CHAPTER - 3

METHODOLOGY

- Aims and Objectives (general aim, specific aim, specific objectives)
- Operational definitions
- Conceptual framework
- Study setting (context, public health delivery system)
- Study design (nature of study)
- Data collection tools and techniques (sampling, selection of districts, blocks and health units)
- Data collection and management
- Data analysis (qualitative and quantitative)
- Ethical issues and quality control
- Study limitations
- Methodological issues
CHAPTER 3

METHODOLOGY

3.1 AIMS AND OBJECTIVES

3.1.1 BROAD AIM

The study aimed to conduct a focused review of local self-governance of public health system, with special reference to the role of Rogi Kalyan Samitis (RKS) in India; to understand the process and extent of local decision making by the RKS; and to assess the perceptions and perspectives of key stakeholders about the functioning of health units and the influence of RKS in health service delivery.

3.1.2 RATIONALE

The role of local self-governing institutions in health in general and of the RKS in particular has expanded over the years, but a framework for and empirical evidence on its functioning is scant in Odisha context. RKS members, health workers and patients and / or carers constitute the key stakeholders for assessing various dimensions of local decision making. The allocation of resources, focus and prioritisation of policy makers depend upon the priority status of the district. Therefore, examining differences between priority and non-priority set-ups could be critical to many a management functions, including differential allocation of resources. Predictors of governance, job satisfaction and patient satisfaction could provide meaningful insight to the RKS and to other decision makers about the focus areas for future interventions.

3.1.3 SPECIFIC AIMS

This study specifically aimed to review the dimensions, difficulties and derivatives of local self-governance in public health sector in India; understand the process and nature of local decision making under RKS at peripheral DMHUs; assess the perception of RKS members about their roles, involvement and practices with respect to local decision making and management of DMHUs; assess the perception (opinion and satisfaction) of health workers about influence of RKS on improving efficiency of DMHUs; assess the perceived satisfaction of patients/carers in DMHUs; and identify predictors governance, and of satisfaction. In the next section, research areas and specific objectives of the study are presented in the order and sequence as they appear throughout the thesis.
3.1.4 RESEARCH AREAS

- Conducting a focused review of local self-governance in health
- Understanding the nature of local decision making under RKS
- Studying the perspectives of key stakeholders (RKS members, health workers and patients/carers)
- Examining differences between PD and NPD categories
- Identifying predictors of governance of RKS and of satisfaction

3.1.5 SPECIFIC OBJECTIVES

I. To undertake a focused review of local self-governance and health system performance, and to suggest a framework for future assessment.

II. To study the process and nature of local decision making under Rogi Kalyan Samitis in public health units in Odisha.

III. To assess the perceptions and perspectives of key stakeholders about the functioning of health units (RKS members, health workers, and patients/carers), and the role and influence of RKS in local self-governance of public health units in Odisha.

A sub-objective of main objective III was to examine the perceptual and functional differences between priority district (PD) and non-priority district (NPD) set-ups, and identify predictors of involvement of RKS members in local governance of health units, and of satisfaction of health workers and patients. For the purpose of academic convenience, the study objectives, research questions, data collection tools and sample size are summarised in Table – 4.

Table 4 – Summary of study objectives, data collection tools and sample size

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Research Questions</th>
<th>Stakeholders</th>
<th>Method of data collection</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conduct focused review of local decision making in health</td>
<td>Dimensions Difficulties Derivatives</td>
<td>NA</td>
<td>Desk review (1990 as base year)</td>
<td>NA</td>
</tr>
<tr>
<td>Study the process and nature of local decision making under RKS in public health sector in Odisha.</td>
<td>Factors contributing to local decision making under RKS</td>
<td>RKS members</td>
<td>Focus Group Discussion</td>
<td>15 FGDs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Key informant</td>
<td>In-depth interview</td>
<td>5 IDIs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RKS meetings</td>
<td>Non-participant observation</td>
<td>5 NPOs</td>
</tr>
<tr>
<td>Objectives</td>
<td>Research Questions</td>
<td>Stakeholders</td>
<td>Method of data collection</td>
<td>Sample Size</td>
</tr>
<tr>
<td>------------</td>
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<td>-------------</td>
</tr>
<tr>
<td>Assess the perception and perspectives of key stakeholders about functioning of health units, and role and influence of RKS in local self-governance of public health units in Odisha</td>
<td>Knowledge, opinion and experience of RKS members</td>
<td>RKS/ZSS members</td>
<td>Interview</td>
<td>112 RKS members</td>
</tr>
<tr>
<td></td>
<td>Perception of health workers</td>
<td>Health workers</td>
<td>Questionnaire</td>
<td>130 health workers</td>
</tr>
<tr>
<td></td>
<td>Perception of patients</td>
<td>Patients/carers</td>
<td>Interview</td>
<td>600 patients</td>
</tr>
</tbody>
</table>

3.2 OPERATIONAL DEFINITIONS

Decentralisation: Means transfer of powers and / or authority from higher level to lower level of decision making chain. When applied in the context of public health system, it may be termed as health sector decentralisation.

Devolution: Refers to the legal transfer of power to democratically elected local political organs, independent of the central government.

Deconcentration is handing over some of its authority to the administrative local offices of the ministry, responsible for health.

Delegation refers to the transfer of defined managerial and administrative functions and responsibilities to institutions that are outside of the central government. These institutions can be indirectly controlled by the health ministry (Abimbola et al., 2015; T. Bossert, 2000; Thomas John Bossert & Mitchell, 2011; Riitta-Liisa Kolehmainen-Aitken, 2004; Mills, 1994; Vargas Bustamante & Bustamante, 2007).

Dimensions: The dimensions of healthcare performance are those definable, preferably measurable and actionable attributes of the system that are related to its functioning to maintain, restore or improve health (E. and J. H. Kelley, 2006). Studies show that appropriate organizational structure promotes productivity, performance, and innovation (Chegini MG, Yousefi S, 2013; Damanpour F, 1998; Pertusa-Ortega EM, Zaragoza-Sáez P, 2010). An appropriate structure should be specified for reforms. It is the organizational structure that determines, organises, and coordinates all organizational activities (Shadpour K, 2006). Daft divided organizational structure into two dimensions: structural and contextual (Daft RL, 1998). Structural dimensions, which represent
internal characteristics, include formalization, centralization, specialization, hierarchy of authority, professionalism, etc. Contextual dimensions are composed of goals, strategies, environment, culture, etc. Decentralisation as a policy reform requires structural reforms at organizational level for optimal performance (Robbins SP, 1990).

**Determinants:** Social determinants, such as poverty, migration, gender, and ethnicity have been explored as social determinants of health as those affect the response of the health system and the impact on individual health conditions (Irwin et al., 2006). I tried to review literature examining influence of decentralisation on social determinants of health.

**Derivatives:** Something produced by modification of something pre-existing (The Free Dictionary by Farlex, n.d.).

**Devolution:** Refers to the legal transfer of power to democratically elected local political organs, independent of the central government.

**Deconcentration:** Means handing over some of its authority to the administrative local offices of the ministry, responsible for health.

**Delegation:** Refers to the transfer of defined managerial and administrative functions and responsibilities to institutions that are outside of the central government. These institutions can be indirectly controlled by the health ministry.

**Priority and non-priority districts:** Government of Odisha has three administrative zones on the basis of several indices, and each zone covers ten districts. We considered IMR as a proxy of population health; from each zone, the district with the highest IMR constituted priority- and the one with the lowest IMR constituted non-priority district for the purpose of this study.

**RKS:** A registered society established in each health unit, and is governed by the designated government officials, administrators/managers, elected political representatives and civil society organizations. RKS has been assigned with several responsibilities and functions by the central/state government to ensure accountability and transparency in local decision making, improve local responsiveness, efficiency and effectiveness of health services in health units.
**Individual factors** in RKS members’ interview included work experience, qualification, interest for future involvement, current training status and interest for future training.

**Organizational factors** in RKS members’ interview included district category, relationship with other RKS members, frequency of conducting RKS review, power/authority, community demands, monetary incentives, good leadership, non-monetary incentives, and other work-related factors.

**Health Workers:** For this study, health workers included medical officers (MO), including specialists, AYUSH MOs, staff nurses (SN), pharmacists, laboratory technicians (LT), lady health visitors (LHV), public health extension officers (PHEO), and male health supervisors.

**Perspective:** A particular way of considering something.

**Perception:** The neurophysiological processes by which an organism becomes aware of and interprets external stimuli. A belief or opinion, often held by many people and based on how things seem; the way you think about or understand someone or something.

**Opinion:** A belief, judgment, or way of thinking about something; what someone thinks about a particular thing.

**Knowledge:** Information, understanding, or skill that you get from experience or education; awareness of something; the state of being aware of something.

**Experience:** The process of doing and seeing things and of having things happen to you; skill or knowledge that you get by doing something.

**Efficiency:** Efficiency of health system is defined by the Institute of Medicine (IOM) as ‘‘avoiding waste, including waste of equipment, supplies, ideas, and energy’’ (Hussey et al., 2009). Technical efficiency is defined as the ability of a DMHU to provide maximum quantities of health services (outputs) from a given set of health system resources or inputs (Kirigia et al., 2004).

**AYUSH MO:** Medical officers from the indigenous streams of Ayurveda, Yoga, Unani, Siddha and Homeopathy disciplines, appointed by the government at different tiers of the health system for provision of health care. They have curative, preventive and promotive roles and are popularly termed as AYUSH MOs.
Composite scores in health workers’ interview were developed for comparison. Ordinal data were converted into composite scores, involving several questions/items of the questionnaire about influence of RKS on individual-centric performance, organization-centric performance, future responsibilities to be entrusted with the RKS, perceived importance of individual-and organization-centric performance, and the mean satisfaction score on individual-and organization-centric performance. This technique was used to improve inferences and reduce subjectivity of data analysis.

In the discourse of decentralisation and health system performance measurements, I came across additional definitions along with their meanings, synonyms and how to measure those variables. These findings are discussed and summarized in Table – 5.

Table 5 – Meaning, synonyms and measuring criteria of key variables in the discourse of decentralisation and health system performance

<table>
<thead>
<tr>
<th>Trait</th>
<th>Meaning</th>
<th>Synonym</th>
<th>How to measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical efficiency</td>
<td>System’s optimal use of available resources to yield maximum benefits or results (JCAHO, 1997). It speaks to a system’s ability to function at lower costs without diminishing attainable and desirable results (Donabedian, 2003).</td>
<td>Efficiency</td>
<td>Staff time utilization</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Average staff productivity</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Unit cost of a product or service</td>
</tr>
<tr>
<td>Accountability</td>
<td>Role of health professions, health care institutions and organizations (government and private), external quality review organizations, or group purchasers of care in quality management.</td>
<td>Responsibility</td>
<td>Specialty board certification and continuing medical education requirements for recertification.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hospitals and HMOs have their own internal quality assurance programs.</td>
</tr>
<tr>
<td>Coverage</td>
<td>Extent of interaction between the service and the people for whom it is intended, this interaction not being limited to a particular aspect of service provision but ranging over the whole process from resource allocation to achievement of the desired objective (Bull World Health Organ. 1978;56(2):295-303).</td>
<td></td>
<td>The ratio between the number of people for whom the condition is met and the target population.</td>
</tr>
<tr>
<td>Equity</td>
<td>Extent to which a system deals fairly with all concerned. Equity, in this context, deals with the distribution of healthcare and its benefits among people.</td>
<td>Equitability</td>
<td>Proportion of marginalised group</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Proportion of women, children and vulnerable population</td>
</tr>
<tr>
<td>Trait</td>
<td>Meaning</td>
<td>Synonym</td>
<td>How to measure</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------------------------------------------------------</td>
<td>-----------</td>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>Competence</td>
<td>Degree to which health system personnel have the training and abilities to assess, treat and communicate with clients.</td>
<td>Skilful</td>
<td>Knowledge and skills on the subject</td>
</tr>
</tbody>
</table>

Source: Author’s compilation

### 3.3 CONCEPTUAL FRAMEWORK

The conceptual framework for this research is heavily derived from the application of WHO Health Systems Building Block to performance of public health units in Odisha. Human resources, RKS members and patients are considered inputs, while the dimensions of decentralisation, difficulties in measuring it and derivatives of local self-governance are considered as processes. The perception and perspectives of key stakeholders are also influenced greatly by the decision making process. Even predictors of governance and satisfaction are also process-related. Thus, all these factors have been included under ‘processes’ component of the framework. Responsiveness, efficiency and quality of services are assumed to be directly and immediately affected by the processed. Even though the interplay of individual factors and systemic outputs is not linear, but for this study purpose, these elements have been considered as proxy indicators of performance (Fig - 3).

**Fig 3 – Conceptual framework for the study**

Source: WHO Health Systems Framework (redrawn and adapted from WHO, 2007)
3.4 STUDY SETTING

3.4.1 Context of Odisha

The modern state of Orissa, now officially spelled as ‘Odisha’ was established on April 1, 1936 as a separate province in India that had only six districts. In 2012, the State was spread across a land area of about 155,707 sq. kms. (4.74 per cent of India) and ranked as the 10th largest state in the country. In terms of urbanisation, it is one of the least urbanised States with wide inter-district variations. Nayagarh is the least urbanised (having less than 5 per cent urban population), while Khurda is the most urbanised (42.93 per cent) district. Fifteen out of 30 districts have an urban population of below 10 per cent and 5 districts, above 25 per cent (Census of India. Final Population Totals, 2011).

Being a natural disaster-prone State, frequent floods, droughts and cyclones regularly affect life and properties of millions of its inhabitants. Frequent occurrences of natural calamities stand as barriers to economic progress of the state. Agriculture sector absorbs about 80 per cent of the total work force and contributes about 50 per cent of State’s gross domestic product (GDP).

As per Census 2011 reports, the actual population of the State is 41.9 million with a decadal growth rate of 13.97 percent. The literacy rate in the State has shown an upward trend and is 73.45 per cent. Male literacy stands at 82.40 percent, while female literacy at 64.36 percent. Sex Ratio of Odisha is 978 for each 1000 male, which is much above the national average of 940 as per census 2011 (Census of India. Final Population Totals, 2011).

Administratively, the state has 3 revenue divisions (also termed as revenue divisional commissioners or RDCs), 30 districts, 58 Sub-divisions, 171 Tehsils and 314 Community Development Blocks. There are 105 local bodies, 31 towns, 6235 Gram Panchayats and 51, 124 villages. Further, the State government has categorised districts into two broad categories of KBK (undivided Kalahandi, Bolangir and Koraput) and non-KBK districts. Out of total of 30 districts in the State, broadly, the KBK category of districts (11) belong to the southern and western belt of the State, while the non-KBK districts (19) are mostly from the coastal and northern belt. The vital health indicators, such as, Infant Mortality and Maternal Mortality data are skewed in favour of non-KBK districts (Vital Statistics Division, 2013).
The public health care system in Odisha

The peripheral public healthcare delivery system operates at four hierarchical levels: sub-centres (SC), PHCs, CHCs, and SDHs and DHH. CHCs serve a population of 80,000-120,000; PHCs cater to about 20,000-30,000 population, while SCs, approximately 5,000. SCs are manned with one auxiliary nurse and midwife (ANM) and, sometimes, another additional ANM to provide essential primary care. PHCs are stipulated to have six inpatient beds, one MO and 16 paramedical and other staff. The activities involve curative, preventive, and promotional health care. PHCs are expected to be equipped to provide 24/7 normal and assisted deliveries, ante-natal care, postnatal care, newborn care, family planning, and full child immunizations. CHCs have multiple doctors and/or specialists, about 20-30 inpatient beds and a committed information manager (Government of Odisha, n.d.). The DHH is the highest service delivery point at district level, with about 100-500 beds, multiple specialists and services. The state has 6688 SCs, 1279 PHCs, 120 other hospitals, 231 CHCs, 22 SDHs, 32 DHHs and 3 Medical Colleges (MC) (Adsul & Kar, 2013). Each institution from PCH to MC has a registered RKS. With an average of 12 RKS members per institution, the state is estimated to have about 20200 RKS members.

3.5 STUDY DESIGN

In view of the inherent methodological challenges, a cross-sectional ‘between groups’ study design without counterfactual analysis was adopted. A mixed method strategy was used for data collection that included: (1) review of policies, reports, scientific literature, grey literature, and records; (2) Interview of RKS members; (3) FGD with health workers; (4) In-depth interview of key decision makers; (5) Non-participant observation of RKS meetings; (6) Interview of health workers; and (7) Interview of patients/carers. To ensure representational sample, population level impact indicator was used for district stratification. Since there was no reference base-line data, it was decided to apply a ‘with-in and between’ comparative analysis as and when appropriate. In other words, important quantitative variables were compared between priority (PD) and non-priority (NPD) district set-ups.

3.6 DATA COLLECTION TOOLS AND TECHNIQUES

3.6.1 Searching and Sampling

Search strategy for focused review

This focused, narrative review is based on application of the WHO’s health systems building blocks framework (2000 and 2007) to the principles of management (Who, 2007; World Health Organization, 2000b). I used key word search strategy (Fig – 4) for searching literature. A
A comprehensive computerised search was conducted during April-July 2015 to search for published papers on decentralisation and HSP in general, and in the next level, pertaining to India. The focus was to identify scholarly studies (both qualitative and quantitative) on dimensions of decentralisation, difficulties in measuring effects of local self-governance, determinants of HSP, and to propose derivatives of HSP in the context of decentralised planning and implementation of health programs. PubMed and Google Scholar databases were chosen for following reasons: PubMed and Google Scholar are freely accessible. The keyword search with PubMed offers optimal update frequency and includes ‘online first’ articles. PubMed is also an optimal tool in biomedical electronic research. Google Scholar covers a wider journal range, though key word searches were found to be non-specific to commands. PubMed was particularly considered of help both in keyword searching and citation analysis. The websites of World Bank and WHO were also specifically searched. Subsequently, the search was narrowed down with use of specific key words.

**Fig 4 – Schematic presentation of search and finalization**

In the focused review section, applying a input-process-output framework, service delivery was considered as the ‘existential’ function of the health system; and inputs, processes and outputs as ‘operating domains’ that in my argument dynamically interact with one another and determine the nature and landscape of individual and population health. The study attempted i) to examine the
dimensions (definitions, functions and instruments; efficiency; quality; health outcomes; conceptual approaches; measuring performance; and tools for measurement) and determinants (health facilities; agents of local decision making; and end-users) of health system performance; ii) discuss the methodological challenges in dealing with performance measurement; and iii) propose derivatives in the form a conceptual framework that is holistic in approach and specific to Indian context.

**Inclusion and exclusion criteria for focused review**

With use of generic words, such as, ‘decentralisation’ and ‘health system performance’, huge volumes of literature were reflected in both the databases. All full texts of articles that focused on ‘dimensions of decentralisation in health’, ‘difficulties in measuring/assessing effects of decentralisation’, and ‘measurement of health system performance’ were retrieved from the original sources wherever available. Three working papers and 101 published articles were finally selected for full review (n=104). On further scrutiny, 28 articles were excluded at a later stage due to non-conformity with the focus of this study. Publications in English language and covering all geographic areas were included. With respect to time frame, I included studies published from January 1990 till July, 2015. The main reason for taking 1990 as the base year being most of the health sector and economic reforms around decentralisation took place in India during early 1990s.

**Selection of districts, blocks and health units**

For collection of all primary data from the field, a multi-stage stratified random sampling technique was adopted. On the basis of pre-existing government of Odisha zoning of the state, 30 districts were geographically clustered into three zones – Central, Northern and Southern. Each zone covered ten districts. Second, the IMR was taken as a proxy indicator of HSP; use of process indicators was avoided in view of poor validity. As per the IMR figures of annual health survey (AHS) report of 2011, from each zone, the best ranked and the worst ranked district was selected as the primary sampling unit (PSU). Three districts from three zones having highest IMR constituted the PD and three having lowest IMR were categorised as NPD (Annexure -1). The location of sample districts and blocks is given in Fig – 5.

Service delivery institutions in the sample districts constituted the secondary sampling units (SSU). To avoid the urban-rural bias, from each sample district, the DHH was invariably included in the study sample. Two CHCs, one each from urban and rural areas; and two PHCs, one each, under the administrative jurisdiction of the sample CHCs were selected randomly. Thus, 30 institutions/health
units (1 DHH, 2 CHCs and 2 PHCs per district) spread across six sample districts constituted the sites for data collection. Details of sample health units are given in Table – 6.

**Fig 5 – Location of sample districts and blocks**

![Location of sample districts and blocks](image)

**Table 6 – Sample institutions covered in the study**

<table>
<thead>
<tr>
<th>RDC</th>
<th>Non-priority districts</th>
<th>Priority districts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Northern RDC</strong></td>
<td>Angul</td>
<td>Bolangir</td>
</tr>
<tr>
<td></td>
<td>Angul DHH</td>
<td>Bolangir DHH</td>
</tr>
<tr>
<td></td>
<td>Godibandha CHC</td>
<td>Ghasian CHC</td>
</tr>
<tr>
<td></td>
<td>Kalamachhunuin PHC</td>
<td>Kusang PHC</td>
</tr>
<tr>
<td></td>
<td>Banarpal CHC</td>
<td>Lohisingha CHC</td>
</tr>
<tr>
<td></td>
<td>Balaramprasadpur PHC</td>
<td>Kusmel PHC</td>
</tr>
<tr>
<td><strong>Central RDC</strong></td>
<td>Balasore</td>
<td>Puri</td>
</tr>
<tr>
<td></td>
<td>Balasore DHH</td>
<td>Puri DHH</td>
</tr>
<tr>
<td></td>
<td>Remuna CHC</td>
<td>Kakatpur CHC</td>
</tr>
<tr>
<td></td>
<td>Tikirapal PHC</td>
<td>Patapur PHC</td>
</tr>
<tr>
<td></td>
<td>Soro CHC</td>
<td>Nimapada CHC</td>
</tr>
<tr>
<td></td>
<td>Pakhar PHC</td>
<td>Rench PHC</td>
</tr>
<tr>
<td><strong>Southern RDC</strong></td>
<td>Nawarangpur</td>
<td>Kandhamal /Phulbani</td>
</tr>
<tr>
<td></td>
<td>Nawarangpur DHH</td>
<td>Phulbani DHH</td>
</tr>
<tr>
<td></td>
<td>Tentulikhunti CHC</td>
<td>Tikabali CHC</td>
</tr>
<tr>
<td></td>
<td>Patrapur PHC</td>
<td>Paburia PHC</td>
</tr>
<tr>
<td></td>
<td>Pujariguda CHC</td>
<td>Gumagadha CHC</td>
</tr>
<tr>
<td></td>
<td>Badabharani PHC</td>
<td>Bisipada PHC</td>
</tr>
</tbody>
</table>

**Selection of health workers/key informants/RKS meetings**

For conducting FGDs, decision makers (existing and old RKS members) were invited to participate. Selection of members was done on random basis. The FGDs took place in a place of convenience.
of majority participants. Voice recorders were used to record the proceedings. District level functionaries from the health department / general administration were selected conveniently on the basis of their willingness to participate. The researcher aimed to attend all RKS meetings that took place in the sample institutions during the period of data collection, that is, from October 2013 to Aug 2014. However, on the basis of feasibility and occurrence of RKS meetings, only five meetings could be attended.

Selection of RKS members
For calculation of sample RKS members, open Epi software (http://www.openepi.com/SampleSize/SSPropor.htm) was used for two groups of districts. The sampling universe constituted all RKS members. The following formula was used for sample size calculation: \[ n = \frac{\text{DEFF} \times Np(1-p)}{\left[\left(d^2 / Z^2 \times 1-\alpha/2 \times (N-1) + p(1-p)\right)\right]} \]. With hypothesised 70 per cent +/- 10 per cent frequency of outcome factor (current involvement in management of the health unit) in the population (p), Confidence limits of 10 per cent of 100 (absolute +/- per cent) (d), and design effect of 1, fifty seven (57) samples from each category of districts were estimated to be sufficient. In total 112 respondents were interviewed.

Selection of health workers
For health workers’ sample size calculation, MOs, AYUSH MOs, SNs, pharmacists, laboratory technicians (LT), lady health visitors (LHV), male multi-purpose health supervisors (MPHS), and public health extension officers (PHEO) constituted the universe. Taking ‘perception about performance of health units’ as the principal outcome variable, with upper limit of 80 per cent and lower limit of 70 per cent, 61 sample from each category of districts was estimated to be adequate to provide 95 per cent confidence level and 80 per cent power. Depending upon their availability and willingness to participate, data was collected from a total of 130 health workers.

Selection of patients/carers
I considered the ‘overall satisfaction with services’ as the primary outcome variable. There were approximately 200, 80 and 40 patient visits per day, respectively, per large (DHH), medium (CHC) and small (PHC) health units. I included about 40 respondents per DHH (40X6=240), 20 per CHC (20X12=240) and 10 per PHC (10X12=120) which was estimated to be sufficient to get 95 per cent Confidence Level (CL) and 80 per cent power. The upper limit was considered as 60 per cent and lower limit as 55 per cent for calculation of sample for each tier of health unit. Thus, total of 600 patients were interviewed. Using systematic sampling technique, sample respondents from OPD services of PHCs were selected; whereas from CHCs and DHHs, 50 per cent samples were drawn
from OPD and rest 50 per cent from IPD services. Only adults above 18 years who were themselves patients or were accompanying patients of younger age group, and availed RCH services, were interviewed.

The sampling process followed for the entire spectrum of respondents is schematically presented in Fig – 6. This includes selection of districts, blocks, health units, RKS members, health workers and patients.

**Fig 6 – Sampling procedure for selection of districts, blocks, health units, RKS members, health workers and patients**
3.7 DATA COLLECTION AND MANAGEMENT

3.7.1 Focused review
For focused review, a comprehensive computerised search was conducted during Dec 2012-Feb 2013 and again during April-July 2015 to search for published papers on decentralisation and HSP in general, and in the next level, pertaining to India. The focus was to identify scholarly studies (both qualitative and quantitative) on dimensions of decentralisation, difficulties in measuring effects of local self-governance, determinants of health system performance and propose derivatives of HSP in the context of decentralised planning and implementation of health programmes.

I chose PubMed and Google Scholar database for following reasons: Most of PubMed and all of Google Scholar are freely accessible. The keyword search with PubMed offers optimal update frequency and includes ‘online first’ articles. PubMed is also an optimal tool in biomedical electronic research. Google Scholar covers a wider journal range, though key word searches were found to be non-specific to commands. PubMed was particularly considered of help both in keyword searching and citation analysis. The study was approved by an independent ethical committee of IIPH-Bhubaneswar. The key words used during web search is given in Table – 7.

Table 7 – Key words used during web searching
| Health system performance; Health system performance measurement; Decentralisation in health; Evaluation of decentralisation in health; Evaluation of decentralisation; Derivatives of decentralisation in health; Dimensions of decentralisation in health; Determinants of decentralisation in health; Decentralisation of health care and its impact on health outcomes |

Emerging themes were explained in four sections: ‘dimensions’, ‘determinants’ and ‘difficulties’ were summarily derived from the reviewed papers, while the last section of ‘derivatives’ was explained on the basis of inductive synthesis of literature review and my observation of RKS governing body (GB) meetings at five different health units in Odisha. The GB meeting of RKS at one DHH was audio-recorded, transcribed and translated it into English, using a non-participant observation (NPO) checklist (annexure – 4.3); for four other meetings, the researcher retrieved the observations from the field diary. Content analysis of these non-participant observations helped in validation of the proposed conceptual framework. During analysis, I included studies published from January 1990 till July, 2015. The main reason for taking 1990 as the base year being most of the health sector and economic reforms around decentralisation took place in India during early 1990s.
3.7.2 FGD, IDI, and NPO

Focus group discussions (FGD) were used to explore about the social and contextual factors related to local decision making of health units. Such understanding is not only necessary to further investigate about the perspectives of service providers, but also examine the nature of local self-governance, successes and challenges that the local institutions face. The main objective of conducting FGDs was to allow participants to express their opinions and feelings freely and fairly, so that participants hear from one another in a group setting. This could provide a valuable opportunity to show and discuss the differences among participants (Ritchie, Lewis, Nicholls, & Ormston, 2013; Ritchie & Lewis, 2014). On the other hand, in-depth interview of key informants (decision makers) were conducted to obtain individually focused responses with respect to the personal opinion / perceptions of participants. Non-participant observations were undertaken of RKS meetings to validate the FGD/IDI inferences.

FGDs and in-depth interviews were conducted according to standard FGD and IDI guidelines. I used Odiya or English language for communication, as appropriate. On an average, each FGD consisted of 6-7 participants, in addition to one FGD-conducting researcher and one observer or assistant. No monetary support was given to any of the participants. Further, no participant denied to participate in the FGDs. All discussions and interviews were audio recorded. FGDs were conducted either at the meeting hall of the CHC/DHH or as decided by the respondents. Each IDI was conducted at a place of mutual convenience, and lasted for 30-50 minutes. Respondents were free not to respond to a question or a set of questions. Responses were voice-recorded, transcribed and translated into English language for analysis. The interview guide contained questions related to the concept of decentralisation in health, necessity of local decision making, composition of RKS, meetings, business transactions, accountability, transparency, enabling factors, systemic barriers, success stories and innovations and specific recommendations.

Direct observation of RKS meetings were recorded in audio recorder in one out of five occasions. The rest four meetings were observed and written in the field diary of the researcher. All FGDs with health workers were invariably recorded in audio voice recorder and stored with unique IDs. The observations were transcribed verbatim by the researcher who was familiar with both English and local (Odia) language.

All transcripts were then translated to English and converted to digital documents (MS-Word document); this was imported to Atlas ti 6.0 for analysis. The researcher’s field notes further were used to contextualise the analysis. The FGD guides, IDI guides, and non-participant observation
checklists were designed on the basis of thematic framework approach, encompassing key themes, such as, involvement of participants in decision making, nature of businesses being transacted, behaviour of group members, coherence in thinking, working on common agenda, awareness about the current health system readiness and quality of services being offered (Annexures 4.1, 4.2, 4.3). The analysis of qualitative data fed into the discussion sections of various themes.

3.7.3 RKS members’ interview
A semi-structured interview schedule was developed in English, field-tested and translated into local language. It contained 65 close-ended questions and 8 open-ended questions. The schedule contained questions on five broad domains: nature of decision making with regard to local governance, HRM, funds management, infrastructure development, and quality control; I also elicited responses on regularity of holding RKS meetings, involvement of RKS members in planning, monitoring and supervision of programs, their current training status and training needs. Permission was obtained from the health & family welfare department, government of Odisha for conducting this study. Subsequently the study was approved by an independent Ethics Committee of IIPHB. Two field investigators were hired, trained and engaged in data collection. The researcher visited about 20 per cent sites for conducting interviews and monitoring quality of data collection. Written consent from each respondent was obtained prior to the interview. The interview schedule used for data collection is annexed (Annexure – 4.4).

3.7.4 Health workers’ interview
The ‘WHO health systems building blocks’ framework (2007) was referred to for designing a semi-structured, self-administered questionnaire. It contained mostly close-ended questions with multiple choice options, and three open-ended questions to elicit their suggestions about improving local self-governance of health units. The tool was developed in English, field-tested and translated into local language. Two field investigators were hired, trained and engaged in data collection. The primary researcher visited all sample health units, partly collected data, and monitored quality of data collection. Since all the respondents were educated, I thought it appropriate to institute a self-administered tool (Annexure – 4.5). In the first section of the tool, basic profile of respondents was captured; in the next section, respondents were asked to rank their perception about the influence of RKS with respect to efficiency in local self-governance, transparency in decision making, community involvement, reduction in absenteeism, improvement in staff motivation and performance, quality improvement, service delivery innovations, and the future responsibilities that may be entrusted with the RKS.
In the last section, respondents ranked the importance of and satisfaction with various provisions, such as, infrastructure, funds availability, quality of services, behaviour of co-workers, patients’ involvement, protection of patients’ rights, etc. I used Likert’s 5-point scale (5=very high and 1=very low) to rank responses. The study was approved by an independent institutional ethical committee of IIPH-Bhubaneswar; permission was obtained from the health & family welfare department, government of Odisha for data collection. Written, informed consent was obtained from all the respondents prior to administration of the questionnaire. Anonymity of responses was ensured through coding. The respondents were free not to answer some/all questions, and to leave the interview at any point during interview.

3.7.5 Patients / carers’ interview

In order to study perceived quality of care, the specific questions this paper aims to answer are: what is the perceived quality of RCH services amongst service users? Is there any association between decentralised service delivery and perceived quality of care? What are the factors influencing perception of quality? I attempted to decipher quality of healthcare system as a whole. Thus, in the analysis I included the resources, the activities, the management, out of pocket expenses, and satisfaction of patients (Mawajdeh & al-Qutob, 1993). Satisfaction was further dissected into components, such as, waiting times, behaviour of providers, knowledge of service provisions, availability of medicines, and non-clinical facilities at the health units (Atkinson & Haran, 2004; E. Kelley & Hurst, 2006; Khan, M. E., Mishra, A., Sharma, V., & Varkey, n.d.; Lohr et al., 1988). The perception and opinion of respondents were grouped into five dimensions: management, client-provider relationship, perceived competence of provider, information exchange, and compliance (Annexure - 4.6).

Field interviewers were selected for conducting patient/carers’ interview; all persons involved in data collection underwent intensive training. Particular emphasis was placed on the adequacy and accuracy of the information to be collected during exit interviews. No health service personnel were involved in collecting data. The validity and reliability of information collected by semi-structured questionnaires, containing mainly close-ended questions and very few open-ended questions, and reliability of data collection techniques, was tested outside the project area before actual data collection. During the opening and closing hours of the services, and during waiting and consultation times data collection was avoided. Interviews were performed outside the compound of the health unit. Anonymity and confidentiality of the information gathered was assured. Information about age, gender, family size, marital status, occupation, level of education, distance between residence and the health units, means of transportation, care-seeking preferences,
expenditure patterns at both public and private health units, satisfaction with respect to various non-clinical provisions at the health units, knowledge about and benefits received from RKS, and satisfaction about waiting time, time spent by and behaviour of service providers, was collected.

Permission was obtained from the family welfare department, government of Odisha for conducting this study and subsequently ethical approval was obtained from an independent Institutional Ethical Committee. Informed written consent was obtained from each respondent prior to interview. Data collection was done during Oct 2013- Aug 2014. The time-line and key milestones of the study are annexed (Annexure - 2).

3.8 DATA ANALYSIS

3.8.1 Analysis of focused review
After conducting full review of the finally selected articles (n=76), content analysis through systematic text condensation (STC) was undertaken. Emerging themes were explained in four sections: ‘dimensions’, ‘determinants’ and ‘difficulties’ which were summarily derived from the reviewed papers, while the last section on ‘derivatives’ is based on inductive synthesis of literature review along with my NPO of RKS GB meetings at five different health units in Odisha. The coding process followed for analysis of transcripts of FGDs and IDIs is given in Fig – 7.

Fig 7 – Process of coding the transcripts

```
Fig 7 – Process of coding the transcripts

1. Read through the entire text
2. Selected relevant text
3. Constructed key words
4. Checked validity of key words
   - Revised the key words
   - Undertook final editing
5. Texts converted into codes
```
3.8.2 Analysis of FGD, IDIs and NPOs

In the first step, after analysing the transcripts, codes were created and family of codes formed on the basis of familialness among responses (Fig – 8). Then, based on the analysis of RKS objectives and functions, organizational and governance related factors affecting local decision making were broadly divided into four themes. Recommendations given by the participants were incorporated in the relevant themes.

- Composition of RKS
- Governance within RKS
- Functioning of RKS
- Supportive environment

**Fig 8 – Summary of code families of focus group discussions**

<table>
<thead>
<tr>
<th>Code Family: Membership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Codes (4): [composition of RKS] [challenges due to composition of RKS] [attitude of RKS members] [challenge of involvement of RKS members]</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Code Family: Meetings and participation</th>
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</thead>
<tbody>
<tr>
<td>Codes (7): [challenges in regularly conducting RKS meeting] [challenges in RKS functioning] [EB meetings] [GB Meetings regularity] [RKS meeting coordination] [RKS meeting frequency] [zilla parishad meeting] [RKS meeting agenda]</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Code Family: Motivation and efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Codes (4): [motivators of work] [challenges leading to loss of motivation] [involvement of RKS members] [issues in developing local strategy]</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Code Family: Meaning of local self-governance</th>
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</thead>
<tbody>
<tr>
<td>Codes (1): [meaning of decentralisation]</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Code Family: Awareness of roles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Codes (14): [knowledge about functioning of RKS] [why decentralisation is important] [knowledge on citizen charter] [knowledge on guidelines] [knowledge about quality] [MO controls nothing] [procedure for conducting meeting] [role of BPM] [role of hospital manager] [role of NHM] [role of RKS in construction] [role of RKS in general] [role of RKS in health education] [role of RKS in hospital cleaning]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code Family: Autonomy of RKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Codes (11): [decision taking powers of RKS] [hospital plan] [power of RKS in monitoring funds utilization] [power of RKS in transfers and postings] [Powers of GB and EB] [powers of hospital manager] [powers of RKS on recruitment] [purchase of drugs locally] [role of RKS in HR recruitment] [role of RKS in recruitment] [role of RKS on AYUSH]</td>
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</table>

<table>
<thead>
<tr>
<th>Code Family: Accountability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Codes (3): [benefits due to local decision making] [RKS role in implementation] [RKS role in instrument purchase]</td>
</tr>
</tbody>
</table>
Code Family: Transparency in governance
Codes (4): [dealing with bidders] [political interference] [prescription practices] [vested interests]

Code Family: Administrative decisions
Codes (15): [challenges for the Minister] [condemnation of articles] [functions of RKS] [perception about functioning of RKS] [problems of RKS functioning] [RKS success]

Code Family: Financial decisions
Codes (4): [challenge of resource crunch] [funds allocation] [funds allocation and user fees] [heads of expenditure under RKS]

Code Family: User fees collection
Codes (2): [User fees collection] [challenges of user fees]

Code Family: Local responsiveness
Codes (4): [complaint box] [follow-up actions] [grievance redressal] [role of RKS in local responsiveness]

Code Family: Quality of care
Codes (2): [accreditation] [quality of services]

Code Family: Service delivery (HR, Logistics, Services, Infrastructure, Utilization)
Codes (14): [availability of services] [bio-waste management] [drugs availability] [drugs utilisation] [high load] [high patient load] [indenting of drugs] [infrastructure] [infrastructure challenges] [laundry services] [ODMS functioning] [quality of construction] [reasons for shortage of specialists] [work distribution]

Code Family: Trust and confidence of patients
Codes (1): [patients trust on hospital drugs]

Code Family: Enabling factors
Codes (1): [Enabling factors]

Code Family: Systemic barriers
Codes (15): [operational challenges] [security issues] [shortage of class IV] [shortage of doctors] [shortage of pharmacists] [shortage of specialists] [shortage of staff] [shortage of staff nurses] [staff staying in the PHC] [unsolved problems] [challenges of cleaning] [challenges of frequent transfers] [challenges of HR] [challenges of medicine availability] [challenges of service delivery]

Code Family: Convergence
Codes (6): [inter-sectoral coordination] [challenges of control mechanisms] [challenges of coordination within] [challenges of RKS due to different viewpoints] [cooperation in NHM and hospital] [different perspectives]
For analysis of themes and topics under each theme, a logical sequence was followed throughout results, discussion and conclusion sections of the thesis (Table - 8).

**Table 8 – Presentation of focus group discussion and in-depth interview results**

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Category of respondents</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Doctors/Staff Nurses/Pharmacists/Lab Technicians</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Composition of RKS</td>
<td>Membership</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Meetings and participation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Motivation and efficiency</td>
</tr>
<tr>
<td>B</td>
<td>Governance within RKS</td>
<td>Meaning of local self-governance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Awareness of role</td>
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<tr>
<td></td>
<td></td>
<td>Autonomy</td>
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<td></td>
<td></td>
<td>Accountability</td>
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<tr>
<td></td>
<td></td>
<td>Transparency in governance</td>
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<tr>
<td>C</td>
<td>Functioning of RKS</td>
<td>Administrative decisions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Financial decisions</td>
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<td></td>
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<td>User fees collection</td>
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<td></td>
<td>Local responsiveness</td>
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<td></td>
<td></td>
<td>Service delivery</td>
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<td></td>
<td></td>
<td>Quality of care</td>
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<tr>
<td>D</td>
<td>Supportive environment</td>
<td>Trust and confidence of patients</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Enabling factors</td>
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<td></td>
<td></td>
<td>Systemic barriers</td>
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<tr>
<td></td>
<td></td>
<td>Convergence</td>
</tr>
</tbody>
</table>

### 3.8.3 Analysis of RKS members’ interview

The data were entered into MS Access 2007 (Microsoft Inc., Redmond, WA, USA), after cleaning and validation. SPSS 20.0 (SPSS Inc) was used for data analysis. Descriptive and inferential statistics were used during data analysis. P value of ≤ 0.05 was considered significant and of ≤ 0.001 as highly significant. Mean, median and standard deviation (SD) were used to analyze respondent profile, frequencies and cross tabulations. All continuous variables were described in-terms of Mean (+/- SD), Median and their Range. Categorical variables were presented in frequency tables. Associations between the two categories of districts (priority and non-priority) were analyzed for each dependable variable. Chi square test of significance was used for nominal and ordinal data. I felt it appropriate to conduct an independent t-test for interval data as well as all ranked responses as those were converted into scores for quantitative comparison. A composite of individual factors with a score range of 0-16 was developed for 16 designated activities in four work-related domains: a) current level of involvement in management of the local health unit; b)
interest for future involvement; c) training status against each activity; and d) interest for future training.

Perception of respondents was assessed in a Likert’s scale of 1-5 (1=least and 5=most) about the importance of organizational factors, such as, power, money, leadership, community demands, non-monetary incentives and other work-related factors in improving performance of the health units. In the last section of analysis, a linear regression model was used to identify predictors of involvement of RKS members in local governance. In the model, we included current involvement in management of the local health unit as dependent variable (DV); and the following as independent variables (IV): individual factors (work experience, qualification, interest for future involvement, current training status and interest for future training); and organizational factors (district category, relationship with other RKS members, frequency of conducting RKS review, power / authority, community demands, monetary incentives, good leadership, non-monetary incentives, and other work-related factors).

Composite scores: Ordinal data were converted into composite scores, involving several questions/items of the questionnaire on influence of RKS on individual-centric performance, organization-centric performance, future responsibilities to be entrusted with the RKS, perceived importance of individual-and organization-centric performance, and the mean satisfaction score on individual-and organization-centric performance. This technique was used to improve inferences and reduce subjectivity of data analysis.

3.8.4 Analysis health workers’ interview

All data were entered into MS Access 2007 (Microsoft Inc., Redmond, WA, USA), after cleaning and validation. SPSS 20.0 (SPSS Inc) and R 3.2.1 was used for data analysis. The proxy for decentralisation was existence of registered RKS - I considered it as an input. Perception & satisfaction of the health workforce, generally considered as process indicators, were our immediate outputs. I) Perception about RKS’ influence was studied by broadly categorizing the health system-related factors into domains of local self-governance, functioning of health units, service delivery and local participation. II) Perceived importance of and satisfaction of respondents with the following provisions were studied in particular: infrastructure, funds availability, quality of services, behaviour of service providers, and community participation. III) For PD-NPD comparison of mean scores, multi-item composite scores were developed on individual-centric performance; organization-centric performance; patient-centric performance; future responsibilities to be entrusted to RKS; importance of individual-and organization-centric
performance; and satisfaction with individual- and organization-centric performance. IV) On the basis of regression analysis, predictors of governance and satisfaction at work were identified. Descriptive statistics (mean, median, SD) and linear regression models were used.

All continuous variables were described in terms of Mean (+/- SD), Median and their Range. Categorical variables were presented in frequency tables. Comparative analysis of results was carried out to analyze PD-NPD differences. Chi square test and independent t-test of significance for ordinal and continuous variables were used, respectively. P value of <0.05 was considered as ‘significant’, and of <0.001 as ‘highly significant’. Open-ended responses, on the other hand, mainly contained descriptive suggestions to improve functioning of health units. Also undertook thematic analysis of those responses and summarized the key findings.

3.8.5 Analysis of patients/carers’ interview
Data collected through semi-structured interview schedules were entered into MS Access 2007 (Microsoft Inc., Redmond, WA, USA). Data cleaning and validation was done before analysis. SPSS 20.0 (SPSS Inc) and ‘R 3.2.1’ softwares were used for descriptive and regression analysis, respectively. Descriptive statistics (mean, median, SD) was used to analyze the profile of respondents, and results were presented in frequencies and cross tabulations. All continuous variables were described in-terms of Mean (+/- SD), Median and their range. Categorical variables were presented in frequency tables. Comparative analysis was carried out between PD and NPD with regard to knowledge, opinion and perception of patients and their carers. Chi square test of significance was used for nominal and ordinal data, while independent t-test and linear regression was used for interval data. The composite score for satisfaction was found to be distributed normally and thus linear models were used to examine the association between satisfaction and its determinants. The key variables used during data analysis are annexed (Annexure – 3)

3.9 ETHICAL ISSUES AND QUALITY CONTROL
For timely completion of data collection, in addition to the researcher, two field investigators were hired, trained and deployed in the field area for administration of the structured interview schedule for patients and undertaking household survey. Particular emphasis was laid down on the adequacy and accuracy of the information that was collected during interviews. No health service personnel were involved in collecting the data. The validity and reliability of information collected by semi-structured questionnaires, containing mainly close-ended questions and very few open-ended questions, and reliability of data collection techniques, was tested outside the project area before actual data collection.
Specifically for patient satisfaction survey, during the opening and closing hours of the services, and during waiting and consultation times data collection was avoided. Interviews were performed outside the compound of the health unit, and confidentiality of the information gathered was assured. Interviews were conducted outside the compound of the health facility or house, and confidentiality of the information gathered was assured. I visited about 20 per cent sites for conducting interviews and monitoring quality of data collection. Each health unit was visited continuously for three days for data collection.

In order to minimise researchers’ bias, Delphi technique was used to establish common understanding before the data collectors departed for data collection. Qualitative data (FGD and in-depth interviews) was collected by the researcher only. Informed consent was obtained from all participants. At the beginning of the interview, the respondents are briefed about the objectives of the study and that their participation was purely voluntary. They were free to leave at any point and not answer any question, if they desired so. Ethical approval for the study was obtained from the Institutional Research Ethics Committee of IIPH-Bhubaneswar. Subsequently permission was obtained from the health and family welfare department, Government of Odisha, for conducting interviews of key stakeholders, such as, RKS members, health workers and patients.

3.10 STUDY LIMITATIONS

This review has some limitations. This study included only published literature in PubMed and Google Scholar and excluded literature of other databases. It also excluded grey literature, such as, unpublished reports, media reports, academic theses and conference proceedings. The inclusion of only published literature might have introduced publication bias. It is difficult to establish exclusive objectivity while screening and reviewing articles. To minimize this bias, I used pre-defined inclusion criteria and discussion throughout the review process. Studies which did include India in their analysis could have been missed out.

This study has several strengths. To our knowledge, this is the first study on assessing the knowledge, experience and opinion of local decision makers in health sector in India. The findings could contribute to the scant literature on the subject. An empowered RKS could only attain the objectives of high quality service delivery in an accountable and transparent manner. Data collection from six 6 districts makes the study geographically representative of the state. However, with the cross-sectional nature of study design, pinning down the direction of association was
difficult. A mixed methods study using reliable and valid health service routine data from these facilities could be helpful in supporting or refuting perceptions of respondents. More detailed in-depth interviews could have explored the reasons for the differences between PD and NPD health facilities.

Further, cross-sectional nature of data makes this study limited by use with regard to establishing causality. Decentralisation operates through a wide range of intermediate variables; therefore, studying its impact on technical efficiency in terms of improvement of skills and satisfaction of the health workforce was a daunting task. Lack of scaled score-card and limited analysis among comparable institutions could be considered as a limitation. However, one of the key strengths of this study is its uniqueness in capturing the ranked responses on functioning of RKS, local participation, governance, and management of service delivery components.

Moreover, in the absence of any base-line, comparing the findings with interventions was not possible. Socially desirability of responses is yet another limitation, especially since the results indicate that many respondents opted out of inconvenient questions. Thus, questions of relationship between clients’ profiles, providers’ profiles and their perspectives need further scrutiny.

One of the key strengths in studying efficiency of health units is its uniqueness in capturing the ranked responses on functioning of RKS, local participation, governance, service delivery components. Representative sample is another strength of this study. Decentralisation operates through a wide range of intermediate variables; therefore, studying its impact on perception, opinion and satisfaction of the health workforce was a daunting task. Lack of scaled score-card and analysis among comparable institutions is a limitation. Views about importance and satisfaction of health workers need to be interpreted with caution, as responses could be socially desirable. The link between views of service providers and end-users of services need to be studied further.

3.11 METHODOLOGICAL ISSUES

Over the last few years, increasing attention has been directed toward the problems inherent to measuring the quality of healthcare. Accreditation and certification procedures have acted as stimulating mechanisms for the discovery of skills and technology specifically designed to improve performance. Total Quality Management (TQM) and Continuous Quality Improvement (CQI) are the most widespread and recent approaches to implementing and improving health care quality control (Lovaglio, 2012; Ovretveit, 2003). Besides offering accreditation and certification
processes, recent approaches measure the performance of health structures in order to evaluate National Health Systems. For example, various international Agencies (Cerne, 1988; Remus, Denise, 2004) measure the performance of health structures in different countries, considering three main dimensions: effectiveness, efficiency, and customer satisfaction. In this perspective, performance measurement for healthcare providers, structures, or organizations (from here, hospitals) is becoming increasingly important for the improvement of healthcare quality. However, the debate over which types of performance indicator are the most useful for monitoring healthcare quality remains a question of international concern (Jencks et al., 2000).

In order to consider the methodological problems that may limit benchmark strategies, it is necessary to explore the possible causes of variation in an outcome. Four major categories of explanation need to be considered. (I) The first of these is: whether observed differences might be due to differences in the type of patients cared for in the different hospitals (e.g., age, gender, comorbidity, severity of disease, etc.). The importance of this cause of variation is illustrated by studies where differences in crude outcome disappear when the outcomes are adjusted to take account of these confounding factors. To this end, researchers propose risk-adjustment methodologies as proper methods of equitable comparisons for evaluating quality and effectiveness of hospitals (Dubois, Brook, & Rogers, 1987). (II) A second cause of variation in outcome (or its risk-adjusted version) is: differences in the way data is collected. Differences in the measurement of events of interest (e.g., deaths) or in the population at risk (typically the denominator of an event rate) depending on different inclusion criteria for determining denominators, or when different case-mix data is used to adjust for potential confounding, will lead to apparent differences in outcome. (III) Thirdly, observed differences may be due to chance. Random variation is influenced both by number of cases included and by the frequency with which the outcome occurs. To this end, a fundamental issue is whether the outcome indicator is likely to have the statistical power to detect differences in quality. Statistical power depends upon how common the occurrence of the outcome is. For some rare events, the limited number of patients experiencing the events limits the power of the study (Rothwell & Warlow, 1999). (IV) Finally, differences in outcome may reflect real, although unobservable, differences in quality of care. This may be due to variations in different measurable or less measurable aspects such as the interventions performed or the skill of the medical team.

Hence, as these are different causes of an outcome variation, the conclusion that a variation in outcome is due to a difference in quality of care among hospitals is essentially a diagnosis through exclusion: if variation cannot be explained in terms of previous components (case-mix, data
collection chance), then hospital quality of care (relative effectiveness) becomes a possible explanation.

One of the most attractive features of multilevel models is the production of useful results in healthcare effectiveness by linking individual (patient) and organizational (hospital) characteristics (covariates). Multilevel models overcome small sample problems by appropriately pooling information across organizations, introducing some correction or shrinkage, and providing a statistical framework that quantifies and explains variability in outcomes through the investigation of patient/hospital level covariates (Rice, Nigel, 1996).

Quality indicators are typically calculated and disseminated at hospital level, dividing the number of events (in-hospital death or adverse event as a clinical error which results in disability, death, or prolonged hospital stays) by the number of discharged patients at risk. However, at the patient/individual level, the event of interest is typically a dichotomous variable and the multi-level model version for this kind of outcome is the Logistic Multilevel Model (LMM) (Stawski, 2013).