flexibility to carry over balances from prior fiscal years. Until 2013-14, central and state contributions to NRHM from the states and the center were pooled at the SHS. However, since 2014, GoI NHM contributions are routed through the state treasury before they are pooled at the SHS along with state share of NHM. As evident from Figure 6, the proportion of NHM in TGHB has declined in the last 2 years.

[5] Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Odisha, Rajasthan, and Uttarakhand

Figure 6: Government Health budgets (nominal) over the seven study years (in Rs crores)



Key messages

- With greater fiscal autonomy, the onus is on the state government to prioritize health. One year since the fiscal devolution, there seems to be little change in how GoUP prioritizes health.
- Total government health budget doubled in UP to Rs. 15,432 crores in 2014-15, with the state contributing a larger share over time. Center's contribution declined from a peak of 35 percent to 20 percent.

Health budget allocation – trends and analysis

Prior to its abolition in 2014, the Planning Commission played a key role in determining allocations of public financing for development including the formulation of the Five-Year plans. The Commission presided over the allocation of "plan" funds to the Center and the States. The "plan" funds represented *new* projects/initiatives, capital projects etc. and the rest, "non-plan", constituted recurrent spending. A similar process took place at state level. However, there are several inconsistencies in how this definition was applied. The Family Welfare or population programs, even though routine, were budgeted under the "plan" allocation by the central government.

In addition to the "plan" and "non-plan" distinction, the state treasury allocates its health budget by grants. This classification is not particularly useful to understand how resources are allocated across different levels of care. All levels – primary, secondary, and tertiary care are aggregated under Medical Allopaty. Therefore, as expected, Grant 32 Medical Allopathy budget is the highest and investment in Public Health remains low. Table 11.

Table 11: Proportion of treasury budget by Grants

Grants	Mean (6 years)	High	Low	2013-14
Grant 31: Medical Education & Training	20%	23%	17%	23%
Grant 32: Medical Allopathy	42%	47%	39%	39%
Grant 33: Ayurveda & Yunani	6%	6%	5%	5%
Grant 34: Homeopathy	3%	3%	2%	2%
Grant 35: Family Welfare	23%	27%	20%	25%
Grant 36: Public Health	6%	9%	5%	5%

We carried out a separate analysis of expenditures for primary health care, as defined in the classification method developed by the NHSRC (NHSRC). Under this tool, each budget item at the sub-minor treasury budget code level was coded to estimate the allocations by level of care – primary, secondary, and tertiary. On an average, allocations to primary care account for about 56 percent of the treasury budget. Despite this large proportion, in 2014-15 the per capita allocation was only Rs. 371 (approximately $5.50). For comparison, some normative estimates of the costing of primary care exist across a range from a minimum recommended $32 per capita per year to $67 per capita per year (World Bank, 1995; WHO, 2001; Prinja et al., 2012; GoI, 2005).

Table 12: Allocations by levels of care (Treasury route budget)

excludes NHM through the Society Route

Share of allocations by levels of care	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Primary care	55%	52%	51%	53%	58%	56%	62%
Secondary care	20%	21%	21%	23%	20%	19%	18%
Tertiary Care	6%	2%	2%	4%	2%	3%	2%
Medical Education	14%	15%	18%	18%	19%	21%	17%
Administration	6%	10%	9%	2%	1%	1%	1%

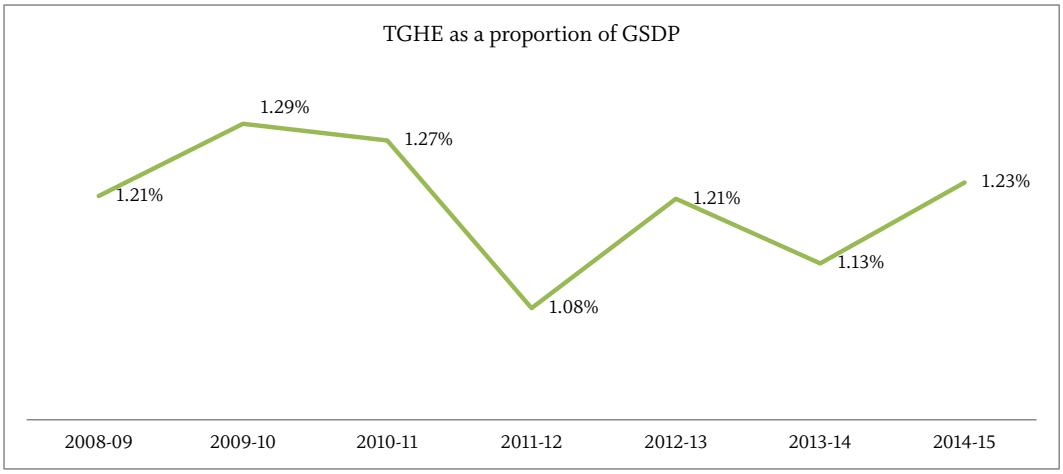
Key messages

- Primary health budget constitutes slightly more than half of the Total State Health Budget (average of about 56%)
- Allocation to primary care increased to 62 percent in 2014-15 by the state from 55 percent in 2008-09; however, it is difficult to say if this upward trajectory can be sustained.
- Primary care allocation of Rs 371 per capita is one of the lowest in the country and far below several international estimates of the resources that are needed to provide an adequate basic package of health services.

Health expenditure analysis – emerging trends

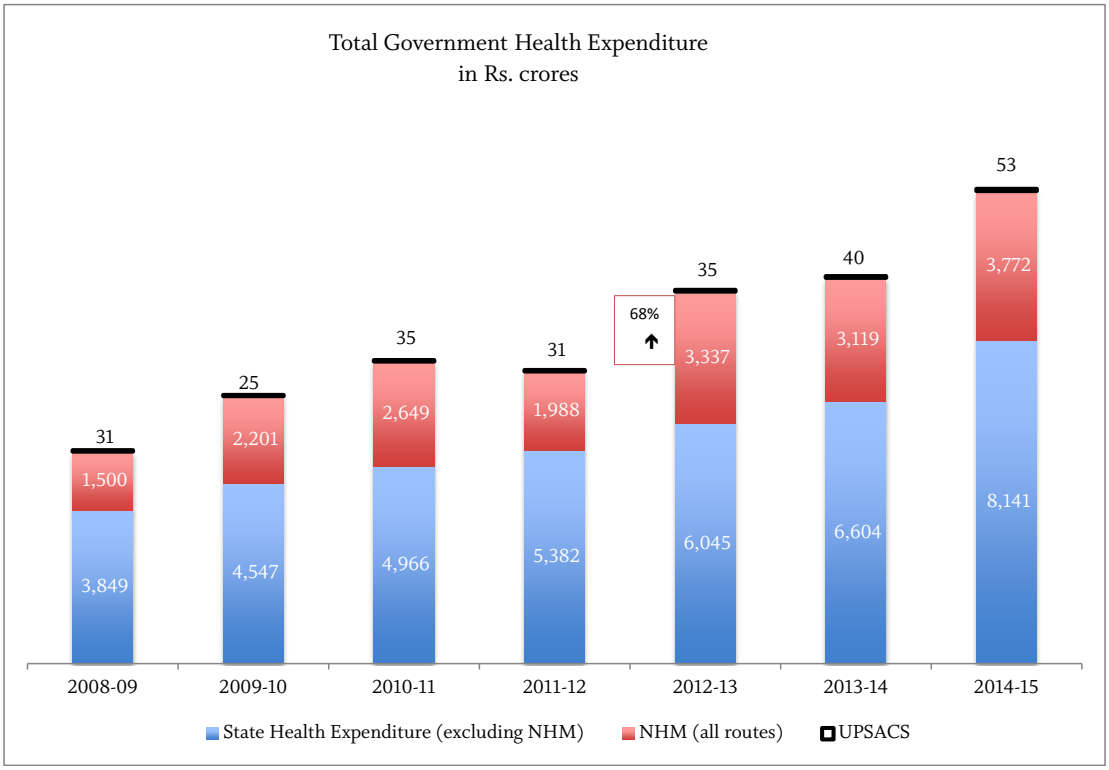
Total Government Health Expenditure (TGHE) increased 220 percent between 2008-09 and 2014-15 to Rs. 11,965 crores, keeping pace with the growing GSDP, which also increased by 222 percent. However, the proportion of TGHE as a percent of GSDP remained constant through out the study period at about 1.2 percent. See Figure 7. Much like everywhere else, low government health spending and weak service delivery performance is associated with high out of pocket expenditures (Kumar et al., 2011), imposing a higher burden on the poor. It is estimated that 8 percent of households in UP fell below the poverty line due to health-related out-of-pocket expenditures (World Bank, 2011). Out of pocket expenditure as a share of Total Health Expenditure in India has not changed much, reduced from 69.4 percent (MoHFW, 2009) to 64.2 percent (MoHFW, 2016) in the last 10 years.

Figure 7: TGHE as a proportion of GSDP



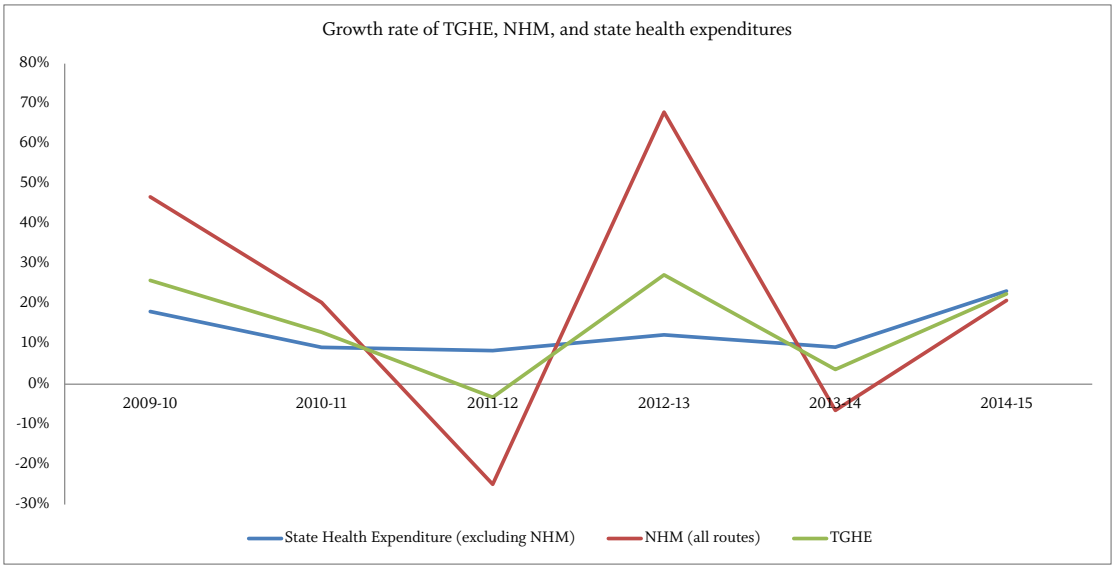
Following two external shocks to the UP health system, - the corruption episode in 2011-12 and the financial crisis in 2009 , the TGHE did stagnate for a couple of years, before recovering in 2014-15. It is worth noting, that the NHM contribution dipped below Rs. 2000 crores in that year as most finances were frozen impending the financial investigation, but a substantial 68 percent increase in NHM funding is observed in 2012-13. However, the NHM share of the TGHE has remained flat in the ballpark of Rs 3000 crores in 2012-13 and 2013-14. Much of the increase in TGHE observed in 2014-15 is due to the 23 percent increase made by the state and 21 percent increase in NHM expenditure. See Figure 8. On an average, the share of NHM has ranged between 27 to 35 percent of TGHE, with the rest financed by the state. UPSACS expenditures are minor compared to the other two components.

Figure 8: Total government health expenditure by sources of financing



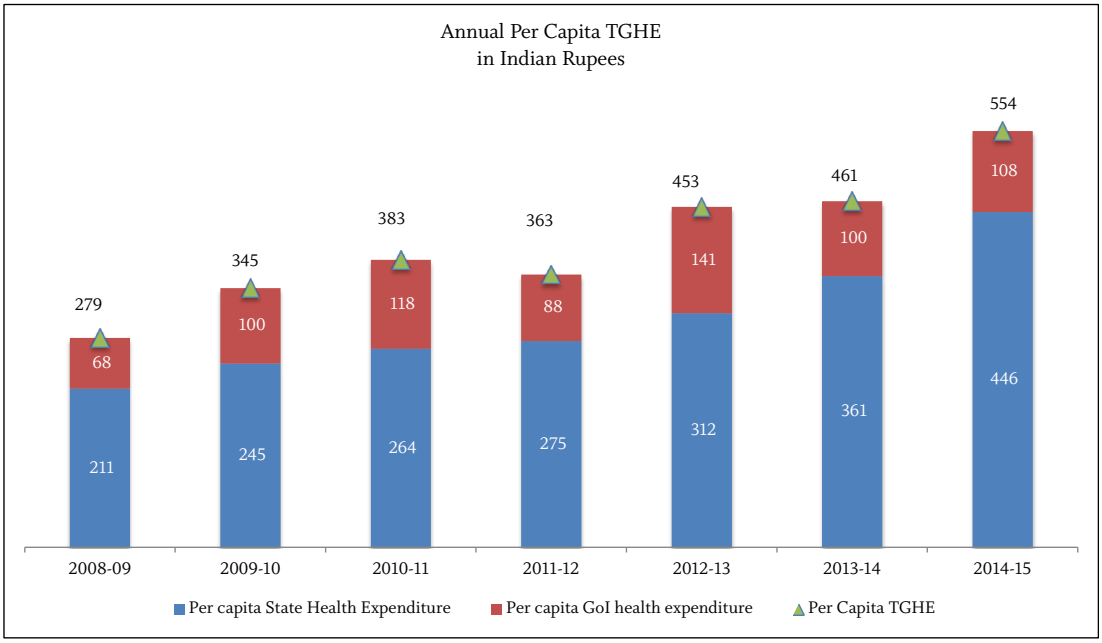
The two external shocks have caused an erratic growth pattern in health expenditure from all sources; however, the expenditures seem to be on an upward trajectory in the last year. (Figure 9).

Figure 9: Growth rate of TGHE, NHM and state health expenditures



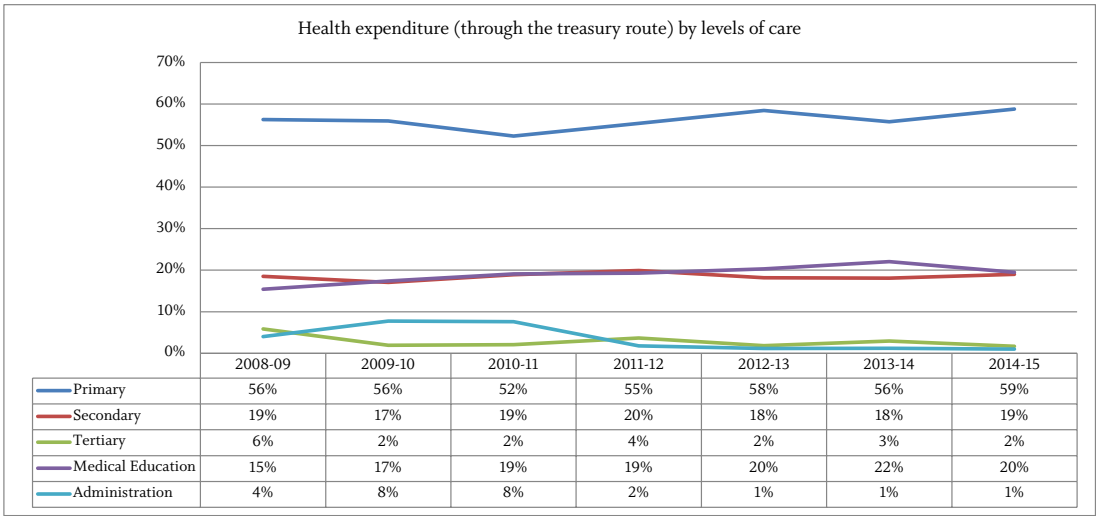
The steady increase in investment by the government in health has limited impact partly because of the high fertility rates in UP (TFR: 3.1), which is well above the national average of 2.3. As a result, the per capita TGHE continues to be very inadequate. See Figure 10 below.

Figure 10: Annual per capita TGHE (in nominal Rs.)



The treasury invests a substantial amount in primary care, predominantly in the form of salaries. Tertiary care shows a declining trend since 2008-09. We were not able to ascertain the reasons for this decline; however, one possible explanation is that tertiary hospitals are also teaching hospitals, and it is likely that the expenditures associated with these tertiary/teaching hospitals and financed by the Medical Education budget is reflected as medical education budget lines. The administration expenditures also show a steep decline in the last 4 years. The years 2008-09 through 2010-11 include substantial portion of unpaid wages to the health personnel (approximately 70% of total administration costs), this backlog was recorded as "arrears" in the budget codes that could be assigned only as 'Administration'. Once this backlog was cleared, the administration stabilized to about 1 percent of total (treasury) health expenditure. See Figure 11.

Figure 11: Distribution of state treasury expenditure by function



	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Primary	56%	56%	52%	55%	58%	56%	59%
Secondary	19%	17%	19%	20%	18%	18%	19%
Tertiary	6%	2%	2%	4%	2%	3%	2%
Medical Education	15%	17%	19%	19%	20%	22%	20%
Administration	4%	8%	8%	2%	1%	1%	1%

Primary care as a share of TGHE has ranged between 58 percent and 62 percent during the study years and is experiencing a gradual declining trend since 2012-13. NHM has made a strong positive impact on the total primary care expenditure in the state. A complete picture of primary care expenditure is presented in Table 13.

Table 13: Sources of government primary health expenditures (GPHE) in Rs crores

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
GPHE - Treasury*	2,318	2,856	2,861	3,392	4,455	3,954	4,996
GPHE - NHM**	1,024	1,397	1,799	1,034	1,410	1,746	2,078
Total GPHE	3,342	4,254	4,660	4,427	5,866	5,700	7,074
NHM as a share of GPHE	31%	33%	39%	23%	24%	31%	29%
GPHE as share of TGHE	62%	62%	61%	60%	62%	58%	59%

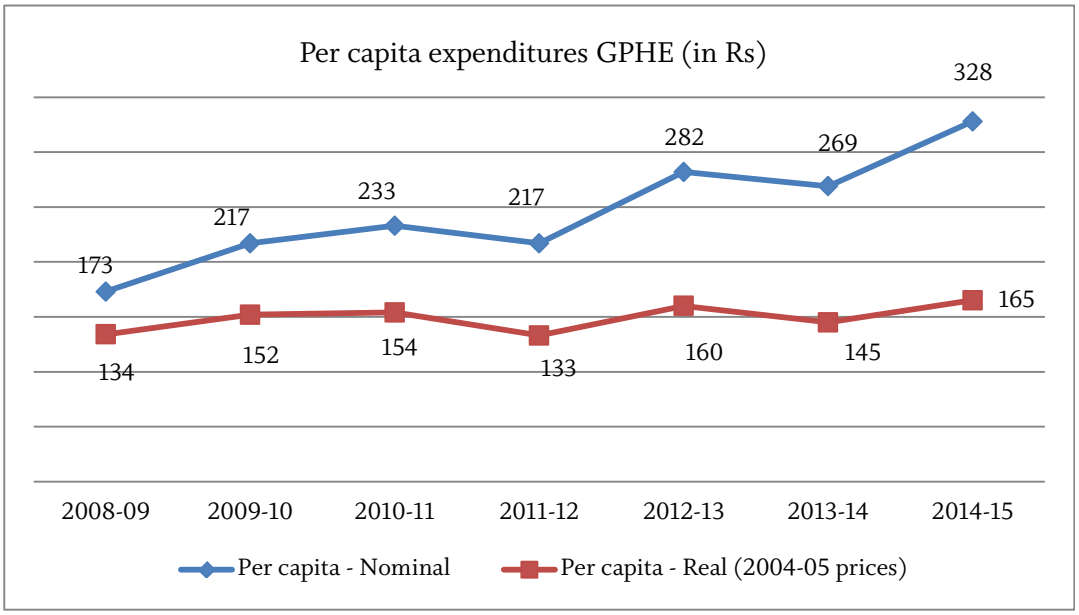
* including infrastructure & maintenance component of NHM and excluding state share of NHM reflected in the state budget books

** NHM expenditure through the State Health Society

Per capita expenditure on government primary care in UP in 2014-15 is Rs. 328 (nominal) and Rs. 165 (adjusted at 2004-05 prices), is extremely low to meet the basic health needs of the population.

The per capita government expenditure (real) for primary care, as presented in Figure 12, has increased from Rs. 134 in 2008-09 to Rs. 165 in 2014-15. This implies a real growth of only 23 percent over the last six years.

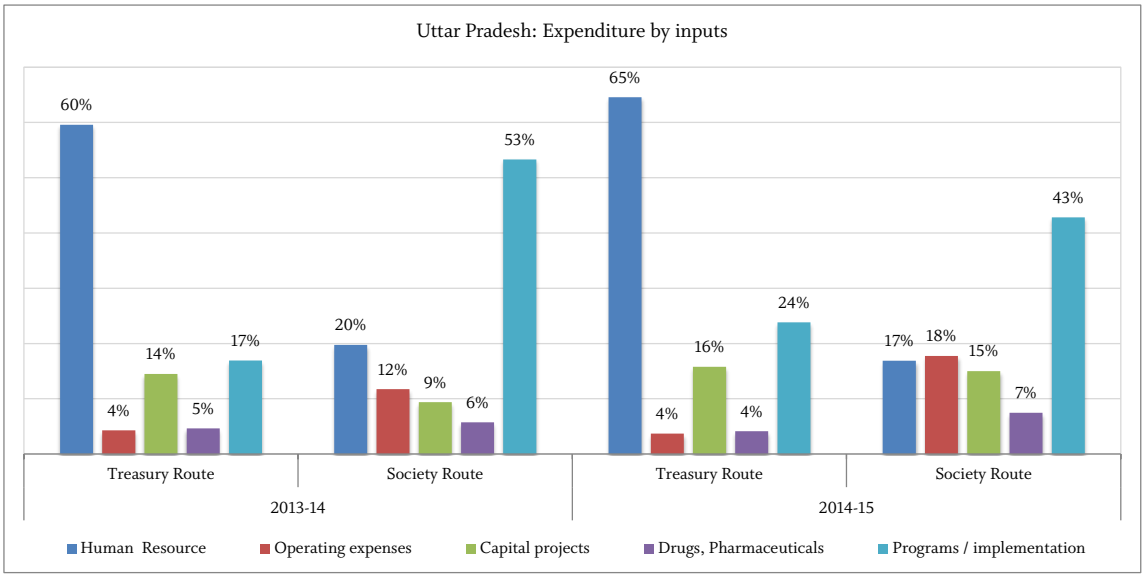
Figure 12: Per capita government primary health expenditure UP



Expenditure analysis by cost inputs

The state treasury spends most of its funds on human resources, whereas the NHM spends most of its money on program implementation. See Figure 13 for a breakdown of expenditures by cost inputs. Program costs for NHM typically include, but are not limited to, operationalizing first referral units, referral transport, JSY, facility and home based new born care, family planning, adolescent reproductive and sexual health, urban and tribal RCH, institutional deliveries, trainings, support to hospital societies in form of annual maintenance grants, untied funds and corpus grants, grants to VHSNCs, etc.

Figure 13: Expenditure by inputs for the last two years



Both NHM and the state combined spend very little on drugs and pharmaceuticals; in 2014-15, the per capita expenditure was less than Rs. 30. See Table 14. It is not surprising then that 70 percent of the out-of-pocket expenditures incurred by household is on drugs (Garg and Karan, 2009). The inadequacy of government provision of drugs and pharmaceuticals may be contributing substantially to the low utilization of government services.

Table 14: Expenditure on drugs & pharmaceuticals

Source	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Through treasury (in Rs crores)	236.15	243.22	289.80	325.77	394.24	417.44	457.98
Through NHM (in Rs crores)	99.03	135.18	173.98	100.07	136.44	168.85	176.64
Total (in Rs crores)	**335.18**	**378.40**	**463.78**	**425.84**	**530.68**	**586.29**	**634.62**
Total Per capita (in Rupees)	17.38	19.28	23.21	20.89	25.53	27.67	29.40
Proportion of TGHE	6.23%	5.59%	6.06%	5.75%	5.63%	6.00%	5.30%

Table 15 below provides a snapshot of overall health expenditure trends in Uttar Pradesh over the last seven years. *Note: 2014-15 figures are unaudited from the state government website called Koshvani – A Gateway to the Finance Activities in the state of Uttar Pradesh http://koshvani.up.nic.in.*

Table 15: Health expenditure trends in UP

Trends in Government Expenditure on Health in Uttar Pradesh								
No.	Indicators	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
	State							
1	Population (in cores)	19	20	20	20	21	21	22
2	Population Growth (%)		1.7	1.8	2	2	1.9	1.9
3	GSDP at current prices (in Rs cores)	444,685	523,394	600,286	685,496	780,399	862,746	976,297
4	GSDP growth rate (%)		18	15	14	14	11	13
	Total Government Health Expenditure (TGHE)							
5	TGHE in Rs. cores (nominal)	5,380	6,773	7,650	7,400	9,418	9,763	11,965
6	TGHE in Rs. cores (real, at 2004-05 prices)	4,171	4,754	5,051	4,517	5,341	5,257	6,035
7	Total expenditure under NHM (nominal) Rs cores	1,500	2,201	2,649	1,988	3,337	3,119	3,772
8	NHM's share in TGHE (%)	27.9	32.5	34.6	26.9	35.4	32.0	31.5
9	Center's share in TGHE (%)	24.3	29.1	30.9	24.4	31.2	21.6	19.5
10	Health expenditure through treasury as a share of Total State Expenditure (%)	4.5	4.5	4.5	4.3	4.4	4.8	4.5
11	TGHE as a share of Total State Expenditure (%)	6	6	7	6	6	6	6
12	State health expenditure as a share of GSDP (%)	0.9	1.1	1.0	0.9	0.9	0.9	0.9
13	TGHE as a share of GSDP (%)	1.2	1.3	1.3	1.1	1.2	1.1	1.2
14	Annual per capita TGHE (in nominal Rs.)	279	345	383	363	453	461	554
15	Annual per capita TGHE (in Rs.) - real, at 2004-05 prices	216	242	253	222	257	248	280
16	Expenditure of HIV (UPSACS) as a share of TGHE (%)	0.58	0.37	0.45	0.42	0.38	0.41	0.44
	Government Primary Health Expenditure (GPHE)							
17	GPHE Rs cores	3,342	4,254	4,661	4,427	5,867	5,700	7,075
18	GPHE (Real) Rs cores	2,591	2,987	3,077	2,702	3,327	3,069	3,568
19	GPHE as share of TGHE (%)	62%	63%	61%	60%	62%	58%	59%
20	Per capita GPHE (Nominal) in Rs	173	217	233	217	282	269	328
21	Per capita GPHE (Real) in Rs	134	152	154	133	160	145	165
	Others							
22	Capital expenditure as a share of health expenditure through the treasury route (%)	19.4	15.8	12.5	13.6	13.2	14.4	15.7
23	Drugs & pharmaceuticals as a share of TGHE (%)	6.2	5.6	6.1	5.8	5.6	6	5.3
24	Per capita expenditure on drugs & pharmaceuticals (in Rs.)	17	19	23	21	26	28	29

Key messages:

- TGHE grew by 2.2 times between 2008-09 and 2014-15. However, TGHE per capita is very low at Rs 554.
- The state – center ratio has shifted, from 3:1 to 4:1, implying that the state is assuming a larger role.
- The decline in GoI expenditures can also be attributed to the corruption of NHM funds that plagued the NHM in Uttar Pradesh. In the immediate aftermath the GoI funding declined sharply. In addition, the delayed impact of the global financial crisis reduced the overall fiscal space at the Center and the state levels.
- Primary care expenditures have varied between 59-63 percent of TGHE during the study period with per capita expenditure at Rs 328, even though it doubled during the seven years.
- Expenditure on drugs is very low at Rs. 634.62 crores in 2014-15, Rs. 29 per capita.

Budget execution/utilization

Employing the National Health Accounts (NHA) matrix, is the best way to understand what are the sources of funds and who manages them. Who manages those funds is particularly relevant to studying budget utilization. Processes and systems at the two financing agents, treasury and the SHS, are unique and affect the budget utilization differently. We have developed a simplistic NHA matrix for the last two years for UP. See Table 16.

Table 16: Sources and managers of funds in UP health system

NHA Table for 2013-14					
Sources	Financing Agents			Total	Percent
	State	NHM	UPSACS		
State	6,604	1,047		7,651	78.37%
Center		2,072	40	2,112	21.63%
Total	6,604	3,119	40	9,763	
Percent	67.64%	31.95%	0.41%		
NHA Table for 2014-15					
Sources	Financing Agents			Total	Percent
	State	NHM	UPSACS		
State	8,141	1,496	-	9,637	80.54%
Center		2,275	53	2,328	19.46%
Total	8,141	3,772	53	11,965	
Percent	68.04%	31.52%	0.44%		

all figures are nominal and in Rs. Crores
State finances include central revenue sharing

The NHA table highlights an important fact that every third government health Rupee is managed by the State Health Society. It is vital then, to ensure the processes and systems within SHS are streamlined to improve utilization of funds. If we include all available SHS funds, only 61 percent of the available funds (including opening balance and bank interest earned) were utilized in 2014-15. A 100 percent utilization of available funds by SHS in that year would have increased the TGHE by another Rs. 2,407 crores that is, by another 20 percent, and would enhance its role as manager of primary care to become an equal partner with the state.

UP has significantly increased its budget allocations for health over recent years but suffers from persistent underutilization of budgets over time. We examined the gap between budgets and expenditures for different types of spending as well as the treasury and society routes.

The utilization rates of budgets under the Treasury route ranged between 82 percent and 90 percent between 2008-09 and 2013-14. In 2014-15 we see a significant decline in the utilization rate, with the caveat that at the time of finalizing this report, these were Revised Estimates and not final audited figures. NHM, through the society route presents a more complex picture. NHM's budget utilization rates, when measured against the approved budget for the given fiscal year, reveal an improvement in the utilization rates over time. However, when measured against the total funds available, the picture is much less positive. In 2013-14 and 2014-15 the utilization rates against available funds were only 47 and 61 percent respectively. See Table 17.

Table 17: Government health budget utilization rates in UP 2008-09 to 2014-15

No.	Utilization rate	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
	State health budget utilization rate							
1	State health budget (excluding NHM)	4,669	5,420	5,560	5,782	6,909	7,348	11,548
2	State health expenditure	3,849	4,547	4,966	5,382	6,045	6,604	8,141
3	State health expenditure against budget (2/1)	82%	84%	89%	93%	88%	90%	70%
	NHM utilization rate							
4	NHM approved budget	1,847	2,900	2,793	2,595	4,352	3,708	3,832
5	Total funds available under NHM	2,443	3,262	3,391	3,338	4,272	6,594	6,179
6	Total expenditure under NHM	1,500	2,201	2,649	1,988	3,337	3,119	3,772
8	Utilization against approved budget (6/4)	81%	76%	95%	77%	77%	84%	98%
9	Utilization against funds available (6/5)	61%	67%	78%	60%	78%	47%	61%

1. All figures are in Rs. Crores
2. All NHM figures are audited
3. Treasury 2014-15 figures are unaudited and sourced from *Koshvani*

Reasons for low utilization rates – unpacking the box

Much of the underutilization of budgets in UP occurs in the NHM. The design of NHM employed included a number of innovative approaches – community focus; more flexible financing arrangements which included additional funding from the Center with matching funds from the State; improved planning and management through capacity building, use of untied grants, strong monitoring against standards; and finally innovations in human resource management (Nandan, 2010). Underutilization of NHM funds reflects both weak capacities at local level to plan and utilize more flexible funds as well as bottlenecks in the society route's financial management systems and capacities.

The point of convergence for this approach is the district and the village/community. Through a process of bottom-up planning, inputs from the village level committees are consolidated at the PHCs, then at the CHCs, where the block plans are prepared. The block plans are consolidated into the District Action Plans. District Action Plans are an important instrument of the National Health Mission. They form the basis for State Project Implementation Plan

for NHM and budget requests from central government sources. Districts vary widely in their specific population needs and in their capacity for innovation (GoI, 2007). Engagement of the PRIs should enable convergence of programs at the local level that address other determinants of health such as safe drinking water and sanitation. It should also provide local accountability in implementation of the programs.

The flexible financing includes a provision for untied funds of up to Rs. 10,000 at the facility level for the facility manager to address small operational problems quickly and effectively, using her or his own discretion. These funds could be used for a range of issues from buying medical consumables, to repairs; or small performance rewards to health volunteers. This was the first time such funds were made available at the facility level.

Finally, the process referred to as "communitization" formally encouraged partnering with NGOs for services ranging from service delivery; training; to various support services. This communitization process also encouraged several innovative actions to improve the operations at the facility level such as, renting or leasing vacant land on the premises of the facility to generate extra income; engaging with the community to maintain the upkeep of the facility; adopting sustainable practices ranging from rain-water harvesting to solar lighting and refrigeration. (Nandan, 2010)

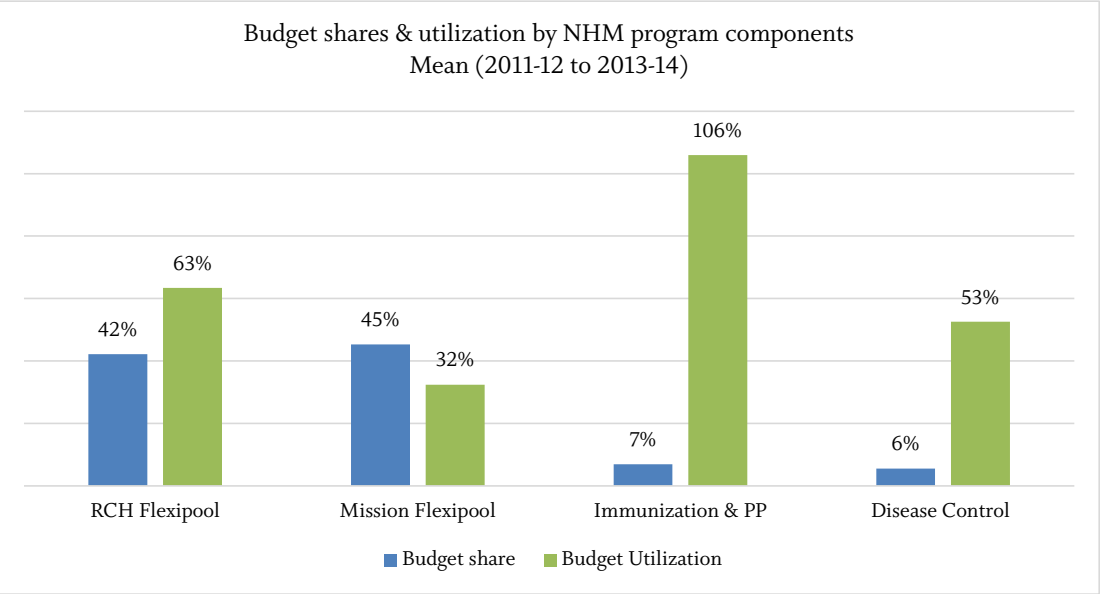
The success of these innovations in NHM depends upon having well-functioning financial management systems and capacity and leadership at all levels. Due to the limited capacity and leadership at the various levels of government in UP they were not able to truly optimise the benefits from NHM's flexible approach and financing. UP's ability to make good use of NHM's benefits was further compromised by a major episode of mismanagement of finances which led to a much more risk averse approach in its aftermath. This further discouraged local innovation or solutions for local problems.

These constraints can be observed in spending patterns for the NHM budget lines which require greater local planning and innovation. Despite additional financing and the flexibility (discretion) in spending, these budget lines were often the most underspent. For example, the budget heads under Mission Flexi Pool (like communitization; and grants to health facilities and village committees) are the budget lines that reflect the greatest under-utilization. Some of the areas of underutilization, as shown from analysis of the FMRs, include:

- selection and training of ASHAs including procurement and replenishment of ASHA drug kits and ASHA incentives;
- untied funds specially at the level of Village Health and Sanitation Committees;
- annual maintenance grants, especially at the level of PHC and below;
- construction of civil works/infrastructure;
- corpus grants, especially at the level of CHCs;
- information, education, communication and behavior change communication component;
- procurement of equipment and drugs;
- maternal death reviews; and
- quality assurance committees.

This is substantiated by the budget and expenditure analysis based on FMR which reveals a contrast where the Mission Flexi Pool has had the largest mean allocation of 45% between 2011-12 and 2013-14 but the least utilization of only 32% during the same period. See Figure 14.

Figure 14: Budget shares of NHM components and their utilization rates



Improving the utilization of resources allocated under the Mission Flexi Pool would have a significant impact on the overall utilization of resources under NHM.

Reasons for underutilization can be generally categorized into 3 distinct areas of weaknesses – **policy** related; **operational** issues and low **capacity**. We delved even further to better understand the nature of capacity constraints using the Potter and Brough's framework (Potter et al., 2004). In UP we identified the capacity constraints as Systems Capacity, Supervisory capacity, Role Capacity and Structural Capacity. Each of these four capacities as defined by Potter and Brough are described in the box below:

Component elements of systemic capacity building

Systems capacity: Do the flows of information, money and managerial decisions function in a timely and effective manner? Can purchases be made without lengthy delays for authorization? Are proper filing and information systems in use? Are staff transferred without reference to local managers' wishes? Can private sector services be contracted as required? Is there good communication with the community? Are there sufficient links with NGOs?

Supervisory capacity: Are there reporting and monitoring systems in place? Are there clear lines of accountability? Can supervisors physically monitor the staff under them? Are there effective incentives and sanctions available?

Role capacity: This applies to individuals, to teams and to structure such as committees. Have they been given the authority and responsibility to make the decisions essential to effective performance, whether regarding schedules, money, staff appointments, etc?

Personal capacity: Are the staff sufficiently knowledgeable, skilled and confident to perform properly? Do they need training, experience, or motivation? Are they deficient in technical skills, managerial skills, interpersonal skills, gender-sensitivity skills, or specific role-related skills?

Structural capacity: Are there decision-making forums where inter-sectoral discussion may occur and corporate decisions made, records kept and individuals called to account for non-performance?

Source: Potter, C., & Brough, R. (2004). Systemic capacity building: a hierarchy of needs. Health Policy and Planning, 19(5), 336-345.

Content analysis of the Common Review Mission Reports of NHM in UP released by the GoI, the FMR, minutes of meetings of reviews undertaken by the state health department and discussions with officials at the state and the district levels, all point to a set of already known and documented factors that contribute to under-utilization of funds in NHM.

Operational issues

Systems capacity and operational issues are very closely linked to each other, and are elaborated in the section below.

1. NHM planning calendar and approval timelines

   The process of planning, budgeting and approvals of plans under the NHM are elaborately documented. In an attempt to institutionalize need-based and bottoms up planning, the process has become so time intensive that the GoI approvals for the plan for 2015-16 were made after almost one-third (38%) of the plan period had elapsed. Whereas the delay in 2014-15 (56%) could be attributed to the General Elections in the country, last four years' data call for strategies to improve the sluggish pace of planning and approval timelines.

Table 18: Timelines for approval for UP State PIP under NHM

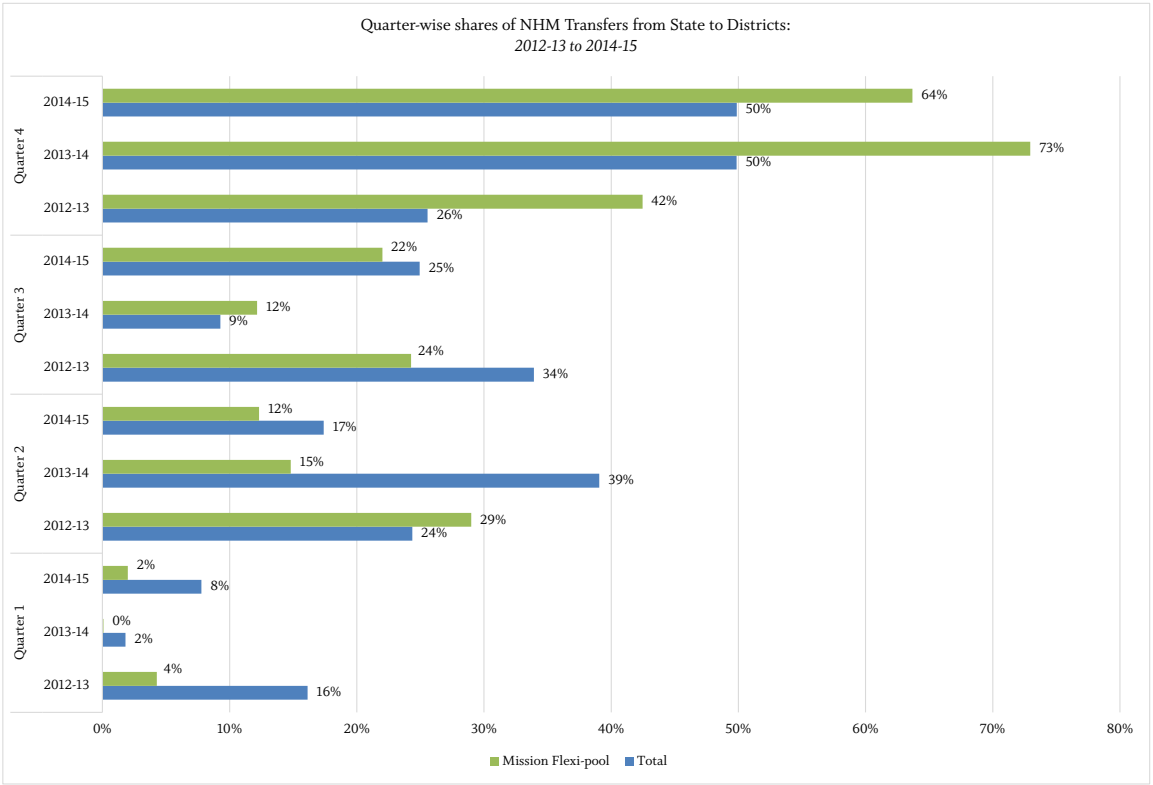
Year	Date of issue of approval (through Record of Proceedings - ROP) by the GoI	Days elapsed of the plan period	Percent time elapsed of the plan period
2012-13	1 June 2012	61	17%
2013-14	4 June 2013	64	18%
2014-15	21 October 2014	203	56%
2015-16	17 August 2015	138	38%

This delay has a ripple effect on the budget approvals and transfers by the state to the districts which takes another 30 days on an average, leaving the districts less than the full fiscal year to implement the activities, thereby contributing to underutilization of available resources.

2. Timeliness of releases

Delays in approvals of plans have a cascading effect on the timeliness of fund releases. Figure 15 shows that based on data from all 75 districts in UP in the last 2 years almost 50 percent of the total funds released were in the last quarter. In addition, funds are not released to district and sub-district levels based on performance and results in large portions of funds lying idle in non-performing units.

Figure 15: NHM fund transfers from state to districts by quarter



Our discussions with officials at the state level express concerns about anticipated delays in receipt of funds from the treasury that were formerly transferred directly to the SHS but are now transferred through the state treasury. SHSs in different states have already started experiencing delays. Recently, almost 10 percent of the total central funds across all states were delayed between 90 to 180 days (GOI, 2016).

3. Time taken for transfer/release of funds at different levels

JSY payments:

Discussions with district level officials reveal that there is a delay of approximately one month at the district level and up to two months at the block level. This is further validated by different NHM Common Review Mission reports which state delay of 15-20 days in JSY payments at the block level and of 20-30 days below the block level.

An evaluation of the ASHA Scheme under NHM in UP found that 29 percent of women eligible for JSY benefits reported receiving their benefits after more than a month and 23 percent within a fortnight. Only 8 percent of the eligible women received their JSY benefits on spot. The same study also indicates 72 percent of the ASHAs reported a delay of 20 days or more in receipt of payment after filing their claim for incentives (SIFPSA, 2013).

Another evaluation study commissioned by the UP/NRHM (CREATE) states that less than one-tenth of eligible mothers had received the JSY benefit amount on the same day. A little more than two-third (68 percent) had received the amount in one visit, while 14 percent had to make two visits to the health facility. About 16 percent of the women reported a turnaround time of more than 30 days in receiving the benefits.

ASHA payments

The 5th Common Review Mission report in November 2011 stated that ASHAs have not received drug kits from year 2009. There was no change in the situation in 2012-13 either where in a study (SIFPSA, 2013), 76 percent of the 460 ASHAs interviewed across 15 districts stated non-receipt of drug kits. Relevant unspent budget lines in the FMR further substantiate the story.

Delays in payments to ASHA have been well documented over time. Interviews with some key experts revealed some of the specific reasons for the delay:

- Frequent delays is verification process once the claims are filed by the ASHAs.
- Insufficient supporting documentation submitted, which is a complex process especially on activities like ensuring birth spacing etc.
- Nomenclature of bank accounts, when the name of the village committees was changed to include 'Nutrition', also resulted in delays.

4. Procurement systems and timeline

Delays in the procurement process for medicines, equipment and civil infrastructure projects are not uncommon in India, where infrastructure and capital projects span beyond the fiscal year. Budget lines related to procurement of medicines, ASHA kits, civil works and also equipment reflect large unspent funds. Procurement baseline study undertaken in 2014 under the Uttar Pradesh Health Systems Development Project identified the procurement cycle time of medicines to be 149 days and equipment tender as 205 days. The report further specifically highlights that lack of market information resulted in 37 percent of the delays followed by lack of technical capacity which accounted for 22 percent of the delays in procurement.

5. Guidelines for expenditure: risk aversion strategy becomes a risk in itself

   Delays in approvals mentioned above, also resulted in delays in releases of funds. The situation is further aggravated by a risk aversion measure that UP employs where the SPMU sends detailed expenditure guidelines to each district along with each fund transfer, only after which expenditure can be incurred. This is applicable even for committed liabilities. As a result, districts cannot not incur expenditure even if funds are available with them and have to wait until the expenditure guidelines are received.

6. Under-utilization in budgets allocated for human resources

   Even when contractual human resource positions are sanctioned and budgeted under NHM, they are sometimes not filled. Over the last few years, this has remained one of the biggest challenges faced by the state. Whereas a more detailed investigation may be needed to generate evidence to address this challenge, prima facie the reasons are shortage of qualified and trained human resources in the state, unwillingness to work in rural areas, salaries and incentives that are not competitive and lack of strong HR management systems. Vacant positions have resulted in high under-utilization rates and has also affected the quality and accessibility of services. The 6th Common Review Mission Report of November 2012 observed significant vacancies in staff nurses (64%), ANMs (61%), paramedical staff (86%), MBBS Doctors (88%) and specialists (80%). Table below provides a snapshot of the extent of vacancies at the district level. The numbers are related to only certain positions for the year 2012-13 and are as of October 31, 2012.

   Table 19: HRH status (selected) under NHM at the district level

Districts		Staff Nurse		ANM		Additional ANM	
		Numbers	Vacancies	Numbers	Vacancies	Numbers	Vacancies
Bareilly	In position	25	22%	8	93%		
	Sanctioned	32		118			
Jaunpur	In position	9	75%			22	81%
	Sanctioned	36				115	
Shahjahanpur	In position	20	47%	12	84%		
	Sanctioned	38		74			

Source: http://upnrhm.gov.in/c-staff12-13.php

Low managerial capacity

- **Supervisory capacity**: An overall lack of dynamic and strategic leadership has a cascading effect all the way to the lower levels of governance. As a result, there is limited supervision, evaluation, or ability to do a mid-course correction, as the delays ranging from issuing ROP, or recruitment of personnel, procurement of drugs, or payment to ASHAs become the norm. These delays and disruptions are further pronounced at the sub-block level. The GoI in its 7th CRM report corroborates this finding. Therefore we see very low utilization rates of untied funds at the lower level of facilities across districts.

- **Technical capacity**: Lack of capacity / skills in budgeting and financial planning, management capacity, procurement and supply chain management capacity is rampant in UP at all levels. However, specific to NHM is the low capacity to utilize its untied grants which stems from a lack of clarity or poor understanding of the guidelines for spending untied grants. Grants to Village Health Sanitation and Nutrition Committees and Rogi Kalyan Samities (RKS) are often left unspent because of lack of clarity on how and when to spend the funds. This is probably also a result of weak monitoring and oversight on this component of the program. Reluctance to spend untied grants was exacerbated especially after the corruption scandal. Administrative delays due to change of the account holder for the bank was also cited as a reason for delayed payments.

Policy and design limitations in the NHM

Power dynamics at the local level can impede innovation and implementation: The design of the NHM emphasizes community engagement; however, it has been observed that the inter-sectoral coordination, especially engagement of the village panchayats often does not support effective implementation reflecting social/power dynamics of the village. In the NHM design, involvement of local bodies is central to the community processes. Another study on utilization of untied funds in UP revealed that about 50 percent of the ANMs could not spend the money due to non-cooperation of panchayat pradhans (Singh et al., 2008). The same report also mentions that in majority of the cases the decision regarding the utilization of untied fund was taken by ANM herself, instead of in VHSNC meetings, therefore defeating the objective of community ownership.

Priorities not given to certain disease control programs: A budget analysis highlighted in a study conducted by Accountability Initiative in UP reveal that in a few select districts, including Sitapur, the funds utilization of the disease control programs component of NHM was much lower as compared to other components. It may be that some disease control programs like Iodine Deficiency, Japanese Encephalitis, Filariasis, Kala Azar are not considered priority programs, consequently their administration, planning, implementation is weak, which contributes to the low utilization. Allocations for these programs as a share of the total district allocation is relatively small.

A breakdown of delays in transfers for specific NHM programs is given in Table 20. It is worth noting that NHM Flexi Pool along with disease programs experiences the most delays in transfer of funds, impeding the efficient implementation of their respective programs.

Table 20: Transfer of NHM funds by quarter

Programs	2012-13				2013-14				2014-15			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Total transfers to districts	16%	24%	34%	26%	2%	39%	9%	50%	8%	17%	25%	50%
RCH Flexipool	23%	24%	45%	7%	0%	46%	4%	50%	13%	28%	23%	36%
NRHM Flexipool	4%	29%	24%	42%	0%	15%	12%	73%	2%	12%	22%	64%
Routine immunisation / pulse polio	31%	8%	12%	49%	10%	38%	10%	42%	5%	10%	29%	56%
Disease control programs & Others	7%	28%	60%	5%	0%	35%	47%	18%	6%	2%	35%	57%

Key messages

- A deeper investigation has revealed that norm based expenditures, where the purpose of the expenditures is explicit, generally tend to have better utilization rates. But for budget lines that require discretion and/ or innovation in its optimal use, the utilization rate is lower. The NHM design and human capacity factors that contribute to low-utilization can be summarized as follows:
    - lack of proper financial, management processes and systems;
    - lack of leadership to conceive and implement an innovation;
    - risk averse attitudes of managers;
    - lack of proper knowledge of spending guidelines; and
    - a shortcoming, or an unintended effect, in the design of NHM – is the power dynamics at the local level. While community engagement, an integral part of the NHM design, is expected to ensure local ownership and accountability, it often becomes a roadblock due to the power play between the various village stakeholders.
- Other key operational reasons for low utilization are:
    - Delays in approval of plans from GoI are significant up to half or one-third of the fiscal year has elapsed in the last 2 years before GoI approval of the UP SPIP was received.
    - Delays in approval of plans inevitably result in delays in releases of funds. Fifty percent of total transfers were made to the districts in the last quarter in the last 2 years.
    - Human resource positions have been sanctioned and budgeted for, but in some districts the vacancies for staff nurses, for example, are between 50-75 percent.
    - Substantial procurement delays for equipment (205 days) and drugs (149 days).

Over the last couple of years, following the funds mismanagement episode in 2012-13, there is an improvement in the utilization rates due to intensive monitoring, follows ups, strengthened governance mechanisms, proactive supervision and management of the SHS (the Executive Committee and the Governing Board meets regularly and all meetings are documented). Consultations at the district level indicate vibrant functioning of the District Health Societies. However, it is important under NHM to question, whether, the decision making structures and processes instituted under NHM to provide oversight and mitigate fiduciary risk are now an encumbrance to better utilization for the funds, and does it reduce innovation and creativity.

Resource productivity

Analysis of resource productivity is intended to document various measures of input-output ratios for government service delivery as indicators of both the average level of productivity and also variations of effectiveness of resource use under similar conditions. To get a picture of how effectively primary care funds are being translated into services, we carried out an exploratory study which looked at all of the 117 blocks in the selected 8 districts of UP for the year 2013-14. We collected information on 6 types of health system human resources, total spending and non-human-resource spending, and 5 co-variates outside of the health system that could impact health system productivity. We also collected information on a set of 6 health system (primary care) outputs to represent the services provided to the population at the consumer side of the health system. An unsuccessful attempt was made to index the output variables; we then included a composite output score, which is a logged sum of quantities for all 6-output variables.

Our approach formulated a composite measure representing all government health care activity at the block level and then to compare that with amounts of financial and HR inputs standardized for population. This produced various output-input ratios which essentially represent how much activity is being produced for a given level of inputs on average and how much variation there is in these measures per capita across blocks. It is an assessment of resource productivity not of program performance and should not be interpreted as such. These ratios are a relatively crude measure of productivity. They do not capture quality differences and they cannot distinguish what causes differences across demand and supply factors. Also, we rely on HMIS data reported by health facilities, which is often seen as unreliable.

Overall, the results of our analysis found very weak associations between levels of inputs and outputs. It appears that the level of government health care activity is largely unrelated to the levels of inputs from government sources. This is a surprising finding that calls for further investigation.

Descriptive summaries of these input and output variables can be found in Table 21 and Table 22 below.

Within the 117 blocks, the average health workers per capita was very low, with less than .05 health professionals per 1000 population for all cadres except for ASHAs and ANMs. On an average, the 117 blocks spent almost Rs 93 on primary health care - Rs 37 per capita from Treasury, and Rs 46 per capita from NHM, but there was significant variation across blocks. The population was predominantly agricultural, and 25 percent are in scheduled (lower) castes. On an average, these low inputs were also associated with very low outputs in the sample.

Table 21: Descriptive summary of input variables

Variable	Definitions	Descriptive Statistics				
		Mean	Std. Dev.	Min.	Max	Observations
Human Resources						
Doctors	Number of doctors per 1000 population	0.04	0.02	0.01	0.11	N = 117
Specialists	Number of specialists per 1000 population	0.01	0.01	0	0.07	N = 117
Nurses	Number of nurses per 1000 population	0.02	0.01	0	0.06	N = 117
Paramedicals	Number of paramedicals per 1000 population	0.03	0.03	0	0.2	N = 117
ASHAs	Number of ASHAs per 1000 population	0.85	0.19	0.37	1.52	N = 117
ANMs	Number of ANMs per 1000 population	0.14	0.04	0.04	0.32	N = 117
Non-HR Spending						
Treasury	Non-human resource Treasury spending on primary care in 2005 Rs per capita	36.52	20.29	7.8	95.8	N = 117
NHM	Non-human resource NHM spending on primary care in 2005 Rs per capita	46.3	16.91	7.72	115	N = 117
Non-health system covariates						
Gates priority (dichotomous, y = 1)	Is the District designated "priority" by the Bill & Mellinda Gates Foundation?	0.49	0.5	0	1	N = 117
Mean distance to facility	Average distance to facility in kilometers	11.51	27.19	3.28	29.6	N = 117
Percent Scheduled Caste	Percent of scheduled caste population	0.25	0.09	0.11	0.5	N = 117
Percent agricultural labor	Percent of workforce in agricultural labor	0.73	0.11	0.4	0.85	N = 117
Above 7 literacy rate	Percent of above age 7 population literate	0.66	0.05	0.58	0.78	N = 117

Table 22: Descriptive summary of output variables

Variable	Definition				
		Mean	Std. Deviation	Min	Max
Composite output score	Sumscore composite of all 6 logged ouput variables below	2.89	0.43	1.73	4.02
Antenatal care	Number of pregnant women who received 3 ANC check ups at public facilities per 1000 population	22.76	9.88	1.53	68.14
Institutional deliveries	Number of institutional deliveries at public facilities per 1000 population	12.5	7.35	1.95	45.36
IUD insertions	Number of IUD insertions done at public facilities per 1000 population	5.33	4.5	0	24.08
Fully immunized children (9-11 mo.)	Number of fully immunized children (9-11 months) at public facilities per 1000 population	30.35	18.81	0	173.05
Vitamin A doses	Number of Vitamin A-1 doses given at public facilities per 1000 population	22.72	11.55	0	56.57
Outpatient visits	Number of outpatient visits at public facilities per 1000 population	319.98	287.76	0	2552.6

In order to delve into the productivity of different health system and non-health system inputs, we ran five groups of linear, fixed-effects regressions with different variable specifications; results from those are summarized below.

- **How does HR affect level of output?**

  We found that when human resources are split into their own categories (doctors, specialists, nurses, paramedics, ASHAs, and ANMs), no individual category shows a significant relationship to outputs, with the exception of ASHAs, which were associated with increased antenatal care visits and IUD insertions. When we included them as a group, they showed strong associations with higher productivity. This suggests that increasing health systems outputs will require an examination into how different types of human resources work together to increase output. In other words, increasing productivity likely requires a better understanding of the relationship between the inputs.

  We suspect that the lack of significance on most individual categories of human resources is partially a reflection of the fact that some categories of human resources are substitutes for each other. We combined all types of human resources into one variable, and we found that human resources as a total was a significant predictor of the output composite, ante-natal care visits, and institutional deliveries. This means that, on the whole, additional human resources were associated with some but not all types of health system outputs. Another likely explanation is the issue of absenteeism. For example, the presence of physicians alone did not have a positive effect on outputs, though it is expected that it would result in increased use of services. However, it is possible that health personnel in rural blocks are just not available and our data represent not actual HR presence but staff who are assigned to work in the blocks. See Annex 5 for more details.

  We also looked at how ASHA's productivity differed from other types of human resources. We found that ASHAs alone are not associated with any of the outputs while the group of other human resources remains associated with the same outputs as before.

  The non-significance of ASHAs does not necessarily allow us to conclude that additional ASHAs have no effect on outputs. It is possible that ASHAs act as substitutes for other human resources, especially other community level human resources, and this relationship masks their individual effect. To dive deeper into this possibility, we ran regressions with ASHAs and ANMs combined into a "community level" human resources category as compared to all other types of human resources. In this case, the community level human resources variables were still not associated with any output variables. This suggests that adding and removing community level human resources alone do not have a strong enough effect to change the productivity of the health system in any way we can detect. See Annex 5 for more details.

- **Non HR Spending**

  Our analysis found that non-human-resource spending from NHM and Treasury were consistently associated with better health system productivity. This suggests that increasing the utilization rates of these streams of funding may be a reasonable way to increase health system productivity.

- **Non-health systems factors**

  In light of the fact that factors outside of the health system are likely to impact the productivity of the health system, we included some of these factors in the models above. We found that distance to facility and percent scheduled castes were the most consistently significant non-health system factors. This tells us that in general, increases in distance to facility and percent scheduled castes are associated with decreases in health system productivity. This could reflect physical and social/financial access barriers. It is also possible that these areas are rural and/or remote which are plagued with high absenteeism and other shortages.

Our results showed that the first 3 outputs (output composite, women who received antenatal care visits, and institutional deliveries) behaved differently than the last 4 outputs (IUD insertions, fully immunized children at 9-11 months, vitamin A doses and outpatient visits). The first 3 outputs tended to respond to changes in the inputs we included in our models while the last 4 outputs did not. This could mean that the last 4 outputs do not change in association with these inputs or it could mean that we were simply not able to detect these changes with the data available. In either case, it may be reasonable to consider whether there is something different about these 2 groups of outputs that makes them behave differently.

Key messages

- Individual HR categories – doctors, specialists, nurses, paramedics, ANMs- have no statistically significant relationship to outputs. However, HR (as a total) are a significant predictor of number of pregnant women receiving 3 ANC check ups and institutional deliveries. ASHAs and ANMs were combined as community level HR category, however there is no detectable relationship to outputs.

- Non HR spending from Treasury and NHM is strongly associated with increased outputs.

- Lack of significant relationship between HR individual categories and outputs but significant relationship when HR is considered as a group, could be explained by some level of informal task shifting among individual HR categories. Another possible explanation for limited relationship between HR and outputs is staff absenteeism.

- Average distance to the facility and percent of SC/ST population are associated with decline in productivity.

The Planning Commission, in its mid-term appraisal of the 10th Five Year Plan summarized the situation for government health care across India as follows: "…the quality of care across the rural public health infrastructure is abysmal and marked with high levels of absenteeism, poor availability of skilled medical and para-medical professionals, callous attitudes, unavailable medicines and inadequate supervision and monitoring" (Planning Commission, 2005). This assessment still holds true today in UP. A recent study further validates that not much has changed as infrastructure, human resources, supplies and medicine are challenges to quality improvement in health facilities as perceived by both users and providers in the context of maternal care in secondary level hospitals in UP (Bhattacharyya et al., 2015).

6. Conclusion

UP is the most populous state in India; in fact, it would be the 5th most populous country in the world if it is was a country of its own. Managing the health needs of such a vast population needs a strategic vision, strong stewardship; adequate financing and an exceptional implementation apparatus in place. UP is limited on all those fronts. The state is burdened with high TFR of 3.1 and a substantial shortage of facilities and human resources to deliver health services. MMR in UP is second worst, only next to Bihar, in the entire country at 258 per 100,000. U-5MR is the highest among the EAG states at 90 per 1000. While one can observe some improvement in the outcomes, it is at an exasperatingly slow pace.

In UP there is no cohesive state-wide health strategy in place as yet that articulates its vision or goals for the future. Absence of such a vision results in a piecemeal approach, with several individual initiatives and programs instituted to improve only specific outcomes. For example, voucher scheme for transportation of beneficiaries below the poverty line; *Saubhagyavati Surakshit Matritva* Yojana (promoting institutional delivery through involving private sector); bi-annual health check-ups in schools and school health week under strengthening school health program; pilot telemedicine projects in 10 districts; certification of family friendly hospitals, etc.

In terms of resource tracking and public financing management, UP does not currently carry out systematic analysis of how resources are used and managed within the system. In addition, it is difficult to assess if the (health) budget reflects sector objectives, strategic and operational plans.

Even after 10 years, it appears that NHM support has not quite achieved its goal of architectural correction to increase the state level health finances in UP and thereby its health outcomes. Government spending, both state and NHM funding collectively, is very low. The Total Government Health Expenditure in UP has kept pace with the GSDP growth. The GSDP grew 220 percent between 2008-09 and 2014-15, the TGHE increased 222 percent to Rs. 11,965 crores. The state is increasingly playing a bigger role as the financier of the health, as the ratio between state and center finances has changed from 3:1 to 4:1 over the 7-year period. However, the total resources continue to be very inadequate.

To exacerbate the situation, there is the paradox that despite limited budgets the utilization of the scarce resources is low, particularly of NHM funds. If the utilization of these funds could be improved, in one of the study years it would make an additional Rs 2407 crores available for spending, which is approximately 20 percent of the TGHE. In 2014-15 utilization of Treasury funds against budget (excluding NHM) was 70 percent and for NHM, utilization against available funds was 61 percent.

Government spending does give priority to primary health care. The proportion of GPCE has doubled in absolute terms, and has been consistently between 52-59 percent of TGHE during the study period peaking at Rs 7074 crores in 2014-15. However, the per capita GPCE is a mere Rs. 328, well below what is needed to fund an adequate package of services. The analysis of expenditure by inputs reveals that the expenditure on drugs and pharmaceuticals is only Rs. 29 per capita, despite the contribution from NHM. It is not surprising then that 70 percent of the out-of-pocket expenditures incurred by households is on drugs. Treasury utilization against approved budget declined from 90 to 70 percent between 2013-14 (audited) and 2014-15 (unaudited), against budget. Utilization against total funds available with the SHS, including the opening unspent balances at the start of the year, is only 61 percent in 2014-15, up from 47 percent in the previous year. Reasons for low utilization can be categorized as capacity and operational issues.

Following the 14th Finance Commission recommendation and the fiscal devolution, the central government puts the onus on the states to invest and expand its social sectors. One year since the Commission's recommendation came into effect, UP has neither deprioritized nor emphasized its spending on health, and continues to follow the same trajectory as before the fiscal devolution. It is probably too early to predict what would be its implication over time.

Finally, the relationship between health inputs and outputs is weak when tested in 117 blocks of UP's eight study districts. Relationship between outputs and a set of health system and non-health system inputs was explored. Among non-system variables, greater distance to a public health facility and higher percent of scheduled castes in the catchment area was associated with decreases in health system productivity. This finding is not surprising as it is likely that these are areas that are poor, rural, poorly staffed, and have limited resources producing less outputs. Financial resources (non-HR) from both, treasury or NHM are positively associated with productivity. The most interesting finding highlights the absence of stronger relationship between human resources and output variables. Individually, none of the HR categories by type, doctors, nurses, etc. appear to be associated with increased productivity. However, when included as a group, they show strong association with higher productivity. Absenteeism among staff can possibly explain at least part of this lack of relationship. This result also alludes to formal/informal task shifting that might be occurring among the different cadres of human resources, which is why it is significant relationship when HR is taken as a total. Increasing productivity requires a deeper exploration of the relationship between the different HR inputs.

7. Policy implications

Our observations and policy implications that emerge from this in-depth resource tracking exercise spanning the last 7 years of data in the state of UP are summarized in this section.

Ten years after its implementation, some flaws in the NHM design and its implementation continue to persist. It appears to be a complex financing mechanism that has contributed further to the fragmentation of health financing system in India. While the NHM design is innovative and empowering, and brought in substantial additional financing, the main challenge in UP is the full impact of these inputs that is undermined by inadequate institutional capacity at all levels and weak management systems of the state's Health Department (World Bank 2011). Some of the implications of this complex mechanism on the UP health sector are summarized below.

- The planning process is arduous and there is very limited capacity at different levels to develop a credible plan. In addition, the integration of the planning process with the financing process is not very streamlined. While all health expenditure data are publicly available, they are not all collated in a format that makes tracking and analyzing easily possible, resulting in inadequate information on total resources available to implement the health program at different levels (center, state and district) or to estimate the share of primary, secondary and tertiary health care; or gauge spending on vertical disease programs as opposed to general health system financing. More importantly, even though all record keeping is now electronic and data available in real time, there is limited evidence of the data being used for mid-course correction. These shortcomings in the planning and financing processes contribute to low budget credibility.

- There is lack of clarity and/or understanding of the financial (e.g., purchase and payments) procedures and guidelines especially at the lower levels. This is particularly true when it comes to block/untied grants and devolved funds at the community and facility level, and as a result had the low utilization.

- Poor information systems and monitoring capacity undermine accountability. The HMIS system, which is managed by the NHM, until two years ago, had serious data quality issues as the data validation and verification systems are weak. In addition, it is nearly impossible to systemically link the performance of the indicators to the use of resources within the HMIS and financial system. This common "disconnect" in results in UP or the Indian system is that resources are focused on funding an input say, buildings, rather than purchasing benefits for the population.

Another specific area of reform to improve efficiency in the system would be to improve the budgeting process. It is difficult to match health spending to priorities when budgets are classified and formed based on inputs. Furthermore, budgets disbursed and accounted for according to input-based line items as in the case of UP, are quite rigid, with lack of provider autonomy to shift resources across the line items. In addition, the structure of program budgets is by type of facility rather than the types of services to be purchased. How budgets are formed and allocated; how they flow through different levels of administration; and how they are executed/implemented has implications for health financing, revenue pooling and purchasing and service delivery. An open and orderly public financial management (PFM) system encourages better health financing mechanism and enables results.

Annexes

Annex 1: Eight study districts – an overview

Table A1.1: Demographic overview of study districts

Sr.Nr.	Indicators	Bareilli	Ghaziabad	Gorakhpur	Hardoi	Jaunpur	Sant Kabir Nagar	Shahjahanpur	Unnao	Uttar Pradesh
1	Population	4,465,344	4,661,452	4,436,275	4,091,380	4,476,072	114,300	3,002,376	3,110,595	199,581,477
2	Population density (persons per square kilometer)	1084	3954	1336	683	1108	1041	684	682	828
3	Share of state's population (%)	2.24	2.34	2.22	2.05	2.24	0.06	1.5	1.56	-
4	Sex ratio	883	878	944	856	1018	969	865	901	908
5	Child ratio (0-6 years)	900	850	905	863	916	940	902	913	899
6	Percentage decadal growth rate (2001- 2011)	23.4	40.66	17.69	20.39	14.43	20.71	21.8	15.19	20.29
7	TFR*	3.6	2.5	2.7	4.2	2.9	3.8	4.2	3.1	3.3
8	Literacy Rate (%)	60.52	85	73.25	68.89	73.66	69.01	61.61	68.29	69.72

Source: Sr. nrs. 1 to 6 & 8: Census of India 2011
* Annual Health Survey 2012-13, Uttar Pradesh

Table A1.2: Comparative snapshot of study districts from AHS 2013

	Indicators	Bareilly	Ghaziabad	Gorakhpur	Hardoi	Jaunpur	Sant Kabir Nagar	Shahja-hanpur	Unnao	Uttar Pradesh
1	Total fertility rate	3.6	2.5	2.7	4.2	2.9	3.8	4.2	3.1	3.3
2	Current usage of any method of family planning	63.9	71.5	61.5	54.7	59.1	46.7	51.6	54.4	59
3	Share of sterilzzation in any modern method of family planning									
	Female	15.1%	24.1%	17.9%	8%	21.4%	11.1%	11%	12.1%	18.4%
	Male	0.1%	0.1%	0.4%	0.5%	0.1%	0.8%	0.0%	0.8%	0.3%
4	Women receiving full ante natal check up	3%	13.9%	7%	5.1%	5.6%	3.8%	5.1%	10.1%	6.8%
5	Institutional delivery	47.5%	62.6%	54.6%	51.6%	56.8%	53.6%	47.1%	57.9%	56.7%
6	Mothers who availed financial assistance under JSY	22.9%	17.3%	33.1%	40%	31.7%	39.8%	36.7%	45.1%	36.4%
7	Pregnancy resulting in abortion	11.4%	8.6%	8.4%	3.6%	8.9%	6.2%	10%	5.4%	7.1%
8	Mothers not receiving any post natal care	22.6%	12.7%	6.7%	32.1%	13.4%	8.4%	24.7%	31.1%	17.9%
9	Percentage of new born checked within 24 hours of birth	75.9%	83.8%	89.3%	58.1%	84.4%	89%	71.3%	64%	77.7%
10	Fully immunized children (12-23 months)	41.4%	59.1%	65.6%	51.8%	60.1%	58.5%	40.9%	63.1%	52.7%
11	Children (6-35 months) who received at least one Vitamin A dose during the last 6 months	33.8%	50.1%	25.7%	48.2%	34.5%	22.1%	37.5%	46.4%	40.8%
12	Percentage of children breastfed within 1 hour of birth	31.2%	33.5%	31.6%	59.4%	35.6%	27.9%	41.2%	51.7%	39.4%
13	Crude Birth Rate	25.9	21	24	27.8	22.3	30.4	28.2	21	24.8
14	Crude Death Rate	8.7	6.7	8	9.3	8.3	9.9	7.7	6.8	8.3
15	Under-5 mortality rate	104	59	76	118	91	91	100	83	90
16	Infant Motality Rate	78	46	62	81	75	63	80	58	68
17	Neo-Natal Mortality Rate	52	30	46	52	59	49	58	37	49

Source: Annual Health Survey, 2012-13, Government of India

Table A1.3: Performance of study districts against select output indicators from HMIS

Indicator	Year	Uttar Pradesh	Barielly	Ghaziabad	Gorakhpur	Hardoi	Jaunpur	Sant Kabir Nagar	Shahjahanpur	Unnao
Percentage of women who received 3 ANC check-ups to total ANC registrations	2012-13	73.1	64.3	79.8	76.5	83.4	86.3	40.1	74.4	66.7
	2013-14	69.9	63	77.7	36.3	68	79	58.7	75.1	58.7
	2014-15	69.5	59.5	66.6	69.3	63.9	72.5	58	70.9	60.5
Percentage of mothers paid JSY incentive for home deliveries to total reported home deliveries	2012-13	4.5	0.4	0	31.8	0.4	0	4.6	0.2	15
	2013-14	5.4	1.2	0.1	15.1	11.2	0.1	9.6	0.1	3.2
	2014-15	2.5	1.7	2	10.3	1.6	0.8	0.3	0.1	1.4
Percentage of institutional delivery to total ANC registrations	2012-13	40.9	26.4	42.1	36.7	45.6	48.7	63.9	27.5	26.3
	2013-14	42.2	33	24.8	23.7	31.6	46.4	64	36.6	44.4
	2014-15	45.4	57.7	10.3	42.5	36.6	40.7	70.7	40.4	46.5
Percentage of institutional delivery to total reported delivery	2012-13	62.8	32.9	68.7	57	58.1	56.7	74.9	44.4	66.6
	2013-14	71.4	50.4	61.8	82.9	67.7	58	79.3	52.9	83
	2014-15	73.3	71.3	63.9	83.1	63.5	56.9	81.7	58	86.5
Percentage of women receiving post partum check-up within 48 hours of delivery to total reported deliveries	2012-13	56.9	19.2	0	92.1	65.7	27.6	22.3	20.4	83.8
	2013-14	58.7	42.2	32.5	51.5	60.5	42.7	59.6	40.1	54.7
	2014-15	56.5	44.2	85.4	58.9	45.3	44.4	52.5	34.8	72.3
Percentage of new born having weight less than 2.5 kg to new borns weighed at birth	2012-13	28.3	68.5	9.4	24.3	22.8	24.6	28.7	19.3	25.5
	2013-14	17.8	24.7	18.4	6	18	25	10.4	15.4	16.6
	2014-15	11.7	13.5	29.9	8	12.4	12.4	6.7	12.1	11.3
Percentage of newborns breastfed within one hour of birth to total live births	2012-13	70.5	41.8	28.4	83.4	69.8	71.3	73.4	47.7	68
	2013-14	84.1	75.9	83.6	70.7	73.1	84.5	89.4	80.9	85.1
	2014-15	86.8	86.9	85.7	81.6	84.2	75	90.4	98.8	96.3
Percentage of new borns visited within 24 hours of home delivery to total reported home deliveries	2012-13	61.6	95.4	35.9	60.6	75.3	40.2	43.3	38.1	56.8
	2013-14	58.3	66.8	83.2	59	43.3	33.6	57.6	41.5	47.6
	2014-15	52.8	34	77.4	75.6	26.3	37.5	39.9	43.9	58.3
Percentage of male sterilization to total sterilization	2012-13	2.2	3.4	30.1	2	0.6	1.1	1.2	1.8	1.6
	2013-14	3.1	14.7	11.6	1	1.3	1	0.9	1.8	0.1
	2014-15	4.1	21.9	9.7	0.1	1	0.1	0.3	6.8	1.5
Percentage of IUCD insertions to all family planning methods	2012-13	81.6	86.7	75.6	73.6	93.1	64.8	89.3	90.3	94
	2013-14	80.2	82.9	82.3	71.7	89.2	62.8	79	95.6	84.6
	2014-15	80.3	78.8	86.6	80.7	83	63.2	76.3	96.6	88.8

Annex 2: Classifying Standard Objects of Expenses in the state budget into cost categories

HUMAN RESOURCES	
Code	Title
1	Salary
2	Wages
3	Dearness allowance
4	Transfer allowance
5	Other allowances
6	Honorarium
21	Scholarships & studentships
31/43	Grant for aide (General salary)
33	Pension / other retirement benefits
45	Leave travel compensation
49	Medical expenses
50	Dearness pay (part of salary)
51	Uniform

DRUGS AND PHARMACEUTICALS	
Code	Title
39	Drugs and pharmaceuticals

OPERATING EXPENSES (18)	
Code	Title
4	Travel
8	Office expenses
9	Electricity
10	Water expenses
11	Stationery
12	Office furniture & expenses
13	Telephone
15	Maintenance of vehicles
17	Rent and taxes
18	Printing
19	Advertisement expenses
22	Guest related expenses
29	Maintenance
35	Grant for account - maintenance
40	Hospital related cleanliness & furbishment
41	Food expense
43/31	Materials and supplies
47	Computer maintenance

OPERATING EXPENSES (18)	
Code	Title
14	Purchase of vehicles
24	Major civil work
25	Minor civil work
26	Machine, equipment, tools & plants
46	Purchase of computer hardware & software
48	Grant for aide - capital

OTHERS	
Code	Title
16	Consultancy expenses
20	Grant for aide
23	Fees for confidential services
30	Investments / loans
38	Interim relieve
44	Training, travelling and conference expenses

"Code' refers to Standard Objects of Expenditure

Source: Vitta Path 2011, Ministry of Finance, Government of UP.

Missing Code numbers between 1 and 52 are due to no amounts booked under these Object Codes by the Health Department.

Annex 3 Classification of NHM expenditure

Cost categories	Includes the following expenses
Human resource costs	Salaries of staff and consultants, internal auditors, honorarium.
Operating costs	Includes printing of manuals, training modules, registers if the budget line is exclusively for printing[6], repairs and maintenance (to ensure consistency with classifications under treasury route), website costs, expenses related to operations of office (including hospitals, clinics, management units and administrative units such as CMO office), strengthening of facilities, unless explicitly stated otherwise, audit fees (unless internal auditors, which are categorized under human resource) and contingency or miscellaneous expenses.
Drugs, pharmaceuticals and consumables	Diagnostics (supplies etc.), blood transfusions, ASHA kits and ASHA drug kits.
Program costs / Others	Diet, referral transport, fuel unless it specifically states administrative purposes, planning, visioning exercises, quality assurance, incentives and awards to personnel, all research, studies, review meetings, and monitoring related expenses, staff at service delivery level (ASHAs, counselors), mobility/transportation for rendering services under a program, all management unit costs, unless explicitly stated as operational, SPMU and DPMU training costs related to program management, all untied funds and corpus grants at different levels, strengthening of training institutions, unless expenditure line clearly states otherwise.
Administrative costs	Purchase and operation of ambulances and setting up of call centers, drug warehouse and medical waste management (unless a medical waste management line specifically indicates the level of facility)

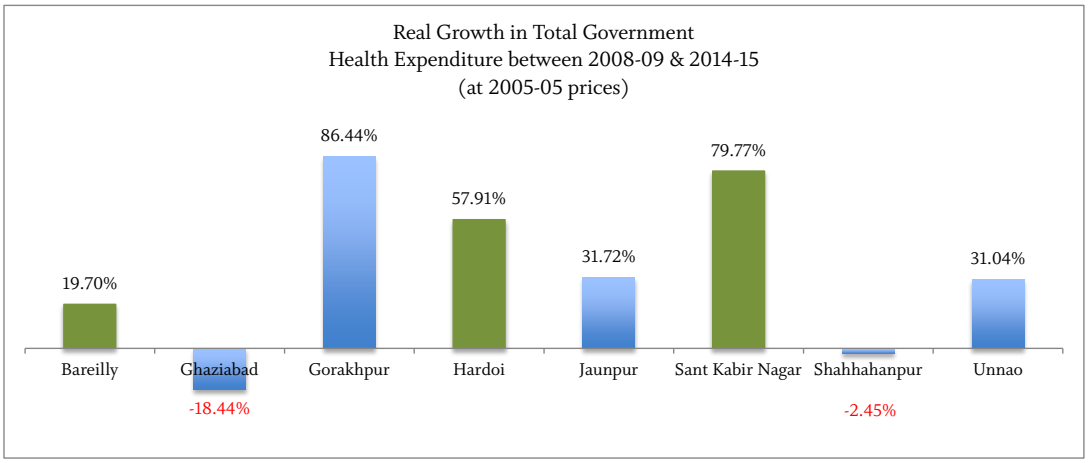
[6] If the line includes anything else in addition to printing (dissemination, design), this has been categorized as 'Program'.

Annex 4: District level expenditure analysis

District level expenditure analysis

TGHE growth rate in real terms across years and districts do not reveal any clear trend like that at the state level. However, when we looked at the growth in expenditure in real terms between 2008-09 and 2014-15, analysis reveals that Shahjahanpur needs special attention as it is spending 2.45 percent less (at 2004-05 constant prices) in 2014-15 than what it was spending in 2008-09. This is despite the fact that Shahjahanpur is one of the high priority districts in the state. The other high priority district, which needs attention, is Bareilly as it has registered only 20 percent growth in TGHE over the last six years. The reduction in the growth rate in Ghaziabad is on account of bifurcation of the district. See Figure A4-A

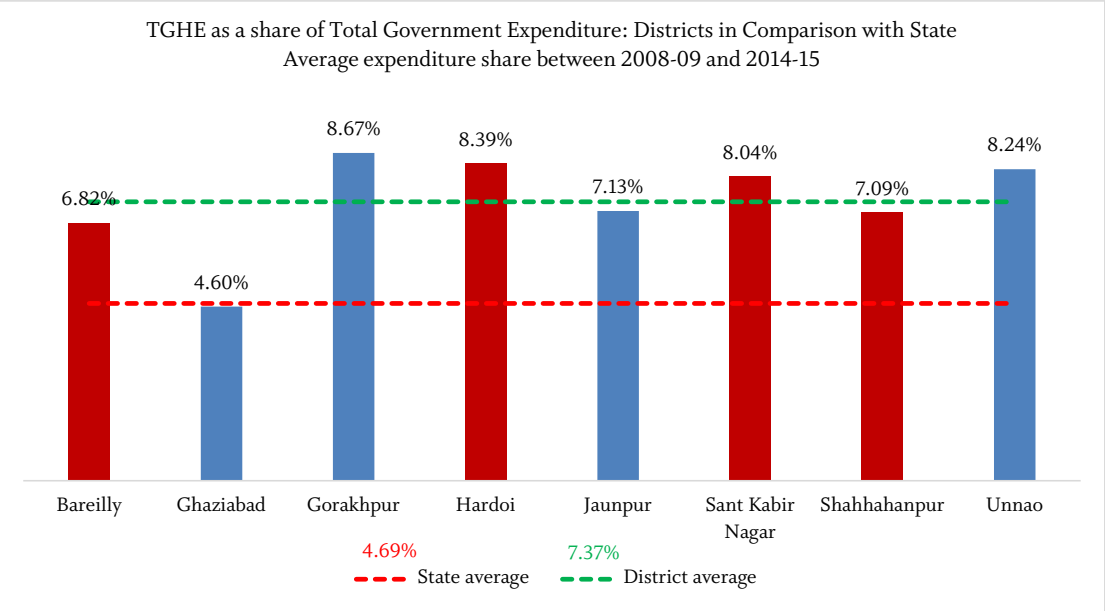
Figure A4-A : Real Growth in TGHE between 2008-09 and 2014-15



Across the eight study districts and across all years, NHM contributes 20 percent to 30 percent of the TGHE. NHM's share in the TGHE across the eight study districts has seen a steady increase in the last four years of the study, with it being the highest (31 percent) in Sant Kabir Nagar and lowest (15 percent) in Gorakhpur in 2014-15.

Overall health expenditure in a district as a share of total government expenditure is higher in the districts (7.37 percent) than at the state level (4.69 percent). Total health spending as a share of total government spending is the highest in Gorakhpur and the lowest in Ghaziabad. We see that two of the four high priority districts which were a part of the study are spending more in health than the average share across districts. See Figure A-4B.

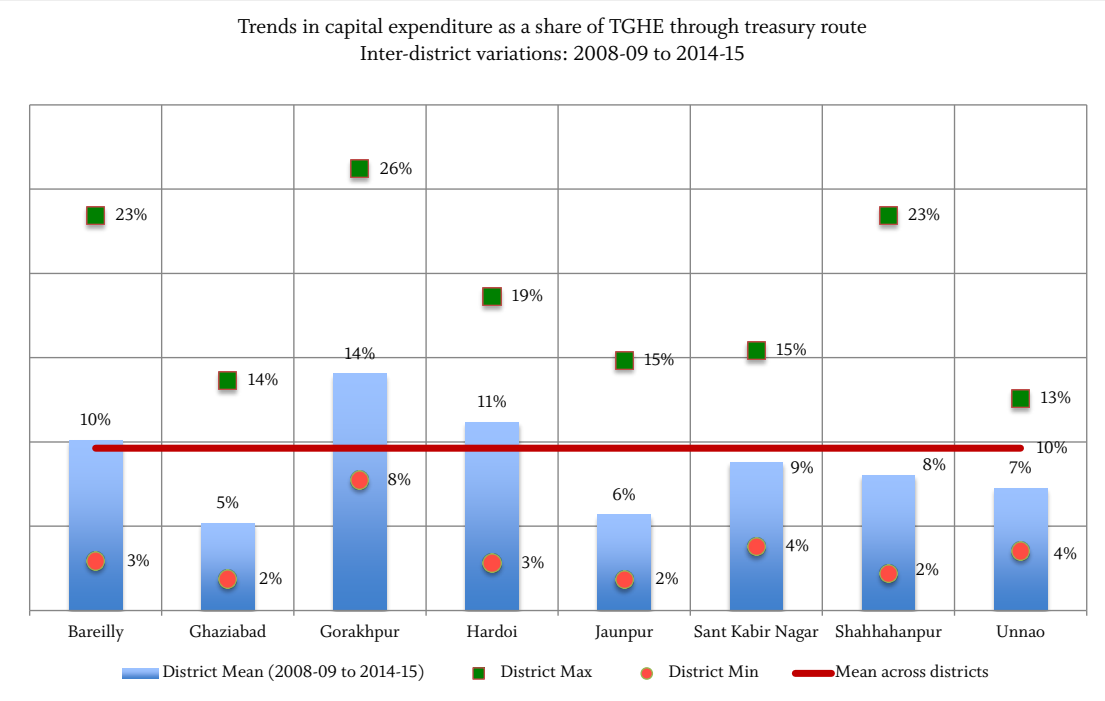
Figure A-4B: TGHE as a share of Total Government Expenditure: Districts in Comparison with State



High Priority Districts

Capital investments in districts

Figure A-4C: Trends in capital expenditure as a share of TGHE through treasury route



Inter-district analysis of capital investments reveal that during the seven study years, Gorakhpur has witnessed maximum capital investment and the lowest investments have been made in Ghaziabad. Hardoi seems to be only one among the four high priority districts where the mean capital expenditure is higher than average of capital expenditure across the eight districts.

As a share of the total government health expenditure through the treasury route at the district level, the mean capital expenditure across districts across time is approximately 10 percent. The maximum share of capital expenditure was witnessed in Gorakhpur in 2008-09, which was at 28.54 percent; and the lowest was at 0.81 percent in Ghaziabad in 2010-11. NHM has made a significant contribution to the total capital expenditure in the health sector at the district level.

Annex 5 – Productivity analysis

Table A5.1: Regression Results - Group 1 -Do individual categories of HR have relationships with outputs?

VARIABLES	(1) Output Composite Score	(2) 48-Hour Postpartum Visits	(3) Ante-Natal Care Visits	(4) Institutional Deliveries	(5) IUD Insertions	(6) Fully Immunized Children (9-11 mo.)	(7) Children (6-35 months) who received at least one Vitamin A dose during the last 6 months	(8) Outpatient Visits
Human Resources								
Doctors	1.383	42.87	-7.036	32.35	29.55	62.13	-33.48	-311.2
	(2.072)	(56.74)	(50.54)	(53.11)	(36.86)	(107.5)	(27.58)	(1,124)
Specialists	-4.082	-75.95	-34.2	-44.96	-12.25	-289.7	-89.63	5,092*
	(5.136)	(57.80)	(154.7)	(68.73)	(58.75)	(401.8)	(125.1)	(2,549)
Nurses	-3.473	-81.05	3.07	-83.94	-71.64	-125	-75.5	1,302
	(4.429)	(66.32)	(154.6)	(80.63)	(47.84)	(214.5)	(117.1)	(2,190)
Paramedicals	-0.195	-24.45	-15.7	-39.55*	-2.94	-4.825	-8.569	-2,175*
	(1.121)	(18.15)	(39.65)	(17.77)	(10.19)	(79.55)	(53.84)	(962.3)
ASHAs	0.609	15.9	16.29***	2.566	6.348**	26.48	6.909	211
	(0.418)	(8.941)	(3.799)	(9.461)	(2.504)	(23.50)	(5.623)	(309.4)
ANMs	-2.055	-21.49	43.38	5.867	-27.85	36.9	-28.59	87.6
	(1.423)	(12.82)	(32.99)	(12.72)	(15.61)	(77.83)	(29.32)	(848.0)
Non-HR Spending								
Treasury	0.0140***	0.144*	-0.0154	-0.00898	0.0593	0.351	0.343***	4.992
	(0.00325)	(0.0688)	(0.189)	(0.0236)	(0.0628)	(0.461)	(0.0699)	(2.968)
NHM	0.0150***	0.190**	0.120**	0.357***	0.0767*	0.186	0.145***	3.745***
	(0.00325)	(0.0713)	(0.0446)	(0.0654)	(0.0370)	(0.118)	(0.0391)	(0.874)
Non-Health System Covariates								
Gates Priority	-0.0348	-1.229	-0.227	-0.945	-2.133	1.071	3.248	-49.18
	(0.108)	(2.499)	(2.234)	(1.679)	(1.351)	(5.727)	(2.181)	(69.73)
Mean Distance to Facility	-0.00110*	0.0133	-0.0378*	0.0301**	-0.00479	-0.00416	-0.0222*	0.902**
	(0.000533)	(0.0136)	(0.0170)	(0.00961)	(0.00564)	(0.0372)	(0.0108)	(0.374)
Percent SC	-0.0624	0.428	-13.63	1.847	2.179	-58.79***	-28.42*	93.89
	(0.477)	(10.58)	(8.472)	(6.742)	(2.836)	(16.50)	(12.19)	(299.3)
Percent Agricultural Labor	0.974*	18.98**	-11.64	7.356	8.728	16.67	-2.984	79.29
	(0.428)	(7.714)	(12.38)	(4.249)	(7.516)	(23.83)	(6.696)	(262.6)
Above 7 Literacy Rate	-1.037	-13.2	-36.83	-6.607	-8.264	26.5	22.28	-1,627
	(0.766)	(24.77)	(27.55)	(27.57)	(12.88)	(67.95)	(15.52)	(1,633)
Constant	1.513	-18.66	35.66	-5.815	-1.769	-32.36	-1.692	801.8
	(0.981)	(23.09)	(26.62)	(18.44)	(13.79)	(75.38)	(13.34)	(1,166)
Observations	113	113	113	113	113	113	113	113
R-squared	0.431	0.303	0.25	0.411	0.162	0.216	0.176	0.22
Number of Districts	8	8	8	8	8	8	8	8
District FE	YES	YES	YES	YES	YES	YES	YES	YES

heteroskedasticity and cluster robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A5.2: Regression Results - Group 2 - Do HR as a whole have a relationship with outputs?

VARIABLES	(1) Output Composite	(2) 48-Hour Postpartum Visit	(3) Ante-Natal Care Visits	(4) Institutional Deliveries	(5) IUD Insertions	(6) Fully Immunized Children (9-11 mo.)	(7) Children (6-35 months) who received at least one Vitamin A dose during the last 6 months	(8) Total Outpatient Visits
Human Resources								
Human Resources	0.0319***	0.996***	0.504**	0.454**	0.151	0.501	0.386	16.39
	(0.00403)	(0.00256)	(0.182)	(0.172)	(0.106)	(0.404)	(0.299)	(11.33)
Non-HR Spending								
Treasury	0.00660	-0.00718**	0.0183	-0.109**	-8.41e-05	0.320	0.157	3.916
	(0.00349)	(0.00231)	(0.101)	(0.0325)	(0.0608)	(0.298)	(0.111)	(3.517)
NHM	0.00841***	-0.00383***	0.0808	0.243***	0.0454	0.143	0.0492	1.229
	(0.00238)	(0.000983)	(0.0794)	(0.0460)	(0.0449)	(0.127)	(0.0670)	(1.625)
Non-Health System Covariates								
Gates Priority	-0.00197	-0.0340	1.179	-0.445	-2.171	2.937	3.874	-35.69
	(0.102)	(0.0339)	(1.800)	(1.128)	(1.425)	(5.049)	(2.084)	(45.41)
Mean Distance to Facility	-0.00120***	1.24e-05	-0.0576***	0.0110	-0.00367	-0.0469**	-0.0287***	1.011***
	(0.000327)	(0.000141)	(0.00561)	(0.00611)	(0.00539)	(0.0151)	(0.00683)	(0.128)
Percent SC	-0.183	-0.308	-9.551	2.332	2.122	-53.73**	-32.73**	210.4
	(0.302)	(0.244)	(7.706)	(5.308)	(2.729)	(16.39)	(9.771)	(219.9)
Percent Agricultural Labor	0.345	0.269	-22.48	-0.852	4.421	1.515	-10.77	-184.7
	(0.200)	(0.152)	(12.84)	(2.851)	(6.734)	(19.60)	(11.52)	(464.5)
Above 7 Literacy Rate	-0.648	-0.0426	-28.81	-0.280	-7.614	35.18	26.99	-1,428
	(1.023)	(0.334)	(24.58)	(19.28)	(14.79)	(71.52)	(20.01)	(1,279)
Constant	2.153*	-0.684*	50.88*	0.690	3.986	-5.679	6.832	979.3
	(0.953)	(0.333)	(24.38)	(14.67)	(15.18)	(65.66)	(24.28)	(1,232)
Observations	113	113	113	113	113	113	113	113
R-squared	0.628	0.98	0.293	0.576	0.160	0.186	0.218	0.346
Number of Districts	8	8	8	8	8	8	8	8
District FE	YES	YES	YES	YES	YES	YES	YES	YES

heteroskedasticity and cluster robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A5.3: ASHA and non-ASHA HR - Regression Results (Group 3) - Are ASHAs different?

VARIABLES	(1) Output Composite	(2) 48-Hour Postpartum Visit	(3) Ante-Natal Care Visits	(4) Institutional Deliveries	(5) IUD Insertions	(6) Fully Immunized Children (9-11 mo.)	(7) Children (6-35 months) who received at least one Vitamin A dose during the last 6 months	(8) Total Outpatient Visits
Human Resources								
ASHAs	-0.0270	-0.0803	14.69	-3.325	1.323	26.38	-0.462	-32.30
	(0.131)	(0.0492)	(7.996)	(4.751)	(1.439)	(18.98)	(8.280)	(149.4)
Other Human Resources	0.0321***	1.001***	0.434*	0.473**	0.145	0.373	0.391	16.63
	(0.00424)	(0.000613)	(0.196)	(0.168)	(0.109)	(0.328)	(0.323)	(11.03)
Non-HR Spending								
Treasury	0.00674	-0.00466***	-0.0149	-0.1000**	-0.00282	0.259	0.159	4.029
	(0.00374)	(0.00128)	(0.102)	(0.0321)	(0.0596)	(0.260)	(0.111)	(3.603)
NHM	0.00858**	-0.000778	0.0406	0.254***	0.0421	0.0701	0.0516	1.367
	(0.00246)	(0.000547)	(0.0591)	(0.0582)	(0.0446)	(0.151)	(0.0650)	(1.922)
Non-Health System Covariates								
Gates Priority	-6.09e-05	0.000840	0.720	-0.323	-2.209	2.099	3.901*	-34.11
	(0.102)	(0.0156)	(1.726)	(1.202)	(1.393)	(5.688)	(2.038)	(44.28)
Mean Distance to Facility	-0.00120***	8.59e-05**	-0.0585***	0.0113	-0.00375	-0.0486***	-0.0287***	1.015***
	(0.000336)	(3.55e-05)	(0.00563)	(0.00659)	(0.00543)	(0.0130)	(0.00673)	(0.134)
Percent SC	-0.169	-0.0576	-12.86**	3.213	1.849	-59.76***	-32.53**	221.7
	(0.305)	(0.0515)	(5.177)	(5.021)	(2.711)	(17.07)	(9.809)	(237.5)
Percent Agricultural Labor	0.328	-0.0453	-18.33	-1.957	4.764	9.084	-11.02	-198.9
	(0.206)	(0.0478)	(10.74)	(2.938)	(6.903)	(20.58)	(12.30)	(455.5)
Above 7 Literacy Rate	-0.646	-0.0116	-29.22	-0.172	-7.648	34.43	27.01	-1,427
	(1.025)	(0.145)	(23.03)	(18.84)	(14.97)	(70.95)	(20.03)	(1,285)
Constant	2.195*	0.0777	40.84*	3.367	3.156	-24.01	7.433	1,014
	(0.975)	(0.142)	(21.09)	(13.07)	(15.70)	(69.72)	(26.45)	(1,230)
Observations	113	113	113	113	113	113	113	113
R-squared	0.628	1.000	0.324	0.580	0.161	0.215	0.219	0.346
Number of Districts	8	8	8	8	8	8	8	8
District FE	YES	YES	YES	YES	YES	YES	YES	YES

heteroskedasticity and cluster robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A5.4: Community HR Regression Results – Group 4

VARIABLES	(1) Output Composite	(2) 48-Hour Postpartum Visit	(3) Ante-Natal Care Visits	(4) Institutional Deliveries	(5) IUD Insertions	(6) Fully Immunized Children (9-11 mo.)	(7) Children (6-35 months) who received at least one Vitamin A dose during the last 6 months	(8) Total Outpatient Visits
Human Resources								
Community Level HR (ASHAs and ANMs)	-0.0774	0.0147	14.95*	-2.238	0.210	24.47	-1.271	0.654
	(0.113)	(0.0322)	(7.188)	(4.469)	(1.725)	(16.03)	(7.533)	(133.6)
Other Human Resources	0.0324***	1.001***	0.431*	0.468**	0.151	0.380	0.395	16.47
	(0.00434)	(0.000516)	(0.189)	(0.167)	(0.110)	(0.339)	(0.322)	(10.95)
Non-HR Spending								
Treasury	0.00706	-0.00312***	-0.0414	-0.0977**	-0.000327	0.220	0.164	3.981
	(0.00373)	(0.000880)	(0.112)	(0.0323)	(0.0569)	(0.252)	(0.111)	(3.732)
NHM	0.00876**	-0.000677*	0.0344	0.252***	0.0452	0.0664	0.0545	1.279
	(0.00255)	(0.000340)	(0.0596)	(0.0592)	(0.0456)	(0.150)	(0.0661)	(1.942)
Non-Health System Covariates								
Gates Priority	0.00248	0.00595	0.591	-0.335	-2.173	1.961	3.941*	-35.05
	(0.102)	(0.00991)	(1.739)	(1.202)	(1.394)	(5.677)	(1.993)	(44.75)
Mean Distance to Facility	-0.00123***	-0.000247***	-0.0538***	0.0103*	-0.00366	-0.0405**	-0.0291***	1.007***
	(0.000340)	(3.02e-05)	(0.00738)	(0.00542)	(0.00528)	(0.0156)	(0.00767)	(0.128)
Percent SC	-0.151	-0.0265	-13.70**	3.105	2.105	-60.62**	-32.25**	214.9
	(0.309)	(0.0244)	(5.454)	(5.268)	(2.944)	(17.72)	(10.14)	(244.2)
Percent Agricultural Labor	0.313	-0.0197	-18.23	-1.645	4.438	8.579	-11.26	-189.3
	(0.203)	(0.0336)	(10.69)	(2.906)	(6.941)	(19.71)	(12.29)	(449.3)
Above 7 Literacy Rate	-0.642	0.0110	-29.60	-0.133	-7.617	33.87	27.08	-1,427
	(1.021)	(0.113)	(22.40)	(18.93)	(14.84)	(70.74)	(19.91)	(1,287)
Constant	2.233*	0.0329	40.32*	2.658	3.943	-23.21	8.044	990.8
	(0.974)	(0.107)	(21.09)	(12.95)	(15.73)	(69.00)	(26.44)	(1,210)
Observations	113	113	113	113	113	113	113	113
R-squared	0.629	1.000	0.334	0.579	0.160	0.217	0.219	0.346
Number of Districts	8	8	8	8	8	8	8	8
District FE	YES	YES	YES	YES	YES	YES	YES	YES

heteroskedasticity and cluster robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A5.5: Doctors & Other Regression Results - Group 5

VARIABLES	(1) Output Composite	(2) 48-Hour Postpartum Visit	(3) Ante-Natal Care Visits	(4) Institutional Deliveries	(5) IUD Insertions	(6) Fully Immunized Children (9-11 mo.)	(7) Children (6-35 months) who received at least one Vitamin A dose during the last 6 months	(8) Total Outpatient Visits
Human Resources								
Doctors	-0.239	-0.507	-16.57	-3.465	9.013	11.69	-64.27	-369.5
	(1.365)	(0.404)	(31.88)	(39.39)	(34.17)	(85.60)	(55.55)	(1,482)
ASHAs	-0.0292	-0.0926*	14.55	-3.357	1.395	26.47	-0.986	-35.43
	(0.127)	(0.0471)	(8.023)	(4.780)	(1.620)	(19.07)	(8.265)	(144.6)
Other Human Resources	0.0322***	1.001***	0.434*	0.473**	0.145	0.372	0.394	16.65
	(0.00423)	(0.000558)	(0.198)	(0.170)	(0.111)	(0.330)	(0.328)	(11.15)
Non-HR Spending								
Treasury	0.00701*	-0.00315**	0.00223	-0.0960**	-0.0117	0.248	0.224**	4.418
	(0.00329)	(0.00100)	(0.100)	(0.0394)	(0.0569)	(0.299)	(0.0803)	(3.409)
NHM	0.00860***	-0.000674	0.0418	0.254***	0.0415	0.0693	0.0561	1.393
	(0.00241)	(0.000425)	(0.0588)	(0.0574)	(0.0445)	(0.151)	(0.0654)	(1.879)
Non-Health System Covariates								
Gates Priority	-0.00105	-0.00464	0.658	-0.337	-2.176	2.140	3.666	-35.52
	(0.105)	(0.0165)	(1.795)	(1.129)	(1.477)	(5.905)	(2.090)	(47.16)
Mean Distance to Facility	-0.00119***	9.77e-05*	-0.0584***	0.0113	-0.00382	-0.0487***	-0.0281***	1.018***
	(0.000332)	(4.54e-05)	(0.00547)	(0.00654)	(0.00542)	(0.0127)	(0.00675)	(0.122)
Percent SC	-0.157	0.00767	-12.12*	3.383	1.465	-60.25**	-29.73**	238.4
	(0.305)	(0.0612)	(6.129)	(3.730)	(2.984)	(17.29)	(10.02)	(228.0)
Percent Agricultural Labor	0.326	-0.0549	-18.44	-1.982	4.820	9.156	-11.43	-201.4
	(0.210)	(0.0381)	(10.84)	(3.046)	(7.123)	(20.67)	(12.19)	(469.1)
Above 7 Literacy Rate	-0.646	-0.0100	-29.20	-0.167	-7.657	34.42	27.08	-1,426
	(1.027)	(0.127)	(22.95)	(19.04)	(15.10)	(71.42)	(18.61)	(1,296)
Constant	2.196*	0.0831	40.90*	3.381	3.124	-24.05	7.664	1,015
	(0.981)	(0.112)	(21.07)	(13.21)	(15.99)	(70.36)	(25.50)	(1,248)
Observations	113	113	113	113	113	113	113	113
R-squared	0.628	1.000	0.325	0.580	0.161	0.215	0.224	0.347
Number of Districts	8	8	8	8	8	8	8	8
District FE	YES	YES	YES	YES	YES	YES	YES	YES

heteroskedasticity and cluster robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

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