

## REPORT FROM FIELD

## Engaging Actors for Integrating Health Policy and Systems Research into Policy Making: Case Study from Haryana State in India

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### Abstract

**Background & objective:** Good examples of evidence generation using Health Policy and Systems Research (HPSR) in low and middle-income countries (LMIC); and its application in policy making are scarce. In this paper, we describe the experience of establishing a system of HPSR from the Haryana state in India, outline how the HPSR is being utilized for policy making and programmatic decision making, and analyse the key factors which have been critical to the implementation and uptake of HPSR. **Material & Methods:** Multiple methods are employed in this case study, ranging from unstructured in-depth interviews, review of the program and policy documents, and participatory notes from the meetings. The steps towards creation of a knowledge partnership between stakeholders are outlined. Four case studies i.e. development of a plan for universal health care (UHC), nutrition policy, centralized drug procurement system and use of RAPID appraisal method highlight the use of research evidence in agenda setting, policy formulation and policy implementation respectively. **Results:** Our analysis shows that the most important factor which contributed to Haryana model of HPSR was the presence of a dedicated and motivated team in National Rural Health Mission (NRHM) at state level, many of whom were researchers by previous training. Overall, we conclude by highlighting the need for establishing an institutional mechanism at Central and State level where health service administrators and managers, academicians and researchers working in the field of health system from medical colleges, public health schools, management and technology institutions and social science universities can identify health system research priorities. Increased budgetary allocation for HPSR is required.

### Keywords

Health systems research; Health policy and systems research; policy analysis; health policy; India; program evaluation; impact assessment

## Introduction

HPSR is the “creation of new knowledge to improve how societies organise themselves to achieve health goals, focusing on policies, organisations, and programmes, but not on clinical management of patients or basic scientific research”.(1) The focus of HPSR is not on any particular disease or service, but rather relates to one or more of the six building blocks of the health system.(2) Despite its existence in the form of health services research since 1970s, it has remained a neglected area, which has been cited in a number of policy documents (3, 4) and the World Health Assembly resolution.(5) Stakeholders who met in Mexico in 2004, called for reinvigorating HPSR and laid the broad roadmap to generate greater activity around HPSR.(1)

HPSR in LMIC has remained an even weaker stream. A survey of research institutions in 2003 and 2008 suggests little change in the focus on HPSR. While international aid is the main source of funding of HPSR, (1) weak organizational capacity and lack of a clear knowledge development agenda further limits its application. Another reason for low application of HPSR is the “two worlds” in which the researchers and policy makers live in with respect to different work, attitudes to research, priorities, accountability issues at stake, organizational constraints and values. (6) So even if there is an evidence generated, good examples of its meaningful application in policy making are not very many. A review of articles published from 1990-95 revealed that only 23% articles had some policy implications, with majority directed towards clinical practice, and a meager 1.3% research bearing recommendations for regulatory/ legislative policy making. (7) Another review in 2004 studying 4876 health research and policy articles published from India showed health policy/ systems to be a neglected field with only 1.9% of total articles. (8)

In absence of evidence around policy-making generated from quality HPSR studies, policy makers and program managers in LMIC rely on two types of sources: population-based coverage evaluation surveys such as demographic health surveys (DHS); or the information from routine management information system (MIS). While each of these sources is useful, there are critical limitations for its application. The DHS surveys mainly focus on outputs and outcomes, and not on inputs and processes, (9) rendering understanding in terms of “why” and “how” of complex health system issues

incomplete. Secondly, DHS surveys are carried out once in 5-7 years in various countries, while decisions in health system have to be taken concurrently. Thirdly, the coverage surveys due to limitation of scale, provide valid information at national or state level while most decision making now happens at district level because of increasing decentralization, necessitating disaggregated sub-district level information. Finally, most of these surveys do not capture health outcomes or utilization and out-of-pocket expenditures together. With increasing emphasis on Universal Health Care (UHC) and equity, reliance on such data becomes even more important. (10, 11) The second source of evidence (local MIS) is fraught with problem of incompleteness and poor quality. (12-14) This underlines the importance of involving various actors in institutionalizing a sustainable system of concurrent HPSR.

In this paper, we describe the experience of establishing one such HPSR mechanism from the Haryana state in India. We first describe the characteristics of state and the study methodology. Development of a knowledge network for undertaking HPSR is described in results. We outline the timeline for establishment of different activities which contribute to HPSR, describing the building blocks evaluated and key indicators monitored by each activity. Along with description of salient features of key HPSR initiatives, we also highlight how HPSR is being utilized for policy making and programmatic decision making in Haryana. While doing so, we use specific case studies of the development of a program for universal health care, nutrition policy, centralized drug procurement system and Regular Appraisal of Program Implementation in Districts (RAPID). These specific case studies have been selected to illustrate how research helped in policy making at 3 levels, i.e. (1) agenda setting, (2) policy formulation and (3) policy implementation. We then shift our attention to analysing key factors critical to the implementation and uptake of HPSR in Haryana state. Issues still not completely addressed in the Indian example are also discussed. Finally, we conclude by discussing the replicability of the Indian (Haryana) model for other LMIC.

## Material & Methods

**Study Profile:** Haryana is one of the northern states of India. It falls in top bracket in terms of per capita

GDP and has a history of progressive growth and development on all social aspects since its inception as a state in 1966. As per census 2011, the state has a population of 25.35 million (65% rural), (15) and 1.99% annual population growth rate. (16) The literacy rate in Haryana is 2.6% higher than the rest of the country. (17)

The annual financial budget 2012-13 of the health department, Haryana was INR 10.5 billion, of which around 14.4% were devoted to public health efforts. The remaining allocation is towards curative medical care provision. The state has 53 district and tertiary care hospitals, 95 Community health centres (CHCs), 440 Primary Health Centres (PHCs) and 2630 Sub-centres (SCs) for these services. (18)

As a result of this, the state boasts of an average life expectancy of 68.9 years for males and 71.3 years for females, which are higher than the rest of the country (67.3 years and 69.6 years respectively).(18) The institutional delivery rate in the state is more than 77%.(18, 19) The total fertility rate (2.3) is also lower than the rest of the country (2.5). (20) Nearly 49% of pregnant women in the state consumed full course of iron folic acid supplementation for more than 100 days as compared to 31% for India.(21, 22) Similarly, full ANC rate for the state is 16.4% higher than national average. (21, 22) Proportion of fully immunized children in Haryana is 71.7% as compared to 61% at national level. (21, 22)

Despite of all these figures, the state lags behind in many other health indicators. In terms of infant mortality rate (42 per thousand live births), Haryana ranks 27 among 35 Indian states and Union Territories. (23) The same is true for maternal mortality ratio (153 per 100,000 live births) which is poorest among states other than Empowered Action Group (EAG) states. (24) The rate of decline of maternal and neonatal mortality in Haryana is much slower than the national average. As compared to 65.6% of neonates receiving medical check-up within 24 hours of birth at national level, the state could reach only to 51% children. (21) Problems with the healthcare delivery system also exist. The beds per thousand population ratio in the state (0.39) is lower than India's neighbours like Bhutan (1.8) and Bangladesh (0.6) as well as some African countries like Gambia (1.1) and Ghana (0.9). (18, 25) Only 83% of the sanctioned positions are filled for Medical and Dental Officers while the same is around 77% for nursing staff. (18) Public health expenditure in the state was USD 14.26 per capita in 2012-13 as

compared to the national average of USD 31 in 2011. (18, 26)

**Data Collection and Analysis:** We undertook this study to document creation of a knowledge partnership for undertaking HPSR in the state. Further we assessed the application of evidence for policy making and the factors which influenced this process. Unstructured in-depth interview of key stakeholders, including 3 state program managers, 8 state level health consultants, 6 civil surgeons (district chief of health department) and 24 district level program officers were conducted. Extensive review of state level records, office memos and policy documents was undertaken by two investigators independently to identify the genesis of HPSR initiatives. In order to identify these factors, we draw upon the recommendations of the WHO's Alliance from Health Policy and Systems Research report. (1, 2) As the three most important factors outlined include domestic leadership for HPSR, local capacity to undertake and utilize research, and a common understanding of HPSR, we analyse the Haryana model in light of these issues. Further, notes recorded by study investigators who attended 12 district and 9 state level meetings were reviewed and analysed in order to identify the push and pull factors for HPSR. We also identified some of the persistent weaknesses which still continue to be a threat to its long term sustainability.

**Ethical clearance:** Ethical approval for the study was undertaken from the Institute Ethics Committee of the Post Graduate Institute of Medical Education and Research, Chandigarh. Administrative approvals from National Rural Health Mission of the Haryana State Government were obtained. Written informed consent was obtained from study participants prior to interviews.

## Results

### Development of Knowledge Partners for HPSR in Haryana

One of the key theories explaining research-policy interface is the elective affinity model.(6) This theory holds that policy making community is more likely to react positively to research insights if its members have participated in the research process and implications of research findings coincide with their values and beliefs.(27) In light of these theoretical notions, the earliest steps preceding development of HPSR in Haryana included setting up of formal communication channels and advisory mechanisms

involving researchers and policy makers to identify researchable questions and research designs jointly ([Figure 1](#)).

The origins can be traced back to rounds of meetings held between policy makers, state health technical officers and researchers during mid-2012. After comprehensive discussions, it was decided to institutionalize a sustainable research mechanism for evidence generation to guide policy over the next 3 to 5 years. This research, was initiated at dual level. While a comprehensive household survey (Concurrent Evaluation of NRHM; CE-NRHM) was commissioned to assess the 'outputs' and 'outcomes' of the health system; a facility level survey (Supportive Supervision; SS) preceded the household survey to collect data on 'inputs' and 'processes' to illustrate reasons for differences in outcomes. ([Table 1](#))

The CE-NRHM household survey differed significantly from existing models of demographic health surveys (DHS) in various LMIC. The sample size estimates for CE-NRHM provided valid estimates of all indicators at a community development block level, which in most instances were even valid at primary health centre and sub-centre level. Secondly, CE-NRHM presented a concurrent flow of evidence allowing observation of immediate and mid-term effects of any policy change in shorter time frame. Thirdly, CE-NRHM combined data collection on health care utilization with information on out-of-pocket expenditures to comprehensively assess the extent of UHC. Finally, it also collected data from health system records on individuals interviewed in the household survey to assess completeness and quality of the routine MIS. Overall, CE-NRHM had a multi-stage stratified random sample design (see web appendix for detailed methodology), which collected data on financing (out-of-pocket expenditures), service delivery (coverage according to specific population groups), information system (completeness and quality of MIS) and logistics (performance of referral systems).

The SS was an attempt at reviewing the 'inputs' and 'processes', with involvement of researchers as well as policy makers and others within the health system. Beginning from May 2012, a randomly selected set of institutions in each district were visited by a team comprising of senior officials from the health department and research institutions. Data on governance, financing, human resources, service delivery, logistics and information systems

were collected to analyse performance of health system by building blocks, and thus identify the reasons for variation in outcomes.

#### **Specific Studies: Analysing performance of building blocks**

A number of studies were commissioned by NRHM to assess the health systems building blocks in this period. ([Table 1-2](#)) Some of these focussing on specific services or programs have been reviewed in brief here.

**Governance:** In the structure of Indian healthcare machinery, Civil Surgeon performs the role of an administrator in a district. His office connects policy making and administration at state headquarters with the implementation machinery operating within a district. A better understanding of this node is thus essential to garner better outcomes from healthcare delivery apparatus. Recognising this, the Health Department commissioned a study to assess governance and managerial capabilities of Civil Surgeons (CS) at district level. In-depth interviews (of CS and deputy CSs) and participatory observation were the key data collection techniques used in eight districts of Haryana. Information was gathered on efficiency and effectiveness in management of official duties by Civil Surgeons. Capabilities to manage finances and delegate work, channels of communication used and frequency of information flow were also observed. Knowledge of CS regarding rules and guidelines and their soft skills (e.g. tendency towards favouritism and quality of interactions with other CS) were assessed.

Simultaneously, another study was commissioned to determine extent of irregularities in financial dealings of institutional committees (SKS) set-up at block and PHC levels. Quantitative data was collected on frequency of SKS meetings and whether guidelines were followed in its functioning. Financial audit of amount collected by facilities as user charges and amount subsequently deposited in SKS accounts was done. The study found discrepancies in financial records maintenance and gaps in transparency in the health system below the district level in Haryana.

**Health Financing:** Data from CE-NRHM was closely monitored by policy makers to understand patterns of out-of-pocket health expenditures in the state. Not only overall OOP health expenditures were assessed for outpatient and in-patient treatment, but public sector schemes offering free services or conditional cash transfers were being studied. One such scheme was Janani Shishu Suraksha Karyakram,

which offered free delivery service and referral transport to pregnant women, and cost-less hospitalization for the child during infancy. (28) As part of this survey, proportion of pregnant women not incurring any OOP maternity expenditure and mean OOP expenditures along with its determinants were studied. Similarly, to monitor progress of Janani Suraksha Yojana (29), a conditional cash transfer scheme for institutional delivery, the data from CE-NRHM was analysed to estimate the proportion of eligible beneficiaries who received the cash benefit.

Another study for assessing economic cost of provision of primary and secondary healthcare services in the state was undertaken. The long-term vision of this study was to undertake a comprehensive economic evaluation to assess the value for money being spent by the Government on delivery of health care services. This also informed evidence-informed resource allocation decision with a focus on efficiency.

A comprehensive State Health Accounts (SHA) was also commissioned by the National Rural Health Mission, in Haryana. SHA provided a standard for classifying health expenditures according to the three axes of consumption, provision and financing. It provided guidance and methodological support in compiling health accounts and provided a framework of the main aggregates of health expenditures. This proved useful for monitoring of health system; to track public and private expenditure on health care; and to assess the extent of efficiency and equity in allocation of health care resources, through disease specific and population group specific extensions of health accounts.

**Management Information System:** NRHM commissioned a number of studies focussed on evaluation of the MIS system and to provide critical inputs for strengthening it (Table 1-2). MIS system was evaluated in terms of completeness, quality and the extent to which it was being used for program decision making. A data quality assessment was undertaken in 6 districts of the state to ascertain the quality of data being generated at the lowest level, i.e. sub-centre, and provided to the district and state level information systems.

**Material Management and Logistics:** The state has a publicly financed model of emergency referral service (ERS) working in all 21 districts since 2009. Free transportation services are provided to

pregnant women, patients from below poverty line households, freedom fighters and ex- servicemen, and to traffic accident victims, post-natal cases and neonates in cases of emergency. NRHM conducted an in-house study initially in order to evaluate this service, following which an external evaluation was commissioned. The external evaluators assessed extent & pattern of utilization and efficiency of operation of the service and reported its positive effect on increasing institutional deliveries in the state.(30) Further it also found that publicly delivered referral transport services in Haryana are operating at an efficient level.(31)

The supportive supervision provided important evidence related to availability and stock-outs of the essential medicines and supplies at peripheral hospitals. State also commissioned a review of the drugs storage and availability in the central warehouses and health facilities. Another review was undertaken to assess the system of drugs procurement at state level, storage facilities and availability of medicines at health facilities, and prescription audits by clinicians at health facilities as part of a multi-state evaluation.

**Research to Policy Transfer:** Policy process is a cycle with three stages: (1) agenda setting; (2) policy formulation; and (3) policy implementation. Often evaluation, referred to as HPSR in our case, is considered as the fourth part of the cycle. In this section we describe four different case studies to demonstrate how HPSR impacted each of the different phases of policy process.

#### ***Agenda Setting: Universalizing Health Care in Haryana***

A need to promulgate a scheme for UHC in Haryana was being discussed in 2012 among the policy circles. These discussions were being influenced by the publicly financed health insurance schemes being implemented in other Indian states. (32-35) In view of this contextual development, there was considerable favour for introduction of health insurance for attaining UHC in Haryana, which resulted in constitution of a committee under health department to undertake review of effectiveness of existing schemes in India and elsewhere. This committee drew on a background paper published by UNICEF (33), and searched for more evidence in literature to review impact of health insurance on improving accessibility to and reduction in cost of health care. The review also assessed whether insurance leads to reduction in impoverishment due

to OOP expenditure, improvement in health status of population and strengthening of the public sector health care delivery system. The answers to most of these questions had no firm positive pointer, hence the agenda of introduction of health insurance in the state was dropped. Instead, a focus on greater public sector financing and strengthening of care was recommended. Subsequently, Government of Haryana promulgated a Chief Minister's Free Treatment Scheme which aspires for free drugs, diagnostics and surgeries at public sector hospitals from January 2014. This is an instance where a major agenda was prevented from being considered as a policy option, based on sound scientific evidence.

#### **Policy Formulation:**

**State Nutrition Policy :** Under-5 child malnutrition in Haryana continues to be a high and persistent problem.(36) Despite of evidence on the impact of nutrition on maternal and child survival, it has remained a neglected agenda of the health department. In order to prepare a comprehensive plan for tackling this problem and to prepare a state nutrition policy, NRHM commissioned a study to assess baseline prevalence and determinants of malnutrition; to assess the performance of ICDS program and its impact on under-nutrition among under-5 year children. This study, undertaken in 4 districts of the state reiterated malnutrition to be a significant problem and pointed out social determinants requiring immediate targeted intervention. Based on this survey, a nutrition program was drafted and subsequent steps for rolling out the program in 3 districts on a pilot basis prepared. A fourth district served as control in the event of undertaking a before and after comparison to assess effectiveness of the program, so that evidence about impact of nutrition program on reduction in malnutrition can be generated.

**Centralized drug procurement and distribution system :** A major finding from CE-NRHM was that significant share of the OOP expenditure for outpatient consultation and hospitalization in public sector facilities was on account of medicines which had to be procured from private pharmacies. Facility data from SS also demonstrated lack of medicines at public health facilities. Moreover, gross inefficiencies and delays in procurement, and lack of inventory control mechanism to alert for stock-outs were identified. Simultaneously, there was prevailing evidence from states like Rajasthan and Tamil Nadu that creation of a centralized procurement system

for drugs reduces medicine stock-outs in health facilities. Based on this evidence, a policy decision was taken towards creation of a similar centralized system for procurement for drugs and development of a robust web-based system of inventory control. This was a major policy decision for which there was political will, but the evidence from HPSR was the enlightening factor.

#### **Policy Implementation: Regular Appraisal of Program Implementation in Districts (RAPID)**

Research conduction is rendered meaningless unless it is used for concurrent improvement of health system. This is adequately exemplified in the Haryana state. A system of feedback mechanism to disseminate evidence being generated through research initiatives by monthly meetings between the CSs, state level program managers and policy makers at state headquarters was institutionalized. In September 2012, for the first time, evidence on health facility preparedness and quality of services delivered by public health facilities in various districts (generated through SS) was presented to district level officers. This was received with scepticism as evidence from research did not match data from MIS reports. Moreover, a number of indicators were from domains of governance, MIS and quality of service delivery which were not usually monitored in existing records and reports. Despite of state's consistent emphasis on use of presented research evidence, a later review reported lack of desired usage levels and hence a substantial change in 15 out of 21 districts in the state. Moreover, from state policy makers' perspective, it was difficult to derive explanations for intra and inter-district variations in performance at these meetings in absence of healthcare personnel who actually provided services at health facilities.

As a result, a paradigm shift in the system of utilizing HPSR evidence in policy implementation was introduced. Rather than state level meetings wherein district CSs participated, from January 2013, meetings were held at district headquarters. About 50-70 state level policy makers and program managers, district CS, district level program officers, and all heads of public health facilities in the district participated in the meetings, along with researchers and representatives from other departments influencing social determinants of health. These meetings were co-chaired by Deputy Commissioner (DC; chief of district administration and chairman of District Health Society) whose presence provided

necessary administrative commitment for undertaking implementation actions. Researchers presented findings on performance of health system building blocks during the course of the 2-day meeting, followed by extensive discussions on identified health system bottlenecks resulting in poor performance. Moreover, weak performing areas within the district were also identified and pushed for improvement.

RAPID meetings enabled policy makers to take mid-course corrective actions. These included development of mechanisms to generate awareness for health services, demand based and performance based material, human and financial resource re-allocation and re-distribution of administrative responsibilities to enhance efficiency in governance. Actions required from related departments such as water supply and sanitation, public works department or social welfare department were also listed and appropriate programmatic decisions taken.

#### **Critical Analysis of the Haryana Model: Role of Actors, Institutions and Context**

The major factor which reduced the extent of traditionally acknowledged 'two-worlds' theory of researchers and policy makers in Haryana was the presence of a dedicated administrative team in National Rural Health Mission (NRHM) at state level. The onset of HPSR in Haryana coincided with joining of a new policy maker in Haryana's NRHM, who initiated and carried forward rounds of discussions between the researchers and policy makers. Subsequently, NRHM Haryana funded 80% of all HPSR initiatives in the state. In contrast, literature reveals Government as the source of funding HPSR in only about 11% projects in low income countries.(1) This major change in the way research was funded in Haryana was because the need for research was driven by the policy makers. Besides funding, policy makers in Haryana were also actively involved in framing objectives, designing of the studies, and in interpretation of findings. In some studies, such as SS of health facilities, the health system program managers also contributed in data collection. Another major benefit of funding from the local health system was a shift in focus from a 'program or intervention' to a more holistic health system based approach to research.

Another major factor contributing to success of HPSR was availability and capacity of research organizations for undertaking research. One of the

research organizations, Post Graduate Institute of Medical Education and Research (PGIMER) Chandigarh, situated contiguous to Haryana state, employs researchers from diverse fields ranging from epidemiology, management, economics, social and behavioural sciences with capacity in undertaking HPSR. The institution also has a track record of generating grants for research and undertaking projects of national scale in India. Another medical institution, Post Graduate Institute of Medical Sciences (PGIMS) in Haryana state, provided strong support for data collection and its analysis. However, it may be acknowledged that presence of a consortium of research institutions is the way forward in any setting as a single or two institutions may have limitations not only in terms of research expertise but also in terms of the logistical requirements for health system research.

The third factor which played a role was the variety of designs employed for undertaking HPSR in Haryana. As Gilson et al explain the range of HPSR to vary from pure 'positivism' to 'relativism', the range of study designs employed in Haryana over this period varied from qualitative case studies to impact evaluations, investigating systems changes over time using quantitative designs and action research.

Despite of a changing focus from a program specific research to a more holistic health systems research, the authors observed that majority of HPSR in the state still overwhelmingly focused on service delivery. There was less comprehension and hence less application of evidence related to other domains, wherein only specific aspects incorporated in the program monitoring were understood. An example for illustration is Janani Shishu Suraksha Karyakram (JSSK). While policy makers keenly act upon evidence for proportion of women who delivered and incurred any OOP in public sector hospitals, interest in mean levels of OOP expenditure or catastrophic health expenditures was less evident. This reinforces the belief that if an evidence from HPSR is to be accepted, it needs to become a focus of overall program or health system monitoring.

A major perceived threat to the HPSR in Haryana was the individual driven nature of HPSR. While HPSR was institutionalized by having longer term memorandum of understandings with research organizations, internal capacity of program managers or policy makers to absorb research evidence and utilize the same for decision making was found to be limited. Other initiatives such as

encouraging health program managers to attend and present in scientific conferences and write scientific papers or policy briefs were being encouraged, however, its real uptake was limited among a few health care managers

## Discussion

Researchers and research are only one, yet most important, of a wide variety of influences on policy processes. Research can help identify policy problems worthy of attention and provide 'enlightenment' over potential solutions. The single most important factor which facilitated the creation of a network of researchers, policy makers and programme managers in Haryana was the initiative of a team of dedicated administrators, and creation of funding opportunities for HPSR by the State Health Department. Thus, the argument that researchers and policy makers comprise two culturally distinct 'communities' is potentially misleading. In fact, neither group is homogeneous as there are areas of common ground shared.

This research identifies a need for establishing an institutional mechanism at Central and State level where health service administrators and managers, academicians and researchers working in the field of health systems can jointly identify health system research priorities. Government programmes such as NRHM should increase budgetary allocation to fund research projects in its Program Implementation Plan. Multi-centric studies with different research designs should be encouraged to fulfil diverse context-specific needs of health services research. A forum should be created where researchers, policy makers and health care program managers should take stock of the evidence produced from such studies which could be incorporated in policy. A steering committee of health administrators and relevant institutions should be constituted to guide this process. Finally, as capacity among researchers to undertake HPSR remains a challenge in developing countries, a pool of epidemiologists, social scientists, economists and health care managers who have the desired skill sets should be created and nurtured. Specific incentives for undertaking HPSR rather than disease or program specific research should be created to crowd researchers out of the narrow-focussed intervention specific research.

## Authors Contribution

SP and RG were involved in conceptualization and design of the study, critically revised the manuscript and gave final approval of the version to be published. AS and SP were involved in collection of data, analysis, interpretation of data and drafting of the manuscript. RG, SKD, AP and SP critically revised the manuscript for important intellectual content and gave final approval of the version to be published.

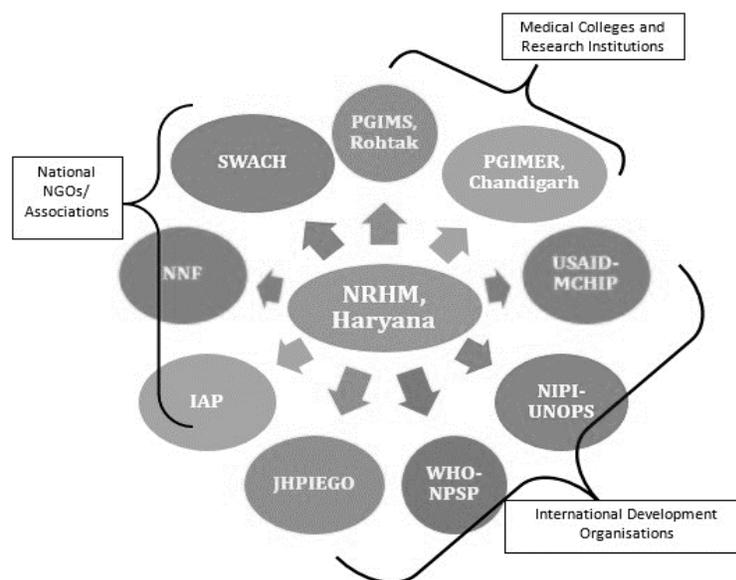
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## Figures

**FIGURE 1 TECHNICAL PARTNERS COLLABORATING WITH NRHM, HARYANA FOR HEALTH POLICY AND SYSTEMS RESEARCH**



## Tables

TABLE 1 DOMAINS COVERED UNDER MAJOR HEALTH ACTIVITIES UNDERTAKEN BY NRHM, HARYANA

HPSR Activities undertaken by NRHM, Haryana	Period of initiation	Technical partner(s)	Health system domains involved					
			Governance and management	Health financing	Human resources	Material management/L logistics	Health management information system	Service delivery
Concurrent evaluation of NRHM	Sep-12	School of Public Health, PGIMER, Chandigarh		+++	+	++	+++	+++
Supportive supervision of health facilities	Jun-12	Dept. of Community Medicine, PGIMS, Rohtak	++		++	++	++	+++
Rapid appraisal of program implementation in districts (RAPID)	Jan-13	Internal assessment; Dept. of Community Medicine, PGIMS, Rohtak; School of Public Health, PGIMER, Chandigarh	+++		++	++	++	+++
Quality assessment of nursing training institutes	Feb-13	SIHFW, Haryana	+		+++			
MIS Data quality assessment	Aug-13	Health, Finance and Governance (HFG)					+++	
State health accounts	Aug-13	Health, Finance and Governance (HFG)		+++				
Baseline study on assess to medicines in public health sector	Jun-13	Public Health Foundation of India, New Delhi	+++			+++	++	++
Impact and efficiency assessment of referral transport system on institutional deliveries in Haryana	Mar-11	School of Public Health, PGIMER, Chandigarh	+	++	+	+++	+	++
Assessment of cost of health care delivery at primary and secondary level in north India	Feb-13	School of Public Health, PGIMER, Chandigarh		+++	+	+		
Rapid labour rooms' assessment and interventions	Jan-13	Internal assessment			+	++	+	++
Baseline facility assessment for maternal health services	Jul-12	JHPIEGO			++	++		++
Community based maternal and infant death audits	Aug-13	Dept. of Community Medicine, PGIMS, Rohtak	+		+	+	+	++
Immunisation Field Volunteers (IVF) scheme for strengthening of routine immunisation in Haryana	Jul-12	WHO NPSP			++	++		+++
Regular Appraisal of Program Implementation in Districts (RAPID) for immunisation and essential new born care: Essential new-born care and resuscitation component	Apr-13	Maternal and child health integrated program (MCHIP)	+		++	++		++
Regular Appraisal of Program Implementation in Districts (RAPID) for immunisation and essential new born care: Quality immunisation and effective cold chain management component	Sept-12	Maternal and child health integrated program (MCHIP)	+		++	++		++
SCNU self-assessments and facility based new-born care trainings	May-13	National neonatology forum (NNF)			++	++		
Identification of RMNCH + A in high priority districts	Aug-13	Maternal and child health integrated program (MCHIP)	+		++	++		+++
Online anaemia tracking system	Apr-13	Internal efforts					+++	
Malnutrition assessment and intervention programme	Aug-13	School of Public Health, PGIMER, Chandigarh; UNICEF						+++

**TABLE 2 KEY INDICATORS STUDIED UNDER VARIOUS HEALTH POLICY AND SYSTEM RESEARCH INITIATIVES IN HARYANA**

Important research activities	Key indicators under different health system domains covered					
	Governance and management	Health financing	Human resources	Material management/ Logistics	Health management information system	Service delivery
<b>Concurrent evaluation of NRHM</b>		Cost of OOP expenditure on hospitalisation Coverage of voluntary insurance schemes Mean OOP expenditure on public sector institutional delivery		Usage of 102 ambulance service	Completeness of ANM records Quality of ANM records Quality of data reporting through single reporting format	Coverage of 100 or more IFA tab consumption during pregnancy Coverage of 2 or more TT injections during pregnancy Full ANC coverage Full immunisation coverage Contraception prevalence rate
<b>Supportive supervision of health facilities</b>	Distribution of human resources at health facilities Frequency of supervisory visits by district officials		Trainings received by healthcare providers	Availability of communication facilities at health centres Availability of transport facility at health centres Availability of diagnostic and treatment instruments and equipment in health facility Availability of medicines and drugs Effective management of cold storage conditions for vaccines	Quality of record keeping at health facilities	Availability of laboratory services at health facilities Number of diagnostic tests performed in last quarter
<b>Rapid assessment of health facilities in districts</b>	Number and distribution of human resources employed at health facilities Availability of grievance redressal mechanisms at health facility Display of IEC material at health facilities		Trainings received by healthcare providers Assessment of desirable service delivery skills in healthcare providers	Availability of communication facilities at health centres Availability of transport facility at health centres Availability of diagnostic and treatment instruments and equipment in health facility Availability of medicines and drugs Effective management of cold storage conditions for vaccines Availability of waste disposal facility at health centres	Quality of record keeping at health facilities Completeness of ANM records at health facilities	Number of patients transported using ambulance service in last month Number of deliveries in last month Number of referrals to higher facilities in last month Number of stillbirths and low birth weight babies Number of IUD services provided in last month Number of diagnostic tests performed in last quarter Number of vaccine doses administered in last month
<b>Baseline study on assess to medicines in public health sector</b>	Usual delay (in days) in procurement of drugs Mode of payment for purchase of drugs		Identification of individuals responsible for procurement of drugs Identification of individuals responsible for dispersing drugs	Availability of essential drugs and vaccines at health facility Availability of space for drug storage Effective management of vaccines and drugs at health facility	Completeness of stock registers at health facilities	Number of patients seen in out-patient department in last month Number of patients seen in in-patient department in last month

			Inventory management skills of human resources			
<b>Assessment of impact and efficiency of referral transport system on institutional deliveries in Haryana</b>	Changes in public sector deliveries after introduction of 102 ambulance service	Per annum economic cost of ambulance service delivery per district		Availability of resources for ambulance service delivery		Extent and pattern of utilisation of ambulance service Mean time taken by ambulance to arrive at site of emergency Satisfaction of users with the service delivery Technical efficiency of 102 ambulance service delivery
<b>Assessment of cost of health care delivery at primary and secondary level in north India</b>		Cost per out-patient consultation Cost per in-patient hospitalisation Cost per out-reach service delivery	Proportional time allocation for various programmes			
<b>Online maternal and infant death reporting system</b>					Number of still births reported from area since Jan 2013 Number of maternal and infant deaths reported from area since Jan 2013 Discrepancies between death reporting from two data sources	
<b>Rapid labour rooms' assessment and interventions</b>	Justification of referrals made to higher health facilities Justification for pattern of deployment of trained human resources at health facilities		Number and distribution of staff trained in delivery services Delivery and complication management skills of human resources Infection prevention skills of human resources	Availability and optimum utilisation of space for delivery services Availability of essential drugs and consumables for intra-partum and post-partum care Availability of instruments and equipment for conduction of deliveries	Completeness of delivery records at health facilities Quality of delivery records at health facilities	
<b>Baseline facility assessment for maternal health services</b>			Number and distribution of staff trained in delivery services Delivery and complication management skills of human resources Infection prevention skills of human resources	Availability and optimum utilisation of space for delivery services Availability of essential drugs and consumables for intra-partum and post-partum care Availability of instruments and equipment for conduction of deliveries	Completeness of delivery records at health facilities Quality of delivery records at health facilities	

<b>Community based maternal and infant death audits (Qualitative research)</b>	Assessment of problems in health facility management		Deficiencies in skills of healthcare providers Assessment of problems in attitude (apathy/indifference) of healthcare providers	Deficiencies of material resources for effective service delivery		Problems in service delivery domains leading to maternal and infant deaths
<b>Immunisation Field Volunteers (IVF) scheme for strengthening of routine immunisation in Haryana</b>	Assessment of quality of RI micro-plans			Effective management of vaccines and drugs at health facility Assessment of cold storage conditions for vaccines		Quality of routine immunisation services by ANMs Vaccine drop-out rates Full immunisation coverage
<b>Regular Appraisal of Program Implementation in Districts (RAPID) for immunisation and essential new born care: Essential new-born care and resuscitation component</b>	Availability of guidelines and protocols regarding new born care		Training status of human resources involved in neonatal care Healthcare providers' knowledge and skills assessment for new-born care	Availability of instruments and equipment for essential new-born care	Quality and completeness of records at health facilities	Qualitative assessment of service delivery process
<b>Regular Appraisal of Program Implementation in Districts (RAPID) for immunisation and essential new born care: Quality immunisation and effective cold chain management component</b>	Availability of RI micro-plans Availability of catchment area maps and supervision plans Conduction of meetings and supervisory visits		Knowledge regarding injection safety practices Skills of human resources for tracking drop-outs and left-out vaccination cases Involvement of ASHA for information of RI in community	Quality of cold chain management Availability of vaccines and consumables Availability of infrastructure at health facility for vaccination programme	Quality and completeness of vaccination records	Vaccine drop-out rates Proportion of immunisation sessions held as per plan Use of proper waste disposal guidelines Delivery of 4 key messages by ANM Display of IEC material at health facility Availability of immunisation cards at homes in community Full immunisation coverage
<b>Online anaemia tracking system</b>					Discrepancy between number of deliveries reported in anaemia tracking module as compared to DHIS	Proportion of severely, moderately anaemic women in district Number of deliveries conducted by ANMs, MOs in last one month
<b>Malnutrition assessment and intervention programme</b>						Prevalence of underweight, stunted and wasted children Prevalence of under nutrition by MUAC Prevalence of anaemia in under-five children Utilisation of services at Anganwadi centres
<b>Study of the quality of nursing training institutes</b>			Knowledge scores and skill scores of nursing students Student-teacher ratio in nursing schools	Availability of infrastructure and resources		