Who benefits from Hospital Equity Fund in Myanmar?

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Abstract

Although Myanmar has committed itself to achieving Universal Health Coverage (UHC), with public spending on health of less than 1% of GDP, poor households face serious problems accessing healthcare services in Myanmar. Partly to address these concerns, in 2012 the Ministry of Health together with GAVI introduced the Hospital Equity Fund (HEF) project. The program was introduced in 20 townships/districts in 2012, gradually expanding to cover 180 townships by end of 2015. The goal of HEF was to increase the inpatient care access of the poor via targeted financial support for specific inpatient care needs. The effectiveness of the targeting strategy under the HEF project in reaching the poor was assessed.

Data were collected in 2014 for 2 townships where HEF had been launched in 2012, using a household survey (204 households) and focus group discussions and in-depth interviews among local government officials, health staff at the village level, NGO representatives and managers of HEF. Information on socioeconomic status, healthcare use, possession and knowledge of HEF memberships, HEF benefits received and administrative processes governing HEF was collected in each township.

In a population segment that was mostly poor, 77% of the surveyed households had not heard of HEF. Among those that had, only one-half knew about the benefits available under HEF. Remarkably, only 1.7 % actually possessed an HEF card; and only 25% of hospitalized cases received HEF benefits. Bottlenecks in HEF fund transfers across government departments further restricted access to poor patients. Little staff effort went into disseminating information about HEF in local communities, as no budgetary allocations were available for this. Although HEF increased hospital use and lowered the financial burden for some households, poor targeting meant that needs of the poor were not well served in the two townships.

Publications during enrolment

1. Htet, S., V. Fan, K. Alam and A. Mahal (2015). Financial Risks From Ill Health in Myanmar: Evidence and Policy Implications. Asia-Pacific Journal of Public Health 27(4): 418-428
2. Htet, S., Alam, K.,and Mahal, A. (2015). The economic burden of chronic conditions among households in Myanmar: The case of angina and asthma. Health Policy and Planning, 30 (9): 1173-1183

Thesis including published works General Declaration

I hereby declare that this thesis contains no material which has been accepted for the award of any other degree or diploma at any university or equivalent institution and that, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

This thesis includes two original papers published in peer reviewed journals. The core theme of the thesis is Health Economics. The ideas, development and writing up of all the papers in the thesis were the principal responsibility of me, the candidate, working within the School of Public Health and Preventive Medicine under the supervision of Professor Ajay Mahal.

The inclusion of co-authors reflects the fact that the work came from active collaboration between researchers and acknowledges input into team-based research.

In the case of *Chapters 2 and 3* my contribution to the work involved the following:

Thesis chapter	Publication title	Publication status*	Nature and extent (%) of students contribution
2	Financial Risks From Ill Health in Myanmar: Evidence and Policy Implications	Published	75%
3	The economic burden of chronic conditions among households in Myanmar: The case of angina and asthma	Published	75%

** e.g. 'published'/ 'in press'/ 'accepted'/ 'returned for revision'*

I have not renumbered sections of submitted or published papers in order to generate a consistent presentation within the thesis.

Student signature: [redacted] **Date: 4 May 2016**

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the student and co-authors' contributions to this work.

Main Supervisor signature: [redacted] **Date: 4 May 2016**

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1. The Myanmar Health Care System and Recent Reform Efforts

This chapter summarizes background information on Myanmar's health system outcomes, key features of its healthcare delivery and financing system, policy challenges and recent developments in its health sector.

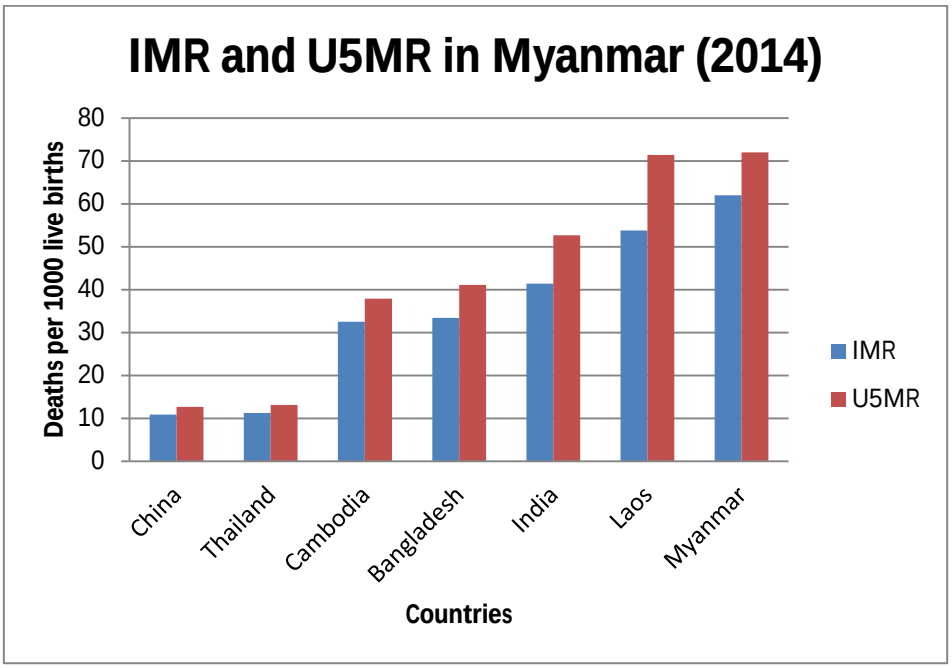
In brief, Myanmar's health system performance can be characterized as poor. Population health outcomes in Myanmar are typically inferior to its regional counterparts and there is considerable inequality, regionally and across population groups. The traditional challenge of communicable disease burden persists but there is evidence of non-communicable conditions acquiring increased prominence. Out of pocket spending on health is high in Myanmar's health system, exposing its population to considerable financial risks from ill health. Although government spending on health has increased dramatically in recent years, its share in Gross Domestic Product (GDP) is still quite small, leaving the population of Myanmar, and especially the poor, to face considerable financial risks from ill health and the national poverty rate (25.6%) in Myanmar according to the World Bank (The World Bank 2014). A major recent effort to address the economic impacts of ill health in Myanmar is the introduction of Township level health equity funds.

1.1. Health System Outcomes: Population Health

Myanmar with a population of 51.4 millions (Ministry of Immigration and Population 2014) was ranked 190 out of 191 countries in terms of overall health system performance in the landmark World Health Report of 2000 (WHO 2000). Although its

life expectancy at birth has increased steadily since that time to 66.8 years at present, Myanmar lags its neighbors in key health indicators such as the maternal mortality ratio (MMR) and infant and child health mortality rates (Ministry of Immigration and Population 2014, WHO 2015)(see also Figure 1.1). Myanmar's Maternal Mortality Ratio (MMR) of 225 maternal deaths per 100,000 live births is amongst the highest in the region (Population 2016). Even this is suspected to be a lower bound to the true numbers, given likely underreporting of maternal mortality in Myanmar (MOH 2010, World Bank 2012).

Figure 1-1: Infant Mortality Rate and Under-5 Mortality Rate: Myanmar and Comparators

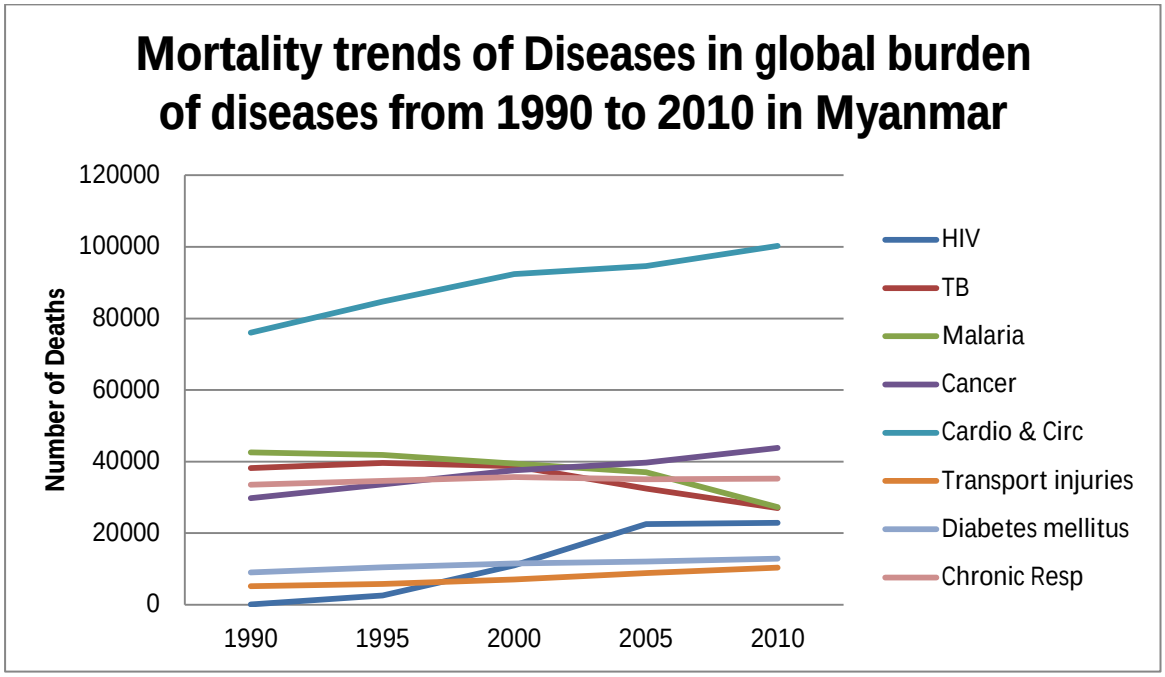


Source: World Health Statistics (Ministry of Immigration and Population 2014, WHO 2015)

Non-communicable conditions are also becoming salient in Myanmar. The Institute of Health Metrics and Evaluation (IHME) has recently made available information on mortality and the burden of disease (expressed as disability adjusted life years

(DALYs) lost) from different causes for a large cross-section of countries for the period from 1990 to 2010. Collected under the ambit of the Global Burden of Disease Study, data from IHME (IHME 2010) show that while communicable conditions such as TB, HIV and Malaria continue to be major causes of deaths in Myanmar, NCDs such as cancers, cardiovascular diseases, diabetes, chronic respiratory conditions are rapidly acquiring significance. Figure 1.2 describes trends in the number of deaths by cause for a selected set of conditions that account for most of the deaths in Myanmar. Note that the number of deaths due to NCDs increased steadily during the period from 1990 to 2010, and in the case of CVDs, this increase occurred quite rapidly. Nearly 40% of all recent deaths in Myanmar are due to NCDs, which also account for about 46.7% of total DALYs lost (IHME 2010, WHO 2011).

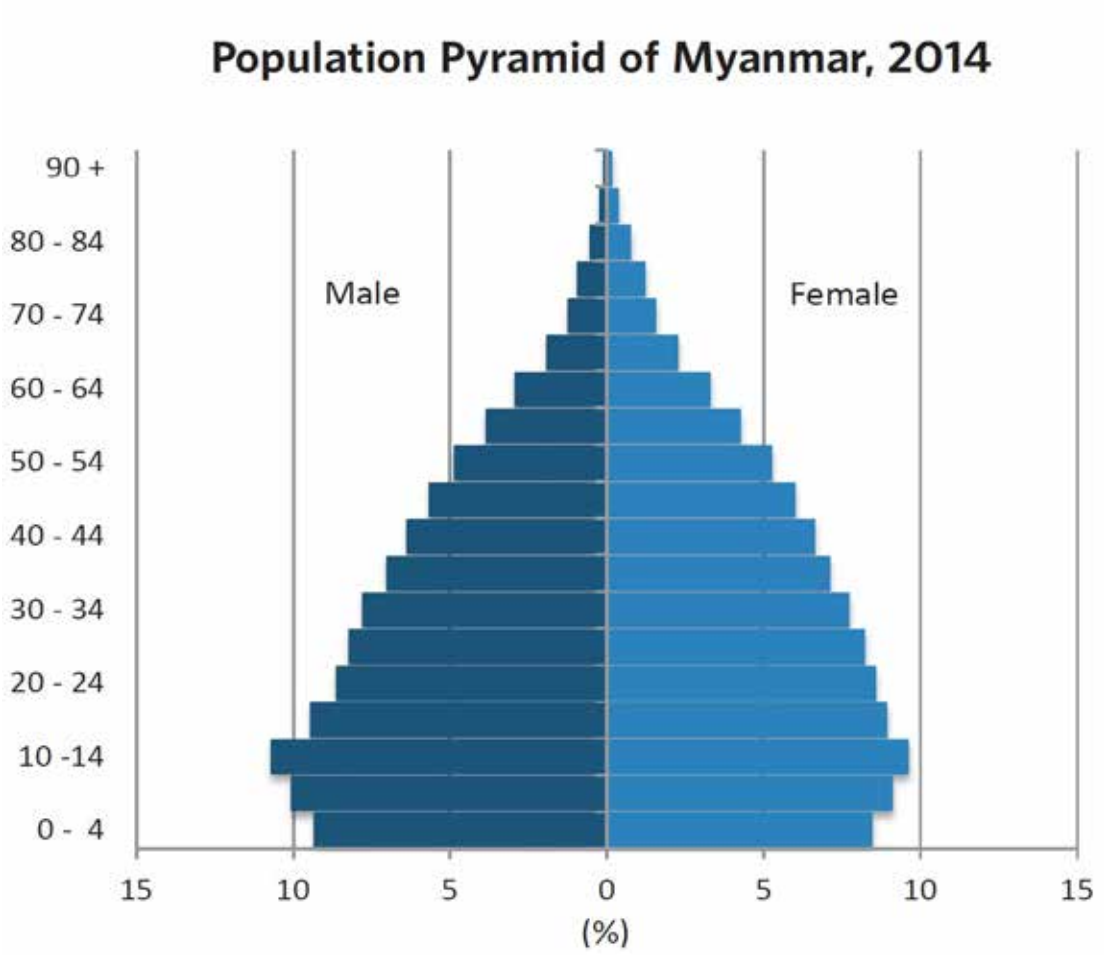
Figure 1-2 : Mortality trends of diseases in global burden of diseases from year 1990 to 2010 in Myanmar



Source: (IHME 2010)

Myanmar's NCD burden can be expected to increase in future years. Figure 1.3 shows the population age-pyramid for Myanmar based on the recently conducted Myanmar Population and Housing Census of 2014. Note that the population pyramid has a considerably larger number of children and youth than age groups of 60 years and over, which can be expected to transition into older age groups in the years to come.

Figure 1-3 : Population Pyramid of Myanmar, 2014

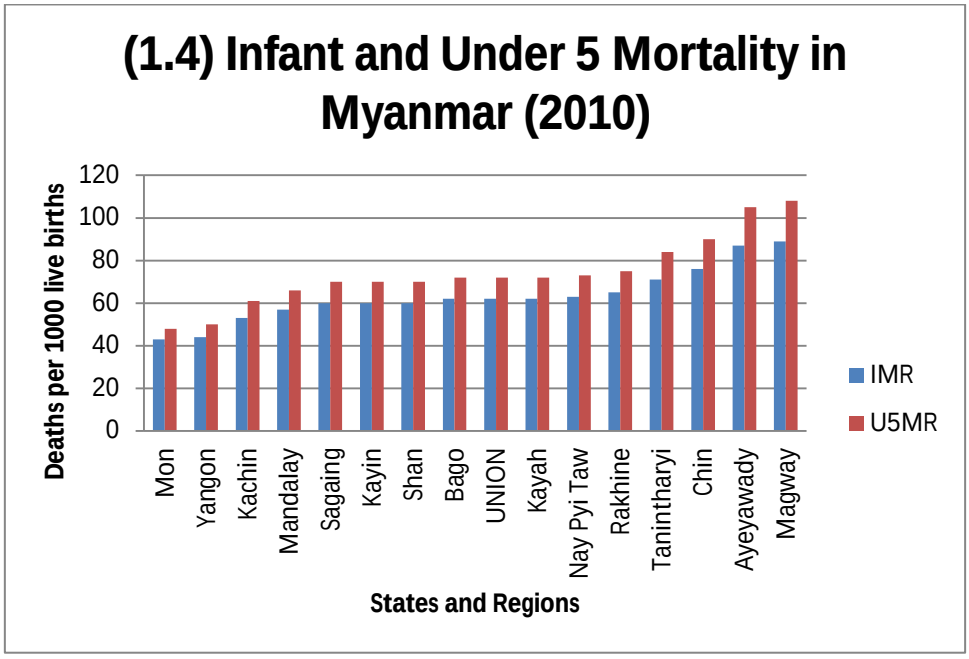


Source: (Ministry of Immigration and Population 2014)

There are also significant within-country inequalities in population health outcomes in Myanmar. For example, higher rates of infant mortality, child mortality and MMR

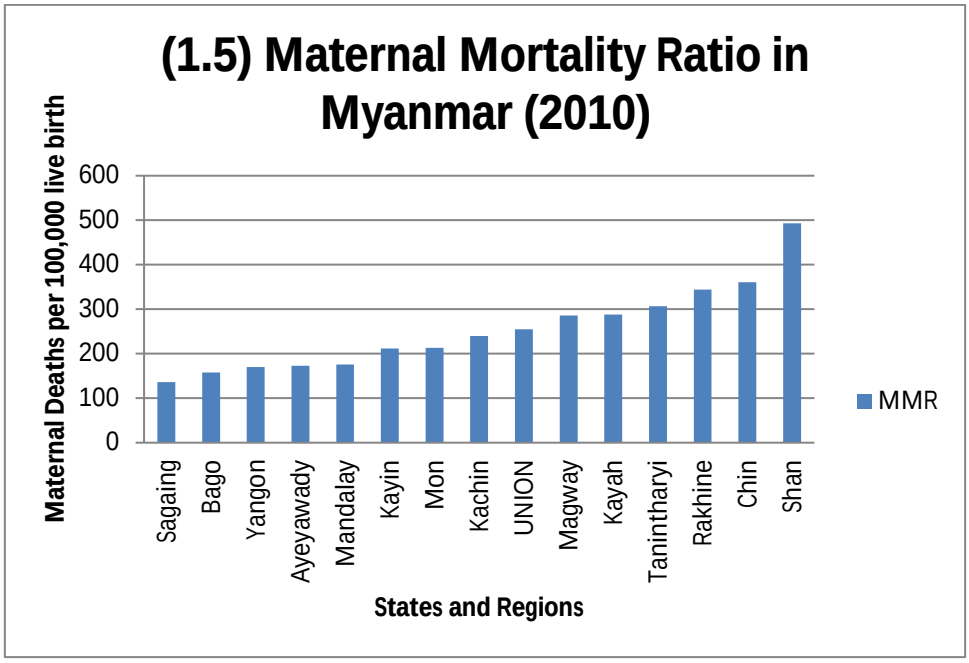
are commonly observed in border areas and regions, where large numbers of minority populations reside. Data from Myanmar Health Statistics (2010) demonstrates some of these inequalities. The data show that MMR was much higher in the border states of Rakhine, Chin and Shan where many of the minorities reside, compared to the ethnic majority-Bamar dominated states such as Sagaing, Bago and Yangon.

Figure 1-4 : Distribution of Infant and Under 5 Mortality among States and Regions of Myanmar (2010)



Source: Myanmar Health Statistics (2010)

Figure 1-5 : Distribution of Maternal Mortality among States and Regions of Myanmar (2010)



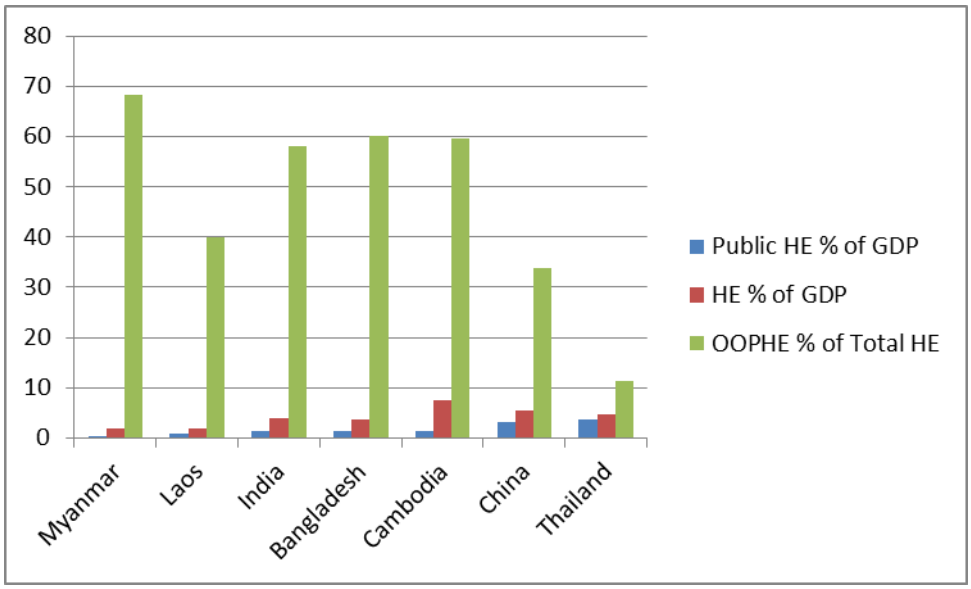
Source: Myanmar Health Statistics (2010), (Ministry of Immigration and Population 2014).

1.2. Health System Outcomes: Household Financial Burden of Ill Health in Myanmar

Myanmar's population also faces a higher financial risk from illness compared to many of its neighbors. Data from the World Bank suggest that household out of pocket spending on health amounted to about 70% of total health expenditure in Myanmar indicating a high level of financial risk due to illness among households. This is not surprising given the currently low level of government spending (1.0% of GDP) on health, and even this level was reached after a significant jump in public resources allocated to health in 2013. Low levels of public spending and the overall low level of health spending (roughly, 2%-3% of GDP) suggest that households in Myanmar are likely foregoing care and incurring income losses. Chapters 2 and 3 of

this thesis indicate some of the likely implications of low public spending on health for Myanmar households.

Figure 1-6 : Public and Private Health Spending (as % of GDP) in Myanmar and Selected Comparator Countries (2013)



Source: World Bank (2013); HE = health expenditure, OOPHE = out of pocket health expenditure; GDP = gross domestic product

These aggregate statistics do not adequately indicate inequalities in the financial risks borne by households in different socioeconomic groups and variations across regions. Existing literature has highlighted the economic burden that households and specific subgroups face from illness in developing countries (Mahal et al. 2013, Alam and Mahal 2014). Because the poor are most likely to be heavily dependent on subsidized public facilities, they are likely to be most at financial risk from illness due to the low levels of government spending in the health sector (MNPED 2007, World Bank 2014). We confirm many of these findings and illustrate the major correlates of financial risks that households face from illness in the specific context of Myanmar.

In Chapter 2, analysis of household survey data from Myanmar is used to show that poor populations rely more on public sector health services than richer groups. It is also shown that households containing elderly and young children and chronically ill individuals, poor households and ethnic minorities face higher financial stress from illness. Rural households use less care, suggesting that in many cases, their observed lower levels of OOP health spending may be at the cost of health.

In Chapter 3, we specifically consider the economic implications of two chronic conditions – asthma and angina – and show that both conditions lead to significant financial implications in terms of increased out of pocket spending, in addition to having important effects (in the case of asthma only) on workforce participation.

1.3. Roots of Health System Performance: Healthcare Delivery System in Myanmar

Health system outcomes are usually the consequence of a complex mix of demand and supply-side factors. On the demand side, the population's awareness and prioritization of ill health, its assessment of quality, and its ability to finance healthcare and other costs associated with seeking care are obvious drivers. On the supply side, the physical availability of services, the clinical and service quality of services provided and prices obviously matter. In turn these; proximate factors are influenced by the organization of health services, how the services are funded and the degree of accountability of providers to the users of services.

In this sub-section we focus on the way health services are provided in Myanmar. In terms of administrative structure, Myanmar consists of 7 States (where the bulk of ethnic minorities reside) and 7 Regions (where the majority Bamar people live) consisting of 330 townships (basic administrative units). Health care delivery in Myanmar is dominated by the public sector, when it comes to modern (allopathic) medicine.

1.4. Public and Private Sector Delivery of Health Services

Concern for population health is clearly established under the Constitution of the Union of Myanmar, dating to 2008. According to the Constitution, Article 28 states that the Union shall: (a) earnestly strive to improve education and health of the people; (b) enact the necessary law to enable National people to participate in matters of their education and health; whilst in Article 32, The Union shall: (a) care for mothers and children, orphans, fallen Defense Services personnel's children, the aged and the disabled; and in Article 351 Mothers, children and expectant women shall enjoy equal rights as prescribed by law. In Article 367, every citizen shall, in accord with the health policy laid down by the Union, have the right to health care (Myanmar 2008).

In strategic matters, there is a National Health Committee (NHC) in Myanmar which is an inter-ministerial and policymaking body for directing and formulating reforms concerning health matters and for ensuring their implementation. The currently existing National Health Policy in Myanmar is quite old and was formulated more than 20 years ago, in 1993. The existing National Health policy of 1993 has placed

"Health for All" as its main objective and relies on the primary health care to promote the physical and mental well-being of the population.

The Ministry of Health (MOH) is the main agency to help deliver on the strategic vision of the NHC. There are six departments that come under the MOH: the Department of Public Health, the Department of Medical Care, the Department of Health Professional Resource Development and Management, the Department of Medical Research, the Department of Traditional Medicine and the Department of Food and Drug Administration.

Figure 1.7 summarizes the organization of the MOH and its relation to the NHC and the general administration. The Green boxes in the Myanmar's health service delivery were the different levels of administrations, cabinet at the central and local governments in states and regions of the country. Yellow boxes were respective health committees organized by members from related ministries and departments for efficient and systematic functioning of the health care delivery system.

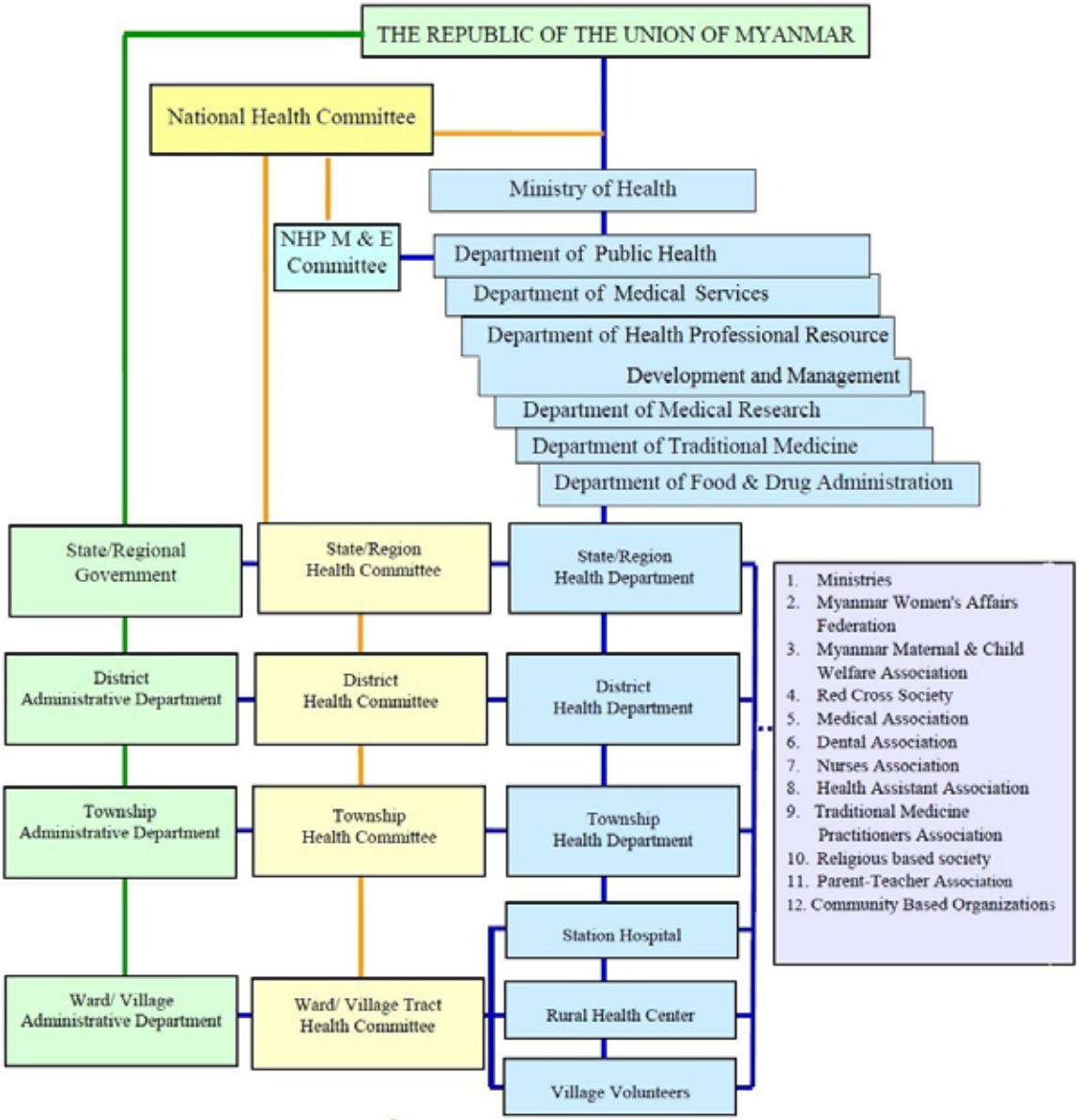
The Ministry of Health is highly centralized and lower level administrative units (such as states, districts and townships) have corresponding departments of health (State health department, district health department, township health department, etc.), with a vertical reporting relationship. For the hospital care services there were a total 1001 public hospitals by the end of 2015. Among them nearly 3% were tertiary specialist hospitals and about 5% were tertiary general hospitals whereas the state and regional level hospitals (500 bedded) shared about 6% and the rest were small (25-50 bedded) township hospitals and station hospitals. At the level of township (or sub-district), there is usually one (township) hospital, ranging in size from 25 beds to

200 beds, and an additional two to three 16-bedded Station Hospitals, under the MOH. Under a township's jurisdiction are 4-8 Rural Health Centres (RHCs), with a further 4-6 Sub-Rural Health Centres (S/C) under each RHC. Every Sub-rural Health Centre is run by a midwife and is expected to cover 3-10 villages in rural areas (or, approximately 5,000 population per midwife) (MOH 2014).

Given the highly centralization vertical-command structure of MOH services, administrative and financing decisions (and flows) also tend to be highly centralized. Line item budgets are standard. Services at MOH facilities at all levels are free for the poor, in theory. Essential medicines and services are free for the poor (while stocks last). However, payments of additional amounts are typically required for investigations and medicines that are not on the essential drugs list, and for purchase of medicines that are unavailable at government pharmacies. Healthcare services are, in principle, also heavily subsidized for the non-poor, but they usually have to pay a portion of the costs of medicines and diagnostics at public facilities.

There is a small private-for- profit sector which mainly provides ambulatory care, and a few private hospitals, mainly in the in large cities. Private sector services in allopathic medicine have been growing in recent years, but no recent data on their spread is available. There are also a large number of providers of traditional medicine. The co-existence of traditional medicine along with allopathic medicine is a well-accepted part of Myanmar's health system.

Figure 1-7 : Organization of the Ministry of Health in Myanmar



(*Source*: (MOH 2014) adapted)

The mountainous terrain and the predominantly rural location of Myanmar's population likely increase the difficulty of physical access to health services resulting in overall low access as well as an unequal access to services. World Health Survey (WHS) data suggest that one-fifth of the survey respondents found travel time to health facilities as being 'moderate to very bad'. Inequalities in physical access are suggested by data indicating variation in the number of nurses - from 20 per 100,000

people in Mon State to 160 per 100,000 people in Chin State. The immunization coverage (especially DTP3) is poor in the Shan, Rakhine and Chin States of less than 60% among the regions (MNPED & MOH 2011). Previous studies have linked health outcomes and child immunization rates to the availability of human resources for health (Speybroeck et al. 2006). This type of relationship is reflected that the distribution of doctors/nurses across the different states and regions of Myanmar and corresponding infant mortality rates (similar results for child and maternal mortality rates) are negatively correlated. It is noteworthy though that there is considerable variation in health outcomes even when states/regions have similarly low doctor/nurse population ratios.

1.5. Regulatory Oversight

There is also a range of legislation pertaining to standards of training and practice for human resources for health in traditional and modern medicine; pharmaceuticals and public health. In addition in 2007, in response to the growing role of the private sector, the government introduced legislation on private health care providers that prescribed the infrastructure requirements and other conditions necessary for private providers to operate (MOH 2014). At present, major challenges relate to the implementation of existing legislation particularly for private sector activity, for which the primary responsibility rests with the MOH. In addition to MOH enforcement which is currently weak, additional protection is provided by tort law. However, litigation in civil courts is limited, possibly due to a culture of respect for doctors, as suggested in Chapter 2. There are also inconsistencies between case law,

enacted laws, directives and notifications in the legal system, leading to recommendations for legal and judicial reforms (Thinn 2006). A variety of provider associations – such as the Myanmar Medical Council and the Myanmar Dental Council – oversee regulations related to medical and dental education and serve as additional regulatory pillars. However, there are no well-defined procedures in place for directing complaints about health care services from the general population to the MMC.

1.6. Roots of Health System Performance: Health Financing in Myanmar

Although out of pocket spending is the major sources of financing for health services in Myanmar, the government of Myanmar remains one of the key funders of health services in Myanmar, primarily through MOH. External aid is another, although smaller, source of financing for health in Myanmar.

Until 2012, government funding for health accounted for only about 0.21% of GDP in Myanmar. However, the last 3-4 years have seen substantial increases in government allocations to health. From a low of 0.21% of GDP in 2011-12, the government share of GDP allocated to health increased to 0.89% in 2013-14 and 0.99% of GDP in 2014-15. Correspondingly, the share of MOH spending in general government expenditures has increased over the same period from 1.03% to 3.38% (MOH 2007, 2009, 2011, 2012, 2014).

In addition to the MOH, some financing for health services is provided in the form of social security scheme (SSS) under the Social Security Act 1954. The act is implemented by the Ministry of Labour and updated in 2012. Under the SSS, all factories, workshops and enterprises employing more than five workers must enrol into the SSS for benefits provided under the Social Security Act. Benefits received by enrollees are funded by contributions from employers (2.5% of salary) employees (1.5 % of salary) and government contributions in the form of capital investments in hospitals specially set up to provide medical services to enrollees (workers' hospitals), dispensaries and mobile medical units. The benefits for the insured (SSS) workers include free medical treatment in addition to cash benefits and occupational injury assistance.

Rising government spending on health in Myanmar in recent years and the existence of social insurance for formal sector workers is likely to have lowered the financial risks faced by households. However, even at these greatly increased shares of government spending, Myanmar's public spending of 1% of GDP on health remains below India's which, at 1.2% of GDP, remains one of the lowest spenders in the world. Kwon (2011) has noted that the low public sector share of aggregate health spending in Myanmar will adversely impact physical access and quality of health services for needy groups. And limited budgets likely result in fewer personnel, shortages of drugs and other equipment and overall quality of care in public sector facilities. Previous work has shown that shortages of drugs and other equipment in public sector facilities are reflected in high levels of OOP spending for drugs and diagnostics in National Health Accounts data (MOH 2011). Thus, even though we do

not have data for the last few years on out of pocket spending, it is likely that Myanmar households will continue to face significant financial risks from ill health.

1.7. Overall Economic and Political Environment

Serious logistical and economic challenges remain alongside the social challenges of a society with ethnic strife just emerging from a long period of military rule. About 70 percent of the population of Myanmar resides in rural areas and the population density is 76 persons per square kilometre. Myanmar also has 135 distinct ethnic groups, speaking almost 100 languages and dialects. Bamar (Burman, Burmese) is the largest ethnic group accounting for about 70% of the total population of Myanmar. There is a need for major investments in education and infrastructure after long years of neglect. Thus, although the government has increased its health allocations, its continuation is questionable without sustained assistance from international donors and innovative changes in the health sector (Myanmar 2012).

1.8. Health Reforms

Over the years, the government of Myanmar has attempted a number of reforms in the health sector. In the 1990s, the Ministry of Health introduced paid rooms and wards in public hospitals. The MOH has also introduced charges for drugs and fees for diagnostics (laboratory and imaging services), for the non-poor. The government also experimented with revolving drug funds (RDF) for essential drugs. Other innovations have included outsourcing some services to the private sector as well as

introducing trust funds in public hospitals to improve their funding base. Presently Community Cost Sharing (CCS) was encouraged to yield share of health care costs (Sein et al. 2014) in practice where the poor patients got free essential medicines, basic laboratory and radiological investigations and non-poor has to share the health care costs with their out of pocket spending for paid rooms and payment for drugs and diagnostics. Major problems with previous reform efforts in MOH have been the absence of clear guidelines as well as careful targeting. In some cases, such as the CCS and RDF efforts, greater community engagement and coordination were needed than actually occurred in practice. As part of the financing system, Myanmar is aspiring to achieve Universal Health Coverage (UHC). In Myanmar's Vision 2030, the UHC is part of it and aimed to have a healthier and more productive population.

With the election of a new government in March 2011, new reforms were introduced, including in the health sector. A multi-party democracy was introduced and set the stage for executive, economic, political and social reforms. In the case of health system reform, the National Comprehensive Development Plan, Health Sector (2011-31) emphasized potential quick wins to bring about tangible and sustainable benefits to the population of Myanmar. The present government is speeding up the momentum in the health care sector in tandem with a rapid acceleration in political, economic and executive reforms.

1.9. Hospital Equity Fund

Perhaps the most significant recent innovation in the health sector is the recent introduction of the Hospital Equity Fund (HEF) Programme in Myanmar, funded by Ministry of Health and GAVI. The HEF intervention, which was launched in 2012 in 20

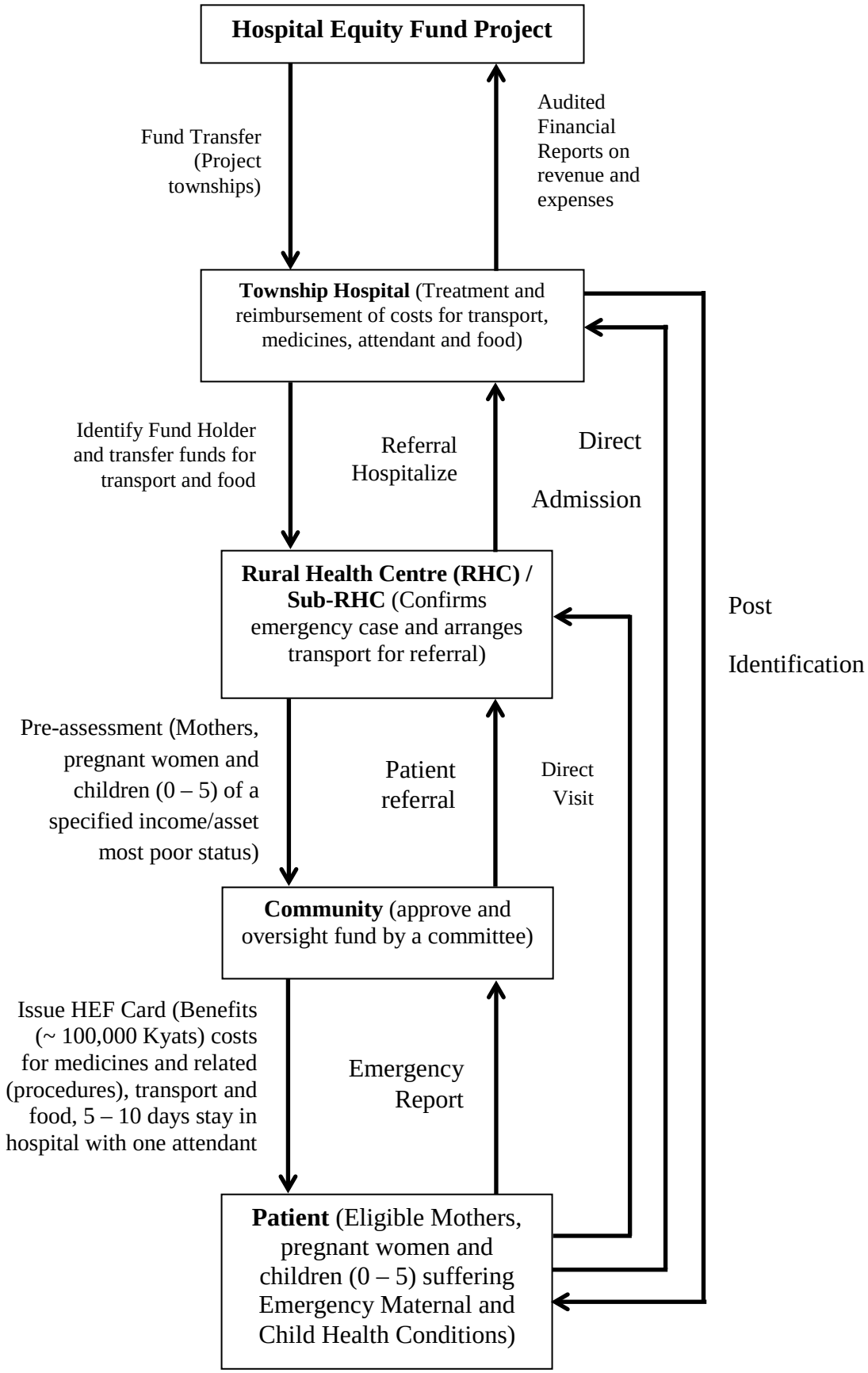
townships in each of Myanmar's 14 states, will be expanded to include new townships each year to reach all 180 GAVI-supported townships (of 330 townships total) by the end of 2016 (Tin et al. 2010).

Figure 1.8 is a summary description of the organization of Health Equity Fund (HEF) program, its intended beneficiaries and associated funding flows. Health Equity Fund (HEF) is a funding mechanism that offers at risk people access to health services. It is primarily a demand side financing (DSF) involving the provision of subsidies to the poor for access to specified health services (Ahmed and Morgan 2011).

The HEF supports hospital services, and is managed (primarily) at the level of the township. Each township with the intervention is annually assigned a fixed amount of 10 million Kyats (approx. AUD 11,000). This is used to finance the 'Patient Referral Fund' or the PRF. The PRF is managed by a group under the overall authority of the Township Health Committee. The group consists of a finance sub-committee (from the Township Auditor's office), the township medical officer (TMO) and others, such as members of NGOs and concerned citizens.

Some portion of the funds managed under the PRF scheme will be transferred to the Rural Health Center Health Committees (there are 4-8 RHC per township). The funds so transferred are intended to support transportation and food costs for beneficiaries. It is expected that when some of the funds are transferred to Rural Health Center Health Committees, they too, can contribute to the travel and medicine costs for poor patients.

Figure 1-8 : Flow Diagram of Hospital Equity Fund (HEF) in Myanmar



1.9.1. Intervention

The intervention is aimed at providing financial support to poor households, particularly women and their children, for inpatient care related to pregnancy conditions, complications of diarrhoea, pneumonia, and malaria and other life threatening hospitalization conditions. The intervention covers medicines, food, and transportation costs, as medical care is provided for free in public facilities.

Beneficiaries can access the funds for the above purposes in two main ways. They can be reimbursed by the Hospital Supervisory Committee (which presumably, will be refunded by the PRF), on production of a patient referral form, a health equity card and receipts for food, transportation and medicines bought by the patients' family for care. Hospital Supervisory Committees typically include, apart from the township medical officer, administrative authorities at the level of the Township, NGO representatives, and other civil society groups are the main responsible parties for providing reimbursement.

1.9.2. Enrolment/Identification of Beneficiaries

There are two ways in which eligible individuals will be identified for the purposes of the intervention. The first method is pre-identification in areas with a high concentration of poor households or with migrant populations and involves two steps. In the first instance, the 'most' poor households and areas with poorest households are identified by community leaders, elders and local authorities. Next, these households (or areas with high concentrations of poor households) respond to a one-page questionnaire that includes questions on household income, assets, debt

and work status. Eligibility is conditioned on household daily earnings (less than 1,000 Kyat/day = approx. ASD1.11/day) provided the household does not have too many assets. This assessment takes the form of a score calculated for each household that assigns points for each response on the questionnaire. Households with score below a certain level are then enrolled as potential beneficiaries.

Eligible households are provided with a 'Health equity card' that includes information on the eligible mother and eligible children, age, address, marital status, photo or thumb prints (as appropriate) and the benefits for which they are eligible (emergency medical care and reimbursement of food and transportation costs).

The second way in which eligible individuals are identified is post-identification. This exercise occurs at the hospital at the time of admission and usually requires more detail since at the time of admission there are no 'elders' or other community leaders present. Individuals arriving at the hospital with a 'Health Equity Card' also have to go through the post-identification exercise, although for them the requirements are less demanding.

1.9.3. Period of Intervention and Geographical Location

The full HEF intervention is intended to run from June, 2012 to June 2016. It will cover a total of 180 townships over these 4 years in the 14 states and regions of Myanmar. The intervention covered 20 new townships in the first year, 40 new townships at the beginning of the second year, and 60 new townships each in years beginning in June-2014 and June-2015, so that a total of 180 townships will be

covered by the intervention as of June 2015. Each state will have at least one new township included in the programme each year. Thus the intervention intends to ultimately cover more than half of the townships and all of the states in Myanmar or more than 30 million people.

2. Financial Risks From Ill Health in Myanmar: Evidence and Policy Implications

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In Chapter 2, analysis of household survey data from Myanmar is used to show that poor populations rely more on public sector health services than richer groups. It is also shown that households containing elderly and young children and chronically ill individuals, poor households and ethnic minorities face higher financial stress from illness. Rural households use less care, suggesting that in many cases, their observed lower levels of OOP health spending may be at the cost of health.

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Financial Risks From Ill Health in Myanmar: Evidence and Policy Implications

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Abstract

The government of Myanmar, with support from international donors, plans to address household financial risks from ill health and expand coverage. But evidence to design policy is limited. WHS (World Health Survey) data for 6045 households were used to investigate the association of out-of-pocket (OOP) health spending, catastrophic expenditures, and household borrowing and asset sales associated with illness with key socioeconomic and demographic correlates in Myanmar. Households with elderly and young children and chronically ill individuals, poor households, and ethnic minorities face higher financial stress from illness. Rural households use less care, suggesting their lower OOP health spending may be at the cost of health. Poorer groups rely more on public sector health services than richer groups. Better targeting, increased budgetary allocations, and more effective use of resources via designing cost-effective benefits packages appear key to sustainably addressing financial risks from ill health in Myanmar.

Keywords

equity, financial risk protection, health financing, health systems, Myanmar

Myanmar is among the poorest countries in Southeast Asia; with a stagnant economy and significant regional inequalities, nearly 32% of its population lives below the poverty line.[1,2] Myanmar also has poor population health outcomes: it has among the highest rates of maternal and child mortality in the Southeast Asian region, with particularly poor health indicators in border areas where minorities live.[3] Noncommunicable diseases (NCDs) are also emerging as a serious health challenge.[4]

Poor health outcomes have economic consequences for households, particularly when subsidized public services are hard to access and insurance options are limited. These economic consequences can take the form of earnings losses and use of health care services can result in

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out-of-pocket (OOP) expenses, borrowing and sale of assets.[5,6] National Health Accounts data show that OOP spending accounts for more than 80% of aggregate health spending in Myanmar, the highest in the region.[7-9] In 2012-2013, the share of health sector allocations in the government budget increased 3-fold, largely on curative care, but even at this higher level budgeted amounts remain low at about 0.8% of GDP.[10]

Discussions on universal coverage in Myanmar are gaining steam among national and international policy makers, and international donors appear ready to increase their health sector support to Myanmar.[11] Expanded insurance coverage can contribute to financial risk protection, a key policy objective in most national health systems. However, the paucity of good quality information on health sector outcomes, including financial outcomes for households and groups who face higher risks from illness, remains a major challenge in effective use of health resources in Myanmar.[11]

We analyzed household-level predictors of OOP health spending, health service utilization and measures of financing stress from the World Health Survey (WHS) to understand the nature of illness related financial risks that households in Myanmar face. The WHS was used because it collected nationally representative information on OOP health spending and its financing and key potential correlates such as socioeconomic status, demographic characteristics, location and morbidity.[12] To our knowledge this is the first study of household financial risks from illness in Myanmar in recent years.

Background

We briefly review the demographic and epidemiological profile of Myanmar and its health system—which likely underpin the financial risks confronting households in Myanmar.

Demographic and Epidemiological Profile

According to the UN (United Nations), Myanmar's population was 51.9 million in 2010, almost 3 times that in 1950. This population is still quite young, with 26.1% of the population aged less than 15 years and 7.7% comprising the elderly (60 years plus).[13] WHS data suggest the average size of a household in Myanmar to be 4.8, with one-third of its members below the age of 18.[12] Life expectancy at birth has also risen from 36.1 years in 1950 to 64.2 years in 2010, with the share of the elderly expected to rise to 22.3% of total population by 2050.[13] The population disease profile is also changing: estimates from the Global Burden of Disease 2010 study show that the share of NCDs in disability-adjusted life years (DALYs) rose from 33.0% in 1990 to 48.9% in 2010.[4] The share of maternal and child health conditions and infectious diseases in DALYs lost correspondingly fell over this period.[4]

Health Service Delivery

Both private and public health service providers are present in Myanmar with the former dominating ambulatory care and the latter dominating hospital services. The public sector accounts for about 90% of the 1090 hospitals currently operating in the country.[3] Our estimates from analysis of raw WHS data for Myanmar show that 88% of the most recent hospital admissions were in the public sector.[12] In contrast, the public sector share in the most recent ambulatory care visit was 28% (Figure 1).[12] Provision of health services and budgets in Ministry of Health (MOH) facilities is highly centralized with little autonomy with regard to decision making at subnational levels. Private hospitals are concentrated in large cities and private for-profit ambulatory services (other than informal providers) are mostly located in urban areas.

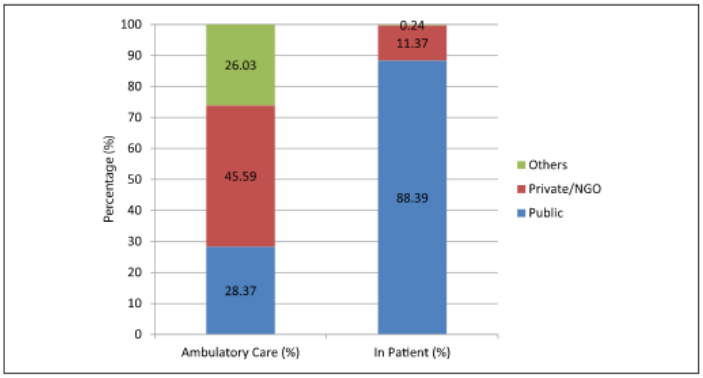

Figure 1. Ambulatory care visits and hospital admissions by provider type in Myanmar, 2003. Source: Authors' (sample-weighted) estimates based on World Health Survey 2003.

Health Workforce

There are serious shortages in the health workforce of the country with only 17 doctors, 28 nurses and 23 midwives per 100 000 people in the public sector. The distribution of these personnel is also geographically unequal: Chin State has the highest density of 59 doctors and 160 nurses per 100 000 people, whereas Mon State had 6 doctors and 10 nurses per 100 000 people. The concentration of private practitioners in urban locations exacerbates these inequalities. Insufficient institutional capacity to absorb new health professional graduates adds to this with as many as 1500 doctors per year seeking employment outside the public health sector.[3]

Health Financing

Health spending in Myanmar was 2.1% of GDP in 2009-2010, financed by a mix of government, households, social security, firms and external assistance.[7] At US$12 per person, health care spending in Myanmar is among the lowest in the region and OOP health spending is 82.2% of total health spending.[12] This contrasts with the share of the government which was merely 0.18% of GDP on health until 2012-2013, when it sharply increased to 0.80% of GDP. External aid accounts for about 9% of total health expenditures, a portion of which is also channeled through the government.[7] Public and overall health spending as a share of GDP has remained essentially unchanged over the past decade (Figure 2).

In theory, services at public facilities are free to poor patients. But patients pay for items unavailable in public health facilities, particularly drugs and diagnostic services. National Health Accounts (NHA) for 2009-2010 in Myanmar show that 44.6% of all health spending was for drugs and consumables. Much of this spending on drugs and consumables was incurred by households, amounting to 53.7% of all OOP health spending. The NHA estimates are comparable to WHS estimates of the share of drugs of 47.8% of OOP health spending by households.[7,12] In addition, NHA estimates of OOP spending on ambulatory care and diagnostics in 2009-2010 amounted to 32.4% of all household health expenses, comparable to WHS estimates of 33.8%.[7,12]

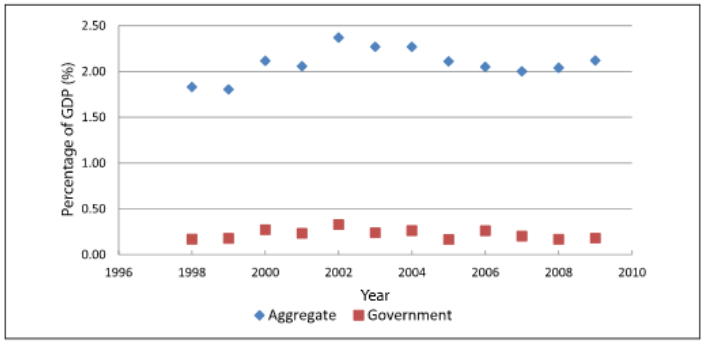

Figure 2. Aggregate and government health spending in Myanmar, 1998-2009. Source: Ministry of Heath reports on National Health Accounts (2007, 2009, and 2011).

Methods

Data

The WHS survey, implemented in Myanmar during 2002-2003, covered 6045 households. The survey was implemented by the Ministry of Health, with a sampling frame that covered 90% of the population of Myanmar. The survey instrument collected information on household socioeconomic status, location and demographic characteristics, components of consumption spending, OOP health care expenditures and mechanisms (such as borrowing and asset sales) for financing health care. Sample households were selected based on a random, stratified sampling procedure, described in detail elsewhere.[14]

Methods

Our outcome measures included household (log) OOP spending and 2 measures of financial stress. The first measure of stress, "catastrophic health spending," was defined as the ratio of a household's OOP health expenditures to its "capacity to pay" exceeding 40%.[8] Capacity was the difference between a household's total expenditure and subsistence level spending based on national poverty line estimates.[1,15] The second measure of stress was whether a household borrowed or sold assets in response to illness in the 12 months preceding the WHS.

We examined socioeconomic and demographic correlates of our 3 outcomes. The existing literature suggests that OOP health spending (and catastrophic spending) is correlated with the availability of health insurance, the incidence and severity of illness, demographic characteristics of households, incomes, and other indicators of socioeconomic position.[16-18] The correlates used in this study are indicators of rural residence, household composition (size, presence of over-60-year-old members in the household, presence of a child younger than 5 years, female as household head), the highest level of education for an adult female family member (15 years and older), ethnicity (membership of the majority Bamar group), and economic status based on household rankings using a wealth index constructed using principal components methods.[19] Two indicators of disease severity were also included (self-reported "bad or very bad" health by survey respondent and whether someone with chronic illness was a household member). An

indicator for a pregnant woman was included given the likely impact on health care use. To account for antimalarial programs or people living in high malarial risk areas, we included an indicator for whether a household used an insecticide-treated bed net.

We estimated multivariate regression models to test the association between our outcomes and the explanatory variables described above. A major concern with any multivariate analysis is that estimated associations may capture effects of variables unaccounted for in the regression model such as interregional differences in costs of health care which can lead to varying OOP spending for local households, all else the same. This can bias our results. Thus, along with a baseline specification (specification 1), a fixed effects specification was estimated to account for such variations, using 108 additional indicator variables for the primary sampling units used in implementing the survey (specification 2). Using multiple specifications also helps to check how robust our results are.

A 2-part model was used to test the association between OOP spending and the explanatory variables."[20] The first part tests the association between an indicator variable for whether a household incurred any OOP spending and explanatory variables. The "second part" examines the correlates of (logarithm of) OOP health spending for the *subset* of households reporting any spending on health care. This is an effective statistical approach to handle large numbers of zeroes in OOP spending data, as in the Myanmar WHS. Moreover, the dependent variable of the first part (whether the household incurred *any* OOP spending) can be interpreted as an indicator of utilization/access, particularly given the high share of OOP spending on health care in Myanmar, and this enables additional insights.[21] For example, if rural households have lower OOP than urban households, this might be due to lower rural average health care use *and* higher OOP when using health care, and not because rural households enjoy better financial risk protection than urban households.

We also assessed the relative share of public and private facilities in health care use at different levels of socioeconomic status (using the wealth quintile) based on the "last visit" or "hospital admission" reported by the respondent. For our statistical analyses, we used Stata, version 12.1.

Results

Summary statistics data in Table 1 underline that 75% of Myanmar's population resides in rural areas, with one-fifth of the households being headed by women. Nearly one-third of the sample had an individual aged 60 years and over living in them, with a similar proportion reporting a child of less than 5 years. The majority Bamar community composed 72% of the sample. The share of respondents reporting "bad or very bad" health was 3%; and 4% of the households reported a member with "chronic" conditions. Nearly 41% of the households reported incurring catastrophic spending, and about 5% reported borrowing or selling assets to finance health care.

Table 2 examines key correlates of catastrophic OOP spending and borrowing/sale of assets to finance health care. Catastrophic spending is positively correlated with a household having elderly members and children aged less than 5 years, larger sized households, female-headed households, households with respondents reporting poor self-reported health, and economically worse-off households. In specification 2, rural residence was negatively associated with catastrophic expenditure. Results for the multivariate analysis on the likelihood of asset sales or borrowing as the dependent variable are similar to those for catastrophic spending. Evidence on the relationship between ethnic status and economic outcomes was mixed, although in the expected direction, in that ethnic minorities were more likely to report financial stress, relative to the majority Bamar community.

Table 3 reports results from the estimation of the 2-part model.

The first part of the model (columns 2 and 3 in Table 3) examines the association between whether a household incurred any OOP spending—a proxy for health care use—and explanatory

Table 1. Descriptive Statistics for Sample Households From Myanmar WHS, 2003.

Household Characteristics	Mean	SD
Out-of-pocket health expenditure (kyats)	2632	7476
Aggregate expenditure (kyats)	42 098	32 190
Catastrophic OOP expenditure (1 if yes, 0 otherwise)	0.41	49.20
Households reporting borrowing/asset sales (1 if yes, 0 otherwise)	0.05	0.23
Rural (1 if yes, 0 otherwise)	0.75	0.43
Household with elderly member (1 if yes, 0 otherwise)	0.35	0.48
Household with under-5 child (1 if yes, 0 otherwise)	0.32	0.47
Household with pregnant woman (1 if yes, 0 otherwise)	0.03	0.18
Household size	4.80	2.03
Female head of household (1 if yes, 0 otherwise)	0.18	0.38
Educational attainment of household head		
Illiterate (1 if yes, 0 otherwise)	0.46	0.50
Primary and secondary (1 if yes, 0 otherwise)	0.46	0.50
High school and above (1 if yes, 0 otherwise)	0.08	0.27
Bamar (ethnic majority) (1 if yes, 0 otherwise)	0.72	0.45
"Bad/very bad" self-reported health (1 if yes, 0 otherwise)	0.03	0.16
Household member with chronic illness (1 if yes, 0 otherwise)	0.04	0.20
Use insecticide-treated bed-net (1 if yes, 0 otherwise)	0.01	0.09

Authors' (sample-weighted) estimates using WHS data for Myanmar. The total number of observations is 6045. Persons aged 60 years and over are defined as elderly. Catastrophic spending is defined as OOP exceeding 40% of a household's capacity to pay (or the difference between household expenditure and the poverty line level of expenditure as per the national poverty line). Note that the means for indicator variables (taking values 0 or 1) in Table 1 can be translated into percentage terms by multiplying by 100.

variables. Health care use is positively correlated with a household having children aged less than 5 years, households where the respondent reported poor health, households where a person with chronic illness resides, household with pregnant women, and larger sized households. Moreover, wealthier households are more likely to use health care than their poorer counterparts.

Columns 4 and 5 in table 3 presents results from the "second part" of our 2-part model: an association of OOP spending and plausible correlates for the *subset* of households that report any spending on health care. The results suggest that households with elderly, households with young children, richer households, ethnic minorities and rural households spend more on average.

Table 4 presents data on the share of public sector ambulatory visits (or inpatient stays) by household wealth quintile. There is a gradient by household wealth in the percentage of visits (or stays) which are public: 93% of hospital admissions among the poorest 20% were in the public sector, compared to 80% among the richest 20%, similar to results from many other developing countries.[22,23] At the same time, data on per capita hospital admissions in the past 5 years in Myanmar (column 4 of table 4) show that wealthier households use public hospitals more frequently than poorer households.

Discussion and Conclusions

Existing literature has highlighted the economic burden that households and specific subgroups face from illness in developing countries.[24] We confirm many of these findings and illustrate the major correlates of financial risks that households face from illness in the specific context of Myanmar: poorer households, households with elderly members, young children, members who are chronically ill or who report poor health, and minority ethnic communities face a greater risk

Table 2. Correlates of Catastrophic Spending in Myanmar: Logistic Regression Analyses, 2003.

	OOP Health Spending > 40% of Household Capacity to Pay		Whether Household Borrowed Funds or Sold Assets to Finance Illness in preceding Year	
Household Characteristic	(1)	(2)	(1)	(2)
Household location (rural = 1, 0 otherwise)	−0.01 (.96)	−2.30* (.01)	−0.06 (.89)	−0.92* (.01)
With individuals aged 60 and over (yes = 1, 0 otherwise)	0.25* (.01)	0.30* (.01)	0.16 (.20)	0.09 (.51)
With under-5 children (yes = 1, 0 otherwise)	0.23* (.01)	0.22* (.01)	0.27† (.08)	0.21 (.15)
Household size	0.10* (.01)	0.15* (.01)	0.07* (.02)	0.03 (.29)
Household ranking on asset index quintile 2 = 1, 0 otherwise	0.03 (.80)	−0.12 (.26)	0.03 (.90)	−0.07 (.76)
Household ranking on asset index quintile 3 = 1, 0 otherwise	0.11 (.37)	0.002 (.98)	−0.14 (.58)	−0.24 (.28)
Household ranking on asset index quintile 4 = 1, 0 otherwise	−0.16* (.27)	−0.37* (.01)	−0.18 (.55)	−0.28 (.29)
Household ranking on asset index quintile 5 (richest 20%) = 1, 0 otherwise	−0.38* (.02)	−0.71* (.01)	−0.92* (.04)	−0.94* (.02)
Sex of household head (female = 1, 0 otherwise)	0.15 (.14)	0.16† (.10)	0.07 (.70)	0.13 (.49)
Most educated female 15+ illiterate = 1, 0 otherwise	0.08 (.53)	0.13 (.28)	0.30 (.28)	0.05 (.85)
Most educated female 15+ primary and secondary=1, 0 otherwise	0.12 (.14)	0.14 (.17)	0.41† (.08)	0.08 (.72)
Ethnic Bamar (yes = 1, 0 otherwise)	0.34† (.06)	−0.05 (.71)	0.41 (.17)	−0.36† (.10)
SRH of respondent (bad/very bad = 1, 0 otherwise)	1.00* (.01)	0.85* (.01)	1.36* (.01)	1.00* (.01)
Member with chronic illness (yes = 1, 0 otherwise)	0.62* (.01)	0.51* (.01)	0.60* (.01)	0.73* (.03)
Uses insecticide-treated bed net (yes = 1, 0 otherwise)	1.86* (.03)	0.52 (.29)	0.23 (.64)	−0.07 (.94)
With pregnant woman (yes = 1, 0 otherwise)	0.31* (.05)	0.19 (.27)	0.46† (.09)	0.39 (.21)
Total number of observations	6045	6045	6045	6045

Authors' estimates based on WHS data and sample-weighted (*P* values for a 2-tailed test are reported in parentheses below the coefficient estimates). S (1) uses Strata fixed effects and S (2) uses an additional 108 indicator variables for cluster fixed effects, for which coefficient estimates are not reported for reasons of space. Standard errors are adjusted for clustering at the primary sampling unit level.
*Statistically significant at the 5% level. †Statistically significant at the 10% level.

of catastrophic health expenditures. While rural households are less likely to incur catastrophic expenses they also use less care. This saves on OOP expenditures, but could adversely affect their health and earnings opportunities. Richer households use more health care and conditional on use, spend more on health care, but face lower financial stress. Although the poor seek health care less frequently than the rich, when they do, they are more likely to rely on the public sector than the rich; similar findings in other settings have been reported elsewhere.[23] Unfortunately, the rich use more of all health services, public and private, so public health subsidies in Myanmar are likely to be unequally distributed across socioeconomic groups.

Table 3. Correlates of Out-of-Pocket Spending Due to Illness in Myanmar: 2-Part Model, 2003.

	Part I Whether OOP Expenditure > 0		Part II Log (OOP Expenditure)	
Household Characteristic	(1)	(2)	(1)	(2)
Household location (rural = 1, 0 otherwise)	−0.27 (.29)	−2.44* (.01)	0.14† (.10)	0.24* (.01)
Individuals aged 60 and over (yes = 1, 0 otherwise)	0.05 (.43)	0.09 (.28)	0.12* (.01)	0.14* (.01)
With under-5 children (yes = 1, 0 otherwise)	0.30* (.01)	0.30* (.01)	0.09* (.05)	0.09* (.04)
Household size	0.005 (.84)	0.06* (.01)	−0.15* (.01)	−0.14* (.01)
Household ranking on asset index quintile 2 = 1, 0 otherwise	0.13 (.31)	−0.12 (.29)	0.003 (.97)	0.01 (.88)
Household ranking on asset index quintile 3 = 1, 0 otherwise	0.35* (.01)	0.21† (.07)	0.10 (.21)	0.12† (.08)
Household ranking on asset index quintile 4 = 1, 0 otherwise	0.36* (.02)	0.14 (.28)	0.21* (.01)	0.21* (.01)
Household ranking on asset index quintile 5 = 1, 0 otherwise	0.53* (.01)	0.36* (.02)	0.52* (.01)	0.51* (.01)
Sex of household head (female = 1, 0 otherwise)	0.08 (.49)	0.05 (.67)	−0.07 (.22)	−0.05 (.34)
Most educated female 15+ illiterate = 1, 0 otherwise	−0.13 (.38)	−0.06 (.63)	−0.15† (.08)	−0.20* (.01)
Most educated female 15+ primary/ secondary=1, 0 otherwise	0.01 (.90)	0.03 (.78)	−0.15* (.02)	−0.17* (.01)
Ethnic Bamar (yes = 1, 0 otherwise)	0.52* (.01)	0.12 (.39)	−0.18* (.02)	−0.26† (.08)
SRH of respondent (bad/very bad = 1, 0 otherwise)	0.94* (.01)	0.80* (.01)	0.43* (.01)	0.38* (.01)
Member with chronic illness (yes = 1, 0 otherwise)	0.88* (.01)	0.59* (.01)	0.43* (.01)	0.47* (.01)
Uses insecticide-treated bed net (yes = 1, 0 otherwise)	1.63† (.10)	0.06 (.93)	−0.15 (.53)	0.10 (.79)
With pregnant woman (yes = 1, 0 otherwise)	0.43* (.02)	0.34† (.10)	0.15† (.10)	0.13 (.17)
Total number of observations	6045	6045	3514	3514

Authors' estimates based on WHS data and sample-weighted (*P* values for a 2-tailed test are reported in parentheses below the coefficient estimates). S (1) uses 8 strata fixed effects and S (2) uses 108 indicator variables for cluster fixed effects, for which coefficient estimates are not reported for reasons of space.
*Statistically significant at the 5% level. †Statistically significant at the 10% level.

Our findings shed light on the need to better target health sector resources in Myanmar, including for curative care, to specific population groups, including households with young children, households living in rural areas and households with chronically ill members. However, Myanmar's public sector share of aggregate health spending is low relative to other countries in the region and will adversely impact physical access and quality of health services for needy groups.[25] Limited budgets likely result in fewer personnel, shortages of drugs and other equipment and overall quality of care in public sector facilities. In WHS data, nearly 15.5% of rural respondents rated their outpatient care experience in the public sector as being moderate to very bad (compared to 5.3% for urban respondents).[12] Shortages of drugs and other equipment in public sector facilities are reflected in high levels of OOP spending for drugs and diagnostics in

Table 4. Public Sector Health Services Use by Quintile in Myanmar, 2003.

Rankings by Asset Quintiles	Share of Public Sector (%) in		Public Hospital Use (per 100 Households) in Past 5 Years
	Most Recent Ambulatory Care Visit (Recall Period: 12 Months)	Most Recent Hospital Stay (Recall Period: 5 Years)	
Quintile 1 (poorest 20%)	37.64	96.53	4.13
Quintile 2	35.23	94.25	6.12
Quintile 3	31.26	84.83	5.07
Quintile 4	23.02	86.80	7.17
Quintile 5 (richest 20%)	16.96	83.41	8.85

Authors' sample-weighted estimates using WHS data. Households are ranked by asset quintiles based on scores constructed using principal components methods.

National Health Accounts data.[7] The mountainous terrain and the predominantly rural location of Myanmar's population is an additional constraint in physically accessing health services with almost one-fifth of WHS respondents finding travel time as being moderate to very bad.[12]

Budgetary constraints in Myanmar government will limit its ability to replicate the large increases in health sector allocations introduced by China and India in recent years.[26] Serious economic challenges remain alongside the social challenges of a society with ethnic strife just emerging from a long period of military rule. Although the government has increased its health allocations in the current budgetary cycle, its continuation is questionable without sustained assistance from international donors.[27] However, the government could still promote efficient spending of public funds on health through priority-setting processes, say by providing well defined benefit packages that are cost-effective in addition to targeting key groups. One example of targeted support is a recent Global Alliance on Vaccines Initiative (GAVI) effort to provide funding for infrastructure development and a pool to cover expenses for poor households requiring inpatient treatment.[28] Resource effectiveness could also be enhanced via targeting key gaps in personnel, drugs, and consumables to help use available resources better and implementing prevention and primary care programs. These could include promoting maternal health, child vaccination, and prevention actions for NCDs and major infectious diseases in Myanmar. Investment in program evaluation is needed to ensure funds are used effectively and efficiently, as the government and donors introduce additional funds and money into the system.

Our analysis has obvious weaknesses. The 2003 WHS data are a decade old and the aggregate health spending in 2003 was slightly higher as a proportion of GDP than in later years (Figure 1). This may influence our findings. The indicators of financial stress used in this article do not adequately capture other possible implications of ill health, such as loss of work effort and earnings, especially when households forgo care due to lack of finances or physical access. Including these considerations would present a bleaker picture of the impact of illness in Myanmar.[24]

These limitations withstanding, Myanmar's domestic policy and economic environment has changed little since 2003. Official data suggest rapid income growth but are considered unreliable by experts.[2] Raw data from 2 rounds of the Integrated Household Living Conditions Survey (IHLCS) in 2004-2005 and 2009-2010 are not readily accessible, but published reports from these data show that OOP health spending has remained unchanged as a proportion of total household spending over the 2 survey rounds at 5%.[1] This is comparable to 6% in WHS data.[12] IHLCS surveys also show that absolute levels of real OOP health spending have also changed little over the 2 survey rounds. While newer data are obviously needed, the findings based on WHS data may not change, even with more recent survey data.

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3. The economic burden of chronic conditions among households in Myanmar: The case of angina and asthma

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In Chapter 3, we specifically consider the economic implications of two chronic conditions – asthma and angina – and show that both conditions lead to significant financial implications in terms of increased out of pocket spending, in addition to having important effects (in the case of asthma only) on workforce participation.

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Economic burden of chronic conditions among households in Myanmar: the case of angina and asthma

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Background: Non-communicable diseases (NCDs) are becoming a major source of the national disease burden in Myanmar with potentially serious economic implications.

Methods: Using data on 5484 households from the World Health Survey (WHS), this study assessed the household-level economic burden of two chronic conditions, angina and asthma, in Myanmar. Propensity score matching (PSM) and coarsened exact matching (CEM) methods were used to compare household out-of-pocket (OOP) spending, catastrophic and impoverishment effects, reliance on borrowing or asset sales to finance OOP healthcare payments and employment among households reporting a member with angina (asthma) to matched households, with and without adjusting for comorbidities. Sensitivity analyses were carried out to assess the impacts of alternative assumptions on common support and potential violations of the assumption of independence of households being angina (asthma) affected and household economic outcomes, conditional on the variables used for matching (conditional independence).

Results: Households with angina (asthma) reported greater OOP spending (angina: range I$1.94–I$4.31; asthma: range I$1.53–I$2.01) (I$1 = 125.09 Myanmar Kyats; I$=International Dollar) almost half of which was spending on medicines; higher rates of catastrophic spending based on a 20% threshold ratio of OOP to total household spending (angina: range 6–7%; asthma: range 3–5%); greater reliance on borrowing and sale of assets to finance healthcare (angina: range 12–14%; asthma: range 40–49%); increased medical impoverishment and lower employment rates than matched controls. There were no statistically differences in OOP expenses for inpatient care between angina-affected (asthma-affected) households and matched controls. Our results were generally robust to multiple methods of matching. However, conclusions for medical impoverishment impacts were not robust to potential violations of the conditional independence assumption.

Conclusions: Myanmar is expanding public spending on health and has recently launched an innovative programme for supporting hospital-based care for poor households. Our findings suggest the need for interventions to address OOP expenses associated with outpatient care (including drugs) for chronic conditions in Myanmar's population.

Keywords Angina, asthma, coarsened exact matching, economic burden, households, Myanmar, propensity score matching

KEY MESSAGES

- Very little is known about the economic burden of non-communicable diseases (NCDs) on households in Myanmar, which is facing major challenges related to economic deprivation and poor population health.
- Analysis of the household economic burden of two chronic conditions, angina and asthma, among Myanmar households reveals significant levels of out-of-pocket (OOP) spending, reliance on borrowing and asset sales to finance care and work participation.
- As Myanmar scales up its public sector allocations to health, it will need to address OOP expenses associated with NCDs, including for outpatient care and drugs.

Introduction

Myanmar is amongst the poorest countries of Asia with 32% of its population living below the poverty line [Ministry of National Planning and Economic Development (MNPED) 2007]. It also lags behind other Asian countries in population health outcomes [World Bank 2012]. Although maternal and child health outcomes and chronic infectious conditions such as tuberculosis continue to be a major source of disease burden, non-communicable chronic conditions are emerging as a serious population health challenge in Myanmar. The global burden of disease (GBD) 2010 study showed that the share of asthma, stroke, cancers, ischemic heart disease (IHD) and diabetes in deaths from all causes increased from 24.9% in 1990 to 35.9% in 2010 [Institute of Health Metrics and Evaluation (IHME) 2012].

Studies conducted in other countries have shown that chronic conditions can have significant economic implications for households in developing nations due to illness-related income losses and out-of-pocket (OOP) spending (Abegunde and Stanciole 2008; Rao et al. 2011; Mahal et al. 2013). Given limited private and social insurance cover, subsidized public health facilities offer an important safety net for the majority of Myanmar's population. The public sector accounts for 90% of all hospital beds in the country and government primary care health facilities reach all the way down to villages. However, patients pay for any drugs and non-durables not available in hospitals and health facilities in the public sector. Ministry of Health data also suggest serious shortages in the health workforce in Myanmar (Htet *et al.* in press). With public sector health spending stagnant at 0.2% of gross domestic product (GDP) until recently, households containing members with non-communicable diseases (NCDs) in Myanmar are forced to rely on private sources of care. Over 70% of outpatient visits in Myanmar are accounted for by private providers and paid for OOP which is significant, given that chronic NCDs are typically managed in outpatient settings (Htet *et al.* in press).

Little is known about the economic implications of chronic NCDs in Myanmar despite their accounting for more than half of all cause deaths. In this article, we highlight the economic burden of NCDs among Myanmar households by focusing on two chronic conditions, angina and asthma, for which information was available in World Health Survey (WHS) data. Angina, a chest pain or discomfort that occurs due to lack of oxygen-rich blood to the heart, is strongly associated with IHD, which accounted for 11.4% of deaths from NCDs in Myanmar in 2010. Asthma accounted for 4.9% of deaths from NCDs in 2010. Diabetes, stroke and cancers are other major chronic conditions in Myanmar in 2010 as per the GBD 2010 study, but available surveys do not contain adequate individual or household-specific information on these diseases.

Although not a severe health condition, such as a heart attack, people with angina will need treatment and preventive measures to avoid longer term adverse health outcomes. These measures include medication (e.g. beta blockers and ACE inhibitors) and surgical procedures such as angioplasty and cardiac bypass surgery, which can be expensive. Analyses of the economic consequences of angina on households are relatively scarce in developing countries, although some work exists for middle- and high-income countries. For example, research for Ukraine showed that angina imposed significant OOP health expenditures, particularly for drugs, on households (Murphy *et al.* 2013). In the United States, angina has been shown to impact ability to work and healthcare costs (Javitz *et al.* 2004). Asthma treatment can also be expensive as it requires regular medication (e.g. corticosteroids) and in acute cases, hospitalization. A recent systematic review of >30 (primarily developed) countries concluded that asthma can impose high resource costs on health systems due to hospitalization and medication expenses but did not assess household-level economic burden (Bahadori *et al.* 2009). Studies in Brazil and Turkey (middle-income countries) show that households spent significant amounts OOP on treatment of asthma-affected members, and individuals with asthma were at high risk for job loss (Beyhun et al. 2007; Cruz and Bousquet 2009; Franco et al. 2009). The financial burden of asthma is likely to be significantly greater in poor countries where health insurance coverage is low.

Using WHS data for Myanmar, we compared household OOP spending, financing for healthcare spending and work participation among households reporting a member with angina or a member with asthma to a set of matched control households. Matching was necessary because the association between illness and household healthcare spending and other economic outcomes is likely to depend on socioeconomic status, demographic composition, residential location and other factors. Propensity score matching (PSM) and coarsened exact matching (CEM) methods were used for these comparisons. Our analysis contributes to the literature on the household economic burden of NCDs in low-income countries and to the development of appropriate policy responses to NCDs.

Methods

Data

We used data from the WHS, implemented by the WHO in >70 countries around the world, including Myanmar, during 2002–

2003. Our sample consisted of 5484 households, with a sampling frame that covered 90% of the population of Myanmar, covering all major geographical regions and population sub-groups. The survey instrument for WHS collected information on household socioeconomic and demographic characteristics and components of consumption spending, including OOP healthcare expenditures. Survey respondents were also asked a number of questions about their own health status, including about angina and asthma from one adult member (randomly chosen using Kish tables) in each household, aged 18 years or older. Detailed household-level information on OOP health spending related to inpatient care, ambulatory care, drugs, healthcare products, laboratory tests and other categories was also collected as part of the survey. Sample households were selected based on a random, stratified sampling procedure. The sampling procedure is described in detail elsewhere (WHO 2003). The interviews were conducted in person following written consent from the respondent and institutional ethical approval for the survey at each study site.

Matching methods: PSM and CEM

We used two matching methods, PSM and CEM, to compare economic outcomes for a household affected by angina (asthma) to a set of matched control households. The indicator of a household affected by angina (asthma) was whether the key respondent reported angina (asthma).

The PSM procedure involved two steps (Dehejia and Wahba 2002). In the first step, the probability (the 'propensity score') that a household affected by the chronic condition, angina or asthma as appropriate, was predicted based on observed household and individual characteristics, sometimes referred to as 'pre-treatment' covariates. This (pre-processing) step involved estimating the following (logit) model:

$$P((c_i = 1)/X_i) = \frac{e^{\beta X_i}}{1 + e^{\beta X_i}}$$

Here c_i indicates whether household i contains a respondent with angina (asthma). The vector X_i indicates household demographic and socioeconomic characteristics, and β is a vector of the parameters to be estimated. In the second step, angina (asthma)-affected households were matched to control households with similar propensity scores using STATA, version 12.1 under the restriction of common support. 'Common support', i.e. overlap in the propensity scores between the treatment and control groups, is needed for obtaining consistent estimates of household-level economic impacts of angina (asthma) (e.g. Nannicini 2007).

A key step in PSM methods is balance checking of pre-treatment covariates X_i. For each covariate used in the regression model that generated the propensity scores, we compared the means between the angina-affected and asthma-affected households and matched control households using a t-test. We also assessed whether the 'standardized bias'—the differences in means between treated and matched control households divided by the square root of the average of the sample variances of the two groups—was <25% (Ho *et al.* 2007). However, even with these precautions, matching can lead to the inclusion of treatment and control households with very different socioeconomic and demographic characteristics when using a summary measure such as the propensity score. Matching simultaneously on all the pre-treatment covariates ('exact' matching) removes the need for balance checking but results in very few matched angina (asthma)-affected households and control households, particularly when the matching variables are continuous or numerous. CEM is a compromise in that angina (asthma)-affected and control households are exactly matched but only after a coarsening of continuous variables into categorical variables.

Households affected by angina and asthma

WHS collected information on angina in two different ways: by inquiring whether the respondent was diagnosed with angina by a medical practitioner or whether the respondent had a set of symptoms consistent with angina, based on the Rose questionnaire (Rose 1965, Rose *et al.* 1977). We defined a household as being angina affected if the respondent either reported as being diagnosed with angina or had symptoms consistent with angina in the last 12 months: 2.70% of the respondents reported having diagnosed angina and 2.12% were identified as having angina based on symptoms. Combining the two sets of households, 4.09% of the households were defined as being angina affected. Asthma-affected households were identified using an exercise similar to that for angina-affected households; 3.02% of respondents reported as being diagnosed with asthma and 2.22% of respondents possessed symptoms consistent with asthma in the 12 months preceding the survey (whether or not diagnosed as having asthma) using definitions in Levesque *et al.* (2013). A household was identified as being asthma affected if the respondent reported being either diagnosed with asthma or having symptoms consistent with asthma. Overall, 3.94% of households were identified as asthma affected.

Variables used to construct propensity scores

Individual respondent characteristics

Age (in the form of indicator variables for whether an individual was 60 years or older and whether the individual was between the ages of 20 and 59 years) and sex of the respondent were included along with an indicator for marital status of the respondent. Ever married and cohabiting respondents were assigned a value of 1, 0 otherwise. An indicator of educational attainment of the household head was included, taking the value of 1 if s/he had completed primary schooling, 0 otherwise. The height and weight of the respondent were converted into body mass index (BMI) and an indicator for 'overweight' (BMI > 25) was used. Finally, we included an indicator variable for whether the respondent 'ever consumed' alcohol (1 if yes, 0 otherwise), given the well-known links between alcohol use, asthma and cardiovascular disease.

Other household members

We used information on socioeconomic and demographic characteristics for household members other than the respondent in the propensity score equation. These included an indicator for a child under 5 years (1 if a member of the household, 0 otherwise), an indicator for an elderly person (defined as being 60 years and over) being a member of the household, the age of the household head (in the form of

indicator variables for whether an individual was 60 years or older and whether the individual was between the ages of 20 and 59 years) and sex of the household head (1 if male, 0 otherwise). Indicators of socioeconomic status and living conditions were also included specifically the type of floor of the dwelling and whether the household belonged to the majority Bamar community.

Other household characteristics

Household size and indicators of geographical location such as rural or urban residence and seven indicators of locational strata used for sampling purposes in the WHS were included.

Outcome variables

OOP health spending

Data on OOP health spending were collected in the WHS for the 4 weeks preceding the survey, using both an omnibus estimate and item-wise estimates for expenses incurred on overnight stays at a hospital or health facility, care received as an outpatient, dental care, care by traditional or alternative healers, drugs, healthcare products (e.g. prosthetics), diagnostic and laboratory tests and a residual category. Item-wise recording of expenditures yields higher estimates in survey data (Xu *et al.* 2009). In this study, we used itemized health spending. Expenditure data were measured in international dollars (I$) using an exchange rate of I$1 = 125.09 Myanmar Kyats, based on World Bank data (World Bank 2014).

Spending on drugs

OOP health spending on drugs by households was measured using a reference period of 4 weeks preceding the survey.

Spending on hospitalization

There were two variables for which information was available: OOP health spending on hospitalization in the 4 weeks preceding the survey and OOP health spending on hospitalization in the year prior the survey. We used information on inpatient spending using the 4-week reference period (Lu *et al.* 2009).

Indicators of the burden of OOP spending

We included multiple indicators of the burden of OOP spending suggested in the literature. These included two indicators of catastrophic spending. First, OOP health spending was defined as catastrophic if it exceeded 20% of total household expenditure. The corresponding indicator used took the value 1 if OOP health spending was catastrophic in this sense, 0 otherwise. Our second measure of catastrophic spending was similar to that used in Xu *et al.* (2003). Household subsistence spending was calculated from the estimates of the national poverty line (World Bank 2012) and subtracted from the total household expenditure to get a measure of the household's 'capacity to pay.' An indicator of catastrophic levels of OOP health spending was defined as taking the value of 1 if OOP spending exceeded 40% of a household's 'capacity to pay' and 0 otherwise.

A measure of household impoverishment due to ill health was also constructed, as in Doorslaer *et al.* (2006). Specifically, aggregate household expenditure was assessed net and gross of OOP spending on health. If the household's aggregate expenditure gross of OOP health payments exceeded the national poverty line, it was defined to be non-poor *ex ante*. Then we considered the same household's aggregate health expenditure net of OOP spending on health. If, upon netting OOP health spending, the household's total expenditure fell below the national poverty line, a household was defined as poor *ex post*. Finally, if a household was *ex ante* non-poor, but poor *ex post*, it was said to be impoverished by the OOP payments associated with illness. An indicator variable (for impoverishment due to illness) was defined, which took the value of 1 for such households and 0 otherwise.

Financing of OOP health expenditure

The WHS also collected information on the methods households used to finance health expenditures in the year preceding the survey. Although not directly corresponding to the data on OOP spending (which used a 4-week reference period), we used a binary outcome indicator for distress financing (=1 for any reported household borrowing or asset sales to finance OOP healthcare, 0 otherwise) in our analysis.

Employment

A binary outcome indicator was constructed taking the value 1 if the individual was employed and 0 otherwise.

Robustness checks and comorbidities

We assessed the robustness of our findings by measuring the economic burden on households using multiple propensity score methods, such as nearest-neighbour matching, radius matching, kernel matching and stratification, in addition to CEM.

Impact estimates based on matching methods (particularly kernel matching) are sensitive to the common support requirement given that it can result in the exclusion of some of the treatment households from the analysis. To assess whether exclusion of treatment households influences our results, we first explored whether and how many asthma (angina)-affected households were excluded from the sample due to the common support restriction. Moreover, the 'thinness' of the overlap in propensity scores has also been raised as a concern in the literature. Thus, we examined the implications for impact estimates of further restricting the common support region by dropping treatment [angina (asthma)-affected] households with the lowest density (in the respective empirical distributions). Specifically, we experimented by dropping between 1 and 10% of the angina (asthma)-affected households with the lowest density for propensity scores to assess the sensitivity of our results to assumptions about common support.

Consistency of impact estimates based on matching methods also requires that conditional on observed covariates used for matching, the distribution of asthma- and asthma-affected households is statistically independent of (potential) household outcomes in the absence of asthma and angina. This is the conditional independence assumption (CIA). Because it is not possible to directly test the validity of this assumption, we followed a strategy suggested in the literature to evaluate the robustness of our impact estimates to violations of CIA. Specifically, we assumed that CIA does not hold for observed covariates used for matching and that there is an unobserved

Table 1 Estimates of probit regression models for stage 1 of PSM

Matching variable	Indicator variable for angina-affected household	Indicator variable for asthma-affected household
Rural residence (1 if rural, 0 otherwise)	0.46 (0.56)	0.44 (0.56)
Household with an individual aged 60+ years (1 if yes, 0 otherwise)	−0.38* (0.20)	−0.18 (0.18)
Household with an under-5 child (1 if yes, 0 otherwise)	0.00 (0.16)	−0.07 (0.17)
Household size	0.02 (0.04)	0.02 (0.04)
Sex of affected individual (1 if female, 0 otherwise)	0.70*** (0.17)	0.45*** (0.17)
Age of respondent is 60+ years (1 if yes, 0 otherwise)	1.43*** (0.54)	2.08*** (0.61)
Age of respondent is 20–59 years (1 if yes, 0 otherwise)	1.01* (0.52)	1.16** (0.60)
Marital status of respondent (1 if ever married, 0 otherwise)	0.04 (0.23)	−0.04 (0.22)
Residence has concrete/hard floor (1 if yes, 0 otherwise)	−0.14 (0.52)	−0.35 (0.47)
Overweight respondent (BMI > 25) (1 if yes, 0 otherwise)	−0.06 (0.24)	−0.00 (0.26)
Whether respondent ever consumed alcohol (1 if yes, 0 otherwise)	0.59*** (0.21)	0.79*** (0.26)
Sex of household head (1 if female, 0 otherwise)	0.05 (0.22)	−0.01 (0.23)
Age of household head is 60+ years (1 if yes, 0 otherwise)	−1.38** (0.68)	−0.93 (0.66)
Age of household head 20–59 years (1 if yes, 0 otherwise)	−0.93 (0.64)	−0.89 (0.65)
Household head completed primary schooling (1 if yes, 0 otherwise)	−0.13 (0.17)	0.04 (0.19)
Bamar ethnic status (1 if yes, 0 otherwise)	0.43* (0.25)	0.46* (0.28)
Indicator variable for strata 1	0.61 (0.61)	−0.59 (0.78)
Indicator variable for strata 2	0.06 (0.59)	−0.70 (0.66)
Indicator variable for strata 3	0.81 (0.54)	0.02 (0.56)
Indicator variable for strata 5	−0.17 (0.30)	−0.34 (0.31)
Indicator variable for strata 6	−1.05*** (0.34)	−0.73** (0.33)
Indicator variable for strata 7	0.18 (0.30)	0.40 (0.31)
Constant	−4.18*** (1.10)	−4.28*** (1.12)
Number of observations	5484	5484
Pseudo R^2	0.05	0.06

Notes: Estimates are based on data from the WHS for Myanmar for 2003. Stratum 1 is the excluded category. Standard errors are reported in parentheses below the coefficient estimates.
*Significant at the 10% level.
**Significant at the 5% level.
***Significant at the 1% level.

binary variable (say U), which, if it were observed and included in the set of matching variables, would lead to CIA being satisfied (Nannicini 2007). Alternative assumptions on its distribution determine how U influences the likelihood of selection into treatment (i.e. household being angina or asthma affected), the magnitude of household outcomes (whether above or below the sample mean) in the absence of angina (asthma) and economic impact estimates if U were observed and used to generate propensity scores for matching. We asked how large the selection and outcome effects had to be to overturn our findings on the economic effects of asthma and angina on households (Nannicini 2007; Ichino et al. 2008).

In our sensitivity analyses, we first assessed the impact of an unobserved confounder on our findings of economic impacts under six different hypothetical scenarios, with each scenario comparing (1) the odds of selection into angina (asthma)-affected household when the binary variable U takes the value of 1, vs the odds of selection when U equals zero and (2) the odds of outcomes taking a value greater than the sample mean when $U = 1$ vs the odds of outcomes taking value greater than the sample mean when $U = 0$, in the angina (asthma)-affected household. In one of these scenarios, we also examined the implications of including an unobservable with the same distribution as an already existing binary variable in our sample—namely, whether the respondent had comorbidities. In the case of angina, information was available on respondents' status with respect to asthma, diabetes and depression and we used a comorbidity indicator that took the value 1 if the respondent reported any of these three conditions, 0 otherwise. In the case of asthma, we used a comorbidity indicator that took the value 1 if the respondent reported any one of angina status, diabetes and depression, 0 otherwise.

Results

Table 1 reports the results of the first-stage probit regressions for generating propensity scores for a household being angina (asthma) affected. Although many of the coefficients are statistically indistinguishable from zero, the age of the

Table 2 Summary statistics for angina-affected and control (matched and unmatched) households

Matching variable	Angina-affected households (95% CI)	Control households—matched (95% CI)	Control households—unmatched (95% CI)	t-statistic	% Bias
Rural residence (%)	68.28 (62.18–74.37)	70.93 (67.94–73.91)	76.43 (75.28–77.58)	−0.73	−5.74
Households with individuals aged 60 years and older (%)	18.06 (13.02–23.10)	19.38 (16.78–21.98)	26.40 (25.21–27.59)	−0.44	−3.38
Households with an under-5 child (%)	33.92 (27.71–40.12)	29.07 (26.09–32.06)	32.68 (31.41–33.95)	1.26	10.43
Household size	4.84 (4.56–5.12)	4.83 (4.70–4.96)	4.94 (4.88–4.99)	0.05	0.42
Sex of affected individual (female) (%)	66.96 (60.79–73.12)	67.84 (64.77–70.92)	55.70 (54.35–57.04)	−0.22	−1.88
Age of affected individual over 60 years (%)	15.86 (11.07–20.65)	14.54 (12.22–16.86)	13.56 (12.64–14.49)	0.48	3.68
Age of affected individual 20–59 years (%)	82.37 (77.39–87.37)	82.38 (79.87–84.89)	81.85 (80.81–82.89)	−0.00	0.00
Marital status of affected individual—ever married (%)	81.50 (76.41–86.59)	81.94 (79.41–84.47)	83.15 (82.13–84.16)	−0.14	−1.14
Living in houses with hard/concrete floor (%)	98.24 (96.51–99.96)	98.24 (97.37–99.10)	97.87 (97.48–98.26)	−0.00	0.00
Overweight respondent (BMI > 25) (%)	9.25 (5.45–13.05)	8.81 (6.95–10.68)	8.41 (7.66–9.16)	0.21	1.53
Whether ever consumed alcohol (%)	17.62 (15.11–20.13)	18.50 (13.45–23.56)	15.16 (14.19–16.13)	−0.28	−2.29
Sex of household head (whether female head) (%)	18.94 (13.80–24.08)	20.70 (18.04–23.37)	16.51 (15.51–17.51)	−0.57	−4.42
Age of household head over 60 years (%)	9.69 (5.81–13.57)	9.25 (7.34–11.16)	14.93 (13.97–15.90)	0.19	1.50
Age of household head 20–59 years (%)	88.99 (84.89–93.09)	89.87 (87.88–91.85)	84.48 (83.50–85.46)	−0.35	−2.86
Whether household head completed primary schooling (%)	72.69 (66.85–78.53)	74.01 (71.12–76.90)	78.79 (77.68–79.89)	−0.38	−2.99
Whether of Bamar ethnicity (%)	77.09 (71.58–82.60)	79.74 (77.09–82.38)	72.07 (70.86–73.29)	−0.79	−6.42
Number of observations	227	888	5257	1115	1115

Notes: Estimates are means from the 2009 WHS data for Myanmar. In columns (2)–(4), 95% confidence intervals (CI) are reported in parentheses below the means. For matching purposes, propensity score calculations were based on probit regression estimates as reported in Table 1. The *t*-test reported in column (5) compares the means between matched angina-affected and control households; the standardized bias (% Bias) reported in column (6) refers to the difference of the sample means of the angina-affected and control households as a percentage of the square root of the average of the sample variances in the angina-affected and matched control households.

respondent, being female, whether the respondent ever consumed alcohol, Bamar ethnicity and geographic location (sampling stratum 6) are associated with the likelihood of a household being angina affected and being asthma affected.

Tables 2 and 3 present summary statistics for angina-affected households and asthma-affected households, unmatched control households and matched control households. The comparison between asthma (angina)-affected and matched households used nearest-neighbour PSM for illustrative purposes). The data show that the means of indicators for the socioeconomic, demographic and locational characteristics of matched controls are considerably closer to the corresponding means for angina (asthma)-affected households, relative to unmatched controls. This suggests that a simple comparison of households affected by angina (asthma) and households unaffected by angina (asthma) is likely to yield biased estimates of their association with economic outcomes without ensuring some degree of similarity in the socioeconomic and demographic characteristics of the two sets of households via matching. In Tables 2 and 3, *t*-tests for differences in sample means of angina-affected and control households in the matched dataset (after nearest-neighbour matching) showed no statistically significant differences at the 5% level. In addition, estimates of 'standardized bias' are reported in the last columns of Tables 2 and 3 and are <12% in all cases, considerably less than the 25% threshold recommended in Ho *et al.* (2007). The data also confirm that over 70% of the survey households lived in rural areas. One-fifth of the households are headed by women and the majority ethnic Bamar group accounted for more than three quarters of the sample.

Figures 1 and 2 describe the empirical distribution of propensity scores for angina (asthma)-affected households and their respective unmatched controls. In general, the empirical distributions of angina (asthma)-affected households and control households track each other well, so we could expect non-trivial matches over the region of common support. Moreover, the support for unmatched controls contains the support for asthma (angina)-affected households, so the standard common

Table 3 Summary statistics for asthma-affected and control (matched and unmatched) households

Matching variable	Asthma-affected households (95% CI)	Control households—matched (95% CI)	Control households—unmatched (95% CI)	*t*-statistic	% Bias
Household location (rural) (%)	84.02 (79.13–88.91)	88.13 (85.95–90.30)	75.76 (74.61–76.92)	−1.47	−11.87
Household with an individual aged 60 years or older (%)	25.57 (19.75–31.39)	21.46 (18.70–24.22)	26.08 (24.89–27.26)	1.22	9.69
Household with an under-5 child (%)	30.14 (24.01–36.26)	27.40 (24.40–30.39)	32.84 (31.57–34.11)	0.71	6.05
Household size	4.75 (4.47–5.03)	4.58 (4.45–4.71)	4.94 (4.89–4.99)	1.02	8.41
Sex of affected individual is female (%)	58.90 (52.33–65.47)	55.25 (51.91–58.59)	56.05 (54.71–57.39)	0.87	7.37
Age of affected individual over 60 years (%)	26.02 (20.16–31.88)	25.11 (22.20–28.03)	13.14 (12.23–14.06)	0.27	2.09
Age of affected individual is 20–59 years (%)	72.60 (66.65–78.55)	72.60 (69.69–75.52)	82.26 (81.23–83.29)	−0.00	0.00
Marital status of affected individual (%)	80.37 (75.06–85.66)	83.11 (80.59–85.62)	83.19 (82.18–84.20)	−0.88	−7.08
Household has concrete/hard floor (%)	97.72 (96.72–99.71)	98.17 (97.27–99.07)	97.89 (97.50–98.28)	−0.43	−3.21
Overweight respondent (BMI > 25) (%)	8.22 (4.55–11.89)	8.22 (6.37–10.06)	8.45 (7.70–9.20)	0.00	0.00
Whether ever consumed alcohol (%)	21.92 (16.43–27.41)	25.11 (22.20–28.03)	14.98 (14.02–15.95)	−0.93	−7.53
Whether sex of household head is female (%)	17.81 (12.70–22.92)	14.16 (11.81–16.50)	16.56 (15.56–17.57)	1.23	9.97
Whether age of household head is over 60 years (%)	19.18 (13.92–24.42)	19.63 (16.97–22.30)	14.53 (13.58–15.48)	−0.15	−1.15
Age of household head 20–59 years (%)	79.45 (74.06–84.84)	80.37 (77.70–83.03)	84.88 (83.91–85.85)	−0.29	−2.28
Whether household head completed primary schooling (%)	81.74 (76.59–78.53)	83.11 (80.59–85.62)	78.40 (77.29–79.52)	−0.43	−3.59
Bamar ethnic status (%)	80.37 (75.06–85.66)	81.74 (79.14–84.33)	71.95 (70.73–73.16)	−0.42	−3.49
Number of observations	219	852	5265	1071	1071

Notes: Estimates are means from the 2003 WHS data for Myanmar. In columns (2)–(4), 95% confidence intervals (CI) are reported in parentheses below the means. For matching purposes, propensity score calculations were based on probit regression estimates as reported in Table 1. The *t*-test reported in column (5) compares the means between matched asthma-affected and control households; the standardized bias (% Bias) reported in column (6) refers to the difference of the sample means of the asthma-affected and matched control households as a percentage of the square root of the average of the sample variances in the angina-affected and matched control households.

support restriction did not to lead to any loss of observations in the treated group. There are, however, a number of cases of angina (asthma)-affected households and controls with a low density for propensity scores, the implications of which were further explored in sensitivity analyses (see below).

Household economic burden of angina

Table 4 reports estimates of angina's economic burden on households in Myanmar under alternative matching methods, namely PSM methods (nearest-neighbour, radius, kernel and stratification matching) and CEM. Per person OOP spending of angina-affected households was significantly greater than matched controls in the 4 weeks preceding the survey, ranging from I$3.67 to I$4.31 under different PSM methods and I$1.94 under CEM. Between 38% and 60% of this expenditure was accounted for by greater drug spending, across the various matching methods; drug spending per person was also greater in angina-affected households compared with matched controls by I$0.72–I$2.41. No statistically significant differences were, however, observed for OOP spending on hospitalization. Respondent employment was lower in angina-affected households relative to matched counterparts, by about 1–8% across the matching methods, but the estimates were mostly statistically insignificant. The estimates in Table 4 also suggest that households where the respondent reported angina incurred significantly higher levels of catastrophic spending than matched controls. An extra 6–7% of angina-affected households incurred catastrophic spending if we use the 20% threshold for the ratio of OOP health spending to total household spending and an extra 5–7% of angina-affected households incurred catastrophic spending if we use the 40% catastrophic threshold for the ratio of OOP health spending and household 'capacity to pay'. Depending on the matching method used, the proportion of angina-affected households impoverished by OOP spending on health was 5–12% higher than matched controls. Finally, the proportion of angina-affected households reporting financing healthcare by borrowing or sale of assets was 12–14% greater than controls across the matching methods.

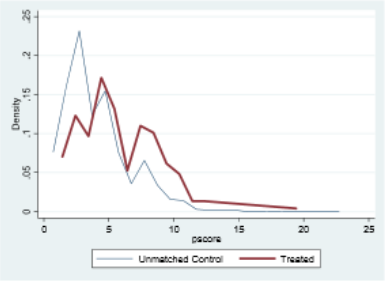

Figure 1 Distribution of propensity scores for angina-affected households and unmatched controls

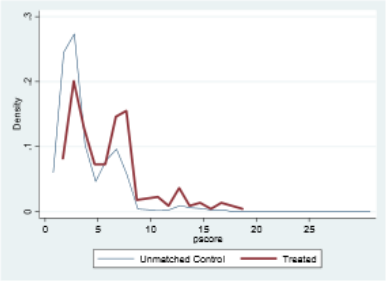

Figure 2 Distribution of propensity scores for asthma-affected households and unmatched controls

Household economic burden of asthma

Table 5 reports our findings on the estimates of the household economic burden of asthma under alternative matching methods. Across the different methods, asthma-affected households incurred an extra I$1.53–I$2.01 per person in OOP health spending relative to matched controls in the 4 weeks preceding the survey. The difference was driven mainly by OOP drug expenditure, which was higher in asthma-affected households by I$0.81–I$1.08 per person relative to matched controls. As in the case of angina, no statistically significant differences were observed in OOP spending for hospitalization between asthma-affected and matched controls. Asthma-affected households were 3–5% more likely to incur catastrophic spending compared with their matched controls when the catastrophic threshold of OOP was defined as 20% of the total household expenditure and by 2–4% when the catastrophic threshold was 40% of a household's 'capacity to pay', although these were not always statistically distinguishable from zero at the 5% level of significance. Asthma-affected households were also 4–8% more likely to report medical impoverishment due to OOP, relative to matched controls. Respondent employment among asthma-affected households was between 8 and 14% lower than matched households. The proportion of asthma-affected households reporting either borrowing or asset sales to finance healthcare was 7–9% greater than of matched controls under PSM but small and statistically insignificant under CEM.

Sensitivity analyses

Common support and trimming

Our sensitivity analyses for common support involved re-estimating the household economic impacts of angina and asthma under alternative 'trimming' assumptions, ranging from dropping 1 to 10% of total treatment households that had propensity scores with a low density in the empirical distribution. The results of this analysis, which are summarized in Supplementary Appendix Tables A1.1–A1.16, show that trimming of the sample of angina (asthma-) affected households with low density propensity scores does not influence our findings on the magnitude of the estimated impacts and overall conclusions.

The results of our sensitivity analysis for confounding by an unobserved binary variable are reported in Supplementary Appendix Tables A2.1–A2.16. Although we cannot directly test for the failure of the CIA, these results (shown for kernel and nearest-neighbour matching) suggest that an unobserved confounder with a distribution similar to that of the comorbidity indicator variable among respondents in our survey data will not affect our main conclusions. Specifically, to overturn our economic impact estimates of angina (in Tables 4 and 5) on total OOP spending (including on drugs), and borrowing and asset sales, the distribution of the unobservable would have to be such as to increase the odds of selection into the treatment group by a factor of 8 or more and the odds of having an outcome greater than the mean by factor of >11. To overturn findings for indicators of catastrophic spending, workforce participation and impoverishment effects require a distribution of the unobservable that increases the odds of selection into the treatment group by a factor of 5 or more and the odds of having an outcome greater than the mean by factor of >8. For asthma, our analysis indicates that with one exception (the impoverishment indicator), the odds of selection into treatment and into an outcome higher than the mean would have to be higher by 8 and 13 times, respectively, to overturn our findings for most outcome indicators under kernel matching. For nearest-neighbour matching, however, the threshold for the odds ratios is lower, roughly 4.5 for selection and 7 for outcomes. The impact estimates for the impoverishment indicator, however, appear quite sensitive to even a small change (due to the unobserved confounder) in the odds of selection into treatment and outcomes greater than the mean. We conclude that with the exception of impact estimates for impoverishment, our results are fairly robust to violations of the CIA of the type assessed in this article, given the fairly rich set of variables used to construct our propensity scores.

Discussion and conclusions

Our findings contribute to the limited literature that exists on the household economic implications of NCDs in developing countries, a major contributor to the GBD (Bloom *et al.* 2011).

Table 4 Household economic burden associated with angina in Myanmar: results from alternative matching methods

Economic outcomes	Nearest-neighbour matching	Radius matching	Kernel matching	Stratification	CEM
Per person OOP health spending in last 4 weeks (I$)	3.67*** (1.43)	4.31*** (1.36)	3.94*** (1.37)	3.74*** (1.23)	1.94* (1.03)
Per person drug expenditures in last 4 weeks (I$)	2.06** (0.99)	2.41** (1.02)	2.29** (1.09)	2.17*** (1.08)	0.72* (0.41)
Per person hospitalization expenses in last 4 weeks (I$)	−0.27 (0.55)	0.10 (0.33)	−0.07 (0.25)	−0.10 (0.26)	−0.30 (0.54)
Workforce participation effect of angina affected individual	−0.04 (0.04)	−0.01 (0.03)	−0.08*** (0.03)	−0.03 (0.03)	−0.03 (0.04)
Borrowing and selling assets to pay any health expenditure in last one year	0.14*** (0.03)	0.12*** (0.03)	0.14*** (0.03)	0.13*** (0.03)	0.13*** (0.03)
OOP health spending as share of total household expenditure at 20% cut-off	0.06*** (0.02)	0.07*** (0.02)	0.07*** (0.02)	0.07*** (0.02)	0.06*** (0.02)
OOP health spending as share of household's 'capacity to pay' at 40% cut-off	0.06** (0.03)	0.07*** (0.03)	0.07** (0.03)	0.06*** (0.02)	0.05* (0.03)
Impoverishment due to OOP health payments	0.07* (0.04)	0.06* (0.04)	0.06* (0.04)	0.05 (0.04)	0.12*** (0.04)
Sample (treatment)	227	217	227	226	146
Sample (control)	888	5257	5181	5182	907

Notes: Coefficients are the average treatment effect estimated from multiple PSM methods [nearest neighbour, radius (radius = 0.0001), kernel and stratification]. Bootstrapped standard errors are reported in parentheses below coefficient estimates. For measuring economic burden in terms of 'capacity to pay' and impoverishment, we used the national poverty line for Myanmar (adjusted for the year 2005 using consumer price index data from the World Bank). For estimates in I$, we used a conversion rate of 1 I$ = 125.09 Kyats provided by the World Bank. (http://data.worldbank.org/indicator/PA.NUS.PRVT.PP?page=2).
For each coefficient, statistical significant differences between the treatment and matched controls were shown at the level of *10%, **5% and ***1%.

Using multiple matching methods, our results suggest that chronic conditions such as angina and asthma are associated with a significantly higher economic burden on affected households in Myanmar relative to a set of closely matched control households. Moreover, our conclusions are mostly robust to sensitivity analyses that allow for varying the range of common support for matching and violations of the CIA associated with a single binary unobserved variable.

We find, firstly that the economic burden associated with angina (asthma) takes the form of increased OOP payments for outpatient care. But increased OOP payments for angina and asthma are not associated with hospitalization expenses. Rather OOP payments were largely driven by payments for medicines, which accounted for 38–60% of OOP payments in our analysis. Although we are unaware of any previous work on OOP spending by households on non-communicable chronic conditions in Myanmar, Lonnroth *et al.* (2007) estimated high levels of OOP spending on tuberculosis treatment in Myanmar, with 60% of all such expenditures being on drugs, comparable to our results. Multiple reports of the Ministry of Health describing the National Health Accounts of Myanmar also estimate shares of OOP spending on drugs (in total OOP spending) of the order of 50–55% during the period 2003–2010. This conclusion is not surprising given the limited government financing for healthcare in Myanmar and an absence of other mechanisms for health insurance, which has led households in Myanmar to rely on their own funds to pay for drugs and health services (Ministry of Health 2007, 2009, 2011).

Our analysis suggests that asthma in particular may be associated with lower household incomes. Although direct data on household earnings from work or income from assets were unavailable, we did find that employment among respondents with asthma was generally lower relative to matched controls by about 8–14%, which confirms findings from other studies for middle-income countries (Franco *et al.* 2009). All else the same, lower employment is likely to lower household incomes. We also found that households affected by angina relied more on borrowings or asset sales to finance their OOP healthcare spending than matched controls. To the extent that some of these may have been productive assets such as land, machinery or livestock, future household incomes could be adversely affected.

There are some limitations to our analysis. The analysis is limited to only the chronic conditions (angina or asthma and associated comorbidities) reported by the respondent. We could not get information on the health status of other household members and this could potentially influence our findings. If, for instance, some household members with angina (asthma) ended up in controls (due to being non-respondents), our estimates of the household economic burden could be biased towards the null. On the other hand, it is possible that individuals reporting angina/asthma may be more aware of their health or have worse health and more likely to seek care than average. In this case, there will be an upward bias in our measures of economic burden of angina/asthma. It is also possible that additional comorbidities of individuals reporting angina/asthma may not have been captured. But sensitivity analyses to assess the impacts of the CIA suggest that these biases may be insufficient to overturn our results.

Finally, our analysis is based on WHS data from nearly 10 years ago (2002). This appears not to be a serious concern given

Table 5 Household economic burden associated with asthma in Myanmar: results from alternative matching methods

Economic outcomes	Nearest-neighbour matching	Radius matching	Kernel matching	Stratification	CEM
Per person OOP health spending in last 4 weeks (I$)	2.01** (0.83)	1.60* (0.83)	1.87** (0.75)	1.84** (0.73)	1.53** (0.77)
Per person drug expenditures in last 4 weeks (I$)	1.01** (0.43)	0.81* (0.45)	1.08** (0.42)	1.04*** (0.38)	0.82** (0.37)
Per person hospitalization expenses in last 4 weeks (I$)	−0.04 (0.30)	−0.04 (0.22)	−0.13 (0.18)	−0.13 (0.19)	−0.04 (0.34)
Workforce participation effect of angina affected individual	−0.14*** (0.04)	−0.09** (0.04)	−0.11*** (0.03)	−0.08** (0.03)	−0.09** (0.04)
Borrowing and selling assets to pay any health expenditure in last one year	0.07** (0.03)	0.08*** (0.03)	0.09*** (0.03)	0.07*** (0.03)	−0.01 (0.03)
OOP health spending as share of total household expenditure at 20% cut-off (%)	0.05** (0.02)	0.05** (0.02)	0.05** (0.02)	0.05** (0.02)	0.03 (0.02)
OOP health spending as share of household's 'capacity to pay' at 40% cut-off (%)	0.02 (0.03)	0.03 (0.03)	0.04* (0.02)	0.04 (0.02)	0.04 (0.03)
Impoverishment due to OOP health payments	0.08* (0.04)	0.04 (0.04)	0.08** (0.03)	0.06* (0.04)	0.08* (0.04)
Sample (treatment)	219	201	219	219	142
Sample (control)	852	5265	4978	4978	885

Notes: Coefficients are the average treatment effect estimated from multiple PSM methods [nearest neighbour, radius (radius = 0.0001), kernel and stratification]. Bootstrapped standard errors are reported in parentheses below the coefficient estimates. For measuring economic burden in terms of 'capacity to pay' and impoverishment, we used the national poverty line for Myanmar (adjusted for the year 2009 using consumer price index data from the World Bank for Myanmar). For estimates in I$, we used a conversion rate of 1 I$ = 125.09 Kyats provided by the World Bank. (http://data.worldbank.org/indicator/PA.NUS.PRVT.PP?page=2).

For each coefficient, statistical significant difference between the treatment and matched control was shown at the level of *10%, **5% and ***1%.

the low and fairly stable share of public and private spending on health in Myanmar (as a share of GDP) until fairly recently. OOP health spending as a share of total household expenditure has also remained unchanged over the last decade at about 6%. Survey data also show that real aggregate household expenditure per capita also remained unchanged during 2004–2010, suggesting stagnant living standards [Ministry of National Planning and Economic Development (MNPED) 2007, 2011]. National Health Accounts data also show that the share of OOP spending allocated to drugs has remained stable at 50–55% over the last decade (Ministry of Health 2007, 2009, 2011). Data on individual drug price trends is unavailable, however, and given the absence of drug price controls in Myanmar and dominance of private pharmacies in drug retail, the economic burden associated with drug expenses for chronic conditions could have risen over time.

These limitations apart, we believe our analysis makes an important contribution to the policy challenges related to NCDs, including the appropriate allocation of health sector resources, in developing countries. Even for conditions that are ordinarily managed in outpatient settings—angina and asthma—we find that economic burden on households could be significant. In Myanmar's case, this seems to be a direct consequence of limited public spending on health services. Our findings suggest a need for expanding spending on subsidised healthcare, including in outpatient settings for chronic care needs of Myanmar's population. Recent efforts to expand healthcare services in Myanmar have included a Global Alliance on Vaccines and Immunization (GAVI) initiative and government budgetary allocation increases to health. The GAVI initiative, however, is intended to support inpatient care. Other new government programmes have focused on child and maternal health services. Our analysis highlights the need to include subsidized access to chronic care in outpatient settings and drugs.

Supplementary data

Supplementary data are available at *Health Policy and Planning* online.

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4. Targeting in Health Programs: A Literature Review

Our goal in this thesis is to assess effectiveness of the HEF program in Myanmar to target its intended beneficiaries: namely, households with poor women and children. In its efforts to target beneficiaries for hospital-based services, the HEF program shares a common characteristic with programs in many countries, both developing and developed, where public subsidies for health are targeted towards the poor and marginalized populations. Targeting is justified by resource constraints faced by governments, so that only a subset of health interventions and population groups receive priority policy attention. For example, countries may choose to increase allocations on only a few services, such as primary care, or alternatively, hospital-based care. The design of benefits packages covered by public sector health services, or publicly funded insurance is a more general manifestation of this concern. Myanmar's health equity fund programme reflects this, given its coverage of only hospital services to a specified population sub-group, and even within that category, on a specific subset of services.

Multiple international examples of targeting exist. Recent expanded coverage in the United States, The Patient Protection and Affordable Care Act (ACA), under the so-called "Obamacare" involves a substantial government subsidy for premiums for those who cannot afford to pay them (Gruber 2011). In the Republic of Korea, its universal social health insurance scheme links the magnitude of premium contributions to earnings, with the poor paying less than their higher earning counterparts, and the government premium contributions make up the gap (Carrin

and James 2005). Among developing countries, many health programs where government subsidies were disproportionately targeted the poor. Recently, in India, multiple publicly funded hospital insurance schemes have been launched that target the poor and informal sector workers (Prinja et al. 2012). Ghana's national health insurance also subsidises the premium contributions of a large number of individuals who are considered more economically advantaged than others (Gajate-Garrido and Owusua 2013). Of course, the targeting of programs to specific sub-populations is not confined to health insurance. There is a vast literature that describes targeting in a number of different contexts, such as employment programs, pension schemes, maternal and child health programs and food supplies (Manasan and Cuenca 2007, Heinrich 2013, Lannoo et al. 2014, Bliss and Striefel 2015).

Because targeting of a sub-set of the Myanmar population is a central element of the Health Equity Fund scheme of Myanmar, the international experience with targeting of disadvantaged populations can serve both as a useful benchmark for an assessment of its own performance, as well as identify alternative approaches to targeting that can be used to compare how well Myanmar could have done, had it chosen to adopt an alternative approach to targeting the its priority sub-population. The first part of this chapter reviews the literature on the main methods for targeting beneficiary populations, particularly in health insurance programs, and potential challenges associated with each approach. The second part focuses specifically on the experience with health equity funds in the region.

4.1. Targeting: Key Concepts

There are many different approaches to targeting beneficiaries to access social programs and the adoption of one as against other depends on a mix of factors. For example, commonly stated criteria for comparing targeting approaches are the effectiveness of the targeting mechanism used in reaching intended beneficiaries, the likelihood of benefits reached populations who do not belong to the beneficiary group (leakages) and administrative costs (Legovini 1999). Economically, inefficiencies imposed by perverse incentives associated with targeting (such as the masking of assets to claim eligibility, or putting in less effort in job searches to continue claiming unemployment insurance) are also relevant when considering the costs of targeting. From the standpoint of policy other criteria may also be relevant, such as political feasibility and stigma in participating populations.

With these criteria as background, the three broad targeting mechanisms can be broadly be described as categorical targeting, means-tested or proxy means-tested (indirect targeting), and self-selecting (direct targeting).

4.1.1. Categorical Targeting

This method of targeting is intended for programs benefiting individuals or households living in a definite geographical area, or in specific social-economic or demographic groups. Geographic targeting of poor individuals, for example, requires information on the geographic distribution of poor households, as indicated by some desired variable (such as indicators of the severity of poverty at the geographic or community level, or poverty ratio). Geographic areas where the targeted households

live in greater concentration (such as urban slums or specific rural areas, where the poor are often concentrated) is an example of categorical targeting. Defining all elderly individuals as eligible for a pension benefit is another example of categorical targeting aimed at poverty reduction, as many elderly tend to be poor in societies with limited levels of formal employment.

The main advantage of categorical targeting is that administrative costs will tend to be low (as will leakage) as a simple proof of residence or age (for elderly benefits) will suffice for determining program eligibility. Stigma will likely be low as well, since benefits are accessible to all, even if they are non-poor. However, categorical targeting does require information on the geographic distribution of beneficiary characteristics that are being targeted. Moreover, there is always the risk that some households that are not needy might benefit if they reside in an area where the social program is offered, or if they possess a certain demographic attribute (e.g., being over 60 years in age). Examples of categorical targeting include the age pension in New Zealand for which all New Zealanders are eligible, or health benefits offered under Thailand's universal insurance scheme.

4.1.2. Means Testing and Proxy Means Testing

In order to get more benefits in low income households, without the concomitant risk of providing benefits to the non-poor, *means-tested targeting* programs are sometimes used. However, social programs relying on means testing require more detailed household income- and asset-related information and verification. Thus the cost of administration in such programs is usually higher than in the other two

targeting methods. Means testing can also be quite difficult as estimating income in rural settings is complicated by production for home use, and because of unpaid work on the family farm. Direct means testing is likely to be more effective in developed countries where sophisticated tax collection systems are common and frequency of work in the formal sector is high.

Proxy means targeting refers to the indirect mechanism of gathering information on means, such as by relying on information that is a good proxy of means. The information in question could be data on basic household and individual characteristics that are likely to be highly correlated to means. Examples of such characteristics include the educational status of the household head, the type of construction used for the family home, size of the family home, household assets and consumer durables, etc. (Kidd et al. 2011). A scoring formula that essentially weights each of the "proxies" using some type of regression analysis is typically used to arrive at a proxy indicator of income (Persaud 2005). The regression analysis usually involves assessing the correlation between a welfare indicator such as household consumption/expenditure and the proxy variables.

Use of proxy means tends to be cheaper and the data more easy-to-collect than means-testing method. However, it is likely to have less targeting efficacy than direct means testing.

4.1.3. Self-Selection

Self-selection or self-targeting refers to a targeting mechanism where transactions costs associated with the social program are thought to be lower for members of the

targeted population than others. For example, access to free public sector health services that require long waiting times means that only those individuals who have higher net benefits of waiting are likely to be able access the public subsidy. Similarly, employment schemes involving opportunities to work in projects that require significant manual labour will appeal only to those individuals who traditionally rely on such work, or those who otherwise have a lower cost (e.g., stigma costs) of doing such work. In social assistance programs, self-targeting is used for increasing participation of the poor in public works to reduce program administration costs. Self-targeting is used in the Government of India initiated self-employment programmes, the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS). The scheme is a demand-driven with participants receiving the benefit of 100 days guaranteed employment in unskilled manual work per rural household. all over the country (Kumar and Helaney 2013, India 2015). Another common use of self-targeting is provision of food subsidies, as food accounts for a much greater share of spending by the poor than the rich (Haddad and Kanbur 1991, Legovini 1999).

The main advantage of self-targeting is that typically involves much lower administrative costs than other targeting techniques as so information on means is required, and any associated leakages to the non-poor are likely to be small. On the other hand, self-selection is this form can work only for population groups for whom this is a low cost endeavour. However, there are circumstances – such as when a poor individual is unable to work owing to disability – where self-targeting may actually fail to help the most needy groups in society.

4.2. Targeting Effectiveness: Empirical Evidence

Because of the large numbers of social programs that target specific population sub-groups, there is a considerable body of empirical evidence on the effectiveness of alternative methods of targeting. We consider the experience with the major targeting mechanisms, noting that in many cases the targeting strategy adopted involved a hybrid of more than one of the targeting approaches listed above. The categorizations under the different heads are therefore, not entirely precise.

4.2.1. Categorical Targeting

The Peruvian Social Fund (FONCODES) directed funds for education in poor communities using a 'poverty map' of districts. This geographic targeting method led to improved school attendance among poor children. The program was also found to be effective in reaching the poorest districts. However, the data also suggested that the program was less effective in reaching the poorest of the poor, with the poorest 7% of the children less likely to benefit than others (Paxson and Schady 2002). Sometimes geographic targeting has been implemented in combination with additional tools to target program benefits to a subset of the population living in the geographical area. In Indonesia, the Social Safety Net program, or the *Jaring Pengaman Sosial* (JPS) health card program, was started in August 1998 in order to get increase the access of the poor to health services in the aftermath of the Indonesian economic crisis. People presumed to be vulnerable to health shocks were selected on the basis of geographic and community-based (by local authorities and communities) targeting and allocated health cards to identify their beneficiary

status. Those holding health cards were had easier access to social services, including free health care services, from public health care providers. More than 10% of the population received health cards within six months. The health card scheme was intended to be pro-poor, but populations in the middle economic quintiles were found to use the health card more often. Although the targeting exercise was decentralized to the local level, it could not overcome the barriers in health care access especially among those residing in remote areas. The Indonesia health card targeting study showed the need for adequate and up-to-date social status indicators and the role of poverty dynamics, with individuals both moving into and out of poverty status (Sparrow 2008).

Another example of community-based individual targeting in action was Pakistan's Zakat cash transfer program, where beneficiaries were identified with the help of local committees. However, leakage rates were estimated to be quite high, with 30% of the program benefits going to households who were not eligible (Yusuf 2007). This experience in turn, pointed to a need to carefully monitor program beneficiaries and to address issues of elite capture of program benefits as also noted (Bardhana and Mookherjee 2004).

This experience apart, delegation of authority in developing country governments in targeting and controlling the community programs are common and often effective. A study on the Food-For-Education (FFE) program in Bangladesh reveals within-village targeting is quite effective in identifying and delivering benefits to targeted populations (Galasso and Ravallion 2005). Bardhana and Mookerjee (Bardhana and Mookherjee 2004) note that decentralized systems can target effectively, especially at the regional level. However, the main drawback in low and middle-income

countries is poor governance and pressure from local elites (Bardhana and Mookherjee 2004). The Community-Based Public Works Programme (CBPWP) in South Africa targeted program benefits to poor and women using geographic targeting (District level) combined with community identification of program beneficiaries using criteria ranging from poverty, unemployment, or infrastructure needs and local perceptions of need and entitlement. The public works programs covered 18 percent of the provincial population, 29 percent of the provincial poor, and 38 percent of the provincial unemployed. The program was found to be effective in distributing benefits and highlighted the importance of transparency and accountability in effective delivery (Adato and Haddad 2001).

Another example of a geographically targeted scheme, this time in combination with elements of self-targeting, was India's Jawahar Rojgar Yohana (JRY). Resources from the central government under the JRY scheme were allocated to states on basis of their share in rural poverty and on the percentage of beneficiaries that were poor. Although 43% of budgeted allocations ended up with poor rural households, there were considerable leakages facilitated by bureaucratic corruption. The programs were found not to be cost effective (Gaiha et al. 2001). A program with similar targeting features was the Social fund program in Zambia that targeted the beneficiaries geographically by district, based on administrative criteria designating districts as poor or non-poor. This was combined with self-selection introduced via interventions that included the provision of goods and services more likely to be used by the poor. The findings of the Zambia program showed the poorest 10% of districts received 9.8% of resources and the richest 10% of districts 8.6%. Many program beneficiaries were not poor. Indeed, the wealthiest quintile accounted for

about 20% of beneficiaries and leakage of benefits to the non-poor was estimated at 29% of resources allocated under the program (Rawlings and Domelen 2003). Another interesting example of geographic targeting was the Armenian Social Investment Fund (ASIF) that was launched to improve local infrastructure financing on community-designed and -implemented projects to rehabilitate primary schools, water systems, and other infrastructure. The targeting of ASIF resources was relatively neutral with regard to poverty, and the requirement of a 10 percent community contribution meant that some poorer communities were likely to be excluded. There are some indications that the targeting favoured the poor. About 20% of the households under ASIF showed same income as households ranked on the 10th percentile of country's income distribution. Moreover, household consumption expenditures of ASIF households were lower than average among households in the program areas (Chase 2002).

4.2.2. Proxy Means Targeting

The Ghana National Health Insurance Scheme (NHIS) was launched in 2003 and sought to increase the access of the poor to health insurance. Households living in districts where a large number of poor lived were sampled and a set of characteristics identified as indicative of low socioeconomic status. The characteristics related to employment and resident status and these were used to identify households who would be eligible to get subsidized premium rates for joining NHIS. Although there were strict controls in place regarding who was enrolled at the district level, in the end the poor were not effectively targeted.

Reducing the premiums resulted a high coverage for the extremely poor but there were still substantial leakages of benefits to the non-poor (Wodon 2012).

Perhaps the best known targeting evaluation, conducted in Mexico, is the Health Education and Nutrition Program (PROGRESA), which identified the beneficiary households for cash benefits. The PROGRESA (precursor to Opportunidades) is an anti-poverty program, which used statistical methods in identifying poor households using census data, a marginality index of seven socio-economic variables such as age, sex, language speaking, education and marital status (proxy means). Proxy means targeting in the context of PROGRESA was combined with geographical targeting by taking account of local characteristics. One study compared the PROGRESA targeting strategy with a similar anti-poverty program PRONASOL operating in Mexico. The study concluded that the PROGRESA selection method was more effective in identifying the very underprivileged households for receiving program benefits (Skoufias et al. 2001). At the same time, the overall leakage (inclusion error of non-poor households) was 40% and overall under-coverage (exclusion of poor households) was 25%. Overall, while PROGRESA's targeting of extremely poor households within localities was generally effective, it was less effective in identifying marginally poor households (Skoufias et al. 1999).

Finally, the Nicaraguan Social Fund provided social investments such as sanitation, education and health facilities to the poor people. Community level and household level targeting were analysed whether the direct beneficiaries below the poverty line and very poor were targeted properly. Around 60% of the direct beneficiaries received the benefits from the program in education and health sector. About 18% of the programme beneficiaries were extremely poor (Pradhan and Rawlings 2002).

4.2.3. Self-Targeting

The Bolivian Social Investment Fund (SIF) was demand driven and targeted the poor with benefits in education, health and sanitation. Overall, the program benefits were equally distributed over the population, but there were regional differences. Investments in health and sanitation benefited the relatively well-off in some regions. In the case of sanitation part, 47 percent of the targeted households were found to have access to piped water compared to only 26 percent of all rural households (Pradhan et al. 1997). A similar program in Honduras (Honduras Social Investment Fund) was found to reach 20% of the lowest income household. However, leakages were also noted with 9% of the richer groups benefiting (Walker et al. 1999).

An anti-poverty program in Argentina, (Trabajar II) was assessed for its targeting effectiveness and program performance. Self-targeting was used to get benefits to the poor in the local communities where 40% of the participants were in the poorest quintile and 60% from the poorest decile. The participants with characteristics of male, married and households were more frequently selected whereas there might have some propensity for them as members of political parties and neighbourhood associations. About 80% pf the participants are poor and the program was well targeted (Ravallion 1999).

In India, a microfinance program was implemented in the state of Jharkhand targeting households at the bottom of the income and wealth distribution. Self-help groups of around 10 women were organized for risk sharing and for identification of members in need of credit. However, participation was very low, with only 23% of the households in the targeted areas accessing and participating in the program.

Overall, the poorest households benefited less than those marginally above the poverty line in the program areas. (Dewan and Somanathan 2007).

4.3. Comparison of Alternative Targeting Mechanisms

Some studies have sought to compare the performance of the different targeting approaches in reaching their intended beneficiaries. One recent analysis compared the performance of alternative targeting methods using a randomized experiment The specific study in question was an assessment of the Program Keluarga Harapan (PKH), a conditional cash transfer program in Indonesia. The study assessed proxy means testing, self-targeting and community targeting of beneficiaries under the program in over 600 villages. Using a consumption based poverty line as the gold standard, the study found that the proxy means test is more accurate than self-targeting in identifying beneficiaries and also has lower administration costs. The proxy means testing was also shown to be more effective than community targeting when using per capita consumption indicators (Alatas et al. 2014). However, community targeting led to greater satisfaction with the programme. PMT also performed well in a study that sought to assess targeting of public subsidies in Iran. The study found that using PMT led to the correct identification of 56% of the poor (belonging to the lowest quintile), whereas there was a leakage of 7% in groups above the 40th percentile (Bakhshoodeh 2013).

As another example, a study conducted under the auspices of the Oportunidades program in Mexico compared targeting by self-selection method with a method of administrative targeting in identifying programme beneficiaries. Administrative

targeting was based on proxy-means testing criterion. In general, the PMT criterion led to higher coverage of poor households. The study authors concluded that administrative targeting using proxy-means scores could reduce misreporting and identify beneficiaries with greater certainty and lead to budgetary savings for the programme (Coady and Parker 2009). A later study compared the self-selection method of targeting with the census/geographic method of targeting. Under a uniform transfer program where the budget is set equal for both methods, targeting costs were compared. It was found that self-selection methods more effectively target poor households and cost less (Hata 2013).

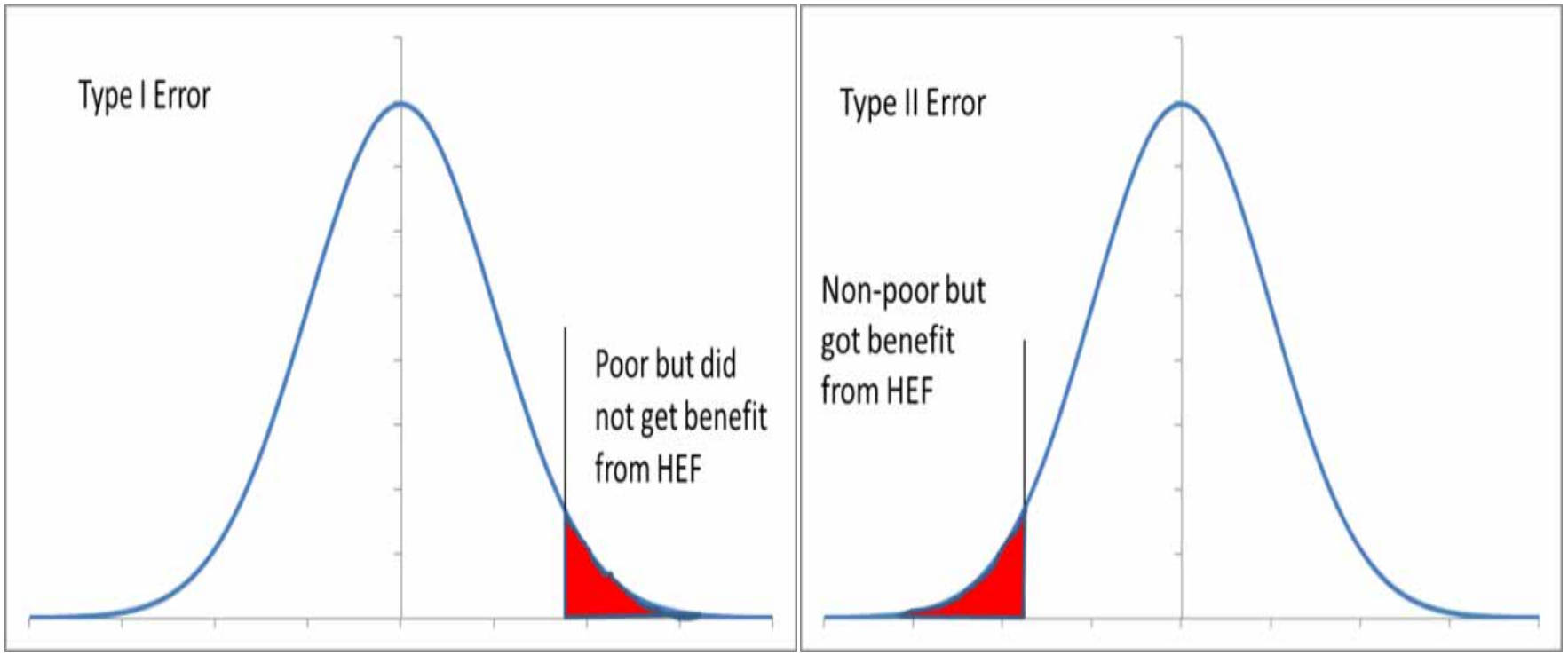
4.4. Key Lessons from the Targeting Literature

The vast international literature on targeting suggests four major lessons. First, almost all targeting methods have some form of leakage to non-eligible beneficiaries and some exclusion of targeted households, or individuals. The latter (exclusion error) can be thought of as a Type I error as in Figure 4.1. The curve shown on the left of Figure 8 indicates the income distribution of beneficiaries and the red shaded area on the right side of the distribution indicates potential beneficiaries who could not be identified as eligible under the targeting methods used for the program. The inclusion of non-eligible individuals and households as program beneficiaries is referred to as “inclusion error” or Type II error. In this case, the distribution on the right is relevant, with the shaded area indicating non-eligible individuals who might be deemed eligible under the targeting criteria chosen. There is no clear evidence on who is affected by exclusion errors. Sometimes exclusion errors adversely affect

people who are extremely poor, as against the marginally well off; at other times it is the opposite.

Second, the gold standard criterion for assessing targeting efficacy in low- and middle-income countries is household consumption or its per capita (or adult equivalent) counterpart. Reliance on consumption is driven by the fact that incomes are hard to measure for households that rely on agricultural work and self-employment, quite apart from masking income in self-reports due for reasons of tax evasion and avoidance. Almost all of the targeting assessments and comparisons of different targeting approaches relied on the household consumption measure as outcome.

Figure 4-1 : The Type I Error (Leakage) and Type II Error (Under-coverage) in Hospital Equity Fund Program



Third, available evidence suggests that while each of the targeting approaches has advantages and disadvantages, in settings where collection of data for proxy means assessment is available, the use of proxy means tests for targeting program benefits are preferable.

Finally, while no direct experimental evidence is available, the pervasiveness of multiple targeting approaches used to identify eligible households for programs suggests that combinations of targeting approaches might do better, such as a two-step strategy that first uses geographical targeting to identify areas disproportionately populated by the poor, and then apply proxy means tests to narrow the set of eligible households. Also helpful might be increased transparency and accountability of targeting approaches.

Recent targeting exercises reflect learning from these policies. For example, in the implementation of the Chattisgarh Tribal Development Programme (CTDP) aimed at the rural poor, International Fund for Agricultural Development examined ways to lower the benefits captured by the non-poor. CTDP targeting measures included direct methods (e.g. quotas), empowerment (information provision, capacity building and empowerment focusing on the poor and women); pro-active design (internalisation of the poverty focus by all major stakeholders) and menu-based/self-targeting (activities tailored to the poorest). A study conducted under the auspices of this program found considerable differences in poverty concentrations in geographical areas produced by its authors and poverty maps based on official BPL (official below-poverty line) figures (Khadka 2004).

In Malawi, the Irrigation, Rural Livelihoods and Agricultural Development Project (IRLADP) selected poorer areas of Malawi in which to implement the program. The program, although geographically targeted, encouraged and enabled people who traditionally had less voice and to participate actively in the planning, implementation and decision-making. Self-targeting measures (related to assets and labour capacity of target groups) and direct targeting on specific individuals or households based on eligibility criteria were used. (Bishop-Sambrook 2007). Evidence from Indonesia's conditional cash transfer program (PKH) of 400 villages, suggests that self-targeting can be improved by incurring an extra administration cost. A randomized experiment assessed the effectiveness of self-selection by the applicant followed by confirmation with an eligibility score based on a proxy-means test. The poor applied more often and participated more in the program than the rich (Alatas et al. 2009).

4.5. Measurement of Living Standards: Income versus Consumption versus Wealth

As is clear from the preceding discussion, the assessment of the effectiveness (or otherwise) of targeting mechanisms is dependent on having a measure of household well-being that can be used to program implications for impoverishment and equity. A vast majority of the assessment exercises use household consumption/ expenditure as the gold standard for a well-being indicator, but is it justified? In this sub-section we explore the literature on this question.

One reason why consumption expenditure is preferred to household income as a proxy for economic well-being is that income is likely to be underreported compared to consumption. Moreover, underreporting of income is likely to be greater for low-income compared to high-income households. One study analysed data from multiple sources in the United Kingdom: household budget surveys (the Living Cost and Food Survey and its predecessors), the Family Resources Survey (FRS) and (Households below Average Income (HBAI)). The study found that incomes tended to be underreported for households with fewer assets. The authors suggest one way to correct it: to impute income from housing (Brewer and O'Dea 2012). These findings have been confirmed by other studies for the developed countries, although with some refinements. (Attanasio et al. 2006) studied UK's Family Expenditure Survey, the US Consumer Expenditure Surveys (CEX), the National Income and Product Account (NIPA) and Diary and Interview Surveys and assessed the relationship between consumption and income of poor families. The analysis showed poor households consumed more than they earned and average consumption was above average income for households up to the 10th percentile of the income distribution in both countries.

Bavier (2008) analysed data from the US Consumer Expenditure Survey (CEX), the Current Population Survey (CPS), the Panel Study of Income Dynamics (PSID) and the Survey of Income and Program Participation (SIPP) data to compare the income and consumption measures for poverty assessment. He found that a measure of income poverty using a 'comprehensive' indicator of income, and trends in incomes and poverty are similar for both consumption and income. However, he also found that

in populations near the bottom of the distribution, income was measured with greater inaccuracy than consumption (Bavier 2008).

Analyses for other OECD countries present a similar picture. Sabelhaus and Schneider (1997) examined Canada's Family Expenditure Survey (FEX) and Survey of Consumer Finances (SCF) for the distribution of household well-being. Consumption-based measures gave different answers in economic well-being measurement than income. However consumption was less dispersed than income. The authors also found that consumption data was less to prone to measurement error than income data. Madden (1999) used data from the Irish Household Budget Surveys (HBS) to measure poverty and changes in it over time. The study found considerable differences between the results based on incomes and the results based on consumption measures. The entertainment (such as alcohol and tobacco) consumption expenditures were under-reported and it was advised to cover more than two weeks duration. Their results on relative poverty lines also suggested that more consumption smoothing was being carried out by low-income households and they suggested that consumption measures are more appropriate for measuring poverty. These findings on the use of consumption for poverty measurement are broadly supported by Noll (2007) who analysed household budget surveys from 12 countries in the European Union.

As seen previously, apart from underreporting of incomes among the poor, incomes also fluctuate more than consumption spending. Coudodouel et al (2002) note in poorer households, incomes were unstable and fluctuated throughout the year, especially in agriculture based developing countries. Calculations of incomes of households engaged in agriculture were likely to inadequately separate out

agricultural revenues and input costs and the value of home production. However, they also noted challenges with measuring consumption (Coudouel et al. 2002). These ideas are also reflected in work by Montgomery et al (2000) who analysed data from examined World Bank's Living Standards Measurement Surveys (LSMS), the Demographic and Health Surveys (DHS) and the Encuesta Guatemalteca de Salud Familiar (EGSF) from Ghana, Guatemala, Jamaica, Pakistan, Peru and Tanzania, respectively. The authors concluded that here was no ideal measure to describe the long-term household income in developing countries. Current income measures were based on multiple sources and had a tendency to change both yearly and seasonally. Instead they proposed household consumption expenditures as a "smoothed" version of a highly fluctuating income to represent a superior conceptual ideal of household well-being (Montgomery et al. 2000).

4.5.1. Consumption Expenditures versus Assets

With consumption as the starting point, can the use of wealth indicators suffice to capture variations in household well-being when consumption data are unavailable? Filmer and Pritchett (2001) used data from India, Indonesia, Pakistan and Nepal's Demographic and Health Surveys (DHS), and the National Family Health Survey (NFHS) to compare an index of wealth with household consumption expenditure. Only two-thirds of households classified in the poorest 40% by expenditure indicators were in similar category by assets. However, 5% of those in the poorest 40% by expenditures were represented in the richest 20% by assets. For the richest 20%, about half of households rich under the expenditure criterion were rich in

assets. However, asset data is more predictive of long-term education outcomes than consumption expenditures. (Filmer and Pritchett 2001).

A more recent study (Srivastava and Mohanty 2010) used data from the India National Sample Survey Organisation (NSSO)'s consumption expenditure surveys, the World Health Survey (WHS), Demographic and Health Surveys (DHS), National and Family Health Surveys (NFHS) and Reproductive and Child Health (RCH) Surveys to compare the wealth versus consumption expenditure in poverty measurement. In lack of direct economic measures, economic proxies were used to explain economic differentials in many developing countries. It was found that wealth or asset-based index was a weak predictor of household consumption expenditure. Only 13% variation in consumption expenditure could be explained by the wealth index. Reflecting this finding, only 31% households were in same quintile of Monthly Per Capita Expenditure (MPCE) and wealth index, and an additional 37% were in a contiguous quintile.

4.6. Pro-Poor Targeting in Health Equity Funds (HEF)

HEF programs in developing countries exist in a number of developing countries such as Bangladesh, Cambodia, Laos, Nepal and Kenya. HEF models in these countries use a variety of approaches to targeting different population groups, in order to improve the utilization of health services and their distribution across socioeconomic groups. The models of HEFs also vary across countries and sometimes also within countries. Most of the HEFs were initiated as pilot projects and scaled up after achieving successful results (for example, in Cambodia and Laos).

The HEF in Cambodia consists of multiple models and some of types of HEF use third party payer models (where money follows the patient) while some HEF programs provide a subsidy, which covers part of the cost of delivery for all users. Interpreting HEF as a demand side funding (DSF) mechanism where money follows the patient, yields many other examples of "HEF-type entities" in the region. For example, Nepal has been increasing healthcare expenditure within last few years and using a demand side financing scheme to support curative care for all (poor and non-poor) mothers and their children (Gupta et al. 2010). No formal evaluation exists but it has been suggested that demand-side financing in Nepal has lowered maternal mortality. Studies from Nepal show that the utilization of maternal health services is increasing and there is some evidence of improved quality (Ensor and Cooper 2004). The main challenge faced by the DSF program in Nepal is the shortage of providers and other complementary supplies in remote and border areas.

Bangladesh faces major challenges in the utilization and extreme socioeconomic inequality in access to maternal healthcare, which was the reason for the introduction of HEF in the country (Gupta et al. 2010). The main issue in Bangladesh is the difference in institutional deliveries across socioeconomic groups: women from the highest socioeconomic group are ten times more likely to get institutional delivery than the women from the poorest category. A number of DSF schemes were introduced in Bangladesh in the last four years aimed at improving maternal healthcare services (Ubaidur et al. 2010). The Maternal Voucher Scheme (MVS) provides vouchers to poor pregnant women and is known to be effective in improving access to healthcare. A household survey was conducted prior and one year after introducing vouchers and women who delivered in the year prior to the

survey were interviewed. All the women in different socioeconomic groups accessed to maternal health services are more in the project areas than those in non-project areas. The difference in utilization rates between rich and poor is small (Ahmed and Khan 2011, Ahmed and Morgan 2011). In the MVS covered area, the utilization on antenatal care, delivery assisted by skilled health personnel, institutional delivery and postnatal care were higher for poor households. This evidence suggests that the voucher scheme reduced inequality in a very short time.

High Maternal Mortality - an MMR of 410 per100, 000 live births is also a major policy concern in Kenya (Abuya et al. 2011). Kenya has adopted an output based approach (OBA) for its financing safe motherhood program in Maternal and Child Health services (Nicole Bellows 2010). Subsequent to introducing reproductive health vouchers, access to maternal health services is increasing sharply as also is the uptake of vouchers. Available evidence shows that the poor can access quality services and the introduction of the voucher itself contributes to improvement of service quality in rural health facilities. Hence, for the success of the demand side financing, some supply side improvement (including possible additional financing) may also be necessary. However, poor women faced difficulties in enrolling into the program in Kenya (Abuya et al. 2011).

A major challenge associated with HEF at a time of resource constraints is ensuring that the needy are effectively targeted. This means that the beneficiaries of the program will need to be identified and included properly (Van Damme 2004). Some of the HEF programs in place relied only on pre-identification (in the community) for the inclusion of beneficiaries to the programs whereas re-identification of process was advised to be there to get higher accuracy in targeting. Others focused on post-

identification (identification at the health facility level). Existing studies suggest that inclusion of ineligible people was smaller in magnitude than the exclusion of the truly poor from the program (Annear 2010). The poorest of the poor were typically included but some were absent at the time of pre-identification process owing to the migratory nature of their work.

The HEF helps increase the poor population's access to public health facilities considerably, and one study has shown that HEF reduces the share of fee-paying patients (Jacobs 2007). Less clear is whether HEF help improve outcomes for people at the lowest end of the income scale (the poorest of the poor) (Nguyen 2004). However, there are a number of areas where additional work is needed. These include assessing the quality of services available to different socioeconomic groups and whether quality of care is the same to poor beneficiaries and fee-paying patients, and the drivers of provider behaviour. Studies on satisfaction levels and awareness of the scheme in the population are rare. Another area where work is limited is in governance issues related to HEF, including the management of funds. In Myanmar, a voucher scheme for Maternal and Child Health services was introduced in 2010 for one pilot township to assess the feasibility and whether it represented good value for money. However, it has not been formally evaluated (Teerawattananon et al. 2014).

DSF are not limited to MCH services. As in Cambodia and Laos, use of curative care is also covered under many of the HEF and similar entities in the region. In India, the Aarogyasri Scheme in Andhra Pradesh (and similar programs in several states) provide hospital insurance intended for the "poor". The idea is to provide hospital-based treatment to families living below poverty line for the treatment of serious

ailments. Households with a card indicating their below poverty line (BPL) status are eligible for enrolment in Aarogyasri. However, available evidence suggests that the scheme was not particularly well targeted and was sufficiently generous to permit significant leakages (Fan et al. 2012). Another hospital insurance scheme, this time implemented at the national level in India and targeted to poor households, the Rashtriya Swasthya Bima Yojana (RSBY), has also faced problems, particularly in the exclusion of eligible individuals, typically because the scheme was not well advertised, and because the enrolment programme was not adequately implemented. In addition, data on BPL (below poverty line) status that used to determine eligibility for enrolment are out of date in many Indian states.

5. Data and Methods

5.1. Research Questions and Outline of Methods

As noted previously, this thesis poses 3 main questions:

1. How effective is the Myanmar HEF for financing hospital services in targeting its proposed beneficiaries?
2. What are the key socioeconomic and demographic correlates of targeting efficacy?
3. How is the HEF program administered in Myanmar and how is targeting linked to features of HEF program administration?

Targeting effectiveness was sought to be measured both by examining the magnitude of exclusion errors (what is the proportion of poor women and children not enrolled into the program?) and inclusion errors (what is the proportion of non-poor women and children who are enrolled into the program?). In particular, we inquired whether the government method for scoring households' economic status was likely to result on program enrollees being women and children from poor households. In addition, targeting was to be assessed by tracking actual recipients of program benefits (users of covered hospital services) and their economic status.

To answer the second question, we first defined targeting efficacy as being the ability of the program eligibility criterion being successfully able to separate the poor from the non-poor. Thus the targeting mechanism was deemed as accurate if a non-poor person was deemed non-eligible (no Type 2 error). The targeting mechanism

was also deemed as accurate when a poor person was identified as eligible (no Type 1 error). Thus the targeting efficacy variable (T) was defined as taking the value 1 when there was neither a type 2 error nor a type 1 error related to household eligibility for program benefits. We also considered alternative definitions of targeting efficacy. One where targeting efficacy was confined to limiting type 1 errors. That is, the targeting efficacy variable (T1) took the value 1 if a poor person was correctly identified as being eligible and 0 otherwise. Similarly, we considered a targeting efficacy variable (T2) that took the value 1 if a non-poor individual was correctly identified as being ineligible and 0 otherwise. The indicators of targeting efficacy were then regressed on potential explanatory variables, including educational status of head of household, geographical location, household composition, indicators of social connectedness and an indicator of household economic status.

To answer the third question, we explored features of the HEF program administration that might explain any inaccuracies in targeting. Factors considered, include availability and flows of funding for HEF financed services, program efforts to identify and inform potential beneficiaries, requirements for pre-payment for reimbursement, accountability mechanisms for program managers, and so forth.

5.2. Data

A mix of quantitative and qualitative methods was used to answer the research questions in two townships where the intervention was implemented in its first year (2012-2013). The townships were chosen to reflect two different hospital settings:

one with a 200-bed hospital; and another with a 25-bed township hospital.

Specifically, our approach to gathering information for evaluation of HEF program targeting involved:

Structured Household Interviews (with a qualitative component)

Interviews with members of Hospital Supervisory Committees, PRF Managers and personnel at various health service facilities (hospitals, village health stations, etc.)

Interviews with Community Leaders, NGO and other civil society representatives (NGOs)

Registers and reports from routine health management information system and hospital administrative records where available. Given the potential of the household survey to erroneously detect "Hawthorne effects", the administrative data could serve as a means to validate the household interviews.

The data collection process was started in September 2014 and took a total of three months, one month for ethics clearance at the Ministry of Health, one month for the data collection and one month for the administrative processes and data cleaning and data entry. The data processing was done in Australia.

5.2.1. Instrument development

The household survey instrument was developed questionnaires used for the World Health Survey (2003), the Living Standards Measurement Survey of the World Bank and the Indian National Sample Surveys. The survey instrument was translated from English to Burmese (Myanmarsar) and then back translated by professional

translators from Myanmar and pre-tested. To verify targeting to the beneficiaries the social ties and disability status were incorporated into the household questionnaire.

5.2.2. Ethical Clearance Procedures

The research underwent assessments by two separate ethics review committees. Approval was obtained firstly on a written application and supporting materials from Monash University, Australia from the Monash University Health Research Ethics Committee (MUHREC). A second approval was obtained from the Ministry of Health (MoH) in Myanmar. Submission of research documents and a presentation in front of a committee consisting of the Director General of the Department of Health 5 Directors from Divisions under MoH was required. Following some minor corrections and a replacement of one township by another (an evaluation of the HEF program had been recently undertaken at the first township) MOH approval was obtained. The substitute township had similar demographic and socioeconomic characteristics to the one it replaced.

5.2.3. Challenges Related to Research Implementation: Process

The proposed research and associated data collection work faced a number of unique challenges. Delays occurred because permission had to be obtained through bureaucratic channels to ensure that the goals of the research project and its time line were consistent with that of the MOH, and that the proposed research would actually be permitted. Ultimately it took nearly one year before the necessary

approvals could be obtained. The communities that this research most closely involved with were villages in rural Myanmar, and local communities in urban wards in 2 townships.

Once approval was obtained at the MOH level, the next challenge was engaging with communities in the townships that were the subject of this research. The engagement was primarily in the form of (a) obtaining permission from community representatives to survey households; (b) and getting the input of a small number of rural and urban community leaders on their experience with the Health Equity Fund. Because the specific communities chosen for the study were identified after a process of random sampling from a list of communities, any steps to engage with specific communities occurred only after the specific villages/wards had been identified and the research project got the go ahead.

As a first step towards engaging these groups, we requested a letter of introduction from the General Administrative Department and from the Ministry of Health that we took to these groups and primary healthcare personnel in their area. The letter introduced the study, summarized the key research objectives, and introduced the study team. Any other community-specific engagement was limited by the requirement of ensuring protection/confidentiality of survey and interview participants.

5.3. Sampling Methods

The following sub-section discusses the methodology used for identifying participants in the household survey and in the qualitative studies.

5.3.1. Sample for the Household Survey

The plan was to sample 200 households in two townships (or sub-districts): 100 in each township (from a total of 40,000-50,000 households per township). 75% of the households were in rural areas, and 25% in urban areas. A total of 100 households were sampled from each township, 75 households in rural areas and 25 households in urban areas. Sample size was limited by budgetary considerations as the data collection was entirely self-funded by the researcher. The budgetary constraints restricted in sampling and resulted in small simple size however it was well rounded by complementing both quantitative and qualitative methods. The reasonable sample size for this type of study was included. A minimum reasonable sample size for this sort of study was 82 and the sample size in this study was robust enough (Onwuegbuzie and Collins 2007).

The rural household sample was identified in two steps. An administrative list of villages available with the General Administrative Department (under the Ministry of Home Affairs) in each of two townships were used and stratified by distance into 3 rural strata in each township. One village was randomly sampled from each stratum with the probability of being chosen inversely related to the population in each village. Second, a sample of 25 households was chosen from each village.

The data collection process worked as follows. The researcher first met the community leaders in each village to describe the research goals of the study and requested their permission and assistance in ensuring households to participate in the study. He shared with community leaders, letters of support from the Ministry of Health and the Ministry of Home Affairs. These letters explicitly stated that there

were no repercussions to the community and to the household from the findings of the study and from participating (not participating) in the study. The Letter of Support from the Ministry of Home Affairs was necessary to access to the Household list available with the village community leadership. Once permission was obtained from the community leadership, the research team obtained a village household list from the community leaders and randomly chose 25 households from the village in front of the data collectors and supervisor. The interviewer approached the household head (or individual most knowledgeable about the household) in the selected households along with the local voluntary health worker who was from the village and was typically well known to village households. The interviewer introduced and explained the study, its risks and potential benefits, and read out a consent form in the local language. The consent form made clear that this was not a government-funded study, and that participation was voluntary. Moreover, there would be no repercussions to not participating, or not responding to some (or all) questions. After they agreed (with a signed consent form), the household was recruited into the study. If the household refused, a household in its immediate proximity was approached.

The procedure for identifying the sample of urban households was similar to that for rural households. Administrative records with the General Administration Department in each township were used to define the 5 poorest urban wards (based on distance from town centre which is usually correlated with inferior infrastructure and facilities). One of these wards was randomly chosen. A complete household list from the administrative department for that ward was then used to subsequently randomly select 25 households.

Once the households to be sampled were identified, the researcher met with the community leaders responsible in each locality where the households were located. In these meetings, the researcher described the research goals of the study, and to request their permission and assistance in ensuring households to participate in the study. He also shared with the community leaders letters of support from the Ministry of Health and the Ministry of Home Affairs. These letters stated that there were no repercussions for the community from the findings of the study and from participating (not participating) in the study.

Following the agreement of community leaders, the interviewer approached the household head (or individual most knowledgeable about the household) in the selected households along with a local voluntary health worker from the ward and was typically well known to households in that ward. If the household refused to participate in the study, a household in its immediate proximity was approached. Individuals and townships were chosen for the interviews were selected as above.

5.3.2. Participants in Qualitative Study (Interviews and Focus Groups)

The qualitative component of the research consisted of semi-structured interviews with HEF program administrators and focus groups with community leaders and primary health care personnel at the village and ward levels.

5.3.2.1. Interviews

24 semi-structured interviews with key HEF managers, members of Hospital Supervisory Committees and Administrative Personnel were done. Four townships

were chosen (with 6 interviews in each) for this purpose, including two in which the household survey was undertaken, and two additional townships in proximity. Within these townships, the following individuals were interviewed: the manager of the Hospital Equity Fund (Township Medical Offer), the hospital public relations officer (assists the township medical officer in managing the PRF and interacting with patients) or an assistant surgeon and other members of the HEF (Hospital Equity Fund Committee) – namely, the clerk-in-charge of the hospital finance department, township auditor's office representative and member of general population/civil society in HEF committee) and a nurse.

The interviews inquired about the formal procedures for enrolment and reimbursement, HEF managers' experience and perception of ground-level challenges in program implementation (delays in reimbursement, speed of enrollment, identification of eligible beneficiaries) linkages with community-level leadership, financial administration of HEF and availability of funds, methods used to identify and enroll eligible populations, and lessons learnt to date on issues relating to identification, enrolment and reimbursement.

The idea behind the sampling of 4 townships was to ensure that interviewee responses could not be linked to specific townships and thus helped provide an additional layer of anonymity to help respondents exercise their rights of participation (non-participation). In connection with the interviews, the Program Manager (Director of Planning, Department of Health) from the Ministry of Health in Nay Pyi Taw (the administrative capital of Myanmar) formally wrote to the township medical officer and introduced the research project and the study team. The letter requested the voluntary participation of members in HEF, Hospital Supervisory

Committees and Hospital Administration. The letter assured there would be no sanction or rewards for not participating (participating) in the survey. Nor would the findings of the study have any repercussions for the individual respondents. Following the letter from the Ministries, the researcher contacted each of the identified participants to set up a date and location for the interview. A consent form was read out (or presented to the participant) prior to the start of the interview and containing the following elements: anonymity of the township where the respondent was based, no respondent names were used when results were being presented or written up, and offering the participant the option of participating (not participating) in the interview, or not responding to one to more queries. Following the signing of the consent form, the interview was conducted.

5.3.2.2. Focus Group Discussions

8 focus group discussions were undertaken in total, 6 in rural areas and 2 in the urban areas, divided equally between the two townships (that is, 3 rural and 1 urban, per township). The main goal of focus group discussions with community leaders was to examine their approach to defining poor households and their role in helping eligible households get enrolled and access benefits. The discussions was also used to assess broader challenges in accessing information, getting reimbursement and financial administration of HEF and other government schemes at the local level.

5.3.2.2.1. Rural Focus Groups

The participants in any ONE focus group in rural areas included: the supervisor at the local health facility (health assistant) or a basic health staff, a voluntary health worker from the closest village which did not have a primary healthcare centre, and two randomly selected community leaders from lists (one each from the village where the health assistant was located, and another from the closest neighboring village). The villages in which the focus groups were conducted were the same as the sample villages for conducting the household survey.

The researcher first met the community leaders, village health workers and health assistants in each village to describe the research goals of the study and requested their permission and assistance in the study. He also shared with them letters of support from the Ministry of Health and the Ministry of Home Affairs to the concerned community leaders/NGOs and primary healthcare personnel in focus groups (the letter introduced the study, summarized the key research objectives, and introduced the study team). The letters stated that there were no repercussions related to the findings of the study and from participating (not participating) in the study. A consent form was read out (or presented to participants individually and confidentially) prior to the start of the focus group discussion containing the following elements: anonymity of the village where the respondent was based, no respondent names would be used when results were being presented or written up, and offering the participant the option of participating (not participating) in the focus group or not responding to one to more queries. Once the consent forms had been signed, the focus group discussion was conducted.

5.3.2.2.2. Urban Focus Groups

The wards used for conducting focus groups were the same as those use for sampling households for the survey. Usually in urban wards, 10 households are assigned a "leader". We chose 3 such leaders (randomly from the same groups that include the sampled households – for instance 25 sampled households had roughly 25 community leaders, of which we randomly invited three to participate), along with the supervisor of the urban health centre for the area.

The researcher first met the community leaders, urban health workers and health assistants to describe the research goals of the study and to request their permission and assistance in the study. He shared with them letters of support from the Ministry of Health and the Ministry of Home Affairs to the concerned community leaders/NGOs and primary healthcare personnel in focus groups (the letter introduced the study, summarized the key research objectives, and introduced the study team). The letters stated that there were no repercussions related to the findings of the study and from participating (not participating) in the study. A consent form was read out (or presented to participants individually and confidentially) prior to the start of the focus group discussion interview and containing the following elements: anonymity of the ward where the respondent was based, no use of respondent names when results were being presented or written up, and offering the participant the option of participating (not participating) in the focus group or not responding to one to more queries. Once the consent forms had been signed, the focus group discussion was conducted.

5.4. Data Collection

Data gathering activities consisted of the implementation of the household survey and information from focus group discussions.

5.4.1. Household Survey

Structured interviews were conducted by 10 trained interviewers (bachelor degree graduates who lived in the townships where the data was being collected for research). The interview teams in the field were composed of five individuals, with at least one female and at least one male enumerator. Respondents were interviewed by a person of the same sex. In each team, an experienced supervisor (this researcher) came along to check the conduct of the interview and to review the completed questionnaires for accuracy.

The respondent for each household was the individual most informed about household economic and social/demographic circumstances (usually the household head, but not always). Information gathered from the household questionnaire included five main components: 1) background information (township code, urban/rural residence, interviewer identification and date and time of the interview), 2) socioeconomic and demographic characteristics(e.g., age, gender, household size, relationship of each member with respondent, the head of household, marital status of each member, educational status, ethnicity and occupation); 3) incomes, expenditures, assets and debts (expenditures on individual components of food and non-food items, out of pocket medical spending; asset position and financial debt position; income of household; housing living conditions including type of water and

sanitation access, social ties and disability status), 4) morbidity and health care utilization (any type of illness episodes within last 4 weeks and one year, proximity to health care providers, expenditures on consultation fees, investigations and medicines, transportation costs, expenditures for person accompanying, reasons for not using health services, reimbursement by Hospital Equity Fund (HEF), hospitalization in the last one year and waiting time for HEF reimbursement), 5) Hospital Equity Fund (HEF) (awareness of HEF scheme and its benefits, enrollment, ownership of HEF card, , payment for HEF card and rating of HEF by the respondent). The full survey instrument is attached in Appendix 1 of this thesis.

To pre-test the questionnaire, a small pilot study was conducted prior to the main survey, in the Lewe Township that was not covered by the household survey.

5.4.2. Interviews and Focus Group Discussions

All interviews and focus group discussions were conducted by the researcher himself. The focus group discussions and in-person interviews of officials and hospital supervisory committee members related to the HEF were carried out in a private area by the researcher. The focus group discussions and personal interviews were audio recorded and transcribed and translated by the researcher.

5.4.3. Data Cleaning and Analysis

The household survey data from 200 households were entered into Microsoft Excel spreadsheets, after checking for consistency. Further data cleaning was carried out using Stata software (Version 13).

Data analysis of qualitative data was carried out by using a software package – Nvivo to have an accurate and transparent data in analysis. The interview transcripts were approached interpretive and reflexive means literally. The transcripts were breaking down into manageable themes so that to organize the data into arbitrary units for the topics and meanings as well. The interviews and FGDs were recorded manually into word documents which will be ready for Nvivo software package for the full study. The documents were imported into the Nvivo which visualize the researcher see simply and make coding easier. Similar and particular words or phrases were linked automatically within different documents to be assessed appropriately, this user-friendly software helped to get into clear direction of the research to draw a theory from the data as well. The qualitative research was carried out in a thorough and transparent manner to have valid and reliable information. The similar meaning words were categorized into themes to express the responses accurately. All similar themes were gathered in a node and then put additional coding attributes to have an understandable data rigorously. The administrative task of organizing data was carried out by Nvivo qualitative data analysis software by cut and pasting different words and texts into relevant nodes and codes clearly. After all, the different themes were bound together to have a short summary on the project. Cleaning and analyzing the qualitative data were done by Nvivo tools and ready to interrogate the research data's inter-relationships and thematic ideas. Finally the data were made into sense of themes and ready for further analyses.

5.5. Sampling Weights for Household Survey Data

Sampling weights were calculated for each household for the purpose of analyzing the household survey data from the two townships. Weights were assigned taking into account the two staged stratified random sample design. For each sampled rural household "i" belonging to village "j", the household weight W_{ij}^{R} was calculated as

$$W_{ij}^{R} = \frac{V_S}{V_T}\frac{25}{H_j}$$

Here, V_S is the number of randomly sampled villages (equal to 3), V_T is the total number of villages in the township, 25 is the number of randomly sampled households and H_j is the total number of households in village "j".

For each sampled urban household "i" belonging to ward "j", the household weight W_{ij}^{U} was calculated as

$$W_{ij}^{U} = \frac{1}{U_T}\frac{25}{H_j}$$

Here, 1 is the number of sampled urban wards, U_T is the total number of wards in the township, 25 is the number of randomly sampled households and H_j is the total number of households in wards "j".

The calculation of sample weights in the manner described above is, strictly speaking, not correct as the single ward was chosen the choice of the ward was from the 5 economically backward wards in the urban areas, and not from the full list of urban wards. Thus, we also considered an alternative weighting scheme, where U_T was assigned a value of 5.

5.6. Construction of Key Socioeconomic Variables used in the analysis

A key goal of the research conducted for this thesis is to analyse how effective the HEF program has been able to target the poor. Thus, considerable emphasis was placed on the construction of indicators of household economic status.

The first set of indicators of household economic status used was based on self-reported consumption expenditure of households. Consumption expenditure is currently considered the gold standard as an indicator of household economic status as highlighted in the literature review in the previous chapter (chapter 4). Two indicators were constructed: household expenditure per capita, and household expenditure per adult equivalent.

Both measures of expenditure were based on household survey data that included information on households' expenditure in the 4 weeks preceding the survey. The survey collected itemized information on household expenditures for a broad range of goods and services, including food, fuel, clothing, education, rent, house tax, electricity bill, medical expenses, transport, telephone, addiction, social and expenses for one's hobby). Item-wise expenditures were aggregated to arrive at a measure of aggregate household consumption. This was divided first by the number of household members to get a measure of household expenditure per member (or per capita). However, it has also been argued in the literature that the per capita measure is likely to underestimate households' economic status, especially if there are children who have less consumption needs than adults. Moreover, there may also be household economies of scale, so that meeting the needs of one additional/marginal person are likely to be much smaller as household size goes up.

For this reason, in the construction of our second consumption-based indicator, we replaced household size by the number of "adult equivalents" using the approach of the recently published IHLCA report (MNPED 2011). Specifically, household economic status under the adult equivalent approach was defined as

$$E(AE) = \frac{E_{nf}}{AE_{nf}} + \frac{E_f}{AE_f}$$

Here E (AE) is household expenditure per adult equivalent; E_{nf} is household non-food consumption; AE_{nf} is the measure of adult equivalents corresponding to non-food consumption; E_f is household food consumption and AE_f is the measure of adult equivalents corresponding to food consumption.

The adult equivalents for non-food and food consumption were defined as:

$$AE_{nf} = (A(M) + \alpha_1 A(F) + \alpha_2 C)^{\delta}$$

$$AE_f = (A + \alpha C)^{\delta}$$

Here A is the number of adults in the household, A(M) is the number of male adults in the household, A(F) is the number of female adults in the household and C is the number of children in the household. Any household member over the age of 15 is considered an adult household member. The parameters α_1, α_2 and α indicate the relative consumption of children compared to adults, and the relative consumption of female to male adults, and lie between 0 and 1; and δ is a household economies of scale parameter, also lying between 0 and 1 (Deaton 2002). The parameter values for calculating the two sets of adult equivalents were taken from the technical report

on the Second Myanmar Integrated Household Living Conditions Assessment Survey (MNPED 2011). The parameter values are taken from the IHLCA technical report, with $\alpha_1 = 0.9$, $\alpha_2 = 0.7$, $\alpha = 0.3$ and $\delta = 0.9$.

Quartiles indicating different levels of household economic status were constructed using the household expenditure per adult equivalent indicator. This calculation required the use of the household sample weights calculated above. In addition, a poverty line was constructed by updating poverty line calculations for the year 2010 from the IHLCA report. The poverty line was used to determine which of the sample households were impoverished and which households were not in the two townships.

5.7. Wealth (or Asset) Quartiles

Wealth indices were constructed and households assigned to different quartiles based on the wealth indices. In the absence of information of the monetary value of different assets, Principal Components Analysis (PCA) was used to construct wealth status (Fry et al. 2014). PCA is essentially a statistical method applied to asset and household data to create a summary asset measure. Assets and other household socioeconomic characteristics were assigned a weight to end up with a wealth index score. The wealth index scores were used to construct wealth asset quartiles, after using sample weights (Filmer and Pritchett 2001).

5.7.1. Outcome Variables

A number of outcome variables related to targeting were constructed. First, an indicator of HEF eligibility based on the government criterion was constructed. The pre-assessment questionnaire (for HEF eligibility) developed by the Ministry of Health was used to calculate HEF eligibility scores for households, based on their income, assets and socioeconomic characteristics. The pre-assessment questionnaire also designates a score to each response (for a copy of the pre-assessment score, see Appendix 2). Similar to the official criterion, a sampled household was deemed eligible for HEF, if its score on the pre-assessment questionnaire exceeded 50. An indicator variable (H) was defined which took the value of 1 for the household if its score exceeded 50, 0, otherwise.

Because program awareness is often a key intermediary steps in ensuring access (Ir et al. 2010), we also an indicator of HEF programme aware among households. In the analysis, awareness to the HEF program was defined as a binary outcome with the value of 1 if the household respondent had heard of the program and 0 otherwise.

In addition to enrolment and awareness, we also assessed targeting by examining the socioeconomic characteristics of households whose members actually used HEF benefits. A binary outcome indicator was constructed taking the value 1 if a household member had been hospitalized in the preceding year and benefited from the HEF program, 0 otherwise.

5.7.2. Socioeconomic correlates of targeting accuracy

As indicated in the introduction to this chapter, a key goal of this research was to explore the socioeconomic correlates of targeting efficacy of the HEF programme in

Myanmar. For this purpose we undertook multivariate regression analysis that assessed the association between indicators of targeting accuracy and a range of socioeconomic correlates. Four indicators of targeting effectiveness were used:

An indicator that took the value 1 when the self-reported household score based on the government self-assessment questionnaire rated a household eligible for HEF and the household was poor (based on the consumption criterion), or the score based on the self-reported household questionnaire rated the household as not eligible and the individual was not poor according to the consumption criterion, 0 otherwise;

An indicator that took the value 1 when the self-reported household score based on the government self-assessment questionnaire rated a household eligible for HEF and the household was poor (based on the consumption criterion), 0 otherwise;

An indicator that took the value 1 when the self-reported household score based on the government self-assessment questionnaire rated a household not eligible for HEF and the household was non-poor (based on the consumption criterion), 0 otherwise;

The fourth indicator took the value 1 when the self-reported household score based on the government self-assessment questionnaire rated a household eligible for HEF, the household was poor (based on the consumption criterion), *and* the household was poor based on the consumption criterion, 0 otherwise;

These indicators were used as outcomes in logit and linear-probability regression models with a range of socioeconomic variables as correlates. These included: indicator of age and gender composition of household members, sex of the

respondent, living conditions, ethnicity, social ties, distance from health facilities, etc.

6. How Effective is HEF Targeting in Myanmar? Evidence from a Household Survey in Two Myanmar Townships

6.1. Introduction

This chapter reports the results of our household survey to assess the effectiveness of the targeting mechanism adopted to identify HEF beneficiaries (poor women and their children) in two townships in Myanmar, where the scheme was implemented in 2012 and the key correlates of targeting efficacy. Partly because these were the early implementing townships, there were some teething problems in the implementation of the HEF program. Specifically, no pre-assessment procedures were in place to identify eligible households, so they could be handed HEF beneficiary cards. Instead, all of the beneficiaries identified in the sampled townships were admitted to the hospital directly for emergency conditions and only post-utilization HEF-eligibility assessments were undertaken. Moreover, funds for travel and food for hospital patients were not distributed to the local community and/or rural health centers in a timely manner, and so were not available to eligible households in a timely fashion.

As noted previously, the HEF program is intended to subsidize poor women and children's use of public hospitals in Myanmar, including their expenditures on drugs, diagnostics and travel. The definition of "poor" under the HEF program is based on an assessment that utilizes household responses to a range of questions about assets, incomes and other characteristics to assign an economic "score" to each household. A household is then rated as being poor if its score is less than 50 (MOH 2008, Tin et al. 2010, MOH 2011).

Because the townships studied in this thesis did not actually distribute cards to all eligible households (but only to those deemed poor following their seeking inpatient care in a public hospital) our first strategy for assessing targeting accuracy is based on comparing households defined as poor under the HEF scoring approach and households deemed poor under a "gold standard" indicator based on household consumption spending (Brewer and O'Dea 2012). Two indicators of consumption spending were used for this purpose: household spending per capita, and household spending per adult equivalent. In addition, we compared household economic rankings based on HEF assessment scores, household rankings based on consumption spending indicators, and household rankings based on wealth indices. We also assessed households' awareness of the HEF-program benefits for different levels of HEF scores and economic indicators using the consumption criterion.

An alternative approach to evaluating targeting errors under the HEF program is to assess the economic status of households that actually used HEF-funded health services. Assessing targeting mechanisms on the basis of actual use of services has the advantage of accounting for economic and social difficulties in accessing health services that may not directly correlate with HEF-determined economic status. For example, household members eligible for HEF may have caregiving responsibilities for a chronically ill member, or they may be unable to travel due to disability to seek hospital care, or they may have had a poor experience previously with public hospitals and facilities, generally. The main weakness of evaluating HEF-targeting in this manner is the far fewer observations one is likely to encounter of actual inpatient cases.

6.2. Summary Statistics

Table 6.1 reports summary statistics of key demographic, socioeconomic, healthcare use variables and HEF eligibility assessments in the households surveyed. The data in Table 6.1 show that more than 70% of the households resided in rural areas, which is similar to the rural-urban population distribution in the Myanmar census of 2014. .

Average household size in the sample townships was 4.8, compared to 4.4 in the national census. Nearly one-quarter of all households were headed by women. About half of all households had either one elderly (over 65 years) member, or a child aged less than 5 years. More than one in ten households had a disabled member (anyone in home, a child or adult, who needs care because of a long-term physical or mental illness or disability or is getting old and weak). The vast majority of sample households belonged the majority ethnic group (Bamar), which is reflective of the ethnic make-up in the two townships studied.

About 42.7% of the households were poor under the HEF criterion, and 5.8% of the households were poor under the consumption (per adult equivalent) criterion. These estimates of the poverty ratio in the two townships are higher in HEF measures and lower by consumption (per adult equivalent) criterion than recent estimates of 37.5% produced by the World Bank for Myanmar as a whole (The World Bank 2014). The consumption expenditure per adult equivalent per day in the sample households was 878.51 Kyats (1 USD= 933.57 Myanmar Kyats – World Bank).

Roughly three in five households lived within 30 minutes of travel time from the nearest public health facility, with the remainder located at even greater distances in

terms of travel time. This is consistent with the well-known difficulties in Myanmar regarding population access to public health services in rural areas.

Table 6-1: Descriptive Statistics

Household Characteristics	Unweighted Means	Weighted Means	Maximum	Minimum
Proportion of households in rural residence (%)	74.51	71.78	0	100
Proportion of female heads of household (%)	24.01	24.22	0	100
Household size	4.80	4.82	1	12
Share of households with children<5 years (%)	33.82	30.70	0	100
Share of households with elderly (65+) (%)	23.53	25.08	0	100
Share of households with disabled member (%)	15.20	14.71	0	100
Proportion of Bamar households (%)	97.55	98.07	0	100
Proportion of poor households using HEF criteria (%)	43.6	42.8	0	100
Consumption expenditure per adult equivalent per day (Kyats)	873.86	878.51	653.92	1081.73
Share of households located less than 30 minutes from public health facility (%)	52.45	57.59	0	100
Proportion of individuals reporting ill in last 30 days (%)	65.69	63.66	0	100
Proportion of individuals reporting hospital stay (%)	19.60	19.41	0	100
Average number of close friends	3.21	3.28	0	20
Average number of community events in last 30 days	3.17	3.09	0	30
Number of sample households	204	204	204	204

Note: Author's estimates using data from the household survey

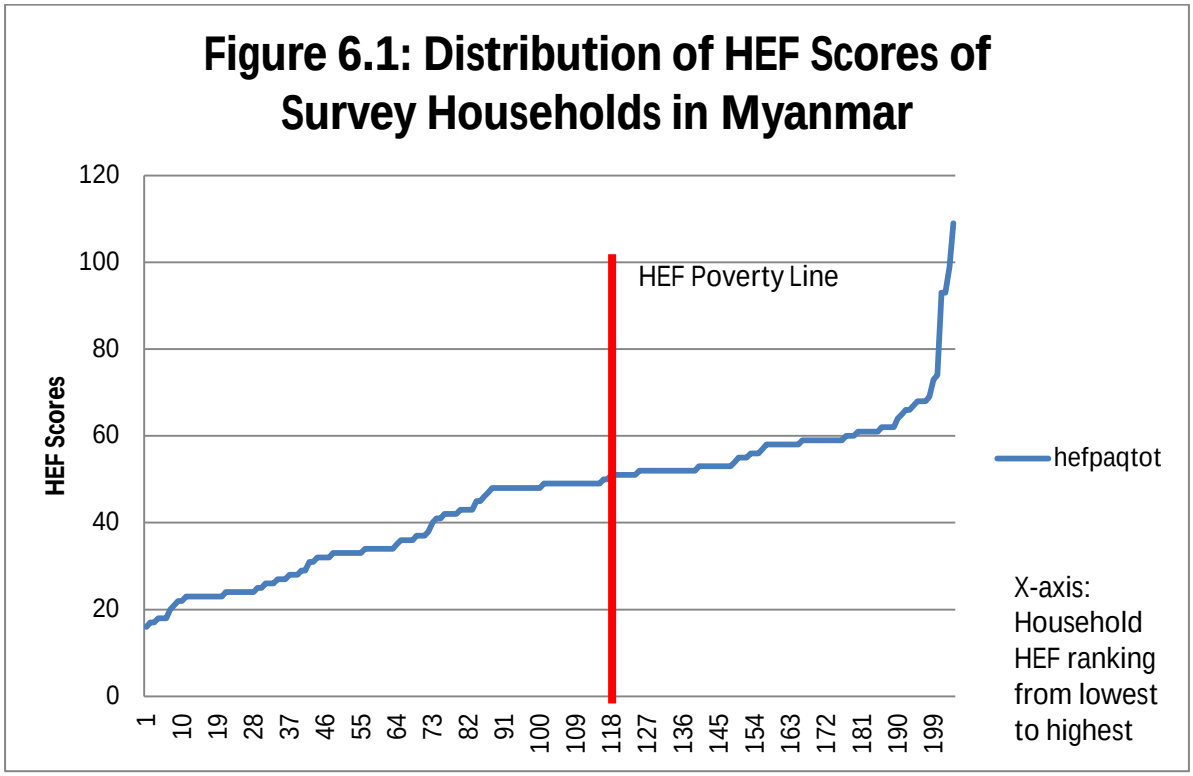
Survey questions on social connectedness suggested fairly close ties, although there was some variation across households. On average, household heads reported having three close friends of three (with a maximum of 20 and a minimum of 0). Households also reported participating in religious and community events on average about three times in the month preceding the survey (with a maximum of 30 and a minimum of 0).

6.3. Identification of HEF Beneficiaries under the Official (Scoring) Criterion

Beneficiary eligibility under the HEF program are based on responses to a pre-assessment questionnaire. Each response is assigned a score and individuals scoring more than 50 are assessed as being eligible to receive subsidized hospital services under the program.

Figure 6.1 plots household scores, using the scoring method of the HEF program, for households in the survey, ranked from the lowest scoring household to the highest. The red vertical line (HEF Poverty line) indicates households (to the right of the line) that would be designated as poor under the HEF program using its own scoring criterion. In the survey, 42.76% of the households would have been designated as poor under the HEF criterion and thus eligible for the HEF program (shown in Table 6.1).

Figure 6-1 : Distribution of HEF Scores of Survey Households in Myanmar



How would households deemed as poor under the HEF criterion fare if the criterion for determining HEF eligibility were changed to household consumption per capita (alternatively, consumption per adult equivalent) often considered the gold standard for assessing household economic well-being, or some other standard indicator? Table 6.2 sheds some light on how household eligibility might change. In the Table, the household survey population is divided into quartiles of economic status, alternatively using household consumption per capita, household consumption per adult equivalent and an asset index. For each quartile, we estimated the proportion of households that would be deemed poor under the HEF scoring criterion (and hence eligible for HEF program benefits).

Table 6-2: HEF eligibility for households under alternative methods for assessing economic status

Quartile Rankings	Share of households eligible under HEF scoring criterion (%)		
	Consumption per Capita	Consumption per Adult Equivalent	Asset Index
1	47.77 (46.70-48.84)	50.64 (49.61-51.66)	39.28 (38.23-40.34)
2	43.99 (42.94-45.04)	45.35 (44.26-46.44)	46.26 (45.20-47.32)
3	32.68 (31.68-33.69)	48.93 (47.87-49.99)	66.67 (65.66-67.67)
4	46.85 (45.77-47.92)	24.85 (23.90-25.80)	18.80 (17.96-19.63)

Note: Author's sample-weighted estimates using household survey data; 95% confidence intervals are reported in parentheses below each point estimate.

The data reported in Table 6.2 suggest poor concordance between the HEF scoring criterion and consumption/asset indicators of well-being, with significant proportions of households eligible for benefits under the HEF criterion even among those at the highest levels of economic well-being under traditionally accepted measures.

Because the HEF measure is directed towards households with poor women and children, we also inquired whether the results reported in Table 6.2 might change if attention was limited solely to eligibility among women and children under-5 years old. Table 6.3 reports findings on the share of HEF-eligible women and under-5 children for different quartiles, under the scoring method. All calculations reported in Table 6.3 assume that women and children under 5 are poor if the household they belong to is classified as poor under the HEF scoring method.

Table 6-3 : HEF eligibility for women and children under-5 under alternative methods for assessing economic status

Quartile Rankings	Share of Women and Under-5 Children eligible under HEF scoring criterion (%)		
	Consumption per Capita	Consumption per Adult Equivalent	Asset Index
1	51.79 (42.39-61.18)	56.82 (48.26-65.38)	44.86 (35.28-54.44)
2	51.69 (42.55-60.84)	43.41 (34.74-52.08)	52.46 (43.47-61.45)
3	36.21 (27.33-45.08)	53.15 (43.72-62.58)	66.36 (57.26-75.45)
4	47.25 (36.80-57.71)	21.54 (11.27-31.80)	20.79 (12.74-28.84)

Note: Author's sample-weighted estimates using household survey data; 95% confidence intervals are reported in parentheses below each point estimate.

However, the results in Table 6.3 indicate that the findings in Table 6.2 are broadly unchanged even if attention were limited to the subset of population – poor women and children aged 5 years or less – the key target population of the HEF program. Being in a specific economic quartile does not directly translate into being poor, as quartiles are a measure of relative ranking, whereas a poverty ratio, particularly in developing countries, is typically an indicator of an absolute standard of living. Thus we inquired whether households that would be classified as poor (non-poor) under a consumption criterion would be classified as eligible (ineligible) under the HEF criterion.

In Myanmar, household poverty is defined in terms of consumption per adult equivalent. Using this criterion, we find that 5.8% of households in our sample would be classified as poor (and thus 94.2% as non-poor). We find, moreover, that among households classified as poor under the consumption criteria, only 53% would be

deemed HEF eligible under the HEF scoring criterion. Moreover, of those who are non-poor under the consumption criterion, 59.35% would be deemed eligible under the HEF scoring method. The national poverty rate (25.6%) in Myanmar according to the World Bank was however in this study the sample villages were working on rubber fields and fishing and comparatively not as poor as national average.

6.4. Effective Program Coverage: Awareness and Utilization

Even if a poor household is classified as being eligible for the HEF program, it may still not be able to effectively access the benefits available (Ir et al. 2010). For instance, services covered under HEF may not be available in proximity, so that physically accessing the program may present logistical challenges, as well as the risk of potential household income losses due to work days missed by caregivers or person accompanying the sick person. Households may also have had poor experience with HEF covered services, or they may have serious concerns about service or clinical quality at the township hospitals and thus may choose to visit private care providers, or not access services at all. Given that HEF benefits relate primarily to hospital-based care, household care-seeking behavior may not be particularly elastic, but they still forgo public care in favor of private care. Cost and quality of HEF benefits are not the only concern. Households may also not be well informed about the HEF program and the benefits covered.

In the following sub-sections we first assess HEF program awareness among households ranked economic status and by HEF eligibility under the scoring criterion.

Next we explore household healthcare seeking behavior, and in particular the choices between public and private providers of care.

6.4.1. Programme Awareness

We relied on a very simple measure of awareness: specifically, whether a household had heard of the HEF program. Only 1.5% of the households possessed HEF cards, whereas 77% of total households had not heard of HEF program while 5.4% were enrolled in it based on self reports. For this purpose, households were ranked by socioeconomic status into quartiles using consumption expenditure per adult equivalent. Within each quartile of consumption expenditure per adult equivalent, households were further sub-classified into those that were eligible for HEF and those that were not. Table 6.4 reports the proportion of households in each sub-group that were aware of the HEF program.

Table 6-4 : HEF awareness among households by consumption per adult equivalent and HEF eligibility in Myanmar

Quartile Rankings	Share of Households Aware of HEF (%)		
	All Households	HEF Eligible Households	HEF ineligible Households
1	27.16 (26.25-28.07)	34.52 (33.15-35.89)	19.79 (18.64-20.94)
2	21.17 (20.28-22.07)	22.72 (21.36-24.09)	19.89 (18.70-21.08)
3	14.96 (14.20-15.72)	3.26 (2.72-3.80)	26.17 (24.86-27.47)
4	15.41 (14.63-16.20)	9.92 (8.60-11.24)	17.17 (16.23-18.11)
All Quartiles Combined	19.85 (19.43 – 20.28)	19.10 (18.46 – 19.74)	20.41 (19.84 – 20.97)

Note: Author's sample-weighted estimates using household survey data; 95% confidence intervals are reported in parentheses below each point estimate.

The data in Table 6.4 suggest that HEF program awareness was lower among better off households than among poorer households. Moreover, for the subset of households that would be deemed HEF-eligible by the scoring method, this pattern of greater awareness among the less well-off was even more marked. Overall, these findings would suggest that when combined with HEF scoring, targeting of program benefits under HEF would generally favor those considered poor by the consumption method. However, overall program awareness is low, with only 19.85% of households and 19.10% of HEF-eligible households being aware of the HEF program, thereby limiting the impact of the program on the targeted populations. Our findings were broadly unchanged even when households were ranked by alternative indicators of household economic status, such as consumption expenditure per capita and wealth indices.

6.4.2. Health Services Utilization

We inquired about inpatient and outpatient health service use in the sampled households. For the purposes of economic ranking, households were grouped into quartiles, based on consumption expenditure per adult equivalent. Information on utilization of outpatient healthcare services was based on household responses to outpatient care use in the month preceding the survey and hospital admissions in the year preceding the survey. Survey questions also inquired about the type of healthcare provider where health care was received, including whether the provider was in a public facility or a private facility.

Table 6.5 summarizes the main findings on healthcare use. Given the small number of households sampled (204) and the overall small number of people in those households, inpatient visits were relatively rare, amounting to only 40 hospital admissions. In contrast, outpatient visits were relatively larger in number and allow for more precise estimation. The average numbers of outpatient visits per person were roughly 17 per 100 individuals in the last one month, or an annual number of approximately 2 outpatient visits per person. In contrast, about 3.4% of sample individuals experienced hospital admissions.

Table 6-5 : Inpatient and Outpatient Use by Socioeconomic Status in Two Townships in Myanmar, 2014

Quartile Rankings	Outpatient Visits		Hospital Admissions	
	Visits per 100 Persons	Public Share (%)	Admissions per 100 persons	Public Share (%)
1	10.25	42.44	4.66	80.04
2	15.52	31.12	3.21	50.08
3	20.70	14.88	3.52	37.50
4	20.57	24.16	2.13	100.00
All Quartiles Combined	16.76	25.70	3.38	76.04

Note: Author's sample-weighted estimates using household survey data.

The main findings can briefly be summarized as follows. Outpatient visits per capita were generally increasing in economic status, and moreover, the share of public sector healthcare services tended to be higher in outpatient visits among lower income groups. For all households taken together, however, the share of public sector outpatient services was small (only about 25%). The data on hospital admissions are much less precise given the small number of hospital admissions in our household sample. Nonetheless, it can be seen that that households rely on

public sector services to a much greater extent for hospital care than for outpatient services. The share of public providers in hospital admissions was nearly 75% in our sample. Moreover, it seems that the poor rely to a greater extent than the richer groups on public hospitals.

In sum, hospital services funded by the HEF would likely reach households eligible for HEF benefits to the extent that they use hospital care. This analysis cannot, of course, tell us what factors drive hospital use; only that once hospital admissions occur; they are more likely to be in public hospitals.

6.4.3. HEF eligibility and Hospital Admissions in Survey Households

Thus far, we have assessed the likelihood of benefits reaching households that are HEF eligible based solely on their HEF eligibility score, their awareness about the HEF program and the overall pattern of health service use by all households (not just HEF households). The main reason for doing so was the small number of hospital admissions in the sample.

However, it is still instructive to see how far actual hospital admissions data and the receipt of HEF benefits correlate with the HEF scoring criterion for eligibility. Table 6.6 reports findings from for the 40 hospital admissions reported in the household survey and their correlation with eligibility (defined as a score of more than 50 on the HEF pre-assessment instrument),

Table 6-6 : Receipt of HEF Hospital Admission benefits by HEF Eligibility Status in a Sample of Myanmar Households Reporting Admissions

Receipt of HEF Benefits	Households with Score Eligible for HEF Benefits	Households with Score Ineligible for HEF Benefits	All Households
HEF Benefits Received	20.83%	31.25%	25%
HEF Benefits Not Received	79.17%	68.75%	75%
All Hospitalizations	26.97%	73.03%	100.0%

Note: Author's estimates using household survey data

Although the sample of hospital admissions is small, the results are instructive and are consistent with the findings in earlier tables. Overall, a quarter of the hospital admission cases reported receiving benefits under the HEF program. Interestingly, of the 26.97% of hospital admissions that would have been deemed eligible for HEF benefits, only 20.83% reported actually receiving HEF benefits. This would suggest a fairly large Type-1 error (individuals deemed HEF eligible but not receiving HEF benefits during hospital admissions) even if we ignore the low correlation between the HEF eligibility score itself and the usual "gold standard" for considering household economic status, namely, indicators of consumption spending (per capita, or per adult equivalent).

In contrast among hospital admissions that would have been deemed ineligible under the HEF eligibility criterion (about two-fifths of the total admissions reported in our sample), about 31% reported receiving HEF benefits. This suggests that type-2 errors (of ineligible households receiving program benefits) are likely to be high under the HEF program.

It is possible that HEF eligibility scores do not capture unobserved elements of the HEF eligibility identification process that might have been undertaken in the two Myanmar townships studied. For instance, assessments might have been more careful in taking account of household impoverishment status than the scores based on the HEF instrument. Thus, in Table 6.6 we consider the targeting of HEF benefits for reported hospital admissions by household economic status using the consumption per adult expenditure equivalent criterion.

Table 6-7: Receipt of HEF Hospital Admission benefits by Consumption per Adult Equivalent Status in a Sample of Myanmar Households Reporting Admissions

Receipt of HEF Benefits	Households with Consumption Expenditure in Poorest Quartile	Households with Consumption Expenditure in top Three Quartiles	All Households
HEF Benefits Received	42.86%	15.38%	25%
HEF Benefits Not Received	57.14%	84.62%	75%
All Hospitalizations	24.14%	75.86%	100.0%

Note: Author's estimates using household survey data

The results in Table 6.7 show that receipt of HEF hospital admission benefits by consumption per adult equivalent status in our study. 24.14% of households with hospitalized patients were in the poorest quartile while three out of five admissions did not receive the HEF benefits. By using this consumption expenditure quartile Type 1 error will be reduced in compared to that of HEF criterion. In the top three quartiles of the consumption expenditure quartiles, only 15% received the benefits from the HEF program indicating Type 2 error might be relatively less than that of HEF criteria.

Our results in this sub-section could also be confounded by the fact that the HEF program targets women and young children and the data on hospital admissions that we present in Table 6.6 includes hospitalization among adult males. Of the 40 hospital admissions reported by households in the survey, 39 hospital admissions were among women and young children. However, even within this group, the proportion of hospital admissions accounted for by HEF beneficiaries was 25.6%.

6.5. Correlates of Targeting Efficacy of the HEF Program: Evidence from a Household Survey for Myanmar

The preceding evidence suggests that HEF is poorly targeted, with both a significant likelihood of benefits not accruing to intended beneficiaries, as of benefits accruing to non-eligible populations. What factors are likely to be associated with poor targeting?

There are a variety of factors that might explain poor targeting, ranging from individual to household level characteristics to social characteristics. Individual characteristics could include gender, educational status and age of ill members that might lead to their being poorly placed to take advantage of HEF benefits. For example, young children in poor households or elderly women may be in a particularly disadvantageous position in terms of obtaining care as they depend on others for accessing their healthcare needs.

Household characteristics may also matter. For instance, given ethnic tensions in Myanmar, households belonging to minority ethnic groups may have poorer access

to public hospitals and health facilities (and public benefits such as under HEF) than the majority Bamar group. Similarly, household members may have additional responsibilities, such as the need to take care of disabled members that may limit their ability to take advantage of benefits available under the HEF program. In addition, households may have low levels of social interaction with others that might lead to their not knowing or being left out of various public programs. Finally, rural households may have poorer access to public benefits such as under HEF, compared to urban households that are located in proximity to township hospitals.

We considered *three* types of outcomes that are likely to be reflect the effectiveness of targeting in our household survey responses: awareness of the HEF program as reported by the household (T=1 if aware, 0 otherwise); concordance of impoverishment status as indicated by consumption expenditure per adult equivalent threshold and an HEF score more than 50 (U =1 if either the household is poor by the HEF scoring method and the consumption per adult equivalent method, or if the household is non-poor by both methods, 0 otherwise); and a concordance measure that captures the likelihood of type-1 error only. The last measure (V) is limited to the analysis of households that are estimated to be poor by the consumption per adult equivalent method and takes the value 1 if the household is also simultaneously poor by the HEF scoring method and 0 otherwise. Results for logit regressions the three sets of outcome indicators are provided in Table 6.8.

Table 6-8: Logit Regression Estimates of Association of Targeting Efficacy with Explanatory Variables for Myanmar, 2014

Explanatory Variables	Awareness Indicator (T)	Concordance Indicator (U)	Type-1 Error Indicator (V)
Rural Dummy (1 if Rural, 0 Otherwise)	-0.03 (0.04)	-0.91** (0.03)	N/A
Household Size	-0.32** (0.01)	-0.27** (0.01)	0.07** (0.02)
Female Head of Household (1 if Yes, 0 Otherwise)	-1.39** (0.05)	-0.30** (0.03)	2.02** (0.74)
Household with Elderly Member/ Under-5 Child (1 if Yes, 0 Otherwise)	0.16** (0.03)	-0.26** (0.03)	0.66** (0.08)
Number of Close Friends	0.04** (0.00)	-0.01* (0.00)	0.01 (0.01)
Frequency of Participation in Community Events (last year)	0.02** (0.00)	0.09** (0.00)	0.08** (0.01)
Household with Disabled Member (1 if Yes, 0 Otherwise)	-0.10* (0.05)	-1.01** (0.04)	0.44** (0.08)
Bamar Ethnic Group (1 if Yes, 0 Otherwise)	0.56** (0.11)	-1.59** (0.09)	N/A
Distance from Health Facility > 30 Minutes (1 if Yes, 0 Otherwise)	-0.38** (0.03)	0.29** (0.03)	-0.77** (0.07)
Consumption Expenditure Per Day Per Adult Equivalent (Kyats)	-6.86** (0.20)	8.22** (0.20)	-1.23** (0.45)
_cons	5.70 (0.24)	-4.20 (0.22)	-3.84** (0.46)
Number of Observations (N)	204	204	204

Author's (sample-weighted) estimates using household survey data for Myanmar.

*Significant at the 5% level; **Significant at the 1% level.

The results for the awareness indicator suggest that households with larger sizes, female heads and living with a disabled member were less aware of the HEF scheme. Moreover, poorer households, households from ethnic minorities and households

that were located further away from health facilities were also less aware of the HEF scheme. These findings suggest that the HEF is likely to exclude households that are more severely disadvantaged than average. There is also some weak evidence that households that have strong social ties are more aware of the HEF scheme. To the extent that more aware households are also more likely to take advantage of its benefits, this further strengthens the suspicion that HEF is not well targeted to the most excluded groups of population in the two townships. On the other hand, there is some evidence that the demographic groups the population is intended to serve – children and women needing hospital services – might be more aware about the scheme, given that awareness is higher among households that have young children and elderly as members.

The results in column 3 (for the variable U) highlight whether targeting errors (type-1 and type-2 taken together) were associated with household characteristics. The results suggest that rural residence is more likely to be associated with targeting errors than urban residence. Moreover, larger households, households with disabled, elderly and younger children as members, and households with female heads are more likely to be incorrectly targeted. Worrying, members of the Bamar ethnic group are also likely to be incorrectly targeted. On the other hand, controlling for other characteristics, economic status, distance from health facilities, and frequency of participation in community events were more likely to be associated with improved targeting.

To get a better sense of how the associated characteristics vary with the different types of targeting errors, Table 6.7 also reports the results of a logit regression

analysis where the sample of households is restricted to those with expenditure per adult equivalent being below the official poverty line, and the outcome variable took the value 1 if he household was also poor according to the HEF scoring method, 0 otherwise. Our main findings for this case are as follows. Among those who are poor, targeting is likely to work better for larger households, households with disabled and elderly individuals, households with younger children as members, participation in community activities and households with female heads. However, economic status and distance from public health facilities were more likely to be associated with type 1 targeting error.

6.6. Conclusion

These findings contribute to the limited literature that exists on the targeting effectiveness of Health Equity Funds. They suggest first that there were large type-1 and type-2 errors in the HEF program in the sampled townships. The HEF program used a proxy means method to identify households that were poor. Inclusion and exclusion errors are known to occur with proxy means tests. In Bangladesh, Indonesia, Rwanda and Sri Lanka, use of proxy means to identify beneficiaries has led to errors of about 20% (Kidd et al. 2011).

These targeting errors in the HEF program are underpinned by low levels of awareness of the program among targeted beneficiaries, and by inadequacy of the HEF scoring criterion to capture poor households. To the extent that consumption expenditures are a superior measure of economic well-being, an alternative strategy might be to choose weights for the HEF scoring method in such a way that they

maximize the correlation with household consumption per adult equivalent. Alternatively, one could use consumption expenditure measures directly, but collecting this information can be quite costly.

7. HEF Program Administration: Qualitative Evidence

7.1. Introduction

According to Coady, there is no standardized methodology to ensure the effectiveness of targeted programs (Coady et al. 2004). In this setting, what is most likely to be helpful are guidelines and policies that have previously been shown to enhance program effectiveness.

Previous experiences with targeted programs point to factors that are likely to influence effectiveness. For example, targeting by "fiat" did not work in Ugandan health facilities, because policymakers failed to appreciate the incentives and interests on both demand and supply sides of healthcare services (Kintu 2002) The benefit for the targeted population was by cost sharing with exemption and waivers at the health facilities as fiat and three different guidelines were sent out and difficult to follow them. For example, health care providers may have needed additional incentives (financial or other) to pay special attention to poor patients. Similarly, availability of healthcare services by itself is unlikely to be sufficient without additional support in the form of subsidies for transport expenses incurred in accessing targeted health services. The organization of Health Equity Funds in Cambodia was, on the other hand, a good example of how funding arrangements and contracting can create incentives for health service providers to address the health service needs of the target population, including providing for increased accountability of service providers (Hardeman et al. 2004). To have increased effectiveness needed for Cambodia's HEF, hospitalized poor patients were

introduced to have a demand side initiative as a third party payer. Building on these and other experiences with targeted programs worldwide, the favored approach is one that emphasizes issues of resources allocation, participant motivation and incentives to build on that motivation.

The role of incentives is only one element in delivering an effectively targeted program. (Walt and Gilson. 1994) suggested that effective policy design should include multiple complementary steps as well: including beginning with an agenda setting exercise that provides the rationale for policy action, the formulation of policy itself, and its implementation, which is where the importance of incentives is most tangible. In addition, he highlights the key role of policy evaluation in the implementation exercise. The policy formulation and implementation exercise involve a number of important subsidiary steps. (Meessen and Criel 2008) highlight the importance of the careful development of the specific intervention to be implemented, including defining the benefits to be provided, informing various targeted groups and stakeholders of these benefits and of the program generally, describing the criteria used to infer whether an individual or household was (or was not) eligible, and establishing the process by which eligible beneficiaries actually received the benefits (or utilized the relevant services). In delivering the assistance to the targeted beneficiaries, it is important for the government to provide services that best meet identified needs. Not all of these services may be available in the public sector and there may be cases where needs are best served by private providers even if they are paid from public funds. (Lavis et al. 2004) also suggested that study tours for policymakers and implementing agencies, pilot studies as well as

performing systematic reviews could provide policy makers with alternative program designs and strategies for implementing them. As noted in Chapter 7, defining program eligibility is also crucial, given that resources are limited. Depending on the country context and data availability, consumption and income indicators (or even wealth indicators) may be needed to better identify beneficiaries when program benefits are means tested. And informing stakeholders and beneficiaries is a vital step to enhance self-targeting and reduce exclusion errors (Noirhomme et al. 2007).

These elements need to be accompanied by other components, including the allocation of adequate resources to the program. In addition, it might be useful to rely not just on increasing awareness among the intended beneficiaries about program benefits, but also legislation that ensures access of such groups to the intended benefits (Neubourg 2002). As one illustration, the introduction of Cambodia's HEF program was accompanied by legislation to ensure that the poor had a right to program benefits (Jacobs et al. 2014). Cambodia was the very first country to introduce health financing charter (HFC) as legislation where user fees were implemented and administered at health facilities by themselves followed by approval from Ministry of Health, Cambodia. Finally, continuous program evaluation is crucial to address problems as they arise as well as to assess the effectiveness of the program relative to other strategies addressing the same population group. In this context and because there are many different ways to assess program effectiveness as highlighted by the preceding chapters (Alkire and Foster 2011) to demonstrate the effectiveness of programs targeting the poor in achieving program objectives.

We use the ideas outlined above to perform an assessment of the administration of the HEF program in this chapter. Unlike the previous chapter where our focus was on household-level responses (the beneficiaries), here we consider the supply side, or the administrative aspects of the HEF in Myanmar. To help in the assessment we relied on qualitative analyses, based on interviews and focus group discussions conducted by the author with key HEF program personnel, public sector health service providers, community leaders and civil society leaders at the same time as the household survey was being conducted.

7.2. Management of the HEF Program: An Overview

The Hospital Equity Fund in Myanmar is a planned activity undertaken by the government of Myanmar in collaboration with the Global Alliance on Vaccine Initiative (GAVI) under the category of "Health Systems Strengthening" (GAVI HSS) with a particular focus on health financing. As noted in Chapter 2, the program was launched partly as a response to the high levels of out of pocket (OOP) payments by households in Myanmar.

The overall goal of the health systems strengthening (HSS) project was to lower child mortality and improved access to maternal and child health care services. The financing component of the HSS program (such as the HEF at the township level) was to operate initially in the form of pilot projects in the targeted townships, with a priority on research and evaluation of township capacity for financial management and administration of the HEF ultimately with the goal of scaling up the programs to

cover the whole country, and to integrate the financing schemes (such as the hospital HEF) with township level planning activities.

The activities of the GAVI HSS project enjoy high level policy support in Myanmar. The central GAVI HSS committee functions under the guidance of the National Health Committee (NHC), the highest policymaking body for Myanmar's health sector, also ensures inter-sectoral coordination with related Ministries, including the Ministry of Health. It is noteworthy that the NHC was broadly responsible for overseeing the design and implementation of health system strengthening strategy, although it was limited in this respect in terms of technical capacity to do so.

For all practical purposes though, policy decisions concerning the GAVI HSS project were directly implemented via the office of the Minister of Health. Within the central ministry of health, the focal point for operational purposes was the office of the Director of the Planning Division in the Department of Health. This office was primarily responsible not just for research and development and organizing funding for the HSS project, but also for coordinating HSS resource activities, and a HSS working group established for this purpose with directors and professionals from different departments and universities under the Ministry of health, Myanmar which report to the GAVI HSS Committee for the progress. The Planning Division of the MOH also provided quarterly update progress to National Health Sector Coordinating (NHSC) Body for Health Systems Strengthening, coordinated activities related to the implementation of the HSS, submitted progress reports along with recommendations for any programmatic changes and ensured that HSS investments were in line with the National Health Plan (NHP).

The State and Regional Health Directors were the local focal points and responsible for technical monitoring and supervision of related health personnel. At the township level, the Medical Superintendent or Township Medical Officer was given the responsibility/authority for planning, implementing, monitoring and evaluating the HEF program activities in collaboration with the township health team with assistant surgeons, nurses, health assistants and midwives from the township hospital and respective Rural Health Centres (RHC).

7.2.1. Funding channels for the HEF program

The GAVI HSS project is a wide ranging project, of which the HEF activities form only one part. Funds for HSS activities were channeled to the government through the WHO country office in Myanmar. Equipment supplies under the HSS project were managed by the Myanmar office of WHO. The role of the WHO in managing fund flows led to an obvious coordination problem given the differences in financial years between the WHO and the government of Myanmar. For the WHO, the financial year ran from January to December of each year, whereas the Government of Myanmar's financial year ran from April 1 of each year to March 31 of next year.

On the side of the Ministry of Health, financial management was undertaken by the Head of the Budget Section and by the Directors of Planning and Administration. Funds received at the central level were disbursed directly to respective Regions and States then onwards to the townships by bank draft to the Government Bank accounts of respective offices. The magnitude of fund disbursement was determined by the central MOH based on coordinated health plans and specific activity plans

that had been drawn up. At the township level, the Medical Superintendent or Township Medical Officer was the drawing officer for the funds. Note that this is a classic top-down fund disbursement system and not a need-based bottom up disbursement system. The latter would have required establishing and strengthening institutional financial management mechanisms for budgeting, financing and monitoring at each level of the country's health system, for which both capacity and funds were limited.

7.2.2. Information Flow and Reporting

Programme activities were administratively monitored in a number of ways. First there is a functioning routine Health Management Information System (HMIS) and reporting for the GAVI HSS for the review and analysis of the programme activities HMIS collects routine monthly and annual reporting by the Townships with minimum essential data set on field services, maternal health services, nutrition, water and sanitation status, school health and disease control activities. Fund flows and allocations were audited internally by the office of the Chief Accountant, and by international audit teams. In addition, periodic research was undertaken and presented to the HSS working group with description on the status of implementation and health service utilization.

7.3. Evidence from Qualitative Data Analysis

A qualitative assessment of the HEF was carried out using Focus Group Discussions and detailed interviews with various stakeholders involved in the HEF programme in 4 townships including two (Townships 1 and 2) where the household survey was conducted. The idea behind the qualitative research was to obtain detailed information on the working of the HEF program from key stakeholders – program administrators, civil society members and community leaders – many of whom would not be covered by information collected from the household survey. Collection information in this manner also helps provide a "balanced" perspective from different players involved in the HEF programme.

As noted previously, in an effort to ensure that participant responses were not overtly biased, voluntary consent was obtained from each individual who participated in the focus group discussions and interviews. An explanatory statement accompanying the consent form explained the objectives and methodology of the research project and the types of questions that would be put to the respondent with respect to HEF. The participants were assured confidentiality and were made aware of the option of withdrawing at any time from the FGD or the interview. Altogether, 56 individuals participated in the FGDs and interviews, from 4 townships. Of these 32 individuals were based in urban areas, and about one-half of these were government staff. The large number of government staff reflects our interest in gathering information about the administrative elements of the HEF programme. Out of the total, 12 individuals represented local authorities and

community leaders. Volunteers and local NGOs were represented by an additional 16 members (8 of each).

7.3.1. How well versed were the participants with the HEF program?

Although all of the participants were linked to the HEF programme in some manner (whether as a provider of services, facilitator of health service use, administrator, or the process for identification of HEF beneficiaries), almost one-third of the participants (19 out of 56) reported having no direct interaction with the HEF program, 15 in township 1 and 4 in township 4. 15 of the rural participants (out of 24) reported having no direct interaction with the HEF program, compared with 4 (of 32) urban participants. Surprisingly, 4 government officials from among the participants also reported having no interaction with the HEF program. The typical participant response can be summed up by the following statement about the HEF program from one of the participants:

> 'I don't know the program but I have the experience of transferring patients to hospitals. However, I am not sure whether the patient was under HEF or not.' (Local authority member from township 1)

Participants that had interacted with the HEF programme had engaged in various roles. 16 participants were involved in the documentation of HEF and 7 participants had some experience in referring patients to HEF. About fifteen participants had experience in identifying beneficiaries: two were involved in selecting hard to reach areas, whilst 13 persons were engaged in the assessing eligibility of hospital patients under HEF program benefits, because these patients did not have the necessary

documentation at the time they came to the hospital. The above said participants were basic health staffs (Midwife, Lady Health Visitor, Health Assistant etc.) and volunteers and local authorities from townships 2 and 4.

7.3.2. How did the Participants Perceive the Value and Goals of the Program?

There were varied assessments about the main goals of the program. 35 participants (or 62% of the total) stated that the main goal of HEF was to provide health services to the poor, and about 25% (14 individuals) also mentioned that the goal of HEF was to lower the financial burden of illness in patients. 10 participants stated that the HEF program was implemented to increase households' access to the hospital services, and 4 stated that the goal of the HEF was to improve the health status of the people. In this connection, 30 % of the participants responded that the HEF was intended to reduce the death of mothers and children younger than 5 years old.

> 'to reduce maternal and child mortality and get convenience of the community' (Basic Health Staff from township 1)

> 'It intends to help poor people who cannot go to clinic and hospital because of poverty.' (Local NGO member from township 2)

> 'To reduce mortality of children under 5 years old and reduce maternal deaths and get emergency medical care and to increase the referrals' (HEF Manager Township 1)

> 'To help the poor for convenience and make them happy and thankful' (Community leader township 3)

'To reduce poverty for the people' (Hospital Staff Township 4)

7.3.3. Effectiveness of Beneficiary Identification

The interviews and focus group discussions also probed the effectiveness of the process of identifying individuals who are eligible for HEF benefits. The responses were mixed. About one-half of the respondents stated that the process of identifying HEF beneficiaries was effective. However, a significant proportion (40%) of the respondents suggested that fraud – in that some households deemed to be eligible for HEF benefits were actually non-poor – was likely. A small proportion of the participants responded with "no comment" to this query. Below are some of the responses that shed light on the participants' views on HEF targeting efficacy:

'I am sure that we really paid HEF benefits to really poor patients. It is very obvious that (the patients) they are poor, just by observation and the type of utensils they possess. They are a very pitiable sight. These households cannot believe that the money paid to them by the HEF was for them, and some of them thought that this was to be paid back to the hospital staff. There is no fraud under this program.' (Hospital Staff from township 1)

'As the patients are really honest and pure it is very easy decide they are poor or not. If we are in doubt, we usually contact the midwife from patients' jurisdiction to confirm their status. We can also clearly see that the poor patient was admitted to the hospital with nothing.' (Hospital Staff from township 2)

'Some people cannot tell clearly as they are poor and did not get the money. Some rich person knew more about the programme and pretended to be poor and got the benefits.' (Local NGO member from township 2)

7.3.4. Key Challenges of the HEF Program

In response to a query on the main challenges facing the HEF programme, more than 60% of the participants had low awareness about the HEF program, both among the intended beneficiaries and some service providers at the local level. Related to this, poverty was mentioned as one of the main challenges by more than 40% of the participants. In addition, respondents referred to poor transport connections, low levels of beneficiary education and the administrative documentation requirements before HEF eligibility was granted. Shortages of fund available for HEF was also mentioned by 15% of the participants as a program challenge. Illustrative responses follow:

'Even our health staffs don't know the HEF program in sufficient detail. We need a proper advocacy for the HEF procedures. As I don't know the HEF program detail and I dare not refer patients to it.' (Basic Health Staff from township 1)

'They went to hospital but the hospital staff communicated rudely with the patients. Thus, even though the public hospitals cost less, the patients went to private hospitals. The public hospital reimbursed some amount, but not all for patients, and most reimbursements were for child birth cases. In my knowledge, most of the patients who went to the hospital didn't do so under

the auspices of the HEF program and got nothing at all.' (Local NGO member from township 2)

Given the key importance of funding for the success operation of such programs worldwide, we specifically queried respondents on the funding flows related to HEF. Roughly half of the participants in the FGDs and interviews reported that the fund flows were appropriate. However almost one-quarter reported the fund flows as being inadequate. The remaining participants did not rate this aspect of the HEF program as they were not associated with health service delivery or other aspects related to HEF fund flows.

'The patients gave feedback that the HEF fund for this year is over and cannot support any more new patients this year. The program will start again next year when the funds become available from the (MOH) headquarters. (Basic Health Staff from township 1)

'As the patients said, they get money for support their expenses about 1-2 days after admission to the (township) hospital. Then they were given some more money later but were unclear about the reason for the receipt of funds. In any case, they felt comfortable receiving the money.' (Basic Health Staff from township 2)

'The fund covers HEF-related expenses for only about 6 months of the year (e.g. May to October). The programme gave us 50 lakhs for one year but we received it quite late and had to spend it early. Because money came late, sometimes we could not use all the funds in time. Given the funding flows,

even when patients with HEF cards came to hospital, we could not cover them under the HEF scheme. Those patients complained to hospital staff and led to much misunderstanding. Even they are very rude, drunk and swear at staff. I have to fill in the list under HEF and report to programme.' (Hospital Staff from township 3)

7.3.5. Strengths of HEF and Recommendations by Interview and FGD Participants

Despite the concerns noted above, more than three-quarters of the participants supported the continuance of the HEF program in the interests of a felt need of the community. However, there many suggestions on how the program could be improved in its implementation. First, almost half of the respondents supported greater program advocacy and generally increasing awareness among potentially eligible households. About one-sixth of the participants wished to see a lowering of the documentation requirements for proof of eligibility for HEF benefits and other administrative requirements. Some of the participants (5) wished to have a separate financial accountant to handle incoming funds and reimbursements for the HEF program as they felt that the accounting requirements were different for the HEF program compared to the standard MOH fund flows. Nearly 20% of the respondents felt that some additional training was needed for hospital staff in communication skills and public relations generally, with respect to the HEF program.

There was some concern about the practice (common in the two townships where the household survey was conducted) of enrolling HEF beneficiaries only once they reached the hospital, and not prior using the scoring criterion. Some of the

participants suggested identifying beneficiaries well before they actually used HEF services and providing them the appropriate beneficiary cards in advance. At least one participant also recommended having regular field visits, having a HEF committee at every level, so as to cover more hard to reach areas and to have a specific contact person for the programme.

> ‘‘We need to advocate more on the health issues regarding this (HEF) program and can help more. The poor did not know about the program.’ (Local Authority from township 2)

> ‘I heard of this but not sure to get the benefits and cannot recommend the community about the program. If we know more detail we can help them.’ (Local volunteer from township 1)

> ‘The patients did not know about the HEF program and they didn’t even know why they get this money (reimbursement). The patients are also reluctant to show the recommendation letters from the local authority as they don’t want to confess that they are poor.’ (Hospital Staff from township 1)

> ‘The patients did not know about the HEF program nor receive HEF card from Basic Health Staffs (Especially Midwife). The BHS cover only the patient they touch with but not those from hard to reach areas in their jurisdiction.’ (Hospital Staff from township 3)

> ‘Some patients experienced the program when the Basic Health Staffs (Especially Midwife) refer the risk patients to hospital. However the poor

people are afraid of hospital and lack of awareness and no health knowledge. Majority of them prefer to give child birth at home.' (Hospital Staff from township 4)

'Most of the patients did not know about the program. We had to explain those details about the program only once they reached the hospital.' (Hospital Staff from township 4)

The service that participants liked most was the payment of daily allowances to the patients, and the fact that the cost of health services for HEF beneficiaries was now eliminated. Nearly one-third of participants also answered that they liked the element of payment for transport fees under the HEF program. Seven individuals were also pleased to have payments for persons accompanying the patient during their hospital stay.

'The patients are needed to be treated efficiently and effectively. Payment for living allowances' (Local NGO member from township 1)

'The main difficulty for the poor people is money and the (HEF) program provides money.' (Local NGO member from township 2)

'I got training under GAVI as auxiliary midwife in 2012. The program is good. (Local Volunteer from township 2)'

'Support to the poor is the best thing I like and consequently the admission of patients to the hospital increases and reduces the mortality' (Hospital Staff from township 2)

'The support for transport is essential to continue so as the patients can access to the hospital easily' (Hospital Staff from township 1)

'What I like most is the payment to patients to cover hospital expenses and getting services.' (Hospital Staff from township 2)

'Better than other programs. Even better than Maternal voucher scheme here as I am from the hospital. Sometimes they asked reimbursement for the things not included in the scheme (like portable DVD).' (Hospital Staff from township 3)

'Paying money direct to patient is the best feature of this HEF program' (Hospital Staff from township 4)

7.3.6. Comparison with Other Programs in the Health Sector

About 30% of the participants reported that there were no programs similar to the HEF in their area. More than 40% of the participants rated the HEF is a better programme than other health sector programs in their jurisdiction. However one interviewee from township 3 answered that the HEF was a weaker program than a health sector program in her township. The most illustrative responses are summarized below.

'The main difficulty for the poor people is money and the program provides money.' (Local NGO member from township 2)

'This is good support to poor patients and happy to see. Other projects cover payment to staffs mainly but not to the patients.' (Hospital Staff from township 1)

'This program is weak in one point in comparison to the Maternal Voucher Scheme. This is the feature that HEF cannot provide any reimbursements for the period that funds are unavailable in the HEF scheme.' (Hospital Staff from township 3)

7.4. Key Conclusions

The findings from the qualitative research are consistent with the results from the household survey reported earlier and additionally highlight important elements on the administrative side of the program that are of policy concern. The key finding of findings based on survey data, as indicated in chapter 7 are firstly that awareness of HEF is low among the intended program beneficiaries. Secondly, there are considerable inclusion and exclusion (type 1 and type 2) errors in the identification of HEF program beneficiaries and in program delivery. Multiple regression analysis indicate some of the household-level characteristics that might explain poor targeting: living in rural areas, remoteness from health facilities, ethnic minority status, etc.

Our qualitative research highlights the relative lack of awareness creation campaigns for the intended target populations for the HEF program. Moreover, there is a lack of awareness among lower-level health facility workers about HEF program benefits.

This may have been another factor that would lowered target populations' knowledge of the HEF program and reduced their likelihood of using HEF benefits in case of hospitalization.

Critically, even if HEF beneficiaries were aware and sought to use HEF benefits, interviews with key participants suggest that funding flows were both uncertain and inadequate. Heightened uncertainty about access would affect adversely affect individuals' choices about seeking HEF benefits. Moreover, this situation, greater with extensive documentation requirements, suits better off users who might seek HEF supported services because of their greater ability to ride out temporary bottlenecks in availability of funds under the HEF or provide more detailed (if not necessarily truthful) documentation. In sum, type-1 and type-2 errors would likely increase on account of uncertainty and bottlenecks in funding flows.

That said, the general view seems to be that these are teething errors and the HEF program is sufficiently beneficial to be sustained over time. The issues with program implementation highlighted in the research suggest that there are ways in which the program could be modified to serve the target populations better. In this sense, our research serves as an important monitoring device for future program improvement, just as envisaged in the introductory portion of this chapter.

8. Policy Implications

The thesis examined the effectiveness of targeting of the HEF program in two townships in Myanmar and sought to assess the major factors that are likely to have influenced the effectiveness of the targeting mechanisms. Our main finding is that there are large inclusion and exclusion errors in the targeting of the benefits under the HEF program in Myanmar.

While the study design does not allow us to make strong causal statements, the totality of the evidence from the analysis of the household survey data and the qualitative component of the study suggests that multiple factors are likely to have driven the poor results regarding targeting. These include:

(a) Low levels of program awareness among households that are likely to have been classified as beneficiaries under the program, using the scoring method. Indeed HEF awareness was low across the entire spectrum of socioeconomic groups. The levels of awareness were particularly low among families in need and those living in remote areas.

(b) Low levels of awareness about the HEF program and its benefits among health facility staff and community members who could potentially influence HEF targeting positively

(c) A measure of assessing economic status – the HEF scoring method based on exogenously assigned weights – that was not well correlated with indicators that are well known to be good proxies for economic status of households. These include consumption and asset-based measures.

(d) Weakness in Program Administration: these include funding limitations and bottlenecks in funding flows, and inadequate capacity in the department with regard to accounting and budgeting and in coordinating both donor and MOH requirements with respect to accounting and organization of fund flows.

The limitations of our analysis notwithstanding, a few broad policy conclusions and recommendations related to the targeting of beneficiaries are suggested by the analyses reported in this dissertation. These can be broken down into 4 broad categories: addressing the fund flow mechanism for HEF and capacity building needs, advocacy and dissemination of knowledge about the programme among potential beneficiaries, enhanced partnerships between the HEF management and other MOH staff as well as the community, and improved indicators of economic status.

8.1. Suggestions

8.1.1. Enhance HEF Program Awareness in the Community via campaigns, Partnerships and increased funding allocations:

Expanded awareness creation campaigns are needed for the HEF project. In its current form, the HEF program lacks funds for supporting information/awareness campaigns, so the program managers faced difficulties in spreading information about the HEF program benefits to a wider audience of households. Thus, there should be increased funding for advocacy and awareness campaigns related to the HEF program.

8.1.2. Encourage greater community participation in identifying beneficiaries

In the interviews conducted for research undertaken as part of this dissertation, volunteers and local community members with knowledge and experience about identifying beneficiaries that satisfied the HEF eligibility requirements were not well informed about the HEF program. This suggests the need for creation of mechanisms that increase interaction local HEF managers and HEF committee members and community leaders and local authorities.

In general, there was no proper planning within community prior to the HEF implementation. We recommend a planning meeting to build and share responsibilities within the targeted population. A mechanism that can include local communities and promote the sharing of responsibilities with health personnel and community planning with interest and awareness may also be useful. HEF program managers could meet with local communities for formulating strategies consistent with program standards appropriate for a diverse targeted population.

8.1.3. Capacity Building, Accountability and Funding Flows

The bottlenecks related to funding, lack of adequate efforts to pre-identify beneficiaries, etc. suggest that township level HEF managers need program management and development training related to effective targeting. Without proper training, the programs managers at the township levels tended to be reluctant to use the HEF fund allocations in time and inadequately targeting benefits

to poor women and children in their jurisdiction. That said, the program also needs ways to address the financial bottlenecks plaguing the HEF program.

We also propose (in addition to various steps related to awareness, partnerships and increased funding, mechanisms that help increase accountability of the HEF teams on the ground and at the centre. This may require setting careful performance standards and ways to monitor performance. Clear program guidelines with respect to eligibility and funding availability must be developed and fund availability should be updated and distributed within the community.

Interviews suggest that the HEF program had neither a proper checklist nor an information channel for reporting apart from regular Health Management Information System (HMIS) which consists of minimum essential data sets for some prioritized projects. To have new and better quality service in the HEF program, the tools for monitoring and evaluation and networking with related professionals are basic requirements.

8.1.4. Alleviate financial and administrative burdens

Impediment in the funding channel and auditing and administrative processes were key obstacles faced by the HEF program managers and staff. We recommend that the HEF program should be designed to overcome barriers in operating the program. This could take the form of consultation between program managers and central level staff for strategy setting and easing the administrative burdens and delays.

A management and information system for HEF was needed to be developed in preparing and supporting program managers at every level. Sharing responsibilities and building community planning on HEF

8.1.5. Improved methods for assessing economic status

In general, we recommend a move away from the HEF type scoring method towards more consumption based measures. Of course, consumption data can be hard to collect so it may be useful to think of weights, when applied to the existing questionnaire under the HEF program would yield a better fit with consumption indicators than the current set of weights.

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MONASH University

Monash University Human Research Ethics Committee (MUHREC)
Research Office

Human Ethics Certificate of Approval

This is to certify that the project below was considered by the Monash University Human Research Ethics Committee. The Committee was satisfied that the proposal meets the requirements of the *National Statement on Ethical Conduct in Human Research* and has granted approval.

Project Number:	CF14/1425 - 2014000661		
Project Title:	Who benefits from the Hospital Equity Fund in Myanmar?		
Chief Investigator:	Prof Ajay Mahal		
Approved:	**From:** 21 July 2014	**To:**	21 July 2019

Terms of approval - ***Failure to comply with the terms below is in breach of your approval and the Australian Code for the Responsible Conduct of Research.***

1. The Chief investigator is responsible for ensuring that permission letters are obtained, if relevant, before any data collection can occur at the specified organisation.
2. Approval is only valid whilst you hold a position at Monash University.
3. It is the responsibility of the Chief Investigator to ensure that all investigators are aware of the terms of approval and to ensure the project is conducted as approved by MUHREC.
4. You should notify MUHREC immediately of any serious or unexpected adverse effects on participants or unforeseen events affecting the ethical acceptability of the project.
5. The Explanatory Statement must be on Monash University letterhead and the Monash University complaints clause must include your project number.
6. **Amendments to the approved project (including changes in personnel):** Require the submission of a Request for Amendment form to MUHREC and must not begin without written approval from MUHREC. Substantial variations may require a new application.
7. **Future correspondence:** Please quote the project number and project title above in any further correspondence.
8. **Annual reports:** Continued approval of this project is dependent on the submission of an Annual Report. This is determined by the date of your letter of approval.
9. **Final report:** A Final Report should be provided at the conclusion of the project. MUHREC should be notified if the project is discontinued before the expected date of completion.
10. **Monitoring:** Projects may be subject to an audit or any other form of monitoring by MUHREC at any time.
11. **Retention and storage of data:** The Chief Investigator is responsible for the storage and retention of original data pertaining to a project for a minimum period of five years.

[redacted]

Professor Nip Thomson
Chair, MUHREC

cc: Assoc Prof Bebe Loff, Dr Soe Htet

Postal – Monash University, Vic 3800, Australia
Building 3E, Room 111, Clayton Campus, Wellington Road, Clayton
[redacted] http://www.monash.edu.au/researchoffice/human/
ABN 12 377 614 012 CRICOS Provider #00008C

GOVERNMENT OF THE UNION OF MYANMAR

MINISTRY OF HEALTH

DEPARTMENT OF HEALTH

NAY PYI TAW

Letter No: Ethical Committee 13/2014(1087

Dated: 31st October, 2014

The Ethical Committee on Medical Research involving Human Subjects, Department of Health, approves to conduct the following proposed research project.

TITLE:

Who Benefits from the Hospital Equity Fund in Myanmar?

[Funded by – Monash University]

Principal Investigator: Dr. Soe Htet

[redacted]

(Chairman)

Dr. Min Than Nyunt

M.B., B.S., M.Med(Occupational Medicine), DMA, Ph.D (Public Health)

Director General

Department of Health

MONASH University

CONSENT FORM

(Households)

Project: 'Who benefits from the Hospital Equity Fund in Myanmar?'

Chief Investigator: Prof Ajay Mahal

I have been asked to take part in the Monash University research project specified above. I have read and understood the Explanatory Statement and I hereby consent to participate in this project.

I consent to the following:	**Yes**	**No**
My participation in the project is voluntary and I can withdraw at any time	☐	☐
The data that I provide during this research may be used by Monash University in future research projects.	☐	☐
The interview will last approximately 30-45 minutes. Notes will be written during the interview.	☐	☐
I understand that the researcher will not identify me by name in any reports. The confidentiality or anonymity of the data collected will be summarized and data will be de-identified.	☐	☐
I understand that this research study has been reviewed and approved by Monash University Human Research Ethics Committee (MUHREC).	☐	☐
I have read and understand the explanation provided to me.	☐	☐

Participant Signature _____

Name of Participant _____ Date _____

MONASH University

CONSENT FORM

(Interviews)

Project: 'Who benefits from the Hospital Equity Fund in Myanmar?'

Chief Investigator: Prof Ajay Mahal

I have been asked to take part in the Monash University research project specified above. I have read and understood the Explanatory Statement and I hereby consent to participate in this project.

I consent to the following:	**Yes**	**No**
My participation in the project is voluntary and I can withdraw at any time	☐	☐
The data that I provide during this research may be used by Monash University in future research projects.	☐	☐
The interview will last approximately 30-45 minutes. Notes will be written during the interview.	☐	☐
An audio recording of the interview and subsequent dialogue will be made.	☐	☐
I understand that the researcher will not identify me by name in any reports. The confidentiality or anonymity of the data collected will be summarized and data will be de-identified.	☐	☐
I understand that this research study has been reviewed and approved by Monash University Human Research Ethics Committee (MUHREC).	☐	☐
I have read and understand the explanation provided to me.	☐	☐

Participant Signature _____

Name of Participant _____ Date _____

CONSENT FORM

(Focus Groups)

MONASH University

Project: 'Who benefits from the Hospital Equity Fund in Myanmar?'

Chief Investigator: Prof Ajay Mahal

I have been asked to take part in the Monash University research project specified above. I have read and understood the Explanatory Statement and I hereby consent to participate in this project.

I consent to the following:	**Yes**	**No**
My participation in the project is voluntary and I can withdraw at any time	☐	☐
The data that I provide during this research may be used by Monash University in future research projects.	☐	☐
The focus group discussion will last approximately 30-45 minutes. Notes will be written during the interview.	☐	☐
An audio recording of the interview and subsequent dialogue will be made.	☐	☐
I understand that the researcher will not identify me by name in any reports. The confidentiality or anonymity of the data collected will be summarized and data will be de-identified.	☐	☐
Taking part in a focus group of up to <5> people	☐	☐
I understand that this research study has been reviewed and approved by Monash University Human Research Ethics Committee (MUHREC).	☐	☐
I have read and understand the explanation provided to me.	☐	☐

Participant Signature _____

Name of Participant _____ Date _____

MONASH University

EXPLANATORY STATEMENT

(Households)

Project: Who benefits from the Hospital Equity Fund in Myanmar?

Chief Investigator's name: Prof Ajay Mahal
Department of Epidemiology and Preventive Medicine
[redacted]

Student's name : Soe Htet
[redacted]

You are invited to take part in this study. Please read this Explanatory Statement in full before deciding whether or not to participate in this research. If you would like further information regarding any aspect of this project, you are encouraged to ask questions of the interviewers and also have the option to contact the researchers via the phone numbers or email addresses listed above.

What does the research involve?
The study is intended to evaluate the effectiveness of the Myanmar Hospital Equity Fund (HEF) programme in reaching eligible households. The ultimate goal of this research is to make the Health Equity Fund function better, including offering policy recommendations.

You will be asked about your socioeconomic status, ethnic and demographic characteristics, healthcare use, healthcare spending and its financing, whether enrolled as a beneficiary in Hospital Equity Fund, and if enrolled the time since enrolment, the household members who are covered by the programme, and their overall experience with the Hospital Equity Fund programme (if enrolled).

Source of funding
Australian Agency for International Development is the source of funding. There is no conflict of interest for sponsors or researchers in the proposed research.

Consenting to participate in the project and withdrawing from the research

Please read, sign and return the form if you agree to participate. You are free to withdraw from the survey at any time or keep silent for some of the questions you don't like to answer. You have the right to withdraw from further participation at any stage, without any consequences for such withdrawal. All the data in the survey will be anonymized.

Possible benefits and risks to participants
Your response will help estimate the effectiveness of the government HEF programme in targeting eligible households. During the study you may experience some level of inconvenience and discomfort, and there is a risk you might get upset about the length of the interview or with the interviewer. It is also possible that you may experience distress or become upset if you are not enrolled in the HEF program. You have the option of not responding to any question (including those relating to their beneficiary status and history of benefits under the program) or withdrawing from the interview altogether. All personal

identifiers (name, rank, location, date) from the interviewee responses will be delinked when storing data. The first priority will be to safeguard your privacy and the confidentiality of your responses. Even though we find that there is a risk of your specific identities becoming public information, we will not use that information.

Services on offer if adversely affected

You can get upset after realizing that you are not enrolled in the HEF program although you are eligible. You might become distressed or get angry because the interview might be too long or the interviewer not respectful.

If you are adversely affected or feeling unclear from this study, you can contact a member of the research team (Dr. Soe Htet) directly via mobile phone (on the explanatory statement) so that to get follow up action, including contacting government staff/facilities on site.

Confidentiality

We will summarize and de-identify the collected data and assure the confidentiality and anonymity.

Storage of data

We will store the data in accordance with Monash University regulations so that will be stored on the Monash University's shared drive. By "shared drive" is meant that data will be stored in a way where it is available to the research team only and standard security and access controls are in place to prevent loss, theft or unauthorised use.

Use of data for other purposes

We assure that future use of data if relevant to this project and only aggregate de-identified data may be used for other projects where ethics approval has been granted.

Results

Results (in summary form) will not be communicated directly to participant households, or even participating villages/wards due to the need for protecting participant confidentiality. Instead summary results will be prepared and provided to Health Equity Funds and to the MOH leadership in the 4 participating townships for dissemination to rural and urban health centres throughout each township. Summary results will also be provided to officials in the Health Equity Funds in the four participating townships

MONASH University

Complaints
Should you have any concerns or complaints about the conduct of the project, you are welcome to contact the
Executive Officer, Monash University Human Research Ethics (MUHREC):

Executive Officer
Monash University Human Research Ethics Committee (MUHREC)
Room 111, Building 3e
Research Office
Monash University VIC 3800
[redacted]

Or

Dr Nwe Nwe Oo
Director General
Department of Health Planning
Ministry of Health
Building 47, Nay Pyi Taw, Myanmar
[redacted]

Thank you,

Prof. Ajay Mahal

MONASH University

EXPLANATORY STATEMENT

(Interviews)

Project: Who benefits from the Hospital Equity Fund in Myanmar?

Chief Investigator's name: Prof Ajay Mahal
Department of Epidemiology and Preventive Medicine
[redacted]

Student's name : Soe Htet
[redacted]

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What does the research involve?
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You will be asked about your socioeconomic status, ethnic and demographic characteristics, healthcare use, healthcare spending and its financing, whether enrolled as a beneficiary in Hospital Equity Fund, and if enrolled the time since enrolment, the household members who are covered by the programme, and their overall experience with the Hospital Equity Fund programme (if enrolled).

Source of funding
Australian Agency for International Development is the source of funding. There is no conflict of interest for sponsors or researchers in the proposed research.

Consenting to participate in the project and withdrawing from the research

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Possible benefits and risks to participants
Your response will help estimate the effectiveness of the government HEF programme in targeting eligible households During the study you may experience some level of inconvenience and discomfort. There is also a small risk that the study's conclusions about the HEF program might reflect on the performance of the township fund management committee. You have the option of not responding to any question (including those relating to their beneficiary status and history of benefits under the program) or withdrawing from

the interview altogether. All personal identifiers (name, rank, location, date) from the interviewee responses will be delinked when storing data. The first priority will be to safeguard your privacy and the confidentiality of your responses. Even though we find that there is a risk of your specific identities becoming public information, we will not use that information.

Services on offer if adversely affected

You might become distressed or feel unsecure because of the interview.
If you are adversely affected or feeling unclear from this study, you can contact a member of the research team (Dr. Soe Htet) directly via mobile phone (on the explanatory statement) so that to get follow up action, including contacting government staff/facilities on site.

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Director General
Department of Health Planning
Ministry of Health
Building 47, Nay Pyi Taw
Myanmar
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Thank you,

Prof. Ajay Mahal

MONASH University

EXPLANATORY STATEMENT

(Focus Groups)

Project: Who benefits from the Hospital Equity Fund in Myanmar?

Chief Investigator's name: Prof Ajay Mahal
Department of Epidemiology and Preventive Medicine
[redacted]

Student's name : Soe Htet
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What does the research involve?
The study is to evaluate the effectiveness of the Myanmar Hospital Equity Fund (HEF) in reaching eligible households. The ultimate goal of this research is to make the Health Equity Fund function better, including offering policy recommendations.

You will be asked about your socioeconomic status, ethnic and demographic characteristics, healthcare use, healthcare spending and its financing, whether enrolled as a beneficiary in Hospital Equity Fund, and if enrolled the time since enrolment, the household members who are covered by the programme, and their overall experience with the Hospital Equity Fund programme (if enrolled).

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Consenting to participate in the project and withdrawing from the research

Please read, sign and return the form if you agree to participate. You are free to withdraw from the survey at any time or keep silent for some of the questions you don't like to answer. You have the right to withdraw from further participation at any stage, without any consequences for such withdrawal. All the data in the survey will be anonymized. The focus group interviews will be audio recorded, with your consent.

Possible benefits and risks to participants
Your response will help estimate the effectiveness of the government HEF programme in targeting eligible households. During the study you may experience some level of inconvenience and discomfort. There is also the risk that the study's conclusions on the HEF programme effectiveness reflect adversely on village-level functionaries in the township. You have the option of not responding to any question (including those relating to their beneficiary status and history of benefits under the program) or withdrawing from the

interview altogether. All personal identifiers (name, rank, location, date) from the interviewee responses will be delinked when storing data. The first priority will be to safeguard your privacy and the confidentiality of your responses. Even though we find that there is a risk of your specific identities becoming public information, we will not use that information.

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[redacted]

Or

Dr Nwe Nwe Oo
Director General
Department of Health Planning
Ministry of Health
Building 47, Nay Pyi Taw, Myanmar
[redacted]

Thank you,

Prof. Ajay Mahal

HOUSEHOLD QUESTIONNAIRE:
HOSPITAL EQUITY FUND

A. BACKGROUND

(Background section to be filled in by the interviewer prior to interview)

1. Code of the township
   1 or 2

2. Location:
   (1) Urban
   (2) Rural

   Interviewer, write the name of the settlement
3. Name of the settlement _____

   Interviewer, write the number of the interview
4. Interview number _____

   Interviewer, write the date of the interview
5. Interview date _____

   Write the local time of the interview start.
6. Local time of the interview start.
   _____ Hours

Hello! How do you do? We are studying the opinions of people about their experiences on the hospital equity fund. You have been chosen to participate in our questionnaire by random choice. We understand that you will spend your time for the talk. We are very thankful to you for your help in our survey and for your sincere answers. This will not take more than one hour.
We want to assure you that the information you share with us will be kept completely confidential. If you give your consent, I would like to ask some background information about you and your family. [Interviewer please read consent form]. Proceed with the interview only if consent form is signed.

Shall we begin with our questions?

B. HOUSEHOLD INFORMATION (Enter this table in landscape and take out the column with "Name")

(Definition of household: All individuals living under the same shelter of dwelling and authority who cook and have meals from the same kitchen.)
Complete the following table for each person living in the house, starting with the respondent first. Fill in the name first then fill the details horizontally from 3rd column. Put an * after the name of head of the household.
7. Household Roster

1 No	2 Age	3 Sex (code)	4 Relation with Respondent (code)	5 Marital Status (code)	6 Education (code)	7 Ethnicity (code)	8 Occupation (code)
01							
02							
03							
04							
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							

<table>
<tr><th colspan="3">Coding categories for Question 7:</th></tr>
<tr>
<td>Sex:
1. Male
2. Female</td>
<td rowspan="2">Education:
1. no formal schooling
2. less than primary school
3. primary school completed
4. secondary school completed
5. high school (or equivalent) completed
6. college / pre-university / university completed
7. post graduate degree completed</td>
<td rowspan="3">Occupation:
1. Regular paid work
2. Irregular paid work
3. Self-employed
4. Housewife
5. On maternity leave
6. Farmer
7. Peasant
8. Student
9. Retired
10. Unemployed
11. Other</td>
</tr>
<tr>
<td>Relation with Respondent:
1. Self
2. Wife/Husband
3. Son/Daughter
4. Mother/Father
5. Parents In law
6. Son/Daughter in law
7. Brother/Sister
8. Grandson/Grand Daughter
9. Niece/Nephew
10. Uncle/Aunt
11. Other</td>
</tr>
<tr>
<td>Marital Status:
1. Unmarried
2. Married
3. Separated
4. Divorced
5. Widowed
6. Cohabiting</td>
<td>Ethnicity:
1. Bamar
2. Other</td>
</tr>
</table>

C. EXPENDITURE, ASSETS AND DEBTS

8. I would like to ask you about your financial expenses in the last one month. If you cannot recall exactly, please provide an estimate of the average expenses over one month (Interviewer: please indicate whether the reported amount is a "monthly average" or expenditure in the last month).

Expenditure: Please consider expenditure in the last one month.

No	Kind of Expenditure	Amount (Myanmar Kyats)
1	Food (Oil, vegetables, grocery etc.)	
2	Fuel (Wood, oil, kerosene, cooking gas etc.)	
3	Clothing	
4	Education (Uniform, Fees, Books etc.)	
5	Rent (House)	
6	House tax	
7	Electricity bill	
8	Medical Expenses	
9	Transport	
10	Telephone (Cellular phone) expenses	
11	Addiction (Betel, Cheroots, Alcohol etc.)	
12	Social (marriage, festivals, death, birth etc.)	
13	Expenses for one's hobby	
14	Other Expenditure	
15	Total	

9. Some of the food items your household would have consumed in the last month may have been grown by you or you may have received in-kind transfers of these food items. Can you provide us with an approximate value of these food items if you had to purchase them from the market in the last month? If you cannot recall exactly, please provide an estimate of the average value over a one month period (Interviewer: please indicate whether the reported amount is a "monthly average" or expenditure in the last month).

No	Food type	Yes or No	Amount (Myanmar Kyats)
1	Staple foods (cereals, grains: rice, wheat, etc.)		
2	Pulses and legumes		
3	Milk, milk products, including butter, cheese etc.		
4	Vegetables		
5	Fruits		
6	Spices and oils		
7	Sugar and sugar products		
8	Egg, fish, meat		
9	Non-alcoholic drinks (Pepsi, cokes, etc.) or beverages (coffee, tea, juice etc.)		
10	All other food items (not mentioned above)		

10. In the last one month, approximately how much did your household spend on food eaten outside of your home, such as dining out, on street foods, and snacks?
_____ Ks

11. **Assets**: Fill up by observation and/or interviewing.

No.	Name of Assets	Number of Items (If none enter "0")
1	Radio / Tape recorder / DVD player	
2	TV	
3	Cellular phone	
4	Fixed line phone	
5	Refrigerator	
6	Big vehicle (Tractor, Shuttle-rickshaw etc.)	
7	Cycle (Motor Bike)	
8	Bicycle	
9	Boat	
10	Sewing Machine	
11	Acres of land owned	
12	Livestock : Cow/ Buffalo / Sheep/ Goat /Poultry	
13	Water Tank, Water Motor	
14	Cart	
15	A Clock	
16	Computer (Desktop/laptop)	
17	Rooms in Dwelling	
18	Tables in Dwelling	
19	Chairs in Dwelling	
20	Other	

12. Do you currently have any debt?
(1) Yes
(2) No

13. If Yes to Q12, how much is your debt?
_____Kyats

14. When did you incur this debt?
(1) In the last 2 months
(2) Between 2 months and 6 months back
(3) More than 6 months back
(4) Don't Know

Housing

15. Home Ownership: (Interviewer: please tick all that apply)
(1) Owned by a household member
(2) Owned by a family member (not part of the household)_____
(3) Don't know
(4) Rented

(5) Other arrangement _____

16. Type of house (observe)
(1) Brick
(2) Wood and brick
(3) Wood
(4) Bamboo
(5) Other

17. What is the main source of light in your home?

Note: (All respondents should be asked, "Do you use solar light at your home?")

(1) Electricity
(2) Solar
(3) Oil/kerosene
(4) Other specify_____

Water and Sanitation:

18. What is your source for drinking water? (Multiple responses are possible - please tick all that apply)
(1) Tap for specific use by household
(2) Tap shared by community
(3) Tap in Neighbour's house
(4) Well
(5) Hand pump (for specific use of household)
(6) Hand pump (shared)
(7) Pond/ River/ Lake
(8) Canal
(9) Tanker
(10) Other specify _____

19. How far is this water source from your home?
(1) 0 - 15 minutes
(2) 16 - 30 minutes
(3) 31 to 45 minutes
(4) 46 - 60 minutes
(5) Other specify _____

20. Do you do anything to make your water safe to drink?
(1) Boil
(2) Filter (cotton cloth, plastic filter etc.)
(3) Water purifying tablets
(4) Nothing
(5) Other_____

Income

21. Approximately how much would you say is your monthly household income from all sources?
_____ Kyats

22. If you cannot recall the exact amount, in which of the following ranges would the household monthly income lie?

(1) Under 30 000 Ks
(2) 30 000 – 59 999 Ks
(3) 60 000 – 99 999 Ks
(4) 100 000 – 129 999 Ks
(5) 130 000 – 159 999 Ks
(6) Over 160 000 Ks

Social Ties

23. How many close friends do you have?

_____

24. How many times do you go to religious place (Monastery, Church, Mosque etc.) every month?

_____

Disability

25. Is there anyone in your home, a child or adult, who needs care because of a long-term physical or mental illness or disability or is getting old and weak?

(1) Yes
(2) No

D. HEALTH CARE UTILISATION

26. Have you (or a household member) been ill in the last 4 weeks?
(1) Yes
(2) No

27. Have you (or a household member) used any health care services in the last 4 weeks?
(1) Yes
(2) No
If yes, fill in the table.

Note: please fill in multiple lines if more than one healthcare provider was used for any illness (a separate row for each provider).

1 No	2 Household Roster Number	3 Type of illness (code)	4 Total duration in days	5 Provider type (code)	6 Type of health facility (code)	7 Referrer (code)	8 Inpatient days in Hospital
1							
2							
3							
4							
5							

28. How far is the nearest health facility from your home?
(1) 0 - 15 minutes
(2) 16 - 30 minutes
(3) 31 to 45 minutes
(4) 46 - 60 minutes
(5) Other specify _____

29. In the last one month, how much did your household spend (Myanmar Kyats) on health related spending.

No	Description	Amount in Kyats
1	Consultation Fees	
2	Drugs and medicine	
3	Investigation	
4	Transportation	
5	Cost for person accompanying	
6	Other	

(or, if appropriate) estimated total spending, _____ Kyats.

30. Other than above, have you (or a household member) ever attended a public hospital before?
(1) Yes (2) No

31. If YES to 30, was any upfront cash paid?
(1) Yes (2) No

Coding Categories for Question 27 & 36:	
Type of illness 1. Neoplasms 2. Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism 3. Endocrine, nutritional and metabolic diseases 4. Mental and behavioural disorders 5. Diseases of the nervous system 6. Diseases of the eye and adnexa 7. Diseases of the ear and mastoid process 8. Diseases of the circulatory system 9. Diseases of the respiratory system 10. Diseases of the digestive system 11. Diseases of the skin and subcutaneous tissue 12. Diseases of the musculoskeletal system and connective tissue 13. Diseases of the genitourinary system 14. Pregnancy, childbirth and the puerperium 15. Certain conditions originating in the perinatal period 16. Congenital malformations, deformations and chromosomal abnormalities 17. Injury, poisoning and certain other consequences of external causes 18. To get a certificate 19. To get a referral to a specialist 20. Other (specify)	**Type of health facility** 1. Public 2. Private 3. NGO 4. Other (specify) **Referrer:** 1. District physician, general practitioner, family doctor from the polyclinics 2. Specialist physician from the polyclinics/hospital 3. Outpatient department doctor of a hospital 4. Referred from Primary Health Centre 5. Self-referred 6. Emergency/ambulance 7. Referred from traditional practitioner 8. Referred or transferred from another 9. Other (specify)

Coding Categories for Question 27 & 36:			
	Provider type / location		**Basic Health Worker (HA/LHV/PHS1/MW):**
1	Called the ambulance (home visit)	11	Called to my home
2	Emergency services at health facility (to polyclinics, hospital)	12	Health centre
	GP/ family doctor:	13	Polyclinic
3	Called to my home	14	BHS's home
4	Polyclinic		**Traditional Practitioner :**
5	Hospital (Private)	15	Called to my home
6	Doctor's home	16	Traditional Practitioner's station
	Specialized physician (specialist):	17	Traditional Practitioner's home
7	Called to my home	18	**Specialist in non-traditional medicine**
8	Polyclinic	19	**Pharmacist**
9	Hospital (Public)	20	**Dentist**
10	Specialist physician's home	21	**Inpatient at a hospital**
		22	**Other**: (specify)

32. (Ask only if Response to 26 was YES and Response to 27 was NO) What was the reason for not using health services?
(Interviewer, multiple choices allowed. Please circle all numbers indicated by respondent)

(1) I thought I would get better without taking up any actions/was not seriously ill
(2) I thought I would get better by using the drugs I had or other self-treatment
(3) I could not afford to pay for healthcare
(4) No time/ I cannot take time off work
(5) I am not satisfied with the quality of medical service
(6) I didn't trust physicians
(7) Remote location of the health care facility
(8) I had no health insurance
(9) Other, please specify_____

33. How did you pay for the costs incurred (indicate shares in %) in the last month?

No	Description	Shares in %
1	Own Savings/ Income	
2	Sell Assets	
3	Pawn Jewellery	
4	Help from family/friends	
5	Borrow from moneylender	
6	Borrow from others	
7	Reimbursement from Health Equity Fund	
8	Other _____	

34. (If Response to Q33 is 7) - If you were reimbursed by the Health Equity Fund, how much were you reimbursed?
_____ Kyats

35. (If response to Q33 is 7): How long did it take for you to get the reimbursement from Health Equity Fund from the date of application?
_____ Days

36. Aside from any hospitalization that you may have reported above, have you (or a household member) been hospitalized (stayed more than 24 hours at the hospital) in the last 12 Months?

(1) Yes (If yes, fill in the table.)
(2) No

1 No	2 Household roster number	3 Type of illness (code)	4 Duration in days	5 Provider type (code)	6 Type of health facility (code)	7 Referrer (code)	8 Frequency of hospitalization (times)
1							
2							
3							
4							
5							

37. In the last 12 months, how much did your household spend (Myanmar Kyats) on hospitalization.

No	Description	Amount in Kyats
1	Consultation Fees	
2	Drugs and medicine	
3	Investigation	
4	Transportation	
5	Other	

(or, if appropriate) estimated total spending. _____

38. How did you pay for the costs incurred (indicate shares in %) in the last month?

No	Description	Shares in %
1	Own Savings/ Income	
2	Sell Assets	
3	Pawn Jewellery	
4	Help from family/friends	
5	Borrow from moneylender	
6	Borrow from others	
7	Reimbursement from Health Equity Fund	
8	Other _____	

39. (If Response to Q38 is 7) - If you were reimbursed by the Health Equity Fund, how much were you reimbursed?
_____ Kyats

40. (If response to Q38 is 7): How long did it take for you to get the reimbursement from Health Equity Fund?
_____ Days

E. HOSPITAL EQUITY FUND

(Interviewer please read out to respondent) The Hospital Equity Fund (HEF) Program is a program providing financial support to poor households, particularly women and their children, for inpatient care related to pregnancy conditions, complications of diarrhoea, pneumonia, and malaria and other life threatening hospitalization conditions.

41. Had you heard of the Hospital Equity Fund (HEF) programme before?
    (1) Yes
    (2) No

42. Are you enrolled in the HEF programme?
    (1) Yes
    (2) No

43. [If Yes to Q42], can I see the HEF card?
    (1) Yes
    (2) No

44. Are you aware of HEF benefits (tick all responses that apply)?
    List of benefits:
    (1) Free emergency medical care
    (2) Free essential medicines and medical supplies
    (3) Free medical investigations including blood tests and X-rays
    (4) Reimbursement of food costs
    (5) Reimbursement of transport costs
    (6) Not aware

45. When did you receive HEF card?
    (1) Last one week ago
    (2) One month
    (3) Two months
    (4) Three months
    (5) Six months
    (6) One year
    (7) More than one year

46. Did you have to pay anything to get HEF card?
    (1) Yes (2) No

47. [If Yes to Q46] How much did you pay?
    _____ Kyats

48. Did you have to go anywhere to get the HEF card?
    (1) I had to go to the township to get the card
    (2) I received it at home
    (3) I received it from the health facility in the village
    (4) I received it from the village head
    (5) Other

49. How long did you have to wait between applying for the card and receipt of the HEF card?

_____ Days

50. You stated that you were hospitalized in the last 12 months [refer to questions on health care use in the previous section]. Which of the following applies to you?

(1) Our household had the HEF card prior to arriving at the hospital
(2) We obtained the HEF card from the authorities after arriving at the hospital
(3) Other

51. Who identify you (or your household members') as being eligible for HEF at the hospital?

(1) Medical Superintendent of the Hospital
(2) Specialist physician
(3) Outpatient department doctor
(4) Nurse
(5) Clerk
(6) Other (please specify):_____

52. How long did you have to wait for the confirmation of HEF eligibility (include any time spent in getting additional proof from your village/community)?

_____ Hours (or, if appropriate)
_____ Days

53. What documentation is needed for verification under HEF (indicate all that apply)?

(1) Health equity card
(2) Patient referral form
(3) Recommendation from local authority of community leader
(4) Other (specify) _____

54. How do you rate your experience with getting the HEF programme (please mark N/A if not applicable)?

No	Service	Rate
1	Benefits provided by HEF programme	
2	The process of getting HEF card	
3	The process of determining HEF benefits eligibility at the hospital	
4	Waiting time for confirmation HEF eligibility at the hospital	
5	Claiming and obtaining reimbursement from HEF	
6	Overall	

(1) Excellent
(2) Good
(3) Moderate
(4) Bad
(5) Very Bad
(6) N/A

55. Are there any other poverty alleviation programs (other than HEF) currently operating in your area?

(1) Yes

(2) No

If yes, please specify (list the programs)

_____

_____

_____

_____

_____

_____

_____

THANK YOU VERY MUCH FOR YOUR COOPERATION!

Interviewer! Write the local time of the interview finish.

56. Local time of the interview finish, _____ hour

Interview Guide for Officials Involved with
HEF: HOSPITAL EQUITY FUND STUDY

1. Consent form/verbal consent
2. Grand Tour Question: Tell me about your experience with the HEF program.
3. What do you see as the main goals of the HEF program?
4. How would you rate the flow of monies from HEF to the ultimate beneficiaries? Specifically, have you experienced delays, difficulties in flow of funds, financial accountability, record-keeping, etc.? .
5. Do you think the HEF programme is able to identify the eligible population with reasonable precision? What, in your assessment, are the major difficulties in doing so? (e.g., Communication between township authorities and village/urban community leaders, awareness of programme among needy, fraud)
6. What do you think are the main challenges, if any, faced by the poor households in accessing this programme?
7. How could the HEF program be improved (e.g., financial organization, claims payment, identification of beneficiaries including speed of approval for HEF cards)?
8. Is there anything else you would like to say about the HEF program that was not covered in these questions?
9. What did you like most about the HEF programme? How does the program compare to other types of government programs you have experienced in the past?

Probes

1. Can you tell me a bit more about the last time you experienced that or felt that way?
2. Can you give me a specific example of that?
3. Do you personally feel that way?
4. Is that something you have experienced?
5. Can you tell me more?
6. Can you expand on your answer?
7. Can you explain your answer?

Wrap up Questions

1. Do you have anything to add?
2. Is there anything I should have asked?

FOCUS GROUP DISCUSSION QUESTIONNAIRE for Community/NGO representatives involved with HEF: HOSPITAL EQUITY FUND STUDY

1. Consent form/verbal consent
2. Grand Tour Question: Tell me about your experience with the HEF program.
3. What do you see as the main goals of the HEF program?
4. How would you rate the flow of fund from HEF to the ultimate beneficiaries? Specifically, have you experienced delays, difficulties in flow of funds, financial accountability, record-keeping, etc.? .
5. Do you think the HEF programme is able to identify the eligible population with reasonable precision? What, in your assessment, are the major difficulties in doing so? (e.g., Communication between township authorities and village/urban community leaders, awareness of programme among needy, fraud)
6. What do you think are the main challenges, if any, faced by the poor households in accessing this programme?
7. How could the HEF program be improved (e.g., financial organization, claims payment, identification of beneficiaries including speed of approval for HEF cards)?
8. Is there anything else you would like to say about the HEF program that was not covered in these questions?
9. What did you like most about the HEF programme? How does the program compare to other types of government programs you have experienced in the past?

Follow-Up Questions

“What is the biggest problem with HEF?”
“How significant is the problem?”
“What causes the problem?”
"What does that mean?”
“How did it happen?”
“What causes the problem?”
“What did you do?”

Probes

1. Do you have anything to add?
2. You mentioned HEF Clients. What about non-eligible clients?

Annex 1 Pre Assessment Questionnaire

Name: **Address:**

s/n	Questions	Actual		Assumption	Scoring if "Yes"
	HOUSEHOLD				
1	No: of persons in HH			5 or greater	10
2	How many are working?			1 or no one	10
	ASSETS				
3	Type of house - brick house	Yes	No		0
4	Type of house - wooden house/zinc roofing	Yes	No		0
5	Type of house - Bamboo house/ thatch roof or palm leaf, coconut leaf	Yes	No		5
6	Electricity	Yes	No		0
7	Acres of land owned			>3 acres = NP	0
8	No: of cows/buffaloes				0
9	Tractor	Yes	No		0
10	Motorcycle	Yes	No		0
11	Bicycle	Yes	No		3
12	Boat	Yes	No		0
13	TV	Yes	No		3
14	Radio	Yes	No		4
15	Telephone (cell phone)	Yes	No		0
	INCOME				
16	Current debt for basic needs (food, health) for at least 2 months duration	Yes	No		25
17	Daily household income < 1000 kyats or total monthly income of < 30,000 kyats				50

Poverty Assessment (eligible: Poorest of the Poor):

Eligible:

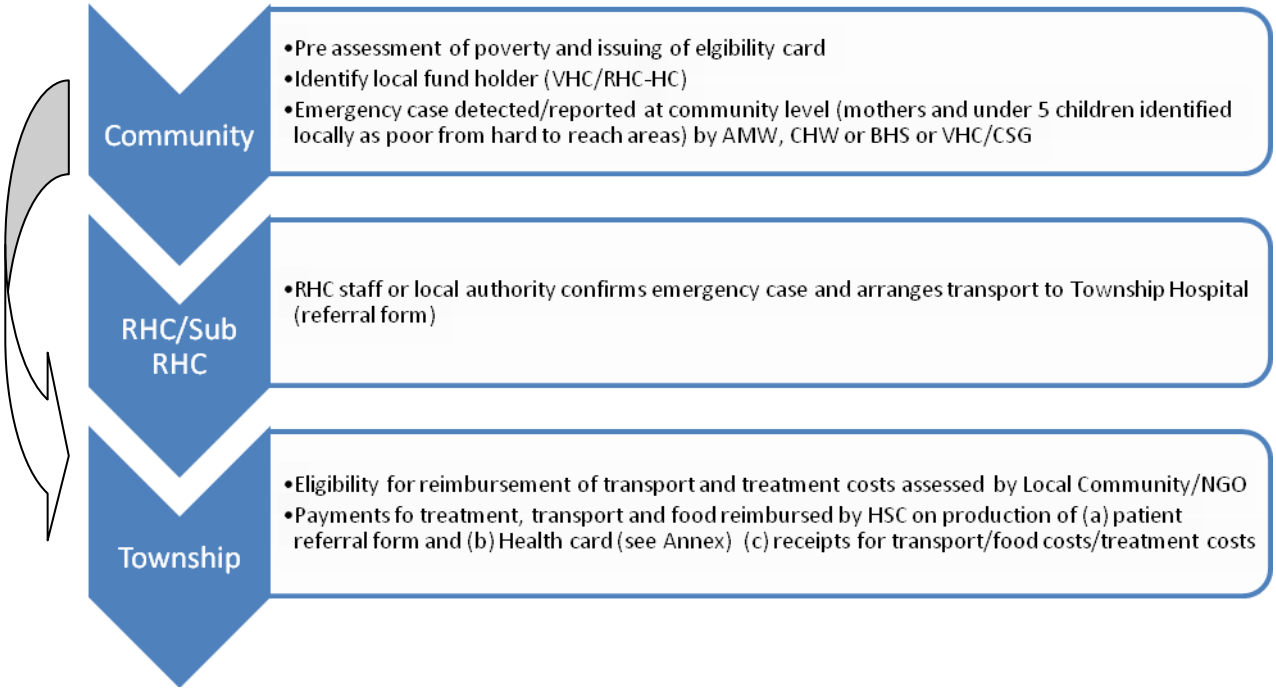
Not Eligible:

Criteria: If score 50 or above, classify as eligible.

Interview administered by:

Date:

Annex 2 Flow of Referral and Approval from Community Level



*** Important note**: in the event of an emergency, patients can be referred directly to the township hospital and still be eligible for benefits

Annex 3 Example of Treatment Costs

SN	Type of condition/disease	Medical or surgical intervention for individual case	Cost of essential medicines and medical supplies (Kyats)	Medical investigations including blood tests and X-rays (Kyats)	Total
Complications during Pregnancy					
1	Ante-partum Hemorrhage (APH)	Surgical intervention : need safe blood transfusions, parenteral infusions, injectable broad-spectrum antibiotics	30,000	25,000	55,000
Complications during Delivery					
2	Obstructed Labour	Surgical as LSCS : need safe blood transfusions, parenteral infusions, injectable broad-spectrum antibiotics	30,000	25,000	55,000
3	Obstructed Labour requiring forceps delivery	Forceps delivery : aseptic preparations	18,000	15,000	33,000
Complications during Post-partum period					
4	Retained Placenta	Surgical intervention : need safe blood transfusions, parenteral infusions, injectable broad-spectrum antibiotics	15,000	15,000	30,000
Newborn complications					
5	Neonatal infections	medical interventions including investigation, special care	2000	20000	22,000
Childhood emergencies					
6	Diarrhoea (both watery and with blood and mucus) with severe	Parenteral infusions and antibiotics	5000	20000	25,000

	dehydration				
7	Child with difficult breathing	Parenteral antibiotics and bronchodilators	15000	20000	35,000
8	Fever of unknown origin (e.g. cerebral malaria)	investigations, parenteral antibiotics, antimalarials ec.	5000	20000	25,000
Other medical and surgical emergencies					
9	Bone and soft tissue injuries	Orthopedic interventions	5000	25000	30,000
10	Acute abdomen (peritonitis, appendicitis)	Surgical intervention : parenteral infusions, injectable broadspectrum antibiotics	30000	30000	60000
11	Cerebral Malaria	Parenteral infusions and antimalarials	9000	20000	29000
12	Diarrhoea (both watery and with blood and mucus) with severe dehydration	Parenteral infusions and antibiotics	12000	20000	32000

**Source of cost estimates: DOH/Merlin Document*

Annex 4 Patient Health Equity Card

Health Equity Card

(for Mothers and Under 5 Children)

PHOTO

Mothers Name: **NRC Number**:

Address:

Age:

Children's Names Under the age of 5:

1. Name: Age:
2. Name: Age:
3. Name: Age:

Eligible Benefits:

Free emergency medical care
Reimbursement of food and transport Costs
Eligible for benefits 2 years from date of assessment:

Date of Assessment: **Signature of Local Authority/NGO:**