# Health Expenditures on the Elderly in Three Indian States: A National Health Accounts Approach

**DRAFT**

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## Introduction

In this report, we describe the methods used to arrive at estimates of health spending on the elderly in three Indian states: Andhra Pradesh, Karnataka and Punjab.

The health expenditure estimates for the three states noted above were constructed using a National Health Accounts (NHA) approach (World Health Organization (WHO) 2003), and applied specifically to understanding expenditure flows associated with the elderly. The elderly are defined, for the purposes of this paper, as the population group aged 60 years and above.

Financial flows under the NHA methodology are viewed as occurring across primarily three sets of agents and/or categories – from ultimate sources of funds to financial intermediaries and from financial intermediaries to the uses to which funds are put. These uses can be classified in a number of ways – by type of provider (government, private, non-profit, say); or by functional classification (inpatient care, outpatient care, collective goods, direction and administration), and there are other ways to cut the data as well.[1] Thus financial flows associated with health care spending can be viewed from several different perspectives (WHO 2003). Because the principal focus of the paper is to assess the aggregate and the main components of health care spending on the elderly and to avoid any double-counting, we limit ourselves to describing financial flows of only three types: (a) From sources of funds to financial intermediaries; (b) from financial intermediaries to providers of care; and (c) from financial intermediaries to the purpose of care (or functions). Given that there are several sources of funds, multiple financial intermediaries and a number of different providers/functions in a country, these flows are best presented in the form of three matrices, each corresponding to a different cut on the financial flows related to health (WHO 2003).

A key step in trying to estimate financial flows linked to health is to start by specifying the meaning of *expenditures on health*. In fact, the precise definition of the latter is often a matter of preference. For the purposes of this paper we define health expenditures to include spending on care and treatment associated with illnesses, on administrative expenses associated with such treatment, spending on public health programs (such as tuberculosis,

[1]Uses of funds can also be explored in terms of amounts spent on wages and salaries, new equipment, depreciation allowances and drugs, although we do not look at these categories in this appendix.

malaria, blindness), on medical research and training, immunization programs and selected components of programs associated with maternal and child health.[2] Adopting a convention standard in the literature, we do not include, however, expenditures for nutrition, clean water and sanitation programs in our analysis. Note, of course, that it can be quite plausibly argued that the omitted categories of expenditures have implications for health, and some studies of health spending have, in fact, included such expenditure flows (Reddy and Selvaraju 1994).

Given the above working definition of health expenditures that we plan to use, who are the players (or, agents) that spend money on health? From the perspective of the *ultimate* sources of funds, this group includes the government, households (because of their out-of-pocket spending and contribution to insurance premiums), non-governmental non-profit entities (NGOs), firms (whether in the public or the private sector), and international institutions. This classification offers a good starting point for describing the flows of health funds through the system as well, i.e., we shall work with the following categories of ultimate sources of funds:

- The Government
- Households
- Firms
- Non-governmental organizations
- International agencies
- Others (such as surpluses of certain organizations that fall outside the above categories)

As we shall see, many of these agencies also serve as "financial intermediaries" as funds move from ultimate sources to ultimate uses.

## I. Government Health Expenditures

For the purposes of analysis we divided the government into three types – (a) the central government, that is, the Government of India; (b) the government of a province, that is, the

[2]Of course, not all of these expenditures pertain to the elderly – for instance, expenditures on child nutrition and immunization, or for pregnant women.

state governments; and (c) local governments, such as municipalities (and municipal corporations) in urban areas and Panchayats in rural areas.

All three sets of governments incur health expenditures as ultimate sources of funds.

*I.1. Central government*

Its health expenditures occur in five main ways:

(a) Through the Ministry of Health and Family Welfare and other central ministries and departments (such as the Department of Science and Technology) that spend on institutions for medical education and research that are deemed to be of national importance – for instance, All India Institute of Medical Sciences (New Delhi), the Post Graduate Institute for Medical Education and Research (Chandigarh), and the National Institute of Mental Health and Neurosciences (NIMHANS) (Bangalore);
(b) Expenditures in Union Territories (areas under its direct administrative control) on inpatient and ambulatory care in public facilities, reproductive health programs, and Indian systems of medicine;
(c) Support for state health departments in the form of "centrally sponsored" schemes under categories of Indian systems of medicine, reproductive health, and disease prevention. Many (but by no means all) of the centrally sponsored schemes in question are funded, at least partially, by international agencies;
(d) Expenditures by central government on its employees: in the form of subsidies to the Central Government Health Scheme (CGHS) that serves as social insurance program for central government employees; and in the form of financial support to current and former employees for accessing expensive medical procedures in the private/public sector whether through CGHS (for retired employees) and reimbursement of medical expenditures via the mechanism of individual ministries;
(e) Expenditures by other agencies of the central government (such as the armed forces, the railways and paramilitary forces) on health – both in the form expenses of operating health care facilities that they possess, as well as through subsidization of care received by their employees, or retired personnel, in private facilities.

The central government also transfers funds to state government treasuries in the form of shares in receipts from income taxes, customs and excise duties and grants, under guidelines established by the Finance Commission of India, a statutory body formed under the Indian Constitution. A portion of the funds transferred under Finance Commission guidelines from the center to the states is used by the latter to finance health spending. Moreover, because of the constitutional right of the state governments to funds devolved under the recommendations of the Finance Commission, the state government is designated to be the ultimate financing source for any health expenditures supported by such funds.

Given our interest is limited to estimating health expenditures in three states – Andhra Pradesh, Karnataka and Punjab – it is obvious that only expenditures by the central government relevant to the specific states ought to be included. That is, relevant portions of defense, railways and paramilitary spending, employees of the central government located in the specific states, appropriate portions of centrally sponsored schemes and any reproductive health expenditures and medical education/research funded by the central ministry of health and family welfare that can be attributed to the specific states we are concerned with.

Information on components (a), (b) and portions of (c) is available from Ministry (and Department) of Health and Family Welfare documents at the central and state levels. The remaining information from (c) and the categories through (e) is typically obtained from individual central ministries and is not always easily accessed. In this paper, we estimate these latter set of expenditures by methods to be outlined below.

*I.2. State Government*

State government expenditures occur in the following ways:

(a) Through the state department of health and family welfare (or, a similar sounding name!). The department funds government operated hospitals, primary centers and sub-centers not covered under the family welfare program. It also funds some portion of activities included under the family welfare (reproductive health) program and under public health.
(b) Contributions made by the state government to the social insurance scheme known as the Employees' State Insurance Scheme (ESIS) established for employees earning

less than a pre-specified amount in firms, public or private, that are above a certain size (see Mahal 2002, for instance). The exact details about who is eligible (or not) and the nature of the contribution scheme can be found in the Employees State Insurance Act and Rules of the Government of India. The state department of health and family welfare also provides information (in its budget) on the contribution of the state government, which typically takes the form of covering wages and salaries for medical personnel working in ESIS facilities. Under ESIS rules, the government is responsible for all health expenditures of ESIS beneficiaries, once the per-capita cost of the ESIS scheme exceeds a certain amount.

(c) Amounts spent by different state government departments on their employees (current and retired) for inpatient care obtained in private, or autonomous, facilities.

(d) Amounts spent by specific state government departments through subsidized care provided at their own department-specific (excluding the Department of Health) facilities – such as the police department that has its own health facilities (police hospitals).

The state government also transfers funds to local governments under provisions of the Indian Constitution emphasizing decentralization of health-related activities, or when state governments act as a collection agency for taxes/revenues that are ascribed to local governments under the Constitution. Health expenditures out of these funds are treated as ultimately being financed by local governments – and not the central or the relevant state government.

As to (a) and (b), information is readily available from state government budget documents. Information for (c) and (d) is not readily available and requires estimation by other means as indicated below.

*I.3. Local Governments*

Local governments belong to two categories, depending on whether they relate to urban settings (Municipal Council, or Corporation), or rural areas (Panchayats). In principle, both sets of governments can raise funds on their own, in addition to benefiting from transfers from the state government. In practice, urban communities have access to superior sources of revenue than rural bodies. Most of the health-related activities of municipalities and municipal corporations are confined to that of public health, sometimes in conjunction with

the operation of a small set of primary care centers. Only large municipal corporations are in any position to operate large hospitals (for example, the Bombay Municipal Corporation). Information on the health-related expenditure of urban local bodies is typically obtained from Statistical Abstracts of the states where they are located.

By any reckoning (Karnataka being an exception), the primary activity of rural local governments does not include the provision of health care; some do help out with centrally sponsored government public health programs, mostly in a voluntary capacity, but the data available are limited in terms of enabling quantification of such participation.

*I.4. Estimation methods for Government Expenditure Flows:*

We proceeded in two steps. First we estimated the total financial flows associated with the government, irrespective of the age of the individual for whom such expenditures were incurred. As a second step we broke the expenditures down by age in two groups – for people aged below 60 years; and for those aged 60 years and above.

I.4.a Central Government and State Government

Government budget documents at the center and the states typically report *actual* expenditures with a 2-year lag. Our concern was with estimating actual financial flows on health for the year 1995-96, since the most recent household survey data on health expenditures are also available for that year (National Sample Survey Organization (NSSO) 1998). Thus we obtained government budget documents for the fiscal year 1997-98 in order to get to the actual spending numbers for 1995-96. We were also able to access previous work on state government expenditure flows for 1995-96 undertaken by the National Institute for Public Finance and Policy (Selvaraju 2000).

Consider first the expenditures incurred by the central government's ministry of health and family welfare under categories 1.1(a) and 1.1(b) above that could be considered as allocable to the specific states in which we are interested – Andhra Pradesh, Karnataka and Punjab. Because 1.1(b) refers to Union Territories that are administrative entities separate from states, expenditure flows associated with these entities were irrelevant for our purposes. As to institutions of national importance for medical research and education funded directly by the

central government, we adopted the following procedure. For purely research/training institutions the amount spent was classified as research, or training, as appropriate, and allocated to each state/region according to its share in total population. The rationale for doing so was that research (in particular) has substantial "externalities", with benefits that accrue to the country as a whole, and not just to the population of the state where the specific institution is located. For institutions that were deemed as providing significant levels of health care as well, we allocated half to research/training (allocated along the principles as above) and the other half to supporting care in the region where they were located. This was relevant in our analysis for PGI, based in Chandigarh that also likely serves the populations of Haryana, Himachal Pradesh and Punjab; and for NIMHANS, based in Bangalore, which we assumed to be serving the health care needs of the populations of Southern Indian states (Kerala, Karnataka, Tamil Nadu and Andhra Pradesh), in addition to its research and training activities. For want of any specific criteria, these latter expenditures were broken across the states in the region on the basis the population in each.

For obtaining estimates of expenditures under centrally sponsored schemes (category 1.1(c)) and for estimating state government expenditures under categories 1.2(a) and 1.2(b), we used state-level budget data from the Demand for Grants for corresponding states.[3] For relevant sections of 1.1(d) and 1.1(e), and 1.2(c), we relied on a mix of budget data and estimation methods to be described below. We ignored 1.2(d) owing to a lack of any reliable information in this category.

I.4.b Local Governments

Data on health-related spending and revenues of urban local bodies is relatively easily obtained, from state statistical abstracts, from departments of urban development in individual states, and from state departments of health and family welfare documents related to demand for grants (in some states).

Information on the revenues and expenditures of rural local bodies are much more difficult to obtain, although, any health spending that is undertaken by them using their own independent

[3]This information can be obtained from the departments of finance of the respective states, or from the library of the National Institute of Public Finance and Policy (NIPFP), located in New Delhi, which is repository of government budgetary information.

revenue sources is rather small in magnitude (e.g., the World Bank 1995). Funding of health activities supported by the state government (as noted above) is obtained from state government budget documents.

**Health Expenditures by Financial Intermediary and Source of Funds**

We proceed by expenditures allocated to type of intermediary, accompanied by a discussion of the way the expenditures were financed.

Central, State and Local Government Spending on Health: Source of Funds

*(a) Support for Expenditures of State Departments of Health and Family Welfare*

**Table A.1** provides information spending on health by the state departments of health and family welfare in the three states – Andhra Pradesh, Karnataka and Punjab. As can be seen, we categorized these expenditures into the following nine (9) categories:

(a) Hospitals
(b) Primary health centers
(c) Sub-centers
(d) Direction and Administration for Medical and Public Health
(e) ESIS
(f) Medical Education and Research
(g) Training
(h) Public Health
(i) Reproductive Health

As a preliminary step, the Direction and Administration category was allocated to individual sub-heads under *Medical and Public Health* in proportion to the amounts spent under each sub-head, except when the amount was already shown under the specific sub-head in the demand for grants data. Amounts spent on Public Health (disease prevention) and School Health Schemes were lumped under Public Health. The expenditure on "medical education and research" was re-classified as follows. Amounts spent on medical colleges were classified fully as training. Of the remainder – medical education/research – *half* was treated

as research and *half* allocated to hospital-based medical care, given that the research budget also includes the financing of operational and capital budgets of large teaching hospitals. The situation after these re-classifications is indicated in **Table A.2**.

To obtain information on how these expenditures were financed we relied first on data from the demand for grants of individual states. These data reveal that during 1995-96, medical expenditures were financed by state governments from their own revenue sources.[4]

Financing for expenditures in the public health and reproductive health categories – much of which includes centrally sponsored national disease control programs –is a mix of international, central and state government financing. The exact financing proportions for public health – between central, state and international – were obtained from demand for grants documents for the concerned states.

For the reproductive health program, state demand for grant documents helped classify expenditures into state funding and non-state funding (international or central government). Information from the annual report of the Ministry of Health and Family Welfare at the level of the central government was used to further disentangle the non-state financed component into that funded purely by the central government and that by international agencies. We used the Garg (2001) formula that suggested roughly 27 percent of central government reproductive health expenditures as being supported by international donors. The formula is based on donor funds data provided in the Annual Reports of the Ministry of Health and Family Welfare. Clearly, one can do better by obtaining financing information separately for each state. We plan to do so in future revisions of this paper.

**Table A.3** summarizes the information on financing (by source and sub-heads) for the three states that are the subject of our study.

*(c) Spending by the State Government not accounted for the State Departments of Health and Family Welfare*

[4]In later years, international donor funding (World Bank's State Health Systems projects) has provided significant support to expenditures in the Medical category (for instance, World Bank 1997). This, however, was not the situation in fiscal year 1995-96.

There are two categories of spending by state departments that lie outside the data collection ambit of the state departments of heath and family welfare as indicated in 1.2(c)-(d) above. These include amounts spent by different state government departments on their employees (current and retired) for inpatient care obtained in private, or autonomous, facilities. They also include amounts spent by specific state government departments through subsidized care provided at their own department-specific (excluding the Department of Health) facilities – such as the police department that has its own health facilities (police hospitals).

We do not include expenditures in these categories in our analysis, primarily because no data relating to them was readily available for 1995-96. The downward bias in state government expenditures produced by this omission is unlikely to be large, however, because even though these expenditures (mainly in the form of reimbursements to state government employees, current or retired) have reached fairly significant levels in recent years, this was unlikely to have been the case in 1995-96. Many of the entitlements under which these reimbursements have typically been paid out appear to be of fairly recent origin.[5]

Note also that health expenditures incurred by public sector undertakings under the control of the state government have been captured elsewhere – as expenditures by public sector firms in the organized sector (see below).

*(d) Spending by the Central Government*

This section discusses the financing of central government expenditures, specific to Andhra Pradesh, Karnataka and Punjab, but not captured by the expenditures reported in state budget documents. These fall into several categories.

First, there are central government expenditures on institutions of "national importance" and these were taken as having been funded by the (central) government from its own revenues. Second, the central government subsidizes the participation of its current and former employees and their dependants in the social insurance program known as the Central Government Health Scheme (CGHS). Specifically, CGHS expenditures help finance dispensaries that provide ambulatory care services to CGHS card-holders; and to reimburse a

[5]Communication with Dr. C.K. George, Director, Institute for Health Systems, Hyderabad.

(large) portion of any expenditures incurred on treatment received at facilities *other than dispensaries* for those CGHS card-holders who are *retired* from service. Garg (1999) estimates that only about 15 percent of CGHS expenditures are financed from employee contributions, whereas the rest is essentially central government subsidies. In the NHA framework, the former is treated as *household contributions*. This is also the formulation we adopt in describing the financing of expenditures under CGHS. **Table A.4** presents a summary.

Our calculations do require a few cautionary remarks, however, especially when age-specific analysis is carried out. For instance, while it is reasonable to assume that 15 percent of all CGHS spending is supported by individual contributions, it is not obvious that a similar argument is valid for CGHS expenditures confined to the elderly (retired employees, or dependents of current employees). That is, the *contributions of the elderly to CGHS* are probably much less than 15 percent of the CGHS spending devoted specifically to them. Because, this raises an essentially distributional issue between individuals (between younger and older beneficiaries), and the source of funding counts as household spending under standard health accounts classification, irrespective of which age-group paid for it, we merely note the problem here but do not impute a value to elderly contributions to their own spending.

Note also that because CGHS support for care received at outside facilities takes the form of reimbursements for expenditures previously incurred by households, any calculation of "out of pocket" spending on health by households in an NHA framework must simultaneously deduct such reimbursements from health expenditures reported by households in the national sample survey (NSS) of 1995-96. To be sure, household survey data do report financing sources and reimbursements for illnesses occurring during the reference period. However, we believe these amounts to be underestimates of the true amount of reimbursements. This is not surprising, since anecdotal evidence suggests that reimbursements occur with a substantial lag – so that survey methodology based on a "reference period" framework fails to fully capture them, even if health expenditures are reported accurately for the reference period.

Third, the central government also spends on the health care of its current employees (and their dependants) outside the CGHS mechanism. This spending takes the form of

reimbursements for expenditures on care received from non-government facilities, based on referrals by doctors at public facilities. Amounts spent in this manner are not reported by CGHS, but instead enter as establishment expenses in the accounts of individual ministries and departments to which the employees belong.[6] This data is not readily accessible, and had to be estimated. All of the expenditure in this last category was assumed financed by the central government.

The method of estimation for this third set of expenditures relied on estimating the total *potential beneficiaries* by age, and multiplying the resulting number(s) by the corresponding estimates of government funded health expenditures per potential beneficiary.[7] To do this, we first obtained data on the number of central government employees from Government of India (2001) and in the respective states from a census of central government employees as of March 31, 1995. The state-wise breakdown of these employees for 1996 was obtained by using estimates of the total number of central government employees in 1996 from the Economic Survey 2002-3 (Government of India 2002a). This process, naturally, assumed that the state-wise distribution of employees for 1996 remained the same as in 1995, the year for which we did have state-level data.

Because these state-wise census estimates also included the employees of the Ministry of Railways (a group of central government employees that we sought to consider separately), we deducted the estimated number of Railway employees in each state from the aggregate in that state, to obtain the state-wise distribution of central government employees, excluding railway employees.[8] The total number of employees in the Railways, in turn, was obtained from the census of central government employees cited above (plus further updating from the website of the Indian Railways). Because state-wise estimates of Railways employees were unavailable, we estimated their distribution across individual states on the basis of length of the railway track located in that state as a proportion of total track length in India.

Having obtained the total number of employees of the central government working outside the Railways (and their state-wise distribution), we proceeded to estimate the total number of

[6]Communication with Mr. KP Gerald, Central Government Health Scheme (Finance Officer), Ministry of Health and Family Welfare, Nirman Bhavan, New Delhi.

[7]By "potential" beneficiaries, we mean all who are entitled to the subsidy, irrespective of whether or not they actually fall sick and benefit from reimbursement.

[8]These estimates do not include members of the armed forces, who are considered separately. They do, however, include the civilian employees of the Ministry of Defense.

*potential beneficiaries* of health benefits offered by the government. This number is different from that of current employees because it also includes dependents (elderly or young). Retired central government employees were not included in the list of potential beneficiaries because their expenditures were assumed to fall under CGHS (for those holding CGHS cards), or covered from own resources.[9] The total number of beneficiaries and their dependents (by age) was estimated as follows. Because the states that are the subject of the study were not substantially different from each other and the national average in this regard, we used National Sample Survey data on household composition to estimate that on average, an Indian household consisted of 4.96 members (of whom 4.68 were less than 60 years of age). On the further assumption that each central government employee mapped one-to-one into a single household, we arrived at the total number of beneficiaries represented by a single employee, by age—that is, whether elderly or not.

The final step was to estimate, on a per-potential beneficiary basis, the amount spent on beneficiary health care by the central government (amounts not reflected in CGHS expenditures). Because such information is not readily available from individual ministries that actually maintain the data, we carried out the estimation as follows: the per capita reimbursement received from the government for care at sources other than CGHS dispensaries (on a per beneficiary basis) received by elderly dependents of current employees was assumed to be the product of two numbers – per capita hospital stays as reported in the NSS household survey and the average reimbursement amount reported by those that reporting being reimbursed by the government for their care.[10] A similar calculation for employees aged less than 60 years and their (under-60) dependants yielded an estimate of Rupees 75 per capita (compared to Rupees 139 per person for people aged 60 years and above).

As might be obvious, the key underlying assumptions in the calculations of the previous paragraph are first that the reimbursements reported in the NSS survey were the full amount due, under whatever rule, to the concerned person reporting it in the survey (even if reimbursements were delayed for other individuals, so as to fall outside the reference period).

[9]The retired group also has the option of receiving a monthly medical allowance should they reside in locations that are far from CGHS facilities (communication with KP Gerald, Ministry of Health and Family Welfare, India).

[10]This yielded an amount of Rupees 139 per elderly dependant, not too different from the average of Rupees 225 of retired CGHS cardholders and their dependants.

Second, the hospitalization rate for potential beneficiaries is assumed to be the same as the general population in both age groups, taken separately. How reasonable are these assumptions? One can imagine that smaller amounts are reimbursed more quickly than larger ones. If so our calculations would tend to underestimate the amounts spent by the government. This is suggested by our calculations where the per capita amount reimbursed to an elderly dependant of an employee comes out to Rupees 139, compared to CGHS per capita elderly reimbursement of Rupees 225. However, one could also plausibly argue that elderly dependants of employees are much less likely to be able to benefit from government reimbursement schemes than retired employees (CGHS card-holders) who know the government system well and also benefit from a well organized CGHS payment mechanism. Thus, we stick to our Rupees 139 estimate, although further work on this issue is obviously needed. A second bias could stem from the fact that hospitalization rates between beneficiaries of government resources and those who do not have such financial access may be different. Our assumption of similar rates of hospitalization across the two groups thus, may have resulted in an underestimation of the per capita hospitalization stays among potential beneficiaries of government financial support, and hence in per capita reimbursements provided by the government. It is not clear how large this bias is. Previous studies for India have suggested an income and price elasticity of almost zero when it comes to hospitalization (Duraisamy 2001; Gupta and Dasgupta 2002).[11] While further exploration would obviously be useful, if these findings are valid, the bias may be within acceptable bounds.

Railways and Defense

Two key central ministries whose expenditures have thus far not been accounted for are the Ministry of Defense (excluding civilian personnel who are counted as central government employees) and the Ministry of Railways. Both have significant health budgets for their personnel and ministry-owned facilities that provide care outside the channels of CGHS and, until recently, had limited reimbursement mechanisms for care received outside their facilities.[12] In the next two sub-sections we describe the methods used to assess health expenditures by the two ministries.

[11]Note that it is the decision to be hospitalized that is the issue here, not the number of hospital days spent. The latter may have a significant elasticity with respect to income and price, although no studies for India exist.
[12]Communication with Dr. C.K. George, director of the Institute of Health Systems, Hyderabad.

*Railways*

Estimates of total spending on health by Ministry of Railways in India were obtained from the demand for grants of the Ministry's budget for fiscal year 1998-1999, which were then used to estimate the expenditures for 1995-96. Government expenditure data on this subject is typically extremely difficult to access and in future versions of this paper we expect to be able to obtain and use the actual expenditures by the Ministry of Railways for 1995-96.

In the demand for grants, expenditures on health are reported under two main heads: (a) Medical; and (b) Health and Welfare. Of the total expenditures of Rupees 4996 million in 1998-99 under these two heads, about 70 percent was allocated to the Medical head, the remainder to health and welfare.

In order to obtain estimates for 1995-96 we carried out two adjustments to the data. First we used the All India wholesale price index for commodities to express the expenditures under the two heads for 1998-99 in 1995-96 prices.[13] However, looking at trends in spending over time in India, it is quite obvious that real spending on health has also increased. Thus, we further adjusted the estimated health spending for 1998-99 by a measure of the estimated real rate of growth of health spending between 1995-96 and 1998-99.[14] These two steps yielded our estimate of spending by the Railways at 1995-96 prices.

All of this spending was assumed financed by the central government for the purpose of National Health Accounts, since the Railways do not require their employees to contribute to the financing of these services. Finally, the expenditures were allocated to different states in proportion of the number of employees in each state, which in turn was based on the share of total railway track length in each state to the national aggregate.

*Defense*

Obtaining data about health expenditures in the Ministry of Defense is even more complicated than in the Ministry of Railways, because Ministry of Defense budgets do not

[13]In future revisions, we plan to use the price index for medical goods and services to make the adjustment.
[14]We used the real rate of growth government health spending in Andhra Pradesh, for which a long time series of real health expenditures was available (Mahal, Narayana and Rao 2003).

report detailed breakdown of spending under different heads. We were, however, able to obtain a figure for the health-related expenditures of the Ministry of Defense for fiscal year 2002-3, of Rupees 14,000 million.[15]

The preceding expenditure data was used to derive an estimate for health expenditures of the Ministry of Defense for its non-civilian personnel in 1995-96, using methods similar to that for the Ministry of Railways (see above). This estimate so derived was broken down by state, on the assumption that the state-wise distribution of armed forces and retired personnel and their dependants drives the distribution of health expenditures of the ministry of defense. To arrive at the state-wise distribution of army personnel a statistic not readily available, we assumed that the number located in any given state was proportional to the total population of that state.[16] This procedure for allocating serving personnel to individual states does not work for allocating retiring personnel since recruitment may be disproportionately high from some states, as for example, from Punjab. As a consequence, post-retirement residence may be different from where one was located during service. To take this into account, we obtained data on retired personnel and widowed individuals located in each state from the official website of the Indian Ministry of Defense (http://www.mod.nic.in).

There was another complication, however. Unlike in most government and private sector jobs, retirement in the armed forces in India occurs at an age that is typically below 60 years – an average of 40 years for soldiers (ranks) and about 54 years for officers (http://www.mod.nic.in). This meant that a straightforward equivalence between the number of retired and the number of elderly employees was not possible, requiring the estimation of the number of retired personnel and/or widows aged 60 years and over.

The process by which the number of retired and/or widowed individuals aged 60 years and above was arrived at was the following: Ministry of defense statistics suggest that roughly about 53 thousand ranks (soldiers) and two thousand officers retire each year in India. Using Life Tables for India from the World Health Organization[17] we estimated the mean number of

[15]Communication with Dr. C.K. George of the Institute of Health Systems, Hyderabad.
[16]One could use the principle that the armed forces are distributed on the basis of the share of each state in total length of the land borders, but this would be inaccurate when one considers the fact that significant reserves are located in regions that are far away from the borders. Moreover, one needs to also account for the proper distribution of naval and air force personnel (as against the army) and for whom land borders need not be relevant. Hence we used the population criterion in our calculations.
[17]http://www3.who.ch/whosis/life_tables/life_tables_process.cfm.

years individuals aged 40 years and 54 years would further live, in India. This information was used to arrive at the number of retired armed forces personnel aged 60 years and above, assuming a constant annual retirement rate at the level given by the Ministry of Defense.[18] This last assumption that requires the numbers in the armed forces having reached some "steady state" level appears reasonable, since there has been little suggestion of a sharp upward lift (or a decline) in the size of the Indian armed forces in the last two decades or so. We also assumed that the average age of a new widow in the army was 45 years, and using the life table method above and information on the number of army widows currently alive, arrived at the average annual number of new widows (in steady state) needed to ensure consistency with the total number of widows currently alive. The life table method was used to estimate the total number of widows above the age of 60 years.[19]

Having obtain the total number of armed forces personnel in active service, the number of personnel/widows who were retired but below the age of 60 years, and the total number of retired personnel above the age of 60 years (**see Table A.5**), we proceeded to estimate the total number of potential beneficiaries of services (or, people entitled to health care provided by armed forces health facilities). The assumptions were respectively: (a) each serving/retired personnel, or a widow, maps one-for-one into a single household; (b) all members of the household are dependents of the serving/retired personnel or widow; (c) the number of dependents of individuals aged 60 years and above is zero; (d) the number of 60 years-plus dependents of per serving personnel and/or retired personnel is 0.28; and (d) the number of dependents aged less than 60 years per serving personnel and/or retired personnel is 3.68.[20]

Assumptions (d) and (e) are based on the results on household composition of the National Sample Survey; whereas assumption (c) assumes that an elderly retiree has no dependent, just as in the case of central government employees. On the one hand, this approach results in a downward bias in the number of beneficiaries of armed forces medical services; but there is

[18]Of course by assuming that military- and non-military personnel of similar ages have an identical life expectancy this procedure could underestimate the number of military personnel over 60 years of age, given that this group is likely to be physically more fit than others.
[19]Incidentally, our assumptions led to an estimate of the total number of retired armed forces personnel (whether aged above 60 years or not) and army widows, that was close to independent estimates available for the state of Punjab from its Government website.
[20]These are based on the numbers for the "average" NSS household.

also a bias in the other direction if there are more than one armed forces personnel living in the same household.

Having obtained the number of serving and retired personnel living in each state and their dependents (i.e., the total number of potential beneficiaries), we assumed that the health care spending of the armed forces was distributed across states in the same way as the potential beneficiaries.

Although not crucial for the discussion of financial flows from the sources of finances to their uses, it is nonetheless worth stating another assumption used by us. In the absence of any additional information, we assumed that the total health care spending was distributed between medical head and the health and welfare head in the same proportion as for the Ministry of Railways and further that it was the same for each state.

Health Spending by Public and Private Enterprises

In general, there is very little data available on the amounts firms in the organized sector spend on health care in India. There is only one large enough study, of one hundred firms, (Duggal 1993; Garg 2001) that can allow any conclusions in this regard.

Specifically, available data suggest that firms support health expenditures of their employees in four different ways:

- As full and partial reimbursements by employers for health expenditures incurred by employees
- As employer contributions to insurance schemes, say those offered by the General Insurance Corporation of India
- By way of free (or subsidized) care at firm-owned facilities; and
- Grants (or lump sum advance payments) against health spending.

Moreover, the Duggal (1993) study cited above also provides two other crucial bits of information: the proportion of employees in the sample of public and private sector firms, respectively, who were covered by a specific scheme; and the amount that public and private

firms, respectively, spent on covered employees, by type of scheme in 1993. Table **(A.6)**, provides this key bit of information.

In order to use the data from the Table for the purposes of our analysis, we proceeded as follows. First, using the wholesale price index for commodities, we adjusted the per employee expenditures of covered employees under each scheme to be expressed in 1995-96 prices. Second, we obtained the total number of employees in the organized sector, public and private separately. The data on public and private sector employment in the organized sector was obtained from the statistical appendix tables in the Economic Survey 2002-3 published by the Ministry of Finance of the Government of India (Government of India 2003). These employment data were multiplied by their corresponding proportions in **Table A.6** to obtain the total number of covered employees, by type of coverage. Finally, the number of covered employees under each scheme was multiplied by the expenditure per covered employee under that scheme (at 1995-96 prices) to obtain the total spent in each category (or scheme) by public and private, firms respectively.

There remains the final issue of allocating the expenditures by firms to the three different states – Andhra Pradesh, Karnataka and Punjab. While we were able to obtain the number of employed in the organized public and private sectors in each state from Government of India (2002b), given the limited nature of firm data on health expenditures, we assumed that the "all India" pattern on health expenditures reported by firms also applied to the individual states. Thus, any differences in health spending are to be attributed wholly to the number of employees in each state and not to differences in firms' policy, either with regard to the proportion of employees covered, or the amount spent per employee. This is obviously a gap, and an important area for future work and analysis. **Table A.7** reports the amounts spent, state-wise and by type of scheme, for public and private firms respectively.

A final set of issues needs addressing: who are the *financial intermediaries* to whom the funds expended by the source of funds (enterprises, whether public or private) are accruing. In keeping with the standard convention on the subject in the national health accounts literature, we allocate reimbursements and lump sum payments to households, group insurance contributions to private insurance companies (as premiums), and expenditures on self-operated health facilities to the firms themselves. Understanding the direction of flows is

crucial if one is to make sense of national health accounts matrices that are presented at the end of this section.

Health Spending Flows to Private Insurance

The previous sub-section pointed to one source of revenue for companies providing voluntarily purchased insurance packages: public and private firms purchasing such packages on behalf of their employees. Another source, obviously, is households directly purchasing insurance in their individual capacity – that is, households as the ultimate source of funds and insurance companies are the financial intermediaries. In India in 1995-96 there was only one lead insurance agency – the public sector controlled General Insurance Corporation, whose four subsidiaries were in operation in different geographic regions of India.

Unfortunately, premium data available in GIC annual reports does not permit a straightforward breakdown into contributions by firms and contributions by households, or premium contributions by state. Information from individual companies under GIC would be more useful at least in terms of identifying the geographic sources of premiums, but this proved to be difficult to obtain.[21] The information from household surveys proved not to be very useful in this regard, because it did not make any distinction between private insurance and social insurance schemes. Thus the amount contributed by households to insurance premiums and its geographical distribution had to be estimated using indirect methods.

We estimated household premium contributions to insurance companies to be the difference between the premium revenues reported by insurance companies and employer contributions to group insurance reported in the previous sub-section. Because we did not have premium revenue data for individual states, that too had to be estimated. On the assumption that employment in the organized sector (and hence income) were likely to be a driving force in the demand for voluntarily purchased insurance, the individual states' shares in aggregate premium revenues were assumed to be the same as their share in total organized sector employment.

[21]Premium data by geographic region, when it becomes available, would obviously help sharpen the estimates of this section.

**Table A.8** provides estimates of the revenues from premiums received by the insurance companies in each state in 1995-96 derived on the basis of the rule of the previous paragraph, the contributions of firms to group insurance schemes and the (residual) contribution of households to insurance premiums for voluntary insurance.

In the language of national health accounts then, there are three main sources of funds for private insurance (public firms, private firms and households). This fact is reflected in the matrix tables.

Employees State Insurance Scheme (ESIS)

Employees State Insurance Scheme is a social insurance scheme set up for employees in the organized sector earning less than a designated wage (see, for example, Mahal 2002; Garg 2001).

Under the ESI (Employees' State Insurance) Act of 1948, "non-seasonal factories using power and employing ten or more persons, and non-power using non-seasonal factories and establishments employing twenty or more persons" are required to be enrolled in this scheme. However, if an establishment provides equal or better social security to its employees, then it can be exempted from the ESIS. ESIS provides a variety of social security benefits to workers and their families including medical care, cash benefits for foregone wages, sickness and disability benefits, maternity benefit, disablement benefit etc. Our concern in this analysis is with expenditures associated with health only.

Medical benefits under the ESIS are provided to workers and their families. Retired workers can also obtain medical benefits for a nominal enrollment fee. For this purpose ESIS has a number of dedicated hospitals, dispensaries and diagnostic centers. Designated private health care establishments in certain areas also provide outpatient health care under this scheme.

Financing of ESIS expenditures is from three main sources. First, there is the state government that picks up 12.5 percent of medical care expenses of ESIS up until a certain limit (of expenditure per enrollee) is reached. Typically, this contribution takes the form of wage and salary support for medical personnel in ESIS facilities, along with administrative expenses. Any expenditure above that limit is fully subsidized by the state government. The expenditure is supported by the statutory contributions (premiums) of employers and the

employees in the organized sector to ESIS. There is a fourth source as well: To the extent that ESIC (Employees' State Insurance Corporation) expenditures exceed premium revenues, the residual portion is supported by an ESIC operating surplus.

The actual shares of the four sources of funding outlined in the previous paragraph were estimated as follows. First, we assumed that exactly 12.5 percent of ESIS expenditures was financed by state governments. These state-funded expenditures are not reported in ESIS accounts for reasons that are not entirely obvious – one reason being perhaps, that this contribution takes the form of supporting directly the wage and salary expenses of medical personnel and not as financial transfers to ESIS (further work to explore this issue is warranted). The data on state-wise expenditures of ESIS were obtained from an examination of Demand for Grants budget data of the individual state governments for 1995-96 (Selvaraju 2000).[22] State government contributions over and above the 12.5 percent rate were ignored in our analysis mainly because this category of state-wise contributions appeared to be insignificant for the three states that we were concerned with. This fact is further confirmed if one examines the aggregate all India financial statements of the Employees' State Insurance Corporation (ESIC) that suggest such state government contributions to be the order of no more than 0.1 percent of ESIC spending in the most recent years for which data are available (http://esic.nic.in/finance/yearend2001.htm).

For the remaining sources of funding we proceeded as follows. Because state-wise information on financing was unavailable (again this is an area where an information gap exists and additional work could be done), we assumed that the share of total premium contributions (by employers and employees) would be the same proportion of ESIS expenditures in each state as the share of this category in total ESIC spending at the all India level, or roughly 82 percent (http://esic.nic.in/finance/yearend2001.htm). This left a residual of 5.5 percent of total ESIS spending (100, *less* 12.5 *less* 82) to be supported by other sources of funding, primarily interest and dividend income of ESIC. In the national health accounts framework, this last category is subsumed under "other" sources of funds. Further work was needed to disentangle the employee and employer shares in ESIS spending. This was a relatively straightforward task, given that employees and employers contribute to the ESIC

[22]This fact is interesting because Demand for Grants data in state budgets for more recent years do not provide any information on ESIS spending other than state government contributions to it (For instance, Government of Andhra Pradesh 2002).

fund in the ratio of 1.75:4.75 (Garg 2001). This ratio was used to separate the total into employer (firms) and employee contributions (households).

Because of our separate treatment of private firms and public firms in the national health accounts analysis of this paper, we had to break down employer contributions separately into contributions of private firms and public firms. This was done on the basis of the total number of employees employed in the private and public organized sector, for which we did have state-level data (see sub-section above on firms). This procedure assumes that the proportion of employees earning below the statutory minimum (for ESIS contributions to be compulsory) is the same in both the public and the private sectors, and needs further verification.

Table **A.9** provides a description of ESIS spending by source of funds in each state.

Spending by Non-Government Organizations (NGOs) and their sources of support

This is probably among the most difficult sectors to get health-related financial information on. In general, health expenditures of NGOs and their sources of funds are not documented in any systematic fashion, either by the government, or by other organizations. NGOs receive funds from a variety of sources – from foreign contributions, central and state government grants, donations from the public, and they potentially also generate funds from their own resources (e.g. charging user fees at charitable clinics). We could find no official source of information, or study, which comprehensively documents NGO-related financial data, either for the three states of interest in this study, or for India as a whole. Thus, indirect methods were adopted to estimate the amounts spent by NGOs on health and their sources of support, and even these are likely to be underestimates.

Keeping track of funding flows from the central and state governments to NGOs is a difficult job. Information on central government grants (i.e. from the Ministry of Health and Family Welfare) to NGOs is available from the Ministry's budget documents. However, the budget documents do not specify the inter-state distribution of central government grants to NGOs goes to which state. Keeping track of state government grants to NGOs is also difficult, because there is no systematic mechanism within the government that documents these flows.

To further complicate matters many NGOs, such as those involved in rural development, end up spending on health care even though they do not describe themselves as explicitly working in health-related issues. Given this confusion and the general paucity of information on NGO expenditures we followed Garg (2001) and estimated NGO spending on health care in an indirect fashion. Clearly, though, there is need and scope for better information on the documentation of NGO funds related to health activities in India.

As a first step, we able to obtain information from a non-governmental organization, that tracks foreign fund inflows to non-governmental organizations in each state under the so-called FCRA (Foreign Contributions Regulation Act) mechanism (AccountAid India 2002). This information, in turn, is culled from a document of the Ministry of Home Affairs called the "Inflow of Foreign Contribution Report" that is published annually. There are a number of pitfalls in using these numbers and need to be stated beforehand. First, the data are based on the total amount reported in statements filed with the Ministry of Home Affairs (FC-3) that are of a mandatory nature. Not all organizations receiving funds file these returns, however. Second, contributions in kind typically go unreported or under-reported. Finally, funds provided to NGOs by international agencies like the World Bank and United Nations are exempt from the requirements of FCRA. Each of these omissions would tend to lead to an underestimation of the actual funding flows. On the other hand, there are biases towards overestimation as well. This happens when agencies receiving funds redistribute them to other NGOs, who may also file their own FC-3, thereby leading to double counting of the amounts received. Moreover, it is not clear that all receiving agencies can be properly classified as NGOs.[23] The AccountAid data also describes the share of foreign funds (about 11.1 percent of the total) going for health and family welfare activities, although it does not give the state-wise breakdown in this regard.

Given these bits of information, **Table A.10** describes our calculation procedure and the resultant estimates. First we estimated the amounts of foreign funds on health and family welfare to NGOs to each state on the assumption that the share of health and family welfare activities in the total is the same for each state (i.e., 11.1 percent).[24] Next, we followed the

[23]It is worth noting, however, that foreign funds received by business enterprises do not fall under the ambit of FCRA.

[24]In the next round of revisions, we intend to use independently available state-wise information on NGOs working in the area of health/family welfare (Mahal, Sanan and Srivastava 2000) from survey data undertaken

Garg (2001) assumption of all NGO funds on health and welfare roughly half were allocated to medical care and half to family welfare. This ratio is typically about the same amount that government budgets allocate to the medical head on the one hand, and public health/family welfare on the other, although we could not access any information specific to NGOs in India.

To estimate total NGO spending on health (medical *plus* public health and family welfare) in the relevant states we draw on Garg's (2001) work on Punjab which estimated that foreign contributions constituted about 13 percent of total NGO expenditures in health in Punjab. We apply the same percentage to our estimates of foreign contribution to NGO spending in other states as well to arrive at total expenditure by NGOs on health in Andhra Pradesh, Karnataka and Punjab. Of course, there is no reason why this assumption should hold, and in future work we intend to use independently available (new) information on the total number of NGOs in each state together with the amount of foreign funds received by them and the Punjab estimate, to construct new estimates that allow for differences in the importance of foreign contributions across states.

To estimate the portion of NGO spending in 1995/96 accounted for by the central government, we make use of Garg's (2001) Punjab study, where 10 percent of total NGO expenditure on health comes from central government grants. We apply the same percentage to our estimate of total NGO spending on health in Andhra Pradesh and Karnataka to arrive at total central government contribution to health spending of NGOs in these states.

The three remaining sources of funds for NGO expenditures on health are revenues raised by the NGO's own resources, donations that NGOs receive from the general public and any contributions from state governments from own resources. The last category appears to be insignificant with most government funds to NGOs flowing through centrally sponsored schemes with funding mainly from the central government and foreign donors. Ignoring the state government's contribution then, the contributions from NGOs own funds and any support from the general public are estimated to be the difference between the total expenditures of NGOs on health and family welfare and the support from foreign sources and the central government. As the discussion suggests, the residual constitutes an upwardly

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by the National Council of Applied Economic Research (NCAER) to calibrate our estimates of NGO spending in each state, and amounts allocated to medical and public health/family welfare.

biased estimate of NGOs own contributions (and household contributions), because the estimates of the contributions of foreign funds are probably biased downwards, and moreover state government contributions have been neglected.

There remains the final step of categorizing separately the contributions of NGOs own resources and household contributions to NGOs. There is no obvious way to estimate this, except by making the ad hoc assumption that the share of the two is about equal. Further work in this area is obviously necessary to improve the reliability of health expenditures and revenue contributions related to non-governmental organizations.

International Contributions

Funding for health from international sources occurs through several channels in India. First, there are official channels under which international agencies such as the United Nations, the World Bank and the Asian Development Bank provide funds to central and state governments. This data is readily captured in state and central budget documents. To the extent that some of these funds are further transferred to NGOs but not captured under any specific NGO-head, we can rest assured in the knowledge that even though there might be mistakes in total expenditures estimated for government and NGO sources taken separately, their combined total is still correct. This information would have been captured in the discussion on government spending earlier in the appendix.

A second set of contributions occurs when multilateral and bilateral agencies fund non-governmental agencies/institutions. In this circumstance, the data are not recorded anywhere in the government and can be obtained only by contacting the funding agencies, or by undertaking surveys of representative samples of recipient institutions. Clearly, the former is the more cost-effective choice, although no information on these flows was available to the authors at the time of writing of this report. In future work, we intend to address this lacuna. Note also that given the focus of development agencies work with NGOs on public health and family welfare in India, neglecting these expenditures would tend to result in an underestimation of expenditures related to the non-elderly, and probably not as much for elderly populations.

A third type of transfer occurs when funds from foreign institutions that are not exempt from FCRA flow to Indian institutions. This information is typically better recorded (subject to the biases noted above), and can be obtained from the Ministry of Home Affairs in its Foreign Contributions cell. In our analysis these flows were assumed to occur from foreign sources to non-governmental organizations and have been accounted for in the discussion on expenditures on health by NGOs.

A fourth type of transfer for health expenditure could potentially occur from Indian citizens living abroad to Indians living in India to finance their health expenses. This transfer is hard to keep track of, given that it is FCRA exempt. However, it will show up in the National Health Accounts data as household health expenditures financed by households. While the precise magnitude is unavailable, one can rest fairly well assured that these flows are accounted for in information relating to out of pocket expenditures by households.

Household Health Expenditures

Household health expenditures were estimated using the National Sample Survey Organization's (NSSO) 52nd round survey on health care utilization and expenditure. This multi-stage household sample survey was conducted from July 1995 to June 1996 and covered all the major states of India. The survey collected information on the prevalence and treatment of illnesses, on sources of treatment, inpatient care expenditures in the year preceding the survey, and expenditures on outpatient visits made in the fifteen days preceding the survey. Some information on different types of financing mechanisms was also included. As with other household surveys, information on the socio-demographic characteristics of the household members was also collected. Additional details about the survey can be found in NSSO (1998).

Payment for household use of health care services in the survey was by one or more of the following sources: households' own current income and savings, employers (public and private employers) and insurance companies. The survey does not make any distinction between government employment proper and employment in *public sector* enterprises.

The survey-based information on household expenditures was used in our analysis as follows. First, it follows from our earlier discussion that reimbursements for health expenditures

provided by the government, and public and private enterprises are already included in health expenditures reported by households in the survey. Thus, in a national health accounts framework these have to be deducted from household expenditures, with the residual being the actual "out of pocket" spending. In the NHA terminology, this amount is defined as being financed by households (as the ultimate source of funds) and going on to households (this time as the financial intermediary).

There remains the question of which set of reimbursement data to use in our calculations: the ones reported in the household survey separately for each state; or the ones that we independently estimate from firm-level data (Duggal 1993) together with using the average for all India public sector reimbursements for health expenditures incurred by households (to get at government reimbursements) from the household survey; with the per capita (or per employee) estimates so derived not varying across states. In this paper, we use the latter estimate mainly because the government reimbursements in the three states appear to be "too low", although the other case can also be readily evaluated.

Not all of household spending related to health shows up as health expenditures in the household survey. In particular, households contribute to insurance premiums (ESIS, CGHS, private insurance) and households also may contribute to resources of non-governmental organizations. Such information is not available from the household survey, and has to be estimated as the previous sections have already done.

II. Financial flows from financial intermediaries to providers of health services

The previous discussion is summarized in Matrix Tables – **A.11, A.12 and A.13** for Andhra Pradesh, Karnataka and Punjab, respectively; and shows the transfers of resources from ultimate sources of funds to financial intermediaries. This section discusses the estimation of financial flows from intermediaries to providers of health services in these three states.

In line with appendix tables **A.11-A.13**, the list of financial intermediaries includes the following:

- The Department of Health Medical and Family Welfare (further sub-divided into the categories medical, public health, family welfare and other)
- Local governments
- Other Ministries (primarily Railways and Defense)
- Firms (public and private)
- Social insurance schemes (CGHS, ESIS)
- Private insurance schemes
- Non-governmental organizations
- Households

We now discuss the methodology used to assess the flow of funds to providers from each category of financial intermediary.

**II.1 Department of Health, Medical and Family Welfare**

Funds in the state government departments of health, medical and family welfare are typically allocated by three key sub-heads: medical (including medical education), public health and family welfare.

*Medical*

Within the medical head, breakdowns are available by category of provider such as hospitals, (ranging from tertiary hospitals to district hospitals, and rural hospitals, or community health centers); primary health centers, dispensaries and sub-centers not covered under the family welfare head; and health facilities that provider care labeled under "other systems of medicine" (such as ayurvedic, homeopathic, and unani). In addition, there are funds allocated under categories such as "direction and administration."

We allocated the expenditures under the medical head into different types of public providers as follows. All amounts shown under hospitals (including teaching hospitals) were shown as flows from the state government to public hospitals. Moreover, half of all amounts shown under medical colleges were also allocated to public hospitals, given that it is likely that an important element of the services provided by medical colleges is care to patients. The other

half was allocated to research and/or training. Clearly, this estimate could be improved upon if more information about the activities of medical colleges and teaching hospitals, in terms of their resource allocation to care, training and research, were available. All amounts allocated to primary health centers, sub-centers (those not covered under family welfare), and other systems of medicine were classified in one cluster under "PHCs, SCs, and dispensaries." In addition, the amounts for "direction and administration" reported under various heads were allocated on the basis of the distribution of expenditures to hospitals, primary health centers and teaching/research institutions.

*Public Health*

Expenditures in the "public health" category cover a range of activities – including various national programs relating to tuberculosis, malaria, filaria, blindness, HIV/AIDS and the like. They also include expenditures incurred in the compiling of statistics, vaccine development, drug distribution school health programs and surveillance activities (if any). Many of the activities under the national disease control programs involve services with a substantial "public good" or "externality" element: for example, education campaigns, tuberculosis prevention and treatment, HIV prevention and the like. For the purposes of our analysis, we lumped all spending reported under national disease control programs as collective goods provision by government service providers. This, strictly speaking, is not a fully accurate picture of the attributes of government expenditure reported in this category. For instance, governments sometimes engage the services of non-governmental organizations to provide services, as in the case of blindness, malaria and HIV campaigns. Moreover, disease control programs sometimes provide support for treatment, which obviously is a service with a private (not a collective) benefit, such as drugs for DOTS. Clearly, our estimates could benefit from more accurate knowledge about the allocations of spending under disease control programs.

There is little question that expenditures devoted to the compilation of statistics are best devoted to the "providers of collective goods" category, since there is strong public goods element in this type of service; and the same goes for any expenditures devoted for drug and vaccine development, or disease surveillance. Expenditures on school health programs that have both "private" as well as public good attributes are, for purposes of simplification, also taken as being purchased from providers of public goods. Again, as in the case of national

disease programs, there is a case for breaking these expenditures down by collective goods and private consumption (of care), as well as by type of provider, whether NGO, private, or some other. Unfortunately, such information is not easily obtainable from government records available at the present time.

Note also that surveillance and statistics compilation activities could potentially also be classified as belonging to "providers of research services", although we do not do so here.

*Family Welfare*

**Table A.14** provides details here**.** Expenditures under the head "family welfare" were broken down into the following: sub-centers, direction and administration, training, transportation, mass education, compensation, materials (including vaccines) for maternal and child health activities, work under the Indian Population Program (IPP), research, and other (hospital-based) activities. The last includes allocations for maternal care involving hospital-based services, such as for safe abortion services and care related to complications with pregnancy.

Leaving aside the contributions for direction and administration, the remainder was reclassified as follows. Allocations for sub-centers were naturally categorized as "payments" for services provided by government sub-centers. Next, half of the total expenditures under the Indian Population Program (IPP) were allocated to training, given that IPP has a significant training component. The other half, given that IPP often covers support for sub-centers, was directly allocated to services provided by government sub-centers.[25] Amounts explicitly stated as going to research were directly allocated to that provider category. Compensation provided to recipients of sterilization services was treated as "other" since it was essentially a payment by the government to households for having undergone sterilization (with, or without, complications resulting there-from). Mass education expenditures, naturally, were allocated to providers of collective services, although the precise characterization of these providers (NGO, private sector, or other) was left unspecified. Again this is an area where more information can lead to greater precision about

[25]Clearly, there is substantial scope for improvement in the description of allocations under IPP.

the nature of the financial flows. Expenditures on materials for maternal and child health – were allocated to public hospitals, the main rationale for this categorization being that a lot of the materials were sterilization related.

The final expenditure categories to be allocated were transportation and direction and administration. These were allocated to all the other expenditure heads in proportion to the magnitude of expenditures reported in each category.

**Local Government Allocations**

All funds allocated to local governments were assumed spent on primary health centers and sub-centers. Except for large urban settings like Mumbai, local governments do not run their own "municipal" or "panchayat" hospitals.

It is possible that some of the funds received by local governments (as a financial intermediary) are used for execution of projects under national disease control programs. These amounts, however, are already included under the head of "public health". The only question is whether one can say something more about the "provider" of collective goods, that is, whether it is a state or local government agency, a non-governmental organization, or a private provider. This information is not available at the present time.

There are some health-related activities that are probably not covered either by the "public health" expenditures of the state government; or the expenditures on health reported by local government. Examples could be malaria control activities, garbage removal and the like. Sanitation activities have been left unaccounted as well, owing to the considerations noted at the beginning of this appendix. There is little information on disease prevention activities undertaken by local authorities from their own funds.

**Other Ministries (Railways and Defense)**

Health expenditures by the Defense and Railway ministries were first divided into two sub-categories: (a) medical and (b) family welfare. For the railway ministry, information on the amounts allocated to the "medical" head was directly available from the demand for grants data. Expenditures allocated under "health and welfare" head for the demand for grants for

the railways ministry were taken to be expenditures on "family welfare." Note that it is possible that at least some of these expenditures could be for public health activities, although additional data required for breaking down these expenditures further were unavailable. For the defense ministry, even this breakdown (medical versus health/welfare) was unavailable. As a consequence, we assumed the share of the medical and family welfare in the defense ministry to be same as their estimated shares in the Ministry of Railways.

Expenditures on the *family welfare component in the two ministries* in each state were then allocated to individual providers – hospitals, primary care, collective goods, training, research, and other – in the same proportions as estimated for the family welfare expenditures of the corresponding state government departments of medical, health and family welfare. More information from individual ministries in this area would be obviously useful. One can also reasonably argue that there is likely to be less variation in shares of railway/defense family welfare allocations across states relative to individual government health departments in each state.

Medical expenditures for employees of railways (defense) and their dependents were allocated in a somewhat complicated fashion. First, estimates of the total number of beneficiaries (by age) were arrived at, using methods that have been discussed previously. An estimate of the total number of inpatient days at railway facilities was constructed by making by assumption that per capita consumption of services at health facilities of railways (defense) employees was exactly the same as that of the rest of the population, as a first step. Next, it was assumed that beneficiaries consumed all of their inpatient care at railway (defense) hospitals. For outpatient care, the allocation procedure was slightly different. For beneficiaries who were current railway (defense) employees, all outpatient care was assumed to be consumed at railway (defense) outpatient care facilities. For beneficiaries who were retired, or were dependents of railway (defense) employees, we assumed that only the number of reported public facility outpatient visits consumed (per capita) were at railway facilities.

We believe that these assumptions are justified on the following grounds. First, major care (inpatient care) of all beneficiaries is most usefully obtained at railway (defense) hospitals owing to the large potential economic benefits associated with it. For outpatient care we assume that per capita usage by railway (defense) employees is the same as that reported in

NSS data, and moreover that all of this care is obtained at railway (defense) facilities. However, outpatient care is less expensive, and also less expensive than inpatient care. Moreover, many of the non-employee beneficiaries are more likely to be staying at some distance from railway facilities. One way to handle this is to assume that per capita outpatient care usage of railway (defense) facilities reported by beneficiaries is exactly equal to the per capita use of public facilities by similar age groups in NSS household survey data. To be sure, this may lead to underestimates of health care usage, to the extent that the "health insurance" provided by the ministries will affect health care consumption by the insured. But no further information is available, and we propose to explore this issue further in future work.

The final step in this analysis was to allocate the total spending in the medical category into hospital-based care and primary care facilities. Here we made the assumption that all inpatient care was obtained at hospitals, whereas all outpatient care was obtained at primary health facilities. This step did require knowing how much to allocate to inpatient care and how much to allocate to outpatient care. For this exercise we needed to weight the utilization of different types of services by their corresponding unit costs. To obtain unit cost estimates by age of the cost of care, for an inpatient day and outpatient visit, we adopted the assumption that the relative magnitude of these costs was exactly the same as the expenditures reported in the NSS household survey. This yielded unit cost estimates (by age) of an inpatient day and outpatient visit, and followed by the step of distributing the total amounts spent in the medical category into hospital- and primary care based care.

**Financial Flows from Firms to Health Care Facilities**

Given that the only funding going to firms (private or public) in their role as a financial intermediary are amounts allocated to firm-owned/operated health facilities, these flows were captured in a straightforward way in the flow of funds matrices: from firms to firm-operated health care facilities .

**Flows out of Social Insurance "Funds" (CGHS and ESIS)**

Fund flows under CGHS and ESIS to health facilities were considered separately. CGHS expenditures were broken down into two categories: amounts allocated to CGHS-operated

facilities (the bulk of CGHS expenditures) and funds provided (reimbursed) by CGHS to health facilities used by its enrollees.

Typically, non-CGHS health facilities are used when enrollees are referred to outside providers to medical staff of the CGHS. Moreover, the amounts paid by CGHS reflect only the amounts paid on behalf of retired beneficiaries. Non-elderly CGHS beneficiaries referred to outside facilities are reimbursed directly by the employing government department or ministry, and no records relating to such expenditures are available with CGHS. How to allocate these CGHS reimbursements for expenditures by the elderly by type of provider? In the absence of direct information from CGHS we assumed that these expenditures were divided across hospital-based and outpatient care/doctors in the same proportion as out-of-pocket health spending by households on average in the NSS household survey (separately for each state) – roughly about 50 percent each on doctors and hospitals. For example, in the case of Andhra Pradesh, this process yielded roughly about Rupees 6.33 million to hospitals and Rupees 6.16 million to doctors/private clinics.

ESIS expenditures were all allocated to ESIS facilities. No estimates were available of any ESIS spending used for financing care provided to enrollees by non-ESIS providers.

**Private Insurance to Providers**

**Table A.15** describes the main elements of the method used to derive the flow of funds from private insurers to health service providers. First, because total claim amounts were smaller than the total amount of premiums received, the balance (surplus) was allocated to the "other" category. Second, total insurance claims were estimated separately for each state. Because a state-wise breakdown of claims was unavailable from GIC, we constructed our estimates by allocating the total GIC claims nationwide into state-wise shares on the basis of their respective share of organized sector employment.

Next, the state-level insurance claims were divided up into payments to hospitals and payments to primary care providers (including private doctors). Our plan was to estimate the number of "potential" beneficiaries of all ages, and to multiply this number, both by utilization rates (for inpatient and outpatient care) separately for all ages; and by the cost per unit of utilization. However, we did not have any direct estimates of the total number of

"potential" beneficiaries of private health insurance, either total, or by age-group. What we did have was some information about employees in the organized sector making up most of the insured. Revenues from group insurance schemes among organized sector employees comprise the bulk of insurance premiums associated with voluntary insurance in India – more than 90 percent of all premiums, as per our estimates.[26] Thus, our estimates of the age-structure of organized sector employees and their dependents and their utilization patterns (suitably scaled upwards) served as a fairly good proxy for the health care use patterns of all private insurance policy holders.

Our method of calculation begin with the assumption that the age-wise share of claims-spending among those entitled to benefits from private insurance was the same as the age-wise share of spending among employees/dependents of firms who were entitled to health facilities directly operated by firms. The main justification for this assumption was that employees entitled to subsidized firm-provided health care ought to behave in much the same way as someone who is insured, all else the same.

How to estimate the age-based expenditure distribution of firm operated facilities? This required several steps. We already know the total amount the firms spent on self-provided health facilities (see above). First we estimated the total utilization by each age-group using the per capita utilization patterns of inpatient and outpatient care (by age) from NSS data. For our purposes, we assumed that the inpatient and outpatient care utilization of employees accessing firm-operated health facilities was equal to the total per capita utilization (of both public and private sector care) in NSS data. Next one needed some estimate of the unit costs for utilization of inpatient care and outpatient care by age. Assuming that the unit costs of utilization in the form of inpatient and outpatient care (by age) in firm-operated facilities were proportionally related to each other in the same way as out-of-pocket spending per day/per visit as reported in the NSS data, we were able to allocate all of the spending on firm-operated health facilities to different age groups. It is the *share* of this allocation (in public and private firms' combined spending on self-operated health facilities) across age-groups that we are interested in, not the absolute amounts themselves.

[26]Some of these employees are in the private sector, others in the public sector.

We assumed that the age-specific share in total insurance claims is the same as the age-specific shares in expenditures incurred on firm-operated health facilities. All that remains is allocating it to private hospitals and doctors.[27] This last step was undertaken using NSS data which provided an age-wise breakdown of shares in total expenditures by private doctors and private hospitals. Note that by taking an average we are allowing for biases in use patterns that would result if we did not consider a person's insurance status – in effect our assumption is that the expenditure share of private sector hospitals and private doctors in total spending on private providers is similar among the insured and the un-insured. For instance, if the insured use more inpatient care, then obviously our procedure would overestimate the amounts being allocated to private hospitals, as against private doctors.

**Non-Governmental Organizations to Providers**

As regards the allocation of funds received by NGOs we make a straightforward assumption, following Garg (1999) – that the expenditures are equally allocated across health care provision (NGO health care providers) and NGO providers supporting family welfare activities. Clearly, this needs further clarification and justification, including allowing the possibility for NGOs supporting health care services provided by non-NGO facilities. One way to improve the information available on the subject would be to undertake more careful surveys of NGOs in India inquiring about health care financing and use patterns.

**Households to Providers**

Household allocations to different types of health care providers were based on out-of-pocket health care expenditures reported in NSS data, with two exceptions. First, we deducted financial support provided by private insurance from out of pocket spending on private facilities. This was done because most insurance claim payouts in India (in 1995-96 at any rate) took the form of reimbursements for expenditures already incurred, and thus included in out-of-pocket spending reported by NSS households. Second, for similar reasons, we deducted CGHS reimbursements from out of pocket spending reported on privately provided care.

[27]It was assumed that insurance reimbursements funded mostly care provided in private facilities.

## III. Financial flows from financial intermediaries: Functional Classification

The previous discussion is summarized in Matrix Tables – **A.16, A.17 and A.18** for Andhra Pradesh, Karnataka and Punjab, respectively; and shows the transfers of resources from financial intermediaries to health care service providers. This section discusses the estimation of financial flows from financial intermediaries by functional classification (see **Tables A.19, A.20** and **A.21**).

In line with appendix tables **A.16-18**, the list of financial intermediaries includes the following:

- The Department of Health Medical and Family Welfare (further sub-divided into the categories medical, public health, family welfare and other)
- Local governments
- Other Ministries (primarily Railways and Defense)
- Firms (public and private)
- Social insurance schemes (CGHS, ESIS)
- Private insurance schemes
- Non-governmental organizations
- Households

We now discuss the methodology used to assess the flow of funds to each functional category.

### III.1 Department of Health, Medical and Family Welfare

Funds in the state government departments of health, medical and family welfare are typically allocated by three key sub-heads: medical (including medical education), public health and family welfare.

*Medical*

Within the medical head, data are available by category of provider such as hospitals, (ranging from tertiary hospitals to district hospitals, and rural hospitals, or community health centers); primary health centers, dispensaries and sub-centers not covered under the family welfare head; and health facilities that provide care labeled under "other systems of medicine" (such as ayurvedic, homeopathic, and unani). In addition, there are funds allocated under categories such as "direction and administration."

We allocated the expenditures under the medical head into different types of services received as follows. All amounts shown under hospitals (including teaching hospitals) **plus** half of all amounts shown under medical colleges were also allocated to medical care services. The other half of expenditures on medical colleges was allocated to research and/or training. All amounts allocated to primary health centers, sub-centers (not covered under family welfare) and other systems of medicine were also classified under medical care services – for primary care. Our aim was to estimate the amounts allocated under each of these heads for inpatient care, outpatient care, and direction and administration. It was assumed that any collective good element under the expenditure categories for hospitals or primary care (after the research/ training component is omitted) is negligible, which we believe to be quite reasonable.

To undertake the task outlined in the preceding paragraph, we first allocated all expenditures on direction and administration to the "administration category." That left the remaining amount to be allocated to inpatient and outpatient care. Because the government does not provide the breakdown of its spending by inpatient and outpatient care, we used NSS data on household utilization of public sector inpatient and outpatient care, in conjunction with assumptions about the relative unit cost of an outpatient visit and inpatient day.

NSS data on public sector inpatient and outpatient care utilization is confounded by the fact that it includes use of health facilities operated by non-MOH entities such as the railways and the defense ministries. Thus, we first estimated the likely magnitude of "public facility" usage by employees/dependents of the Railways and Defense Ministries (non-civilian) and deducted it from the public sector utilization estimates reported by households in the NSS data. The estimation of utilization in railways and defense ministry facilities was based on the assumption that age-specific per capita utilization of inpatient and outpatient care by potential beneficiaries of these two ministries was equal to the total per capita utilization of

inpatient and outpatient care (*whether in private or public facilities*) reported by NSS households. Making this assumption appears to us to be a natural consequence of the extensive range of health facilities offered by these ministries, so that it makes little sense to rely on private care when one has privileged access to such public sector care.

Another confounding factor was that NSS data on utilization also includes any reported use of CGHS dispensaries by central government employees and other CGHS card holders. Instead of estimating separately the utilization of CGHS facilities (as we did for Railways and Defense), and given the small magnitude of the expenditure involved relative to state government spending on health, we added CGHS dispensary expenditures to the MOH expenditures.[28]

Next we classified all utilization into inpatient days and outpatient visits, separately for the two main age groups (under-60 years and the elderly). We could, had we desired, broken this down further by level of care, but for reasons that are more fully explained in Mahal et al. (2002), chose not to do so. Unit costs were estimated for each type of utilization by assuming that (a) the expenditure was fully used up for the four utilization categories and (b) the relative magnitude of the per unit subsidies (but not the absolute level) in the four categories of utilization was the same as that per capita out-of-pocket spending on private care reported by NSS households for these categories – namely, inpatient day for elderly, inpatient day for under-60 year olds, outpatient visit per elderly, outpatient visit for under-60 year olds. Multiplying the unit subsidies by the number of units of utilization of each type (by age) we were able to obtain estimates of the financial flows broken down by age, as well as by type of care, inpatient or outpatient.

One final adjustment was made before the estimates reported in the first column of **Table A.19** were arrived at. Because CGHS expenditures are so obviously for outpatient care and because they are undertaken by an entity separate from the state government, these were deducted from the state government outpatient expenditure estimates arrived at by the method shown above.

[28]CGHS expenditures were added after deducting 5 percent for Direction and Administration, based on estimates of Garg (1999).

The amounts for research/training and for administration, obviously, were allocated in line with the considerations noted above.

*Public Health*

A full description of expenditures in the "public health" category has been provided in the previous section. For our purposes, the only relevant issue is that we classified all public health spending (with the exception of administrative expenses) as expenditures for collective goods.

Administrative expenses were assigned to the category "administration."

*Family Welfare*

Expenditures under the head "family welfare" can be broken down into the following: sub-centers, direction and administration, training, transportation, mass education, compensation, materials (including vaccines) for maternal and child health activities, work under the Indian Population Program (IPP), research, and other (hospital-based) activities. The last includes allocations for maternal care involving hospital-based services, such as for safe abortion services and care related to complications associated with pregnancy.

Leaving aside the contributions for direction and administration, the remainder was reclassified as follows. Allocations for sub-centers were naturally categorized as outpatient services. Next, half of the total expenditures under the Indian Population Program (IPP) were allocated to training, given that IPP has a significant training component. The other half, given that IPP often covers support for sub-centers, was directly allocated to outpatient services provided by government sub-centers.[29] Amounts explicitly stated as going to research were directly allocated to that category. Compensation provided to recipients of sterilization services was treated as "other" since it was essentially a payment by the government to households for having undergone sterilization (with, or without, complications resulting there-from). Mass education expenditures, naturally, were allocated to collective goods. Expenditures on some materials for maternal and child health – were allocated to public hospitals, the main rationale for this categorization being that a lot of the materials

[29]Clearly, there is substantial scope for improvement in the description of allocations under IPP.

were sterilization related. As classified in Table A.19-21, the hospital category is shown as "inpatient care." This is a matter of choice, and we could also have classified this as outpatient care, for want of ready characterization of sterilization procedures.

**Local Government Allocations**

All funds allocated to local governments in Andhra Pradesh and Punjab were taken to have been spent on primary care services, mainly outpatient care. Except for large urban settings like Mumbai, local governments do not run their own "municipal" or "panchayat" hospitals.

In Karnataka, however, there has been decentralization of expenditures to a much greater degree with the budget of the local government also covering primary health centers that provide some limited form of inpatient care. This is reflected in the funding flows as a small amount being directed towards inpatient care from local governments (see the section on age-specific flows for further details). The remainder is for outpatient care. Unfortunately, it was not possible to disaggregate the Karnataka data on local governments to estimate flows for the "administration" category.

**Other Ministries (Railways and Defense)**

As indicated above, health expenditures by the Defense and Railway ministries were first divided into two sub-categories: (a) medical and (b) family welfare. For the defense ministry, even this breakdown (medical versus health/welfare) was unavailable. As a consequence, we assumed the share of the medical and family welfare in the defense ministry to be same as their estimated shares in the Ministry of Railways.

Expenditures on the family welfare component in the two ministries – for inpatient care, outpatient care, collective goods, training, research, other, and direction and administration – were assumed to occur in the same proportions as estimated for the family welfare expenditures of the corresponding state government departments of medical, health and family welfare.

Medical expenditures for employees of railways (defense) and their dependents were allocated to inpatient and outpatient care, and direction and administration, in a somewhat

complicated fashion. First, estimates of the total number of beneficiaries (by age) were arrived at, using methods that have been discussed previously. An estimate of the total number of inpatient days at railway facilities was constructed by making by assumption that per capita consumption of health facilities of railways (defense) employees was exactly the same as that of the rest of the population. Next, it was assumed that all beneficiaries consumed their inpatient care at railway (defense) hospitals. For outpatient care, the procedure was slightly different. For beneficiaries who were current railway (defense) employees we assumed that all outpatient care was consumed at railway (defense) outpatient care facilities. For beneficiaries who were retired, or were dependents of railway (defense) employees, we assumed that only the number of reported public facility outpatient visits consumed (per capita) were at railway facilities.

The final step in this analysis was to allocate the total spending in the medical category into inpatient care and outpatient care. The approach taken was to multiply the estimated utilization by an estimate of unit costs (by type of care, by age). To obtain unit cost estimates, by age and the cost of care, for an inpatient day and outpatient visit, we adopted the assumption that the relative magnitude of these unit costs (not the absolute size) was exactly the same as the corresponding per unit out-of-pocket expenditures reported in the NSS household survey for private care. With the further assumption that the entire medical section of the budget was used for providing inpatient and/or outpatient care, we obtained unit cost estimates (by age) of an inpatient day and outpatient visit. These were multiplied by utilization numbers to distribute the total amounts spent in the medical category into inpatient care and outpatient care.

**Financial Flows from Firms to Type of Care (Inpatient or Outpatient Care)**

Given that the only funding going to firms (private or public) in their role as a financial intermediary are amounts allocated to firm-owned/operated health facilities, these flows were captured in a straightforward way in the flow of funds matrices: from firms to firm-operated health care facilities. However, understanding their breakdown by type of care received required further calculation.

The calculations are best described in a step-by-step fashion. First, an estimate of the potential beneficiaries (or users), by age, of facilities operated by enterprises was arrived at.

These were derived from an estimate of the number of employees with access to firm operated facilities, and further assumptions about their dependents (see above for the assumptions related to this last point). Second, the estimated number of potential beneficiaries, by age, was multiplied by per capita utilization of inpatient and outpatient reported in NSS data to obtain utilization information for enterprise operated facilities (we did not have direct information on utilization of facilities operated by firms). The per capita utilization estimate used for this purpose included both private and public facility utilization. The assumption underlying this method is that subsidized access to firm-operated facilities operates like insurance and so one would expect greater use of such facilities than if it one had to pay for care provided by them. One case (the one used here) would be that potential beneficiaries rely on these facilities for all of their care – and if so, using the per capita utilization rate reported by NSS households, irrespective of the source of care – would be the appropriate statistic to use. Third, we assumed that the expenditure was fully allocated to inpatient and outpatient care, and that the relative per unit cost of utilization (per day of inpatient care, and per outpatient care, by age) for services provided by firms was the same as per unit out of pocket expenses for private care reported in NSS data. These two assumptions, along with the information for estimated levels of inpatient and outpatient care use by age, was sufficient to enable the allocation of funding flows under this category to inpatient care expenses and outpatient care expenses.

**Flows out of Social Insurance "Funds" (CGHS and ESIS)**

Fund flows under CGHS and ESIS to health facilities were considered separately. CGHS expenditures were broken down into two categories: amounts allocated to CGHS-operated facilities (the bulk of CGHS expenditures) and funds provided (reimbursed) by CGHS to health facilities used by its enrollees.

Amounts allocated to CGHS facilities – essentially dispensaries - can be directly allocated to outpatient care (after allowing for 5 percent of expenses to be allocated for administrative purposes). Expenditures reported by CGHS also include some spending on non-CGHS health facilities, as when retired enrollees are referred to outside providers to medical staff of the CGHS. These amounts are paid by CGHS and reflect only the amounts paid on behalf of retired beneficiaries. As discussed above, non-elderly CGHS beneficiaries referred to outside facilities are reimbursed directly by the employing government department or ministry, and

no records relating to such expenditures are available with CGHS. How to allocate these expenditures on elderly beneficiaries by inpatient or outpatient care? In the absence of direct information from CGHS we assumed that outside expenditures by retirees enrolled with CGHS were divided across inpatient care and outpatient care/doctors in the same proportion as out-of-pocket health spending by individuals aged 60 years and above in the NSS household survey (separately for each state).

ESIS expenditures were fully allocated to ESIS facilities. How to break this expenditure down by inpatient and outpatient care? The first step was to estimate the total number of potential beneficiaries by age. From Garg (1999) we were able to obtain data on the number of insured employees for 1995-96. Even if one were to exclude dependents, the number of insured generally exceeds the number of insured employees, if retired employees were to choose to remain insured. Because information on the total number of insured (employees plus retired) was unavailable for 1995-96, we used the number of insured employees to estimate the total number of insured by assuming that the ratio of total insured to insured employees in the 1995-96 was the same as in 1998-99, an year for which we had data (Garg 1999). Estimates of insured persons and insured employees for each state were then constructed on the assumption that states' shares in the year 1996-96 were the same as in 1998-99.

We estimated the total number of retired employees who were insured in each state as the difference between insured persons and insured employees. Retired insured employees were assumed to have no dependents. For current employees who were insured, we assumed the NSS average for the number of 60-plus dependent members - (0.28) – per insured employee. This yielded a total of nearly 2.47 million retired insured under ESIS, with 0.14 million in Andhra Pradesh, 0.20 million in Karnataka and 0.12 million in Punjab, respectively. The difference between the total number of ESIS beneficiaries (available from ESIS records) and the number of ESIS elderly beneficiaries that we previously derived was taken to indicate the number of non-elderly retired beneficiaries.

We hoped to calculate the number of inpatient and outpatient visits (by age-group) for ESIS beneficiaries using the information above. However, there were two issues that needed to be considered. First, the Employees' State Insurance Corporation (ESIC) independently provides information (albeit at the national level) on inpatient stays and outpatient visits.

Second, the NSS data also provide specific information on the number of outpatient visits (data on inpatient stays and days were, for some reason, missing from the data records). The NSS data also provide a more detailed breakdown by states and age-groups. Thus, we sought to reconcile information from these two data sources. As per the ESIC records, a total of 0.42 million inpatient stays and 74.31 million outpatient visits were undertaken by ESIS beneficiaries in 1995-96. While NSS data did not have any information on ESIS inpatient stays, they did provide data on outpatient visits and these were several orders of magnitude less than the numbers provided by ESIC. Because there were many reasons to suspect underreporting of ESIS facilities' utilization in NSS, we adjusted upwards the number of NSS outpatient visits for each age-group and state to be consistent with ESIC records, keeping relative magnitudes the same.

Because information on inpatient stays at ESIS facilities was unavailable, we assumed that the per capita number of inpatient stays at ESIS facilities for each set of ESIS beneficiaries (by age) was the same as the average for individuals in the NSS dataset. This yielded a total of 0.52 million inpatient stays, quite close to the actual number reported by ESIC of 0.42 million. Nonetheless, we adjusted the estimated number of stays to the actual reported, keeping the relative magnitudes – by age and state – the same. This was further converted in inpatient days by age-group (and state) using the corresponding NSS information on the average length per hospital stay.

Next we divided up the total amounts allocated to ESIS facilities into three categories – medical benefits, administration (about 11 percent of medical benefits, based on ESIC data) and depreciation. Keeping administration aside, we allocated the total of medical benefits and depreciation into expenditures for inpatient and outpatient care, by age, by assuming that the relative cost of each service was the same as the out-of-pocket spending reported for the corresponding unit of private care reported by NSS households, a method that has been used several times previously.

**Private Insurance to Providers**

The flow of funds from private insurers to health service providers was estimated as follows. Because claims were smaller in magnitude than the total amount of premiums received, the

balance (surplus) was allocated to the "other" category. Next, the state-level insurance claims were divided up into divided up into payments for inpatient care and outpatient care. Our plan was to estimate the number of "potential" beneficiaries of all ages, to multiply this number, both by utilization rates (for inpatient and outpatient care) separately for all ages; and by the cost per unit of utilization. However, we did not have the total number of "potential" beneficiaries of private health insurance, either the total, or distributed by age-group. We did have information about "potential" beneficiaries among organized sector employees covered by private insurance (see above). Revenues from group insurance schemes in this group comprise the bulk of insurance premiums associated with voluntary insurance in India – more than 90 percent of all premiums, as per our estimates.[30] Thus, our estimates of the age-structure of employees/dependents and their utilization patterns (suitably scaled upwards) served as a fairly good proxy for the health care use patterns of all private insurance policy holders.

Our method of calculation assumed that the age-wise share of claims among those with private insurance was the same as the age-wise share of spending among employees/dependents of firms who were entitled to health facilities directly operated by firms. The main justification for this assumption was that employees entitled to firm-provided health care ought to behave in the same way as someone who is insured, all else the same.

How to estimate the age-based expenditure distribution of firm operated facilities? This required several steps. We already know the total amount the firms spent on self-provided health facilities (see above). We then estimated the total utilization by each age-group using the per capita utilization patterns of inpatient and outpatient care (by age) from NSS data. For our purposes, we assumed that the inpatient and outpatient care utilization of employees at firm-operated health facilities was equal to the total per capita utilization (of both public and private sector care) in NSS data. Next one needed some estimate of the unit costs for utilization of inpatient care and outpatient care by age. Assuming that the unit costs of utilization (by age) in firm-operated facilities were proportionally related to each other in the same way as out-of-pocket spending per day/per visit to private facilities in NSS data, we were able to allocate all of the spending on firm-operated health facilities to different age

[30]Some of these employees are in the private sector, others in the public sector.

groups, by type of care. We assumed that the age-based share in total insurance claims is the same as the age-based shares in expenditures incurred on firm-operated health facilities, by type of care – inpatient, or outpatient.

**Non-Governmental Organizations to Functions**

As regards the allocation of funds received by NGOs we first made the assumption indicated in Section II, and following Garg (1999), that these expenditures are equally allocated across health care provision (NGO health care providers) and NGO providers supporting family welfare activities. In the absence of any other information, we also assumed that about 9.6 percent of all spending by NGOs on health services (whether health care, or family welfare) – the same as for ESIS spending – was allocated for administrative expenses. This left us with the problem of allocating the remaining NGO expenditures into inpatient and outpatient care, or other service categories.

We allocated health care expenditures into inpatient and outpatient care (by age) using data on utilization of NGO services from NSS data. For instance, the all India utilization of NGO facilities was estimated to be nearly 8.5 million inpatient days; and more than 5 million for outpatient visits, annually for all ages. This information was available for individual states in the NSS data. Assuming once again that the relative costs of inpatient days and outpatient visits and across ages were identical to per unit (of utilization) out-of-pocket payments reported by NSS households for private facilities, we were able to allocate total NGO spending on inpatient and outpatient care, separately by age, for different states. We did not attempt to break down NGO expenditures on family welfare activities any further.

**Households to Providers**

Household allocations to health care providers were based on out-of-pocket health care expenditures reported in NSS data for inpatient and outpatient care, with two exceptions. First, we deducted from out of pocket spending on inpatient and outpatient care, financial support provided by private insurance for the two categories (note that we have already derived the share of claims directed to supporting inpatient and outpatient care above). Again, this was done because most insurance claim payouts in India (in 1995-96 at any rate) took the form of reimbursements for expenditures already incurred, and thus reflected in out-

of-pocket spending. Second, and for the same reason, we deducted CGHS as reimbursements from out of pocket spending reported on privately provided care, separately for inpatient and outpatient care, as already noted.

## IV. Health Expenditure Flows, Broken Down By Age-Group

Because of our focus on the elderly, we considered only two age-groups in our analysis: those aged 60 years and above, and those aged less than 60 years. Of course, other age breakdowns are possible, and it is straightforward to do so with the methods illustrated here. Moreover, because expenditure on one group is simply the complement of the other, we focus only on the age-group, 60 years and above.

This section is relatively short because if all we had were expenditure flows relating to the age group 60-years and above, the above analysis of expenditure flows (in sections I – III) would carry over without any modification. Thus, the main focus of this section is to indicate the methods used to disentangle the portion of expenditures allocated to people in the two age groups.

### IV.1 Department of Health, Medical and Family Welfare

Funds in the state government departments of health, medical and family welfare are typically allocated by three key sub-heads: medical (including medical education), public health and family welfare.

*Medical*

As indicated in sections II and III, we were able to classify all public facility utilization into inpatient days and outpatient visits, separately for the two main age groups (under-60 years and the elderly) – after deducting age-specific utilization of inpatient and outpatient care at railway and defense operated facilities. Unit costs were estimated for each type of utilization by assuming that (a) the expenditure was fully used up for the four utilization categories and (b) the relative magnitude of the per unit subsidies (but not the absolute level) in the four categories of utilization was the same as that per capita out-of-pocket spending on private care reported by NSS households for these categories – namely, inpatient day for elderly,

inpatient day for under-60 year olds, outpatient visit per elderly, outpatient visit for under-60 year olds. Multiplying the unit subsidies by the number of units of utilization of each type (by age) we were able to obtain estimates of the financial flows broken down by age, as well as by type of care, inpatient or outpatient. Given our interest in expenditures for the 60-years plus group, only the inpatient and outpatient care expenditures for individuals aged 60-years and above were accounted for.

Because CGHS expenditures are so obviously for outpatient care and because they are undertaken by an entity separate from the state government, these were deducted from the state government outpatient expenditure estimates arrived at (for individuals aged 60-years and above) by the method shown above. In the case of Karnataka, expenditures for people aged 60 years and above incurred by local governments (see below) were also deducted.

The amounts for administration were allocated across ages in the same proportions as the allocations for health care. However, because we perceived research expenditures to be a public good with potential equal benefits to every individual, the allocation of these expenditures was determined on the share of each age-group in total population (and not utilization).

*Public Health*

A full description of expenditures in the "public health" category has been provided previously, and it is worth noting that we classified all public health spending (with the exception of administrative expenses) as expenditures for collective goods. Administrative expenses were assigned to the category "administration." These expenditures were allocated to different age-groups on the basis of their respective shares in total population.

*Family Welfare*

All expenditures under this head were allocated to the under-60 group, because of the primary focus on women in reproductive age groups and young children.

**Local Government Allocations**

Recall that all funds allocated to local governments in Andhra Pradesh and Punjab were taken to have been spent on primary care services, mainly outpatient care. Except for large urban settings like Mumbai, local governments do not run their own "municipal" or "panchayat" hospitals. Given no direct evidence on age-specific outpatient care usage pattern of local government operated facilities, we assumed that this pattern was the same as for other government facilities. Specifically, the share of elderly in total outpatient care expenditures of local governments was assumed to be same as their share in the total outpatient care of other state government facilities. This has already been derived in the "Medical" subsection.

In Karnataka, however, there has been decentralization of expenditures to a much greater degree with the budget of the local government also covering primary health centers that provide some limited form of inpatient care. We proceeded as follows. First, all government spending (including local government spending) was consolidated, with the exception of spending by railways and defense ministries. Then using inpatient and outpatient care utilization patterns by age and type of health facility, and assuming that their unit costs were directly proportional to the out of pocket expenses of accessing such facilities in the private sector, we were able to allocate spending by age, health facility type and inpatient and outpatient care.

Next, we made the reasonable assumption that health facilities operated by local governments in Karnataka were essentially primary health centers and dispensaries, some of which also provided inpatient care. We also assumed that the inpatient and outpatient cost distribution (by age) across primary health centers and dispensaries obtained in the previous paragraph was what one would likely observe in facilities operated by local governments. This ought not to be surprising, given that these facilities are mostly operated by such governments in Karnataka. Taken together, these yield the age-wise allocation of inpatient and outpatient care expenditures of local governments.

**Other Ministries (Railways and Defense)**

As indicated above, health expenditures by the Defense and Railway ministries were first divided into two sub-categories: (a) medical and (b) family welfare. For the defense ministry, even this breakdown (medical versus health/welfare) was unavailable. As a consequence, we

assumed the share of the medical and family welfare in the defense ministry to be same as their estimated shares in the Ministry of Railways.

Expenditures on the family welfare component were ignored given our focus on the age-group 60 years and above.

Medical expenditures for employees of railways (defense) and their dependents were allocated to inpatient and outpatient care by age, and direction and administration, in a somewhat complicated fashion. First, estimates of the total number of beneficiaries (by age) were arrived at, using methods that have been discussed previously. An estimate of the total number of inpatient days at railway facilities was constructed by making by assumption that per capita consumption of health facilities of railways (defense) *employees* was exactly the same as that of the rest of the population. Next, it was assumed that *all beneficiaries* consumed their inpatient care at railway (defense) hospitals. For outpatient care, the procedure was slightly different. For beneficiaries who were current railway (defense) employees we assumed that all outpatient care was consumed at railway (defense) outpatient care facilities. For beneficiaries who were retired, or were dependents of railway (defense) employees, we assumed that only the number of reported public facility outpatient visits consumed (per capita) were at railway facilities. The justification for these assumptions has been provided previously.

The final step in this analysis was to allocate the total spending in the medical category into inpatient care and outpatient care. The approach taken was to multiply the estimated utilization by an estimate of unit costs (by type of care, by age). To obtain unit cost estimates, by age and the cost of care, for an inpatient day and outpatient visit, we adopted the assumption that the relative magnitude of these unit costs (not the absolute size) was exactly the same as the corresponding per unit out-of-pocket expenditures reported in the NSS household survey for private care. With the further assumption that the entire medical section of the budget was used for providing inpatient and/or outpatient care, we obtained unit cost estimates (by age) of an inpatient day and outpatient visit. These were multiplied by utilization numbers to distribute the total amounts spent in the medical category into inpatient care and outpatient care, by age. Administrative expenses were allocated to different age-groups, based on their respective share of total (inpatient *plus* outpatient) spending.

**Financial Flows from Firms to Type of Care (Inpatient or Outpatient Care)**

Given that the only funding going to firms (private or public) in their role as a financial intermediary are amounts allocated to firm-owned/operated health facilities, these flows were captured in a straightforward way in the flow of funds matrices: from firms to firm-operated health care facilities. However, understanding their breakdown by type of care (inpatient or outpatient), and age, required further calculation.

The calculations are best described in a step-by-step fashion. First, an estimate of the potential beneficiaries (or users), by age, of health facilities operated by enterprises was arrived at. This estimate was derived, in turn, from an estimate of the number of employees with access to firm operated facilities, and further assumptions about the number of their dependents (see above for the assumptions related to this last point). Second, the estimated number of potential beneficiaries, by age, was multiplied by per capita utilization of inpatient and outpatient reported in NSS data to obtain utilization information for enterprise operated facilities (we did not have direct information on utilization of facilities operated by firms). The per capita utilization estimate used for this purpose was the total of both private and public facility utilization. The assumption underlying this method is that subsidized access to firm-operated facilities operates like insurance and so one would expect greater use of such facilities than if it one had to pay for care provided by them. One possibility (used by us) would be that potential beneficiaries rely on these facilities for all of their care – if so, using the per capita utilization rate reported by NSS households, irrespective of the source of care – would be the appropriate statistic to use. Third, we assumed that the expenditure was fully allocated to inpatient and outpatient care, and that the relative per unit cost of utilization (per day of inpatient care, and per outpatient care, by age) for services provided by firms was the same as per unit out of pocket expenses for private care reported in NSS data. These two assumptions, along with the information for estimated levels of inpatient and outpatient care use by age, was sufficient to enable the allocation of funding flows under this category to inpatient care expenses and outpatient care expenses, and by age.

**Flows out of Social Insurance "Funds" (CGHS and ESIS)**

Fund flows under CGHS and ESIS to health facilities were considered separately. CGHS expenditures were broken down into two categories: amounts allocated to CGHS-operated facilities (the bulk of CGHS expenditures) and funds provided (reimbursed) by CGHS to (non-CGHS) health facilities used by its enrollees.

Amounts allocated to CGHS facilities – essentially dispensaries - can be directly allocated to outpatient care (after allowing for 5 percent of expenses to be allocated for administrative purposes). We allocated these expenditures by age on the assumption that these followed the same age-pattern of spending on outpatient care as for overall government spending (see section on "Medical" above).

Expenditures reported by CGHS also include some spending on non-CGHS health facilities, as when retired enrollees are referred to outside providers to medical staff of the CGHS. These amounts are paid by CGHS and reflect only the amounts paid on behalf of retired beneficiaries. Thus, these expenditures are obviously relevant for the 60 year plus age category. How to allocate these CGHS expenditures on elderly beneficiaries by inpatient or outpatient care? In the absence of direct information from CGHS we assumed that outside (non-CGHS facility) expenditures by retirees enrolled with CGHS were divided across inpatient care and outpatient care/doctors in the same proportion as out-of-pocket health spending by individuals aged 60 years and above in the NSS household survey (separately for each state).

ESIS expenditures were fully allocated to ESIS facilities. How to break this expenditure down by inpatient and outpatient care, and by age? The first step was to estimate the total number of potential beneficiaries by age. From Garg (1999) we were able to obtain data on the number of insured employees for 1995-96. Even if one were to exclude dependents, the number of insured generally exceeds the number of insured employees, if retired employees were to choose to remain insured. Because information on the total number of insured (employees plus retired) was unavailable for 1995-96, we used the number of insured employees to estimate the total number of insured by assuming that the ratio of total insured to insured employees in the 1995-96 was the same as in 1998-99, an year for which we had data (Garg 1999). Estimates of insured persons and insured employees for each state were then constructed on the assumption that states' shares in the year 1996-96 were the same as in 1998-99.

We estimated the total number of retired employees who were insured in each state as the difference between insured persons and insured employees. Retired insured employees were assumed to have no dependents. For current employees who were insured, we assumed the NSS average for the number of 60-plus dependent members - (0.28) – per insured employee. This yielded a total of nearly 2.47 million retired insured under ESIS, with 0.14 million in Andhra Pradesh, 0.20 million in Karnataka and 0.12 million in Punjab, respectively. The difference between the total number of ESIS beneficiaries (available from ESIS records) and the number of ESIS elderly beneficiaries that we previously derived was taken to indicate the number of non-elderly retired beneficiaries.

We hoped to calculate the number of inpatient and outpatient visits (by age-group) for ESIS beneficiaries using the information above. However, there were two issues that needed to be considered. First, the Employees' State Insurance Corporation (ESIC) independently provides information (albeit at the national level) on inpatient stays and outpatient visits. Second, the NSS data also provide specific information on the number of outpatient visits (data on inpatient stays and days were, for some reason, missing from the data records). The NSS data also provide a more detailed breakdown by states and age-groups. Thus, we sought to reconcile information from these two data sources. As per the ESIC records, a total of 0.42 million inpatient stays and 74.31 million outpatient visits were undertaken by ESIS beneficiaries in 1995-96. While NSS data did not have any information on ESIS inpatient stays, they did provide data on outpatient visits and these were several orders of magnitude less than the numbers provided by ESIC. Because there were many reasons to suspect underreporting of ESIS facilities' utilization in NSS, we adjusted upwards the number of NSS outpatient visits for each age-group and state to be consistent with ESIC records, keeping relative magnitudes the same.

Because information on inpatient stays at ESIS facilities was unavailable, we assumed that the per capita number of inpatient stays at ESIS facilities for each set of ESIS beneficiaries (by age) was the same as the average for individuals in the NSS dataset. This yielded a total of 0.52 million inpatient stays, quite close to the actual number reported by ESIC of 0.42 million. Nonetheless, we adjusted the estimated number of stays to the actual reported, keeping the relative magnitudes – by age and state – the same. This was further converted in

inpatient days by age-group (and state) using the corresponding NSS information on the average length per hospital stay.

Next we divided up the total amounts allocated to ESIS facilities into three categories – medical benefits, administration (about 11 percent of medical benefits, based on ESIC data) and depreciation. Keeping administration aside, we allocated the total of medical benefits and depreciation into expenditures for inpatient and outpatient care, by age, by assuming that the relative cost of each service was the same as the out-of-pocket spending reported for the corresponding private sector unit of care reported by NSS households. This allowed an age-wise breakdown of expenditures by inpatient and outpatient care.

**Private Insurance to Providers**

The flow of funds from private insurers to health service providers was estimated as follows. Because claims were smaller in magnitude than the total amount of premiums received, the balance (surplus) was allocated to the "other" category. Next, the state-level insurance claims were divided up into divided up into payments for inpatient care and outpatient care. Our plan was to estimate the number of "potential" beneficiaries of all ages, to multiply this number, both by utilization rates (for inpatient and outpatient care) separately for all ages; and by the cost per unit of utilization. However, we did not have the total number of "potential" beneficiaries of private health insurance, either the total, or distributed by age-group. We did have information about "potential" beneficiaries among organized sector employees covered by private insurance (see above). Revenues from group insurance schemes in this group comprise the bulk of insurance premiums associated with voluntary insurance in India – more than 90 percent of all premiums, as per our estimates.[31] Thus, our estimates of the age-structure of employees/dependents and their utilization patterns (suitably scaled upwards) served as a fairly good proxy for the health care use patterns of all private insurance policy holders.

Our method of calculation assumed that the age-wise share of claims among those with private insurance was the same as the age-wise share of spending among employees/dependents of firms who were entitled to health facilities directly operated by

[31]Some of these employees are in the private sector, others in the public sector.

firms. The main justification for this assumption was that employees entitled to firm-provided health care ought to behave in the same way as someone who is insured, all else the same.

How to estimate the age-based expenditure distribution of firm operated facilities? This required several steps. We already know the total amount the firms spent on self-provided health facilities (see above). We then estimated the total utilization by each age-group using the per capita utilization patterns of inpatient and outpatient care (by age) from NSS data. For our purposes, we assumed that the inpatient and outpatient care utilization of employees at firm-operated health facilities was equal to the total per capita utilization (of both public and private sector care) in NSS data. Next one needed some estimate of the unit costs for utilization of inpatient care and outpatient care by age. Assuming that the unit costs of utilization (by age) in firm-operated facilities were proportionally related to each other in the same way as out-of-pocket spending per day/per visit to private facilities in NSS data, we were able to allocate all of the spending on firm-operated health facilities to different age groups, by type of care. We assumed that the age-based share in total insurance claims is the same as the age-based shares in expenditures incurred on firm-operated health facilities, by type of care – inpatient, or outpatient.

This yielded an age-wise breakdown of the kind we needed. This breakdown of claims expenditure by age was also used to allocate the portion of "surplus" of premiums over claims to be allocated to different age-groups.

**Non-Governmental Organizations to Providers**

As regards the allocation of funds received by NGOs we first made the assumption indicated in Section II, and following Garg (1999), that these expenditures are equally allocated across health care provision (NGO health care providers) and NGO providers supporting family welfare activities. In the absence of any other information, we also assumed that about 9.6 percent of all spending by NGOs on health services (whether health care, or family welfare) – the same as for ESIS spending – was allocated for administrative expenses. This left us with the problem of allocating the remaining NGO expenditures into inpatient and outpatient care, or other service categories.

We allocated health care expenditures into inpatient and outpatient care (by age) using data on utilization of NGO services from NSS data. For instance, the all India utilization of NGO facilities was estimated to be nearly 8.5 million inpatient days; and more than 5 million for outpatient visits, annually for all ages. This information was available for individual states in the NSS data. Assuming once again that the relative costs of inpatient days and outpatient visits and across ages were identical to per unit (of utilization) out-of-pocket payments reported by NSS households for private facilities, we were able to allocate total NGO spending on inpatient and outpatient care, separately by age, for different states.

We did not attempt to break down NGO expenditures on family welfare activities any further. In any event, given our focus on the elderly, such expenditures were likely to be not relevant. Administrative expenses related to medical care provision were broken down by age, based on the total amounts allocated for care (inpatient or outpatient) to a specific age category.

**Households to Providers**

Household allocations to health care providers were based on out-of-pocket health care expenditures reported in NSS data for inpatient and outpatient care, by age, with two exceptions. First, we deducted from out of pocket spending on inpatient and outpatient care, financial support provided by private insurance (note that we have already derived the share of claims directed to supporting inpatient and outpatient care above). Again, this was done because most insurance claim payouts in India (in 1995-96 at any rate) took the form of reimbursements for expenditures already incurred, and thus is reflected in out-of-pocket spending. Second, and for the same reason, we deducted CGHS reimbursements from out of pocket spending reported on privately provided care, separately for inpatient and outpatient care, as already noted.

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