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Strengthening Institutions to Improve Public Expenditure Accountability

Uniform Level of Funding or Differential Financing: A Policy Simulation Exercise for Health Financing

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ACRONYMS

AMG	Annual Maintenance Grants
ARS	Arogya Rakshya Smithi
ARS	Arogya Raksha Samitis
AYUSH	Ayurveda, Yoga and Naturopathy, Unani, Siddha, Sowa Rigpa and Homoeopathy
BIA	Benefit Incidence Analysis
CBPS	Centre for Budget and Policy Studies
CHC	Community Health Centre
DF	Differential Financing
DH	District Hospital
DLHS	District Level Household and Facility Survey
FRU	First Referral Unit
ICDC	Integrated Child Development Centre
JSY	Janani Suraksha Yojana
NFHS	National Family Health Survey
NRHM	National Rural Health Mission
NSSO	National Sample Survey Organization
PBA	Project Budget Analysis
PCA	Principal Component Analysis
PHC	Primary Health Centre
RKS	Rogi Kalyan Samiti
SC	Sub Centre
TH	Taluk Hospital
UF	Untied Funds
UHC	Urban Health Centre
VHSC	Village Health and Sanitation Committee

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BACKGROUND

Health care in India is financed through a number of sources: (i) the tax-based public sector that comprises local, state and central governments, in addition to numerous autonomous public sector bodies; (ii) the private sector including the not-for-profit sector, organizing and financing, directly or through insurance, the health care of their employees and targeted populations; (iii) households, through out-of-pocket expenditures, including user fees paid in public facilities; (iv) other insurance, social and community based; and (v) external financing (through grants and loans) (Government of India [GoI], 2005).

Health spending in India is estimated to be 4.2 per cent of the GDP. In proportion to total health expenditure, public expenditure constituted around 19 per cent, private sector expenditure 77 per cent, and external support 2.3 per cent (GoI, 2009).

The Centre for Budget and Policy Studies has conducted several studies on budget analysis and cost effective analysis on the health expenditure of the Government of Karnataka. The analysis shows that health spending is still low in the state (less than 1 per cent), and there is increased dependence on the central government for improving health spending.

The per capita expenditure of the state health department is only ` 225 (US$ 4.5 approximately), and if health spending by other departments were included, it would increase to ` 390 (US$ 6.8 approximately). The National Rural Health Mission's (NRHM) spending pushes this expenditure to ` 468 (US$ 9 approximately). Low public spending on health care has often been cited as one reason for the poor quality of services in public health facilities, leading to a shift in health care utilization from the public sector to the private sector. Studies show that about 72–78 per cent of outpatient care and about 40–62 per cent of inpatient care is sought from the private sector (National Sample Survey Organisation [NSSO], 1989, 1998, 2006; Peter, 2002). On the other hand, there is low insurance coverage, with only 15–20 per cent of the population covered by any form of insurance. This has led to a high degree of out-of-pocket payment by individual households when availing of medical services.

Relying heavily on one's own resources for financing health care with hardly any risk-pooling mechanism in place has two undesirable consequences on the health system. First, it constitutes an important barrier to access health care. Second, for those who seek care, there is a danger of impoverishment (Peters et al., 2002; Doorslaer et al., 2006). In India, about 5 per cent of patients who require hospitalization do not seek health care because of financial constraints, and among those who do seek hospital care, more than 50 per cent have to borrow or sell assets to meet their medical expenses (NSSO, 2006). A more disturbing fact is that, of the rural population in India, which represents 73 per cent of the total population, every 4th hospitalized falls into poverty due to the related costs (Peters et al., 2002). Doorslaer et al., 2006) estimate that about 2 to 4 per cent of Indians are impoverished every year because of health care expenditure.

Universal coverage is the necessary foundation within the health sector on the road to health for all and health equity (World Health Organization [WHO], 2008). India is one of the 192 member states of the WHO that has adopted the resolution on a global vision of

"sustainable health financing, universal coverage and social health insurance" to develop health financing systems that allow all people access to needed services while avoiding catastrophic expenditure and impoverishment of people as a result of seeking care (WHO, 2005).

The financing of public health facilities should be designed in a way that is directed to achieve the goals of a country's health system. This means that the health facilities are funded efficiently, equitably, and incentivized to perform towards achieving the health goals.

The funds allocated to the public health sector in India are planned through an annual budget exercise. The government allocates funds to health facilities through planned and non-planned allocation. It is fixed for each activity and the health centers. These are generally dependent on the level of health facilities and are uniform across health facilities at the same level, irrespective of needs and performance. All other funds are tied to specific programmes with rigorous guidelines, like Janani Suraksha Yojana, Accredited Social Health Activist (ASHA) and others. Thus, we can see that the current approach of financing health facilities does not leave scope for unforeseen expenditure, need-based activities, innovations or workload.

The Government of India launched NRHM in 2005 with a mission to fill this gap and increase spending on health from the current figure of 0.9 per cent to 2 to 3 per cent of GDP. The plan was to achieve this goal of increased funding by raising the allocation by 10 per cent every year.

The NRHM has introduced an innovative approach of flexible financing to public health facilities. This is the "Flexible Financing" approach, whereby NRHM has allocated funds under the budget head, "NRHM Additionalities", through which the central government has made provisions of untied funds (UF), annual maintenance grants (AMG), and Rogi Kalyan Samitis (RKS) for the different health care facilities. The purpose of the funds is to decentralize the planning and implementation of innovations, taking into consideration local situations.

The specific purpose of each type of funds is shown in Table 1.

Table 1: Purpose of Arogya Raksha Samitis/ Rogi Kalyan Samitis (ARS) Corpus Funds, Untied Funds and Annual Maintenance Grants

Type of Grant	Objective
ARS (Corpus Grant)	For smooth functioning of the health facility and maintaining the quality of services
Untied Grants	Conducting various health activities, including Information, Education and Communication (IEC), household surveys, preparation of health registers, organization of meetings at the village level, etc.
AMG	For improvement and maintenance of physical infrastructure

Flexible financing was indeed a shift from past government health policies in India. The guidelines also state that societies and committees be formed and empowered with

knowledge and power to execute tasks. The guidelines also see the end-users or beneficiaries as active stakeholders in the process and have been directed to incorporate a "community approach" in the formation and functioning of the societies and committees. Through untied and flexible financing, NRHM is trying to drive reforms that empower local communities to make their own decisions. The current policy simulation focuses on resource allocation among the three categories of flexible finance to public health facilities (Table 2).

Table 2: Funds Received under ARS Corpus Funds, Untied Funds and Annual Maintenance Grants at Each Level of the Health Facility (in `)

Grant	District Hospital	Community Health Centre/First Referral Unit (FRU)/ Taluk Hospital (TH)	Primary Health Centre	Sub Centre	Village Health and Sanitation Committee
ARS (Corpus Grant)	5,00,000	1,00,000	1,00,000	-	-
Untied Grants	-	50,000	25,000	10,000	10,000
AMG	-	1,00,000	50,000	10,000*	
Total	**5,00,000**	**2,50,000**	**1,75,000**	**20,000**	**10,000**

*Funds are disbursed only if the sub-centre has a building.

PROBLEM STATEMENT

The flexible financing approach introduced under NRHM has been able to address the issue of providing flexibility in the use of funds. On the other hand, it still provides a uniform level of funding to each health centre irrespective of needs and performance.

The state-level utilization of untied grants and other funds provided for health care facilities are shown in Table 3.

Table 3: State-level Utilization of UF ARS Corpus Grants and AMG Funds for the Years 2009–10 and 2010–11 (` in millions)

Grant	2009–10			2010–11*		
	Budget	Expenditure	%	Budget	Expenditure	%
Untied Funds	464.5	194.2	42	448.7	158.1	35
ARS (Corpus Grant)	267.5	196.3	73	260.2	115.1	44
AMG	151.9	139.0	91	183.1	76.7	42
Total	**883.9**	**529.5**	**60**	**892.0**	**349.9**	**39**

*From 1 April 2010 to 31 December 2010.

Thus, although the funds are provided to these facilities with adequate flexibility and guidelines, utilization has not been encouraging. Many of these health facilities are marginally functional or non-functional. This may be due to various factors: level of awareness; capacity of the institutions and human resources to plan and execute the same; workload; needs of the health center, etc.

The facilities that don't spend do not provide a utilization certificate on time and therefore the next installments remain pending. This affects the facilities which need to continue spending.

The level of funding is not tied to performance or utilization (here performance connotes the ability of the health facility to utilize untied funds). Therefore, facility 'A', even if not performing at an optimal level, serving a higher population and utilizing the funds allocated, may be allocated the same funds as facility 'B' which might be serving a very small population, not performing optimally and not utilizing the funds allocated.

Thus the problem with the current mode of financing is:

- A uniform level of funding allotted to performing as well as non-performing health facilities.
- The poorest performers set the pace of funding. It acts as a disincentive to well-performing health facilities when the next installment of funds is released because of the non-performance of some health facilities.

RATIONALE

As discussed above, the health systems in India suffer from low level of public spending. Given the limited resources available for health care in the country and state, there is a need to rationalize the distribution of these funds and allocate them more efficiently to health facilities. The financing of health facilities should also act as an incentive to health facilities to perform better. Hence, this becomes a strong case to introduce differential financing (DF) for these health facilities. It is assumed that differential financing will result in increased availability of funds to the health facilities that need it the most, utilize the funds efficiently, and release the unutilized funds from the facilities that do not need them or lack the motivation to utilize them. This will thus result in efficient utilization of limited public funds. The government would also be able to rationalize the use of funds by setting a clear relationship between inputs and outputs.

Thus, the study focuses on the utilization of untied funds under the NRHM umbrella to different levels of public health facilities. Untied funds are categorized as "NRHM Additionalities" disbursed to health facilities to improve their functioning, for innovative ideas and unforeseen expenditure. Hence, the prime focus of the study is to comment on the utilization of untied fund and provide alternative approaches for reallocation and effective utilization of funds which ensures equity and efficiency. However, whether the reallocation of funds would benefit the needy/poor in terms of accessing health care is beyond this exercise of policy recommendation.

LITERATURE REVIEW

Different methods of allocating public funds to public health facilities have been tried out in various countries. Based on their experience and learning how to implement various methods of formula-based funding, they have made several amendments and evolved in the way they fund their health facilities. The literature suggests that there can be various ways of funding public health facilities (Smith, 2008). The allocation of funds can be arbitrary, based on political influence. The allocation of public funds can also be done historically, based on the previous experiences of the health facility.

- The government can also choose to allocate funds to a public health facility based on the expenditure incurred by the health facility.
- The public health facilities can also bid for the limited public funds available.
- Formula funding has also been gaining popularity as a method of allocating public funds.

Differential funding, also termed as formula funding, has been tried out with very simple to most complex formulas. Smith (2003) described three broad reasons for adopting the formula funding approach: reflecting efficiency, equity and political objectives. In another paper he describes that both allocative and managerial efficiency can be achieved by using formula funding.

Differential funding helps estimate the allocation to health institutions in advance. The two most common approaches attempted in developing countries are diagnosis-related groups (DRG) and capitation funding. The capitation method is preferred to reduce unnecessary demand for health services. DRG leads to two different sets of incentives: it encourages treatment of patients at a cost lower than the DRG rates, while it also encourages strong treatment.

Funding local agencies on the capitation method requires (i) the organization and purchasing of health services to be devolved, (ii) adequate, timely and reliable data made available to assess the level of funding to be allocated to each health facility, and (iii) the financial allocations allotted as per the formula should have an inherent incentive for the health center to adhere to.

The challenge of allocating funds through formula funding has been availability of timely and reliable data (Bennett, 1982). The experience of the US Medicare System suggests that when data are expected to be provided by the health facilities, i.e. the recipients of funds, there are inherent dangers of fraud (Becker et al., 2005). Developing countries specifically face the challenge of availability of data such as individual level expenditure and utilization of services to develop a complex funding formula.

METHODOLOGY

Determining the level of distribution of limited public funding requires complicated technical estimation and implications. The Centre for Budget and Policy Studies has conducted an exercise in partnership with the State Health Systems Resource Centre, Government of Karnataka, to understand the major issues currently related to utilization of untied funds, the correlation between factors such as service delivery load, management capacity and training, to usage levels of the untied funds at the facility level and the indicators which may be used for disbursing differential levels of untied funds to the districts (population, health care service delivery load, etc.).

A cross sectional study of primary and secondary level health facilities (Village Health and Sanitation Committee [VHSC], Sub-centres [SC], Primary Health Centre [PHC], Community Health Centre [CHC] and District Hospital [DH]) in the sample districts of Udupi and Bangalore urban in Karnataka was undertaken. Retrospective data on resources, finance and performance in the last three years (2008–09, 2009–10 and 2010–11) were collected. The study was conducted from November 2011 to March 2012.

A purposive sampling was used to decide the sample size and sample health facilities. In the two selected districts of Udupi and Bangalore urban, the following framework was used:

- The hospitals in both districts were selected since they are the only district level hospitals in each district.
- One CHC from three different taluks was selected based on the level of performance. The PHCs, SCs and VHSCs were selected from the above three taluks where the CHCs were located. The selection was dependent on the President of the committee heading the centre. A purposive selection of these facilities was done so that no two health Centres selected had common Presidents.
- The Secretary and President in each health facility surveyed were interviewed. In case they were not available, some other member of the management committee was selected for the interview.

The sample studied includes 46 health facilities and interviews with 92 stakeholders managing these funds.

1) Health facilities:

Table 4: Study Sample—Health Facilities

Districts	District Hospital	CHC/First Referral Unit (FRU)/Taluk Hospital (TH)	PHC	SC	VHSC	Total
Bangalore Urban	1	3	5	5	10	24
Udupi	1	3	6	6	6	22
Total	2	6	11	11	16	46

2) Stakeholders interviews:

Table 5: Stakeholders Interviewed

Level of Institution	Total number of Institutions to be Studied		Stakeholder to be Interviewed at each Level of Health Facility	Total Stakeholders Interviews	
	Bangalore Urban	Udupi		Bangalore Urban	Udupi
VHSC	10	6	2	20	12
SC	5	6	2	10	12
PHC	5	6	2	10	12
CHC/FRU/TH	3	3	2	6	6
DH	1	1	2	2	2
Total	**24**	**22**		**48**	**44**

Thus, a total of 24 health facilities and 48 stakeholder interviews were covered in Bangalore Urban district, and 22 health facilities and 44 stakeholder interviews were covered in Udupi district.

Based on the findings of the study, the policy simulation exercise is conducted between two options for the two districts studied.

FRAMEWORK FOR POLICY SIMULATION

The policy simulation exercise is conducted with the following framework.

Policy options explored

Policy option 1: Distribution of untied funds uniformly as per the level of health facility.
Policy option 2: Distribution of untied funds on a differential financing (DF) approach based on need, utilization and performance.

Table 6: Policy Simulation Framework

Criteria	Policy Option 1: Uniform Funding as per Level of Health Facilities	Policy Option 2: Differential Financing
Cost	The cost of uniform level of funding would be calculated based on: • Distribution cost • Cost of improving the current implementation: training, supervision, improving guidelines	The cost of differential financing would be calculated based on: • Data collection cost of indicators which will be used for DF of health facilities • Calculation cost of DF to be given to each health facility • Developing guidelines • Training cost • Supervision cost • Distribution cost
Outcome	Outcome will be measured in terms of: • Increase in services delivered by health facility • Percentage of funds utilized • Improvement in infrastructure • Improvement in supplies at the facility	Outcome will be measured in terms of: • Increase in services delivered by the health facility • Percentage of funds utilized • Improvement in infrastructure • Improvement in supplies at the facility
Benefit Incidence	Benefit incidence would be measured in terms of difference in % of funds utilized by the current method of financing and DF since the increased utilization in public health facilities directly reaches the poorest section of the community	Benefit incidence would be measured in terms of difference in % of funds utilized by the current method of financing and DF since the increased utilization in public health facilities directly reaches the poorest section of the community
Sources of Financing	It is the current policy and thus does not require any thinking on source of financing	There is no extra cost in implementing DF
Implementation Issues	The current policy of financing has implementation issues such as: I. Training the staff in use of untied funds II. Monitoring detailed expenditure in tandem with the objective for which the funds was disbursed III. Low utilization	The implementation issues in DF can be: IV. Collection of facility- wise data based on which DF would be given V. Analyzing the indicators and calculating the rate of DF VI. Training the staff in use of untied funds and DF VII. Grievance response of the facilities as a result of different level of funding VIII. Monitoring detailed expenditure compared to the objective for which the funds were disbursed

COST IMPLICATIONS OF IMPLEMENTING THE POLICY OPTIONS

In this section, the cost of implementing the current policy option is compared to a differential funding formula. For policy option 1 which is a uniform level of funding, the cost of the two scenarios is calculated: in the first scenario, we calculate the allocation required for the health facilities if all of them are allocated according to the current allocation formula. The second scenario describes the actual allocation made to the health centres in the previous year, 2011–12. In policy option 2 which is differential financing, we start with one differential financing formula of allocating funds to the health centres and find that the allocation required as per the formula is much less than the current cost of implementation. Thus, a second scenario of differential financing is worked out so that the health facilities can be allotted more funds.

Policy Option 1: Cost of implementing uniform financing at optimal level of performance—Scenario 1

As per the current allocation system, Table 2 shows the government's fixed amount of funds to be allocated to each level of health facilities. If the health facility is not able to utilize the total amount allocated in a year, they are allocated the balance amount after deducting the previous year's unspent amount in the coming year. In scenario 1, we assume that all the health facilities are allocated funds as per the allocation criteria set by the government and that they are able to utilize it fully. The cost of implementation of scenario 1 is: (1) distribution cost; and (2) amount of funds distributed. There is no need to improve guidelines, training and supervision for scenario 1 since we assume that the facilities are able to utilize the funds entirely.

1) Distribution cost: The funds are distributed from the states to the districts and from the districts to the health facility through a core banking system. We assume that the state incurs ` X for the distribution of funds. It is difficult to assess distribution costs as there are many governmental human resources involved in the process. But the time allocated by them would be minimal in terms of approving the files and monitoring the process. It is difficult to track the number and level of human resources involved and time allocated by them. Thus it is best to assume ` X for distribution cost.
2) Amount of funds distributed: The amount of funds distributed under the three categories of funds—ARS, AMG and UF— in the sample health facilities as follow:

Table 7: Total Allocation of Funds Required as per Current Funding Formula

		Allocation per Health Facility	Total Allocation for the Sample
Sample	VHSC (n=16)	10,000	1,60,000
	SC (n=11)	20,000	2,20,000
	PHC (n=11)	1,75,000	19,25,000
	CHC (n=6)	2,50,000	15,00,000
	DH (n=2)	5,00,000	10,00,000
Total			**48,05,000**

Thus the total cost for scenario 1 is ` 48, 05,000 + x for the sample health facilities.

In scenario 1 of policy option 1 it is assumed that all health facilitates are able to spend all the funds allocated to them in the same accounting year. Hence there is no need to

incorporate the cost of revising guidelines, providing training, and any extra cost in terms of providing supervision and monitoring. Hence, in the current implementation, no additional cost of supervision was assumed because there is no provision for regular individual supervision to support the utilization of untied funds. Thus it is not possible to estimate any cost for the same. It may be possible that the supervision of these funds is done along with regular supervision. But to estimate this cost, we need to understand the type and number of human resources involved in supervision, the time allotted for supervision of these funds from within the total time, and then finally estimate the cost. This is a huge exercise and a study in itself.

Policy Option 1: Cost of implementing uniform financing at current level of performance—Scenario 2

The cost of implementation of the current policy, i.e. uniform level of funding to the same level of health facilities based on the data of the year 2010–11 is calculated below:

The cost of implementation of policy 1 is (i) distribution cost; (ii) amount of funds distributed; (iii) cost of improving the guidelines; (iv) cost of providing training to improve implementation; and (v) cost of providing supervision.

1) Distribution cost: The funds are distributed from the states to the district and from the district to the health facility through a core banking system. We assume that the state incurs ` X amount for the distribution of funds.

2) Amount of funds distributed: The amount of funds distributed under the three categories of funds—ARS, AMG and UF— in the sample health facilities for the year 2010–11 are shown in Table 8.

Table 8: Amount of Funds Distributed at Sample Health Facilities as per Current Policy of Financing

		Current Allocation for the Year 2010–11 (amount in `)
Sample	VHSC (n=16)	2,16,293
	SC (n=11)	2,13,286
	PHC (n=11)	17,62,910
	CHC (n=6)	19,61,855
	DH (n=2)	23,68,035
Total		**65,22,379**

3) Cost of improving guidelines: Cost of improving guidelines is assumed to be ` 1, 00,000 which might be revised in coming years based on need.

4) Cost of providing training: The cost of providing training to Udupi and Bangalore Urban is given in Table 9.

Table 9: Cost of Providing Training for Current Implementation of policy Option 1

Cost of Training	No. of Health Centers	Number of Training Sessions*	Cost per Training Estimated (amount in `)	Total Cost (amount in `)
Bangalore Urban	589	117.8	10,000	11,78,000
Udupi	248	49.6	10,000	4,96,000
Total Training Cost				**16,74,000**

*It is assumed that one training session will be conducted for five health centres.

5) Cost of supervision:

Table 10: Cost of Implementing Supervision for Current Implementation of Policy Option 1

Cost of Supervision	No of Supervisors	Salary + Travel per Person per Annum	Travel & Miscellaneous Expenditure	Total Cost (amount in `)
Bangalore	10	3,60,000	2,00,000	56,00,000
Udupi	5	3,60,000	2,00,000	28,00,000
Total Cost of Improved Supervision				84,00,000

Thus the total cost of implementing the current policy but with improved implementation is ` 1, 66, 96,379 + x.

Policy Option 2: Cost of implementing differential financing—Scenario 1

At the primary level, the public health facilities in India are expected to cater to a standard number of people. The VHSCs cater to a population of 1,000; sub-centre caters to a population of 5,000; PHCs cater to a population of 30,000. The study found a huge variation in the population served by each health center, but the funds allocated to them is uniform. Thus, the current per capita allocation of funds at the VHSC level ranges from ` 0.5 to ` 31.1. The per capita allocation at the sub-centre level ranges from ` 1.6 to ` 17.3, and the per capita allocation at the PHC level ranges from ` 5.1 to ` 26.3.

The per capita expenditure has a direct impact on per capita allocation: a VHSC that receives ` 0.5 per person can only spend ` 0.5 or less per person in a year while a VHSC receiving ` 31 per person has the flexibility to spend ` 31 per person per year. Thus, although the allocation of flexible funds is at a uniform level at the same level of the health facility, the analysis showed that there is a huge variation in per capita allocation which impacts expenditure. The assumption was tested further (analysis below). It showed that at the VHSC and PHC levels, the per capita expenditure is high in the health facilities serving a smaller population and the per capita expenditure is low in the facilities serving a larger population.

Table 11: Table of Per Capita Expenditure and Population Served by VHSC

Per Capita Expenditure Rate at VHSC Level in Sample Health Facilities	Low Population (< 1500)	High Population (>1500)
Low Per Capita Expenditure (<6)	1	6
High Per Capita Expenditure (>6)	6	3

Table 12: Table of Per Capita Expenditure and Population Served by SC

Per Capita Expenditure Rate at SC Level in Sample Health Facilities	Low Population (< 3500)	High Population (>3500)
Low Per Capita Expenditure (<2)	*3*	*1*
High Per capita expenditure (>2)	3	4

Table 13: Table of Per Capita Expenditure and Population Served by PHC

Per Capita Expenditure Rate at PHC Level in Sample Health Facilities	Low Population (< 20,000)	High Population (>20,000)
Low Per Capita Expenditure (<6.5)	0	5
High Per Capita Expenditure (>6.5)	6	0

Thus, at the primary level it is proposed to finance the facility on a per capita basis rather than through uniform funding. The proposed amount at each level is presented in Table 14.

Table 14: Proposed Formula of Differential Financing at VHSC, SC and PHC levels

Level of Health Facility	**Proposed formula**
Village Health and Sanitation Committee	Untied funds VHSC based on population served by it @ per capita ` 10
Sub-centre	Population served by sub-centre @ ` 2 per capita for sub-centre in rented building @ ` 4 per capita for sub-centre in government-owned building
Primary Health Centre	Population served by the PHC @ per capita ` 4.17

The health centres at the secondary level work as referrals for primary health centres. Table 15 shows our proposed formula for the secondary level based on workload and infrastructure.

Table 15: Proposed Formula of Differential Financing at CHC and DH levels

Community Health Centre	Population served by the CHC + number of functional beds @ ` 0.63 per capita + ` 2,500 per functional bed
District Hospital	@ Current norm of ` 5,00,000 per DH

The proposed formula for funding primary health centers was calculated on following basis:

- In the proposed formula, the estimation of funds for all the facilities includes only ARS and untied funds; AMG funds have not been added.
- A VHSC is allocated funds of ` 10,000 and it caters to a population of 1,000. Thus, to normalize the funds to health facilities as per the population, the standard population norm was divided by the amount of funds fixed for that level and the per capita allocation was derived.
- In the same way, standard population of sub-centre and primary health centers was divided by the amount of funds allocated at that level and per capita allocation was derived.
- Likewise, a CHC receives ` 1, 50,000 in the two grants (ARS and untied funds) and it is divided in half for per capita allocation and per bed allocation.

The estimated cost of implementing differential financing would be (i) cost of assessing the level of financing distribution cost; (ii) distribution cost; (iii) estimated amount of funds to be distributed; (iv) developing guidelines; (v) cost of training committee members and health staff in the new method of financing and use of funds; and (vi) cost of monitoring and supervision.

1) Cost of assessment of level of financing: The cost of assessing the level of financing requires facility-wise collection of data/indicators, which are required for differential level of financing and assessing the level of financing based on the indicators of each health facility.

The facility-wise data collection is already done under the quality assessment initiative of the state. Thus there will be no extra cost for availing of this data. For assessing financing based on indicators, there is a requirement to develop software which can later be integrated with departmental activities. The development of the software might need a one-time expenditure of ` 5, 00,000. It was assumed that a simple software would be sufficient to serve the purpose. Thus, a maximum amount of ` 5, 00,000 was allocated.

2) Distribution cost: The funds are distributed from the states to the district and the district to the health facility through the core banking system. The cost of distributing different levels of funding to different facilities won't change. We can assume that cost of distribution in differential financing would also be ` X as it is in the current mode of financing.

3) Estimated amount of funds to be distributed: The estimated funds to be distributed under the three categories of funds—ARS, AMG and UF—in the sample health facilities as per proposed formula of differential financing for two study districts is shown in Table 16.

Table 16: Estimated Funds needed to be distributed as per Differential Financing policy

		Total Estimation on the Proposed Formula (amount in `)
Sample	VHSC (n=16)	3,37,990
	SC (n=11)	1,08,320
	PHC (n=11)	9,38,408
	CHC (n=6)	9,76,042
	DH (n=2)	10,00,000
Total		**33,60,761**

4) Cost of developing guidelines: The cost of developing guidelines is assumed to be ` 1, 00,000 which might be revised in the coming years based on needs.

5) Cost of imparting training: The cost of imparting training to Udupi and Bangalore Urban is presented in Table 17.

Table 17: Cost of Imparting Training for Implementing Policy Option 2

Cost of Training	**No. of Health Centers**	**Number of Trainings***	**Cost Per Training Estimated (amount in`)**	**Total Cost (amount in `)**
Bangalore Urban	589	117.8	10,000	11,78,000
Udupi	248	49.6	10,000	4,96,000
Total Training Cost				**16,74,000**

*It is assumed that one training session will be conducted between five health centres.

6) Cost of supervision:

Table 18: Cost of Implementing Supervision for Policy Option 2

Cost of Supervision	**No. of Supervisor**	**Salary +Travel per Person per Annum (amount in`)**	**Travel & Miscellaneous Expenditure(amount in`)**	**Total Cost (amount in`)**
Bangalore	10	3,60,000	2,00,000	56,00,000
Udupi	5	3,60,000	2,00,000	28,00,000
Total Cost of Improved Supervision				84,00,000

The cost of implementing scenario 1 of differential financing is ` 1, 40, 34,761 + x.

Comparison of cost of policy options 1 and 2 (see Table 19).

Table 19: Comparison of Cost of Implementing Policy Option 1 and Policy Option 2

Cost Description	**Policy Option 1**						**Policy Option 2**		
	Scenario 1			**Scenario 2**					
	Capital	**Revenue**	**Total**	**Capital**	**Revenue**	**Total**	**Capital**	**Revenue**	**Total**
	(amount in `)								
Cost of Assessment of Level of Financing				0	0	0	5,00,000	0	
Amount of Funds Distributed		48,05,000	48,05,000		65,22,379	65,22,379		33,60,761	33,60,761
Distribution Cost		x	x		x	x		x	x
Cost of Developing/Improving Guidelines				1,00,000	0	1,00,000	1,00,000	0	1,00,000
Cost of Training				16,74,000		16,74,000	16,74,000		16,74,000
Cost of Supervision					84,00,000	84,00,000		84,00,000	84,00,000
Total Cost			48,05,000	17,74,000	1,49,22,379	1,66,96,379	22,74,000	1,17,60,761	1,40,34,760

Table 19 shows that if the current policy of uniform funding is implemented at the optimal level, the cost is minimal. Implementing policy option 2, i.e. differential financing, requires an additional one-time capital expenditure of ` 5, 00,000 as compared to the current implementation cost, i.e. policy option 1 and scenario 2. But the overall revenue expenditure is almost half in the differential financing option. This gives an opportunity to double the proposed per capita allocation formula as described in scenario 3. We estimate the cost of this in second scenario under differential financing.

Policy Option 2: Cost of implementing differential financing—Scenario 2

The cost of implementing differential financing as per the formula in scenario 1 is almost half the current funds allocated to the health facilities. Thus scenario 2 gives us a chance to allocate double the rate of per capita under the differential financing formula. The cost of implementing scenario 2 of differential financing is worked out in Table 20.

Table 20: Proposed Formula of Differential Financing at VHSC, SC and PHC levels

Level of Health Facilities	Proposed Formula
VHSC	Untied funds for VHSC based on population served @ per capita ` 20
SC	Population served by sub-centre @ ` 4 per capita for sub-centre in rented building @ ` 8 per capita for sub-centre in government owned building
PHC	Population served by the primary health centre @ per capita ` 8.34

Secondary level health centres, as mentioned, work as referrals for primary health centres. Thus, for the secondary level we have proposed a formula based on workload and infrastructure.

Table 21: Proposed Formula of Differential Financing at CHC and DH Levels

Community Health Centre	Population served by the CHC + number of functional beds @ ` 1.26 per capita + ` 5,000 per functional bed
District Hospital	@ ` 10,00,000 per DH

The estimated cost of implementing scenario 3 (differential financing) would be (i) cost of assessing the level of financing distribution cost; (ii) distribution cost; (iii) estimated amount of funds to be distributed; (iv) developing guidelines; (v) cost of training committee members and health staff for the new method of financing and use of funds; and (vi) cost of monitoring and supervision.

1) Cost of assessment of level of financing: The cost of assessing the level of financing requires facility-wise collection of data/indicators for differential level of financing and for assessing the level of financing based on the indicators of each health facility. The facility-wise data collection is already available under the quality assessment initiative of the state, and will not require extra cost for use of this data. To assess financing based on indicators, there is a requirement to develop software which can be integrated in the departmental activities later on. The development of the software might need a one-time expenditure of ` 5,00,000

2) Distribution cost: The funds are distributed from the states to the district and further from there to the health facility through a core banking system. The cost of distribution of different levels of funds to different facilities won't change. Thus, we assume that the cost of distribution under differential financing would also be ` X as it is in the current mode of financing.

3) Estimated amount of funds to be distributed: The estimated amount of funds to be distributed under ARS, AMG and UF in the sample health facilities as per the proposed formula of differential financing for the two study districts is given in Table 22.

Table 22: Estimated Amount of Funds Needed to be distributed as per Differential Financing Policy

		Total Estimation on the Proposed Formula
Sample	VHSC (n=16)	6,75,980
	SC (n=11)	4,33,280
	PHC (n=11)	18,76,817
	CHC (n=6)	19,52,085
	DH (n=2)	20,00,000
Total		**69,38,162**

4) Cost of developing guidelines: The cost of developing guidelines is assumed to be ` 1, 00,000, which might be later revised based on needs.

5) Cost of imparting training: The cost of imparting training to Udupi and Bangalore Urban is shown in Table 23:

Table 23: Cost of Imparting Training for Implementing Scenario 2 of Policy Option 2

Cost of Training	No. of Health Centers	Number of Trainings*	Cost per Training Estimated (amount in `	Total Cost (amount in `)
Bangalore Urban	589	117.8	10,000	11,78,000
Udupi	248	49.6	10,000	4,96,000
Total Training Cost				**16,74,000**

*It is assumed that one training session will be conducted between five health centres.

6) Cost of supervision:

Table 24: Cost of Implementing Supervision for Scenario 2 of Policy Option 2

Cost of Supervision	No. of supervisors	Salary + Travel per Person per Annum (amount in `)	Travel & Miscellaneous Expenditure (amount in `)	Total Cost (amount in `)
Bangalore	10	3,60,000	2,00,000	56,00,000
Udupi	5	3,60,000	2,00,000	28,00,000
Total Cost of Improved Supervision				84,00,000

The cost of implementing scenario 2 of differential financing is shown in Table 25.

Table 25: Total Cost of Implementing Scenario 2 of Policy Option 2 and Differential Financing

Cost Description	Policy Option 2		
	Scenario 2		
	Capital	Revenue	Total
	Amount in `		
Cost of Assessment of Level of Financing	5,00,000	0	
Amount of Funds Distributed		69,38,162	69,38,162

Distribution Cost		x	x
Cost of Developing/Improving Guidelines	1,00,000	0	1,00,000
Cost of Training	16,74,000		16,74,000
Cost of Supervision		84,00,000	84,00,000
Total Cost	**22,74,000**	**1,53,38,162**	**1,76,12,162**

EXPECTED OUTCOME

The expected outcome of differential financing would be in terms of rationalization of funds as per the population served by the health centers. Thus, all the health facilities will have the same level of per capita allocation, thereby addressing issues of equity and efficiency. Equity will be achieved since all health facilities will have similar levels of per capita allocation. Differential financing will also result in improved efficiency by freeing the unutilized resources and reallocating the funds according to the population served, which indirectly addresses the workload of a health center.

Figure 1: Per Capita Allocation to VHSC as Per Current Policy for the Year 2010–11 and Differential Financing

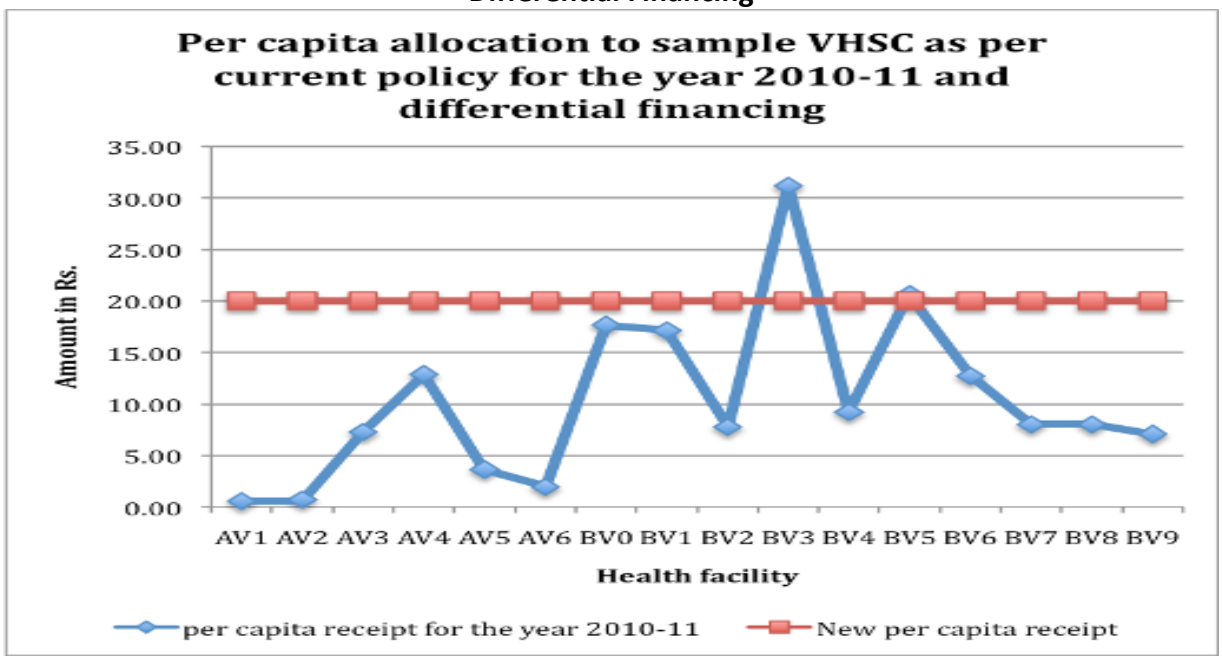


Figure 2: Per Capita Allocation to Sub-centres as Per Current Policy for the Year 2010–11 and Differential Financing

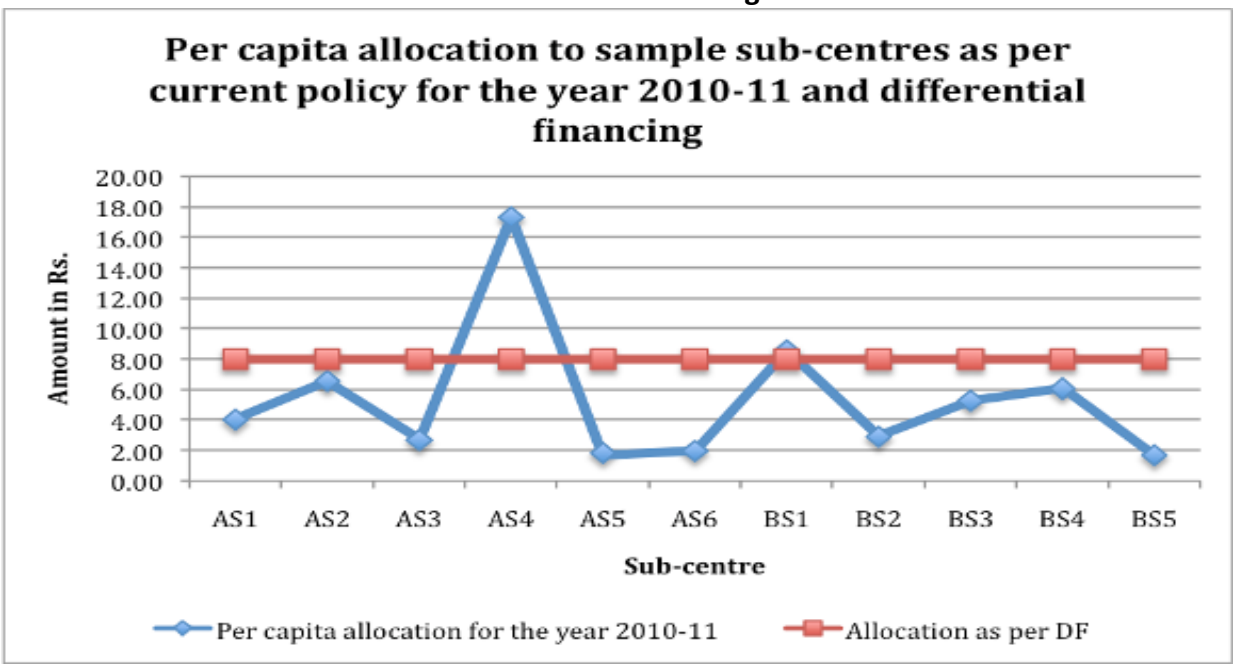
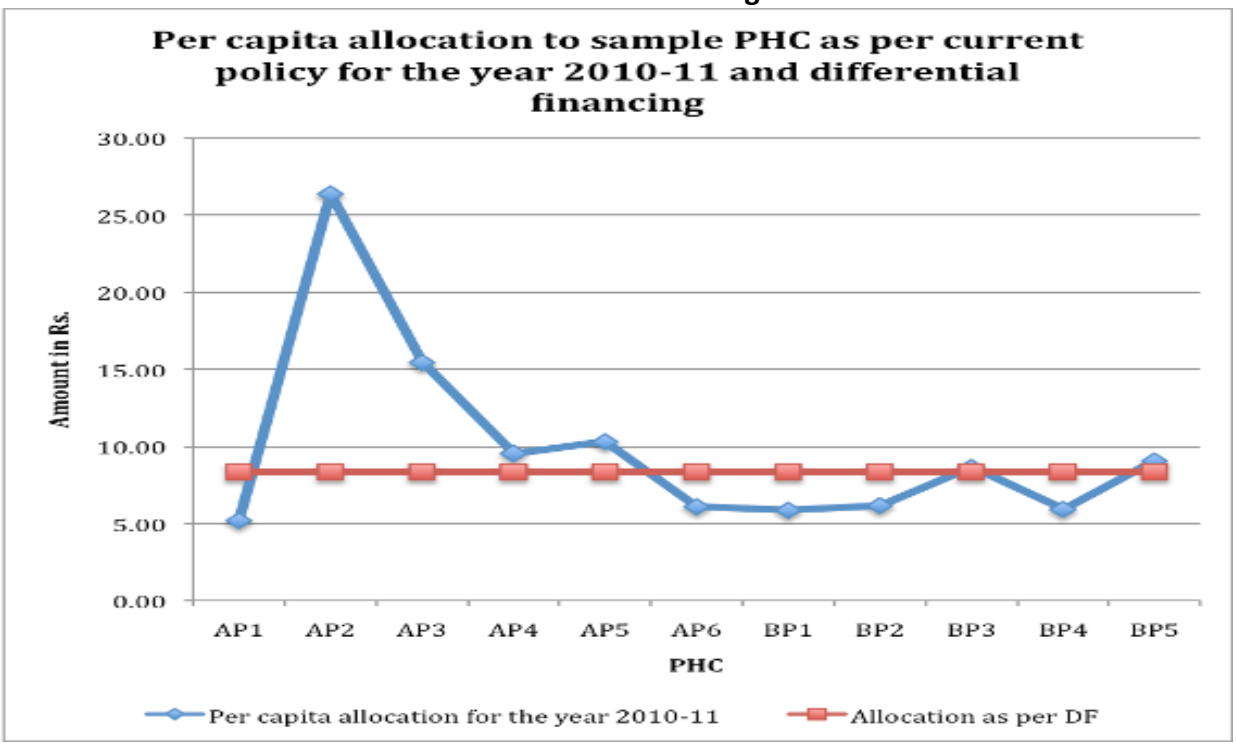


Figure 3: Per Capita Allocation to PHC as Per Current Policy for the Year 2010–11 and Differential Financing



We can see that the per capita allocation of most of the health facilities can be improved by differential financing.

BENEFIT INCIDENCE ANALYSIS

Benefit incidence measures the distributional incidence of public spending for different sectors. Public spending can be in terms of public transfers, taxes, subsidies or policy change with respect to prices of services provided by public institutional bodies. Benefit incidence tells us who benefits from the services, transfers, subsidies or a policy change while estimating the magnitude of the benefits received by people.

Considering a typical case in India's health sector, it has been seen that health care spending is 4.2 per cent of GDP—public expenditure constitutes around 19 per cent, private sector expenditure is 77 per cent; and external support is 2.3 per cent of total health expenditure. Public health care facilities which cater largely to people from lower economic strata are highly subsidized (NSSO; 2004).

Here, benefit incidence analysis attempts to estimate the distributional benefit of public spending on health among different economic strata in Karnataka.

BACKGROUND ON BENEFIT INCIDENCE ANALYSIS

Addressing the need for poor people to access health care is a critical objective for most governments. Measuring the benefits of government expenditures across income, race and other individual characteristics is an extensive empirical exercise. The poor often have limited access to services because of their compromised economic status. Hence, the government is expected to target the provision of these services to the poor. But how does one ascertain the extent to which either the increased allocation or the existing allocation is reaching the poor? (Davoodi et al., 2003). Benefit incidence analysis (BIA) is a tool that addresses this question. It brings together elements of the supply of and demand for public services and can provide valuable information regarding inefficiencies and inequities in government allocation of resources for social services and in the utilization of these services.

The literature on benefit incidence covers three distinct periods. In the early, pre-1975 literature, benefits were allocated to households either on a per capita basis or in proportion to the income of the household. Both allocation mechanisms yield obvious conclusions about benefit incidence. There is also a preoccupation in the early literature with allocating the entire budget, including the benefits of so-called pure public goods such as defence. Aaron and McGuire (1970) attempt to reduce the inherent arbitrariness of the allocation of pure public good benefits to households by deriving benefit measures based on a specific utility function. The parameters of their utility function suggest a strong pro-rich distribution of benefits, at least in developed countries (Selden, 1992).

We believe the approach adopted by these social scientists has great potential for informing policy choices on the transfer of resources within programs to target benefits to the poor more accurately. Nonetheless, researchers studying the benefits derived from public spending in developing countries may need to pay extra attention to (i) expenditures made through off-budget programs such as public enterprises, (ii) benefit shifting, especially for agricultural programs, (iii) differential public service quality, especially between urban and rural areas, (iv) the effects of benefits on inter- and intra-family transfers, and (v) the effects of benefits on urban–rural migration.

In a further analysis of benefit incidence, Gertler and Glewwe (1989), Gertler and van der Gaag (1988), Gertler et al. (1988) estimated demand curves for various social services. Demand curves for particular population sub-groups can be used to calculate changes in welfare-based measures (or compensating variation) of social services benefits. Studies using welfare-based measures of benefits for a wide range of public functions can yield valuable information to policy makers and help target the limited resources for redistribution to those public services which maximize benefit to the poor. However, these studies do not, to date, offer benefit measures on the broad range of government services that more traditional benefit incidence studies have to offer (Wasylenko, 1992).

Households incur out-of-pocket expenses to obtain in-kind subsidies embodied in health care services and these should be incorporated in the benefit incidence analysis. Some can be considered as transactions costs (such as transport expenses), while others add to the benefits that are obtained from the service (such as user charges). Benefit incidence refers only to the distribution of public subsidy; it is often useful to incorporate into the analysis household spending on the service to arrive at a complete account of the service involved.

THE PROCESS OF BENEFIT INCIDENCE ANALYSIS

The following information is essential for the estimation of the incidence of public spending on the services:

1. Government spending from the budget report by the department of finance.
2. Public utilization of resources.
3. The socio-economic characteristics of the population using the service.

The data used in the benefit analysis is typically reported on an aggregate basis. The process by which the analysis can be carried out is as follows:
Obtain the average unit cost of providing a public service by dividing government spending and the total number of users of the service. Total state budget financing figures for health may be used to obtain total public spending on the service, which includes recurrent and capital financing. The total number of beneficiaries of the services is estimated from the household survey.

Data requirements

1. Information on public expenditure to estimate the value of benefits.
2. Individual or household level data from the household survey on use of services.
3. Socio-economic characteristics of users of services.

Data source

Information on public expenditure is obtained from budget documents of the government to estimate value of benefits. The present analysis uses the project budget analysis (PBA) report (CBPS, PBA Health 2012) data to estimate total public spending on health care. The number of beneficiaries is estimated from District Level Household and Facility Survey (DLSH-III) data for Karnataka and extrapolated for the population figure of Census 2001.

Quintile-wise distribution of population accessing health care in public health facilities is estimated from DLSH-III. The study has used DLHS Round-III data for this analysis. DLHS-III data was collected in 2007–08 and surveyed a total of 29,062 households; 27,864 ever-married women; and 6,452 unmarried women in Karnataka. Information was collected at various levels and at different dimensions.

The wealth index was constructed based on the methodology proposed by Filmer and Primchet (2001) as a proxy of the income/consumption quintile. The wealth index was constructed based on information on the nature of housing, access to basic amenities, and possession of durable goods. Households were categorized from the lowest (poorest) to the highest at the state level. This categorization is used as a proxy for the income/consumption quintile to ascertain the benefit incidence across income/wealth classes of public spending/expenditure on health care.

METHODOLOGY

Four basic BIA steps are:

- Ranking all individuals from poorest to richest by chosen measure of welfare (in the current analysis it is the wealth index).
- Identifying which individual used each type of publically provided service (net of cost recovery in terms of user fees or charges).
- Calculating the average unit cost of providing the service.
- Multiplying the utilization figure by the government's unit cost of provision. This gives the amount of public spending on services reaching each group.

Estimation: $Xj = \Sigma Eij (Si / Ei)$; Where $j = 1, 2, 3, 4, 5$, $i = 1, 2$

Xj is the benefit analysis in local currency that accrues to wealth group j from (net) government spending denoted as S, also measured in local currency; Eij represents number of total beneficiaries in level i from group j where each group is a quintile; and Si/ Ei is the unit cost of providing health care at level i. Groups are typically arranged from lowest to highest with respect to the classifying variable.

Assumptions and limitations

- DLHS-III provides information on access to health care when any member falls sick. Information on access to secondary health care is ambiguous. Hence, the data on access to secondary and tertiary health care is clubbed together.
- As per DLHS-III, it is assumed that those who had responded to accessing health care would eventually access health care in respective health facilities.
- Unit cost is assumed to be uniform for the respective level of health care.
- No distinction is made regarding the rural–urban divide.
- Expenditure on administration and other overheads are not included while considering total public health spending. Only the expenditure on primary, secondary and tertiary issues (development and recurring expenditure) is considered while estimating total public health spending. However, a separate analysis was given for recurrent expenditure for the financial year as well.
- Cost recovery in terms of user charges collected constitutes a small amount and is not considered while estimating unit cost.
- The total number of beneficiaries is estimated based on the population figure as cited in the Census of 2001.

FINDINGS OF BIA

Public spending on health care is estimated through the budget document of the state (2007–08). Budget data from PBA (CBPS, PBA-Health 2012) is used to estimate the average cost of providing services. In the present BIA, two estimates are provided, i.e. one based on total health spending (development and recurrent), and the other on recurrent spending only. As the recent practices confine the analysis to recurrent spending only, it avoids the difficulties encountered in estimating the flow of services/benefits from capital expenditures. But when capital budgets are large, they can have a profound effect on the benefit incidence of public spending. Average cost is estimated by dividing the total public expenditure on health care by the total number of beneficiaries.

The total number of beneficiaries is estimated from the population figures of the 2001 Census which stood at 5,28,50,562 for Karnataka state. The total number of households was 1, 03, 62,855 and average household size was 5.1. Considering that 42.9 per cent of households in DLHS-III sought treatment in public health facilities, the total number of beneficiaries in Karnataka state is 2,26,72,891 (44,45,665 households) . Based on the estimated figure of total beneficiaries, the average unit cost of providing public health care services is estimated for primary health care and secondary /tertiary health care.

Expenditure on public health care is estimated at three different levels of health care: primary, secondary and tertiary sectors (development and recurrent expenditure). Administrative and other expenditure are not included. Data on secondary and tertiary care is clubbed for further analysis based on the assumption already mentioned.

To estimate access to public health care facilities according to economic class, DLSH-III collected the data from 29,062 households in 2007–08 regarding their demographic, socio-economic, health seeking behaviour, and reproductive and child health related issues. The wealth index based on PCA was used to categorize the population into five categories ranging from poorest to richest. To construct the wealth index, 30 variables related to structure of house, access to basic amenities, and possession of durable goods is used. Household data are used to analyze health seeking behaviour. The question, "When members of your household get sick, where they mainly go for treatment?" is used to estimate health seeking behaviour. Table 26 shows the distribution of sample by wealth categories and source of treatment.

Table 26: Wealth Class and Source of Treatment

Characteristics	Households as per DLHS-III	Accessing Health Care at Public Health Facility	Not Accessing Health Care at Public Health Facility	Percentage Accessing Health Care in Public Health Facilities	Distribution of those Accessing Health Care in Public Health Facility by Wealth Classes
Poorest	5,598	2,913	2,685	52.0	23.3
Poor	6,027	2,995	3,032	49.7	24
Medium	5,813	2,783	3,030	47.9	22.3
Rich	5,811	2,396	3,415	41.2	19.2
Richest	5,813	1,383	4,430	23.8	11.1
Total	**29,062**	**12,470**	**16,592**	**42.9**	**100.0**

Source: DLHS-III, 2007–08.

Table 26 shows that in Karnataka, 42.9 per cent of households seek treatment in a public health facility when any member of household falls sick. Few observations that emerged from the table are: (i) fifty-two per cent of the poorest access health care in public health facilities, (ii) from the poorest to the richest wealth class, the per centage of households accessing health care at public health facilities declines; and (iii) even in the richest wealth quintile, 23.8 per cent households seek treatment in public health facilities. This may be attributed to the preference of even richer households to seek tertiary care in public health facilities as has been citied in various studies regarding health seeking behaviour in India (NSSO, 60th Round).

Table 27 shows the distribution of households by wealth quintile and level of health care. In general, the majority of those who access treatment in public health facilities belong largely to the poorest, poor and medium socio-economic status, this being truer for primary health care. Here public health facilities include government hospitals, PHC, CHS, SC, Urban Health Centre (UHC), Ayurveda, Yoga and Naturopathy, Unani, Siddha, Sowa Rigpa and Homoeopathy (AYUSH hospitals, anganwadi/Integrated Child Development Centre ICDC, government mobile clinic and other public health facilities.

Table 27: Wealth Quintile-wise Distribution of Level of Health Care

Level of Health Care	Wealth Quintile					Total
	Poorest	Poor	Medium	Rich	Richest	
Primary	2,267 (25.4)	2,246 (25.1)	2,017 (22.6)	1,660 (18.6)	752 (8.4)	8,942
Secondary and Tertiary*	646 (18.3)	749 (21.2)	766 (21.7)	736 (20.9)	631 (17.9)	3,528
Total	2,913 (23.4)	2,995 (24.0)	2,783 (22.3)	2,396 (19.2)	1,383 (11.1)	12,470

* Secondary and tertiary health care levels are clubbed. Figures in brackets show the percentage distribution
Source: DLHS-III, 2007–08.

Table 27 shows that out of 12,470 households who access health care through public health facilities, 71.7 per cent availed of primary health care while the rest opted for secondary or tertiary health care. From the poorest to the richest wealth class, the percentage of households availing of primary health care declines. A mere 8.4 per cent in the richest wealth quintile availed of primary health care in public health facilities.

The Table also provides the socio-economic background of users of public health services. Based on this analysis, Census 2001 data is used to estimate the total number of beneficiaries accessing health care in public health facilities in Karnataka. Findings from DLHS-III regarding the total number of beneficiaries are extrapolated. Table 28 shows the estimated number of beneficiaries of public health spending in Karnataka.

Table 28: Estimation of Beneficiaries of Public Health Spending

Characteristics	Number	Per cent
Total Population (Census 2001)	5,28,50,562	100.0
Estimated Number of Total Beneficiaries (based on DLHS-III)	2,26,72,891	42.9
Estimated Number of Total Beneficiaries of Primary Health Care (Based on DLHS-III)	1,62,56,463	71.7

Source: Census 2001, DLHS-III 2007–08.

Table 28 shows that based on population figure of Census 2001 for Karnataka state and percentage of households accessing health care in public health facilities (42.9 per cent) from DLHS-III, estimated total beneficiaries are 2, 26, 72, 891. Out of 42.9 per cent households, 71.7 per cent availed primary health care and rest availed secondary tertiary care as per DLHS-III.

Table 29: Estimated Beneficiaries* Accessing Health Care in Public Health Facilities by Wealth Quintile and Level of Facility

Level	Primary Health Care	Secondary and Tertiary Health Care	Total
Q1 (Poorest)	41,21,382	11,74,890	52,96,273
Q2 (poor)	40,83,205	13,62,218	54,45,423
Q3 (Medium)	36,66,885	13,93,136	50,60,021
Q4 (Rich)	30,17,863	13,38,575	43,56,437
Q5 (Richest)	13,67,128	11,47,609	25,14,738
Total	1,62,56,463	64,16,428	2,26,72,891

* For estimated number of beneficiaries in respective wealth class by level of health care refer to Table 27

Table 29 shows that the estimated number of beneficiaries declines from the poorest to the richest wealth quintile. A greater number of the poor access primary health care in public health facilities than the rich. However, not much difference was observed in secondary and tertiary health care.

The foregoing analysis fulfils the requirement of data related to utilization of public health facilities and socio-economic characteristics of beneficiaries of public health facilities to conduct a benefit incidence analysis.

The unit cost of providing the services is ascertained from state budget documents. As discussed earlier, total budgeted expenditure for three sectors for the year 2007–08 was used to estimate unit cost in the primary and secondary/tertiary health care sector. Total budgeted expenditure in these was ` 7,327.7 million (primary health care ` 3,952.3 million, and secondary and tertiary care ` 3,375.4 million). These figures include development expenditure in respective health care. Based on this information, the average cost of providing health services is ` 323.2. Table 30 shows the per capita public expenditure on health in Karnataka in different sectors.

Table 30: Per Capita Public Expenditure* on Health in Karnataka

Health Sector	Per Capita Expenditure (Development and Recurrent)	Per Capita Expenditure (Recurrent)
Primary Health Sector	243.1	224.9
Secondary and Tertiary Health Sector	526.1	302.1
Total	**323.2**	**246.8**

*Per capita expenditure figures are arrived at by dividing total expenditure in the respective sector by estimated number of total beneficiaries in the respective sector

Total health expenditure incurred in the primary, secondary and tertiary sectors is included while estimating the per capita public expenditure on health. Table 30shows that in Karnataka, ` 323.2 (absolute figures) per capita is spent on health care (development and recurrent expenditure); per capita health expenditure on primary health care is ` 243.1. The combined secondary and tertiary care sectors account for ` 526.1 per capita health expenditure. However, when considering recurrent expenditure, per capita expenditure in Karnataka in different sectors is ` 224.9 (primary sector) and ` 302.1 (secondary and tertiary sector).

Multiplying the utilization figure by the government's unit cost of providing services (Table 31) gives the amount of public spending on services that goes to each group. Table 31 shows the benefit incidence of health spending to different wealth groups.

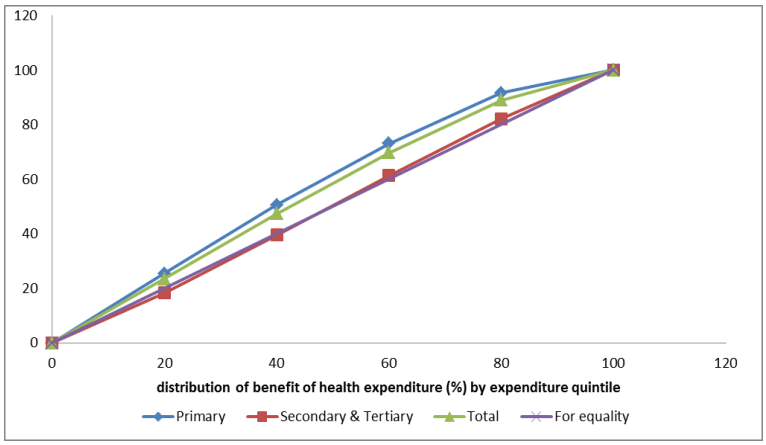
Table 31: Benefit Incidence of Spending Accrued to the Wealth Group (In ` millions)

Level	Total Expenditure (Development and Recurrent)			Recurrent Expenditure		
	Primary Health Care	Secondary and Tertiary Health Care	Total (Per Capita)*	Secondary and Tertiary Health Care	Primary Health Care	Total (Per Capita)*
Q1 (Poorest)	1,002.0 (61.6)	618.1 (96.3)	1,711.7 (75.5)	927.0 (57.0)	355.0 (55.3)	1,306.9 (57.6)
Q2 (Poor)	992.7 (61.1)	716.6 (111.7)	1,759.9 (77.6)	918.4 (56.5)	411.5 (64.1)	1,343.7 (59.3)
Q3 (Medium)	891.5 (54.8)	732.9 (114.2)	1,635.4 (72.1)	824.8 (50.7)	420.9 (65.6)	1,248.6 (55.1)
Q4 (Rich)	733.7 (45.1)	704.2 (109.7)	1,408.0 (62.1)	678.8 (41.8)	404.4 (63.0)	1,075.0 (47.4)
Q5 (Richest)	332.4 (20.4)	603.7 (94.1)	812.7 (35.8)	307.5 (18.9)	346.7 (54.0)	620.6 (27.4)
Total	3,952.3 (243.1)	3,375.5 (526.1)	7,327.7 (323.2)	3,656.4 (224.9)	1,938.5 (302.1)	5,594.8 (246.8)

*Figures in brackets show per capita distribution of benefit of public spending in rupees.

Table 31 shows the distribution of benefits of public health spending at different levels of health care that accrues to different wealth groups. It is observed that public health spending in Karnataka at the primary level is more pro-poor as compared to the secondary or tertiary levels. Table 31 also shows the incidence of the entire expenditure across all the quintile classes. Aggregate expenditure on health in a particular quintile is taken into consideration. To summarize the expenditure pattern further, the benefit incidence of public spending on health can also be illustrated by a concentration curve graph. A concentration curve of government spending plots the cumulative proportions of households, ranked from the poorest to the richest, on the horizontal axis, against the cumulative proportion of benefits received by the household, plotted on the vertical axis. Figure 4 shows the cumulative distribution.

Figure 4. Concentration curve showing incidence of public spending on health in Karnataka



The figure shows three concentration curves (tier-wise and total health care) and benchmarks, the 45 degree line (purple line labeled line of equality). The graph is an illustration of the structure of benefits derived from government spending.

Benefits from public spending are said to be pro-poor if the concentration curve is above the line of equality. This concentration curve is concave rather than convex. This implies that authorities follow policies which target the poorer sections of society. The concentration curve for primary health care is more concave than for secondary/tertiary health care.

The analysis of distribution of public spending on health care shows that Karnataka is more pro-poor at the primary care level which highlights the commitment of authorities to provide affordable health care services to the needy. However, at the secondary or tertiary levels the distribution of public spending on health care is just pro-poor.

The overall benefits of public health spending being pro-poor shows that authorities follow a policy which target poorer sections. As has been the experience, most people belonging to the poorer sections of society access health care services in public health facilities. It makes sense that the benefit of distribution of public spending on health care should accrue to the poor. Considering that most of the people belonging to poor economic strata access health care in public health facilities, it is essential on the part of financing and implementing authorities to invest more in public health facilities so that it benefits economically weaker sections of society.

An empirical exercise based on the data collected from 46 public health facilities in two districts of Karnataka shows that utilization of untied funds under the current norms is low. State-level utilization of untied funds under "NRHM Additionalities" shows that public health care facilities are not motivated/encouraged to spend untied funds. It was estimated that out of the total funds received in the financial year 2009–10, public health facilities were able to spend 60 per cent, and in the year 2010–11 (till December 2010), the utilization was only 39 per cent of total funds received. This is the utilization level of untied funds as per the current norms of funds disbursement in public health facilities.

Untied funds are provided to public health facilities to ensure basic hygiene which includes adequate sanitation facilities, clean environment in the facility, routine wear and tear/ repairs and maintenance, setting the basic requirements to ensure the privacy of patients, and to set an overall friendly and conducive environment in the facility which will indirectly ensure flow of patients to access health care. Hence, effective utilization of untied funds would help a health facility to ensure these basic essentialities and provide scope for innovation and improvement in the functioning of the facility. Behavioral differences in the health seeking behavior of the community by their socio-economic character have profound implication on BIA (Demery, 2000). A study from Vietnam, Bulgaria and Ghana estimated that 74 per cent of individuals in the poorest quintile (55 per cent in the richest quintile) reported an illness which was either self-treated or not treated at a facility. In Bulgaria, the poor were also far more likely to self-medicate than the rich. In Ghana the differences are less striking, but clear nonetheless. In all countries the rich were far more likely to use hospital services than the poor. Likewise, equity

and efficiency in the use of resources and services need not be the same as impact, and does not take into account the quality of care (Mahal et al., 2001).

Analyzing the data of funds allocation and utilization (2009–10, 2010–11) of the sample health facilities, we see that since the commencement of NRHM in 2005, facilities are not able to spend all the untied funds allocated to them. There has always been a gap in the funds received and funds spent in the given year in this category.

Data for the year 2009–10 shows that in Karnataka, state public health facilities were able to spend 60 per cent of the funds allocated to them under the untied funds category for the year, even five years after the initiation of NRHM in the state. This highlights the low absorption capacity of some health facilities to utilize the funds effectively. This affects the well-performing facilities that could benefit from higher budgets to fulfill their demands. The pace of expenditure is such: sadly, set by the poorest performers. The challenge has been to make fund allocation responsive to the actual requirements and absorption patterns. Currently some basic measures of differential allocation of the untied funds have been introduced, along with retaining 15 per cent of the untied funds as a district pool meant for giving more to facilities and requiring more inputs (NRHM 2007–12).

Based on the proposed formula for differential financing and recommendations for reallocation of untied funds, the government is enthusiastic about conducting a pilot study in selected districts of Karnataka. This may provide a realistic view of the effectiveness of policy recommendations and benefits of policy change, provided the pilot study is rolled out and data accessible within a given timeframe.

Sources of financing

Policy option 1: this is the current policy and thus does not require any thinking on source of financing.

Policy option 2: there won't be any substantial additional funds required to implement this since the funds would be provided under the same heads but on a differential basis to the health facilities.

Implementation issues

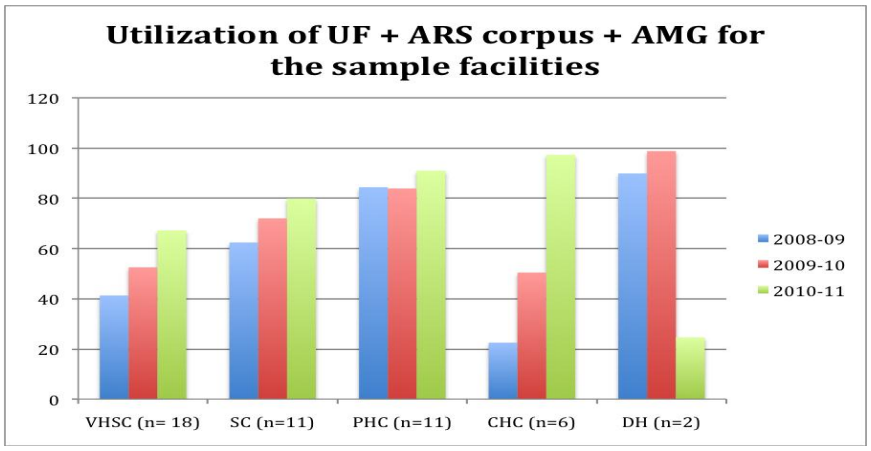
Policy Option 1: The current implementation issues of the study conducted are:

1) Understanding of the use of funds: The study conducted on differential financing showed that there is a low awareness of use of funds among the decision makers. The decision is taken by a committee appointed at each health facility and comprises representatives from the staff, local panchayat, the legislative body, civil society, and officials from the government sector. We interviewed the President and Secretary of each of the health facilities in our sample. The study found that 37 per cent of the interviewed sample at the VHSC level, 82 per cent at the sub-canter level, and 9 per cent at the primary health care level did not have an adequate understanding of their role. Fifty-three per cent also did not have sufficient knowledge of the use of funds allotted. Thus it is crucial to develop the

capacity to use untied funds among the health facility staff and management committee, especially at the lower level of health facilities where the utilization is less.

2) Monitoring detailed expenditure as compared to objective for which the funds was disbursed: The expenditure analysis showed that more than 50 per cent of the funds at the PHC and CHC levels are used in the "not allowed" category specifically mentioned in the guidelines. Thus, regular monitoring and support is required in the current policy to ensure that funds are utilized rationally.
3) Low utilization: The utilization of funds at the sample health facilities are shown in Figure 5.

Figure 5: Percentage Utilization of UF, AMG and ARS Corpus Funds for the Years 2008–09, 2009–10 and 2010–11



We observe that though utilization of funds has improved over the years, it is still a concern at the lower level of health facilities.

Policy Option 2: The policy option of differential financing to health care facilities might raise the following implementation issues:

1) Collection of facility-wise data based on which DF will be given: Currently the data required for differential financing is collected by the state and is well-monitored. Thus there won't be any implementation issue in a short run to collect the required data. But in the case the state stops collecting data for quality monitoring, the data collection for differential financing would be an additional task.
2) Analyzing the indicators and calculating the rate of DF: The software for differential financing needs to be developed and a person dedicated to operate the software should be appointed.
3) Training the staff in use of UF and DF: The current level of knowledge of the role of committee members and use of funds is insufficient. With a different funding formula there would be a greater need to train the health staff.
4) Opposition from local government and politicians: The change in method of financing may create resistance from the local governments and politicians, especially in the areas where allocated funds are low.
5) Grievance response of the facilities as a result of different level of funding: There are also chances of grievance from the facilities that have been allocated less funding. They might

use it as a reason for poor performance. Thus the state has to prepare itself for responses to such grievances.

6) Monitoring detailed expenditure as compared to objective for which the funds were disbursed: As mentioned, the experience of implementing the current policy of funding health facilities shows that PHCs and CHCs spent more than 50 per cent of funds on the "not allowed" category specifically mentioned in the guidelines. Implementing policy option 2 will also require close monitoring of the expenditure from the untied funds.

CONCLUSION AND DISCUSSION

This policy simulation exercise shows that the alternative policy option (per capita norms based differential financing) needs only half the amount of funds to be distributed under the current funding. Thus there is scope to increase the per capita allocation to almost double of the current level of funding (uniform financing). Redistribution through differential financing will also raise the chances of full utilization of funds as per needs. This will result in higher efficiency in public health facilities. It will also be a motivating factor for performing facilities, and a de-motivating factor for poor performing health facilities. Thus, implementing the alternative policy can provide the state an option to use the remaining funds efficiently. The current policy option is equitable when we take the health facility as a unit, but policy option 2 seems to be more equitable when we take population served by the health facility as a unit. Implementing the current policy leads to concentrating more funds on the health facility which serves a lower population. Redistribution of the funds as per population served will result in greater benefit incidence. The simulation exercise also resulted in listing probable issues that might arise out of implementing differential financing. Choosing differential financing may result in an uproar among the health facility staff and politicians, but it will also help change thinking from budget based funding to performance based funding in the public health system. We conclude that the state government should try out scenario 2 of policy option 2 on differential financing in a few districts and assess the impact.

NEXT STEPS

It is suggested that the following steps be implemented by the state in order to rationalize flexible financing under NRHM:

- Revise and improve the guidelines for implementation.
- Re-train the staff and committee members on the use of flexible financing, guidelines and differential financing.
- Strengthen the management information system (MIS) to prepare implementation of differential financing.
- Develop software to assess the level of funds to be allocated to each health center.
- Select the pilot districts for implementation.
- Recruit supervisors to support health facilities.
- Concurrent evaluation of the implementation.
- Finalize the formula of differential financing based on experience.

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