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HNP DISCUSSION PAPER

RAISING RETURNS: THE DISTRIBUTION OF HEALTH FINANCING AND OUTCOMES IN YEMEN

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Health, Nutrition and Population (HNP) Discussion Paper

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Health, Nutrition and Population (HNP) Discussion Paper

Raising Returns:
The Distribution of Health Financing and Outcomes in Yemen

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Abstract: Summary in 300 words maximum.

Given relatively few resources and lagging health outcomes in Yemen, the quest for equitable, cost-effective health care delivery continues as long-term, sustainable development remains a priority. This paper assesses overall value for money of the health system mainly as indicated by an analysis of public expenditure trends from 1997 until 2008 and by the degree to which health care benefits are conferred equitably to the population. Total health expenditure in 2007 accounted for 5.2% of GDP, or only PPP$ 41 per capita, with nearly 70% sourced by direct household payments (67%). Despite recent improvements in health status, Yemen continues to lag behind countries of similar or lower income and health expenditure levels. Levels of health outcomes in Vietnam, Indonesia and the Kyrgyz Republic are 2 to 6 times better than levels found in Yemen regarding the proportion of infants with low birth weight, the prevalence of malnutrition amongst children, the rate of births delivered by skilled attendants, and the rate of coverage of antenatal services. Although health facilities are relatively evenly distributed across the population, the operational status and quality of these facilities is highly variable. The availability of pharmaceuticals at health facilities ranges from 31% of facilities having medications on site in the governorate of Al-Maharah to 94% in Amran. To more effectively alleviate inequities and inefficiencies in health service delivery in Yemen, national policies are recommended to more strategically prioritize resource allocation and develop innovative service delivery models to more efficiently connect rural communities.

Keywords: public expenditure, financial management, efficiency, health equity, burden of disease

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Executive Summary

Given relatively few resources and lagging health outcomes in Yemen, the quest for equitable, cost-effective health care delivery continues as long-term, sustainable development remains a priority. Total health expenditure in 2007 accounted for 5.2% of GDP, or only PPP$ 41 per capita, with health care provided mainly through governmental facilities and non-governmental organizations. Of this expenditure, a substantially large amount comes from foreign assistance (5%), in addition to direct household payments (67%) and the public purse via general revenues (28%). Further, health expenditure appears to be less efficient in Yemen than in other countries with similar levels of health expenditure. For example, levels of health outcomes in Vietnam, Indonesia and the Kyrgyz Republic are 2 to 6 times better than levels found in Yemen regarding the proportion of infants with low birth weight, the prevalence of malnutrition amongst children, the rate of births delivered by skilled attendants, and the rate of coverage of antenatal services. This inefficiency is largely due to a lack of strategic resource allocation.

Health status has gradually improved since 1992 as evident by declining fertility and infant mortality rates. Yet Yemen faces among the highest population growth rates, infant and child mortality rates and maternal mortality ratios in the world. The prevalence of communicable diseases and malnutrition are high and gender and regional disparities persist. Cardiovascular conditions remain the single largest cause of death and disability in Yemen.

Acute and prenatal health service utilization appears to be higher among upper-income groups, and stark geographic differences exist as urban households are nearly twice as likely to access prenatal care as rural households. Although health facilities are relatively evenly distributed across the population, the operational status and quality of these facilities is highly variable. Human resources and goods are lacking, particularly in rural areas: Only 77% of all public health facilities are open and functioning, and these facilities do not provide sufficient health services to citizens: on average, only 72% have required medications available (range: 31% -94%); only 23% have systems in place to deal with emergency child birth deliveries; and only 14% use infection prevention protocols, largely due to poor incentives and a lack of skills development for health care workers.

To more effectively alleviate inequities and inefficiencies in health service delivery in Yemen, national policies are recommended to more strategically prioritize resource allocation and develop innovative service delivery models to more efficiently connect rural communities. Investing more proactively in prenatal health services represents a particularly cost-effective area for public resources in Yemen, given the high returns expected vis-à-vis early childhood development and macroeconomic growth. Human resource investments that aim to expand health education and improve the quality of local health care staff will likely alleviate inequity to a greater extent than health care infrastructure investments alone.

I. Background

Aims and Structure of the Paper

This paper assesses overall value for money of the health system mainly as indicated by the degree to which health care benefits are conferred equitably to the population. The paper evaluates the following key policy questions:

- Given relatively low revenues in Yemen, how effective has public spending been in improving health status overall and, if so, for which populations?

- How equitable has the distribution of public spending been, particularly across geographic regions and socioeconomic levels?

The Government of Yemen (GoY) has been in the process of implementing a public financial management (PFM) reform strategy aimed at improving budget execution at the central and decentralized levels since 1998. Chief amongst these aspects is the anticipated shift from line-item to programmatic budgeting within a mid-term expenditure framework (MTEF), which would potentially contribute to more efficient and equitable resource allocation. The way in which these reforms may influence the distribution of health care services is explored in this paper by examining the ways in which public expenditure trends may be influencing health outcomes in Yemen.

The paper is structures as follows. Section I provides a background to the paper's aims and data sources. Section II briefly introduces the country context and section III presents an overview of the health financing system and recent policy trends. Section IV assesses the distributional effects of health financing in terms of health outcomes, service distribution and household health expenditure. The paper concludes in section V with an overview of policy considerations for improving the effects of health financing.

Methods, Data Sources and Limitations

The paper employs quantitative analysis of survey data to address the key policy questions presented above as well as a review of existing documents on health financing arrangements in Yemen. For purposes of the analysis, the distributional effects of health financing are defined as the way in which patterns of health spending influence access to health services by geographic setting or socioeconomic status. The paper draws on data and information summarized in Annex 1, including governmental and academic reports on the organization and financing policies of the health system; primary data analysis using surveys on household consumption and health facility characteristics; public expenditure analyses and national health account data for 1998-2007; qualitative information collected through interviews of public authorities, service providers and community-based organizations.

The key limitations of the analysis are mainly associated with insufficient data with which to assess all aspects of the effects of health spending, including data on functional spending categories (i.e., by health condition); quality of health services; intrasectoral distribution of spending across levels of health care (i.e., primary, secondary, tertiary); and recent data on health care costs across facilities. Due to these limitations, the analysis has focused on assessing health outcomes, access to care, and aggregate expenditures by governorate and by socioeconomic level.

II. Country Context

Recent Economic Developments

Yemen currently faces civil challenges that influence the distribution of resources at large. As of 2007, Yemen had a population of 23 million and a per capita income of PPP $2,276, ranking 123rd out of 166 in terms of human development (Annex 2). The majority of the population (60%) lives in relatively remote highlands and approximately 12% of the roads are paved[1], leaving many areas difficult to reach. The country's high unemployment, relatively low levels of education and labor force participation especially for women, and scarce natural resources exacerbate internal civil strife. Three main social safety net programs operate in Yemen, which are the Social Welfare Fund, the Social Fund for Development and the Public Works Program.

Yemen's economy relies heavily on crude oil, although services and agriculture are steadily growing. Dwindling oil reserves and their impact on long-term fiscal revenues are a key governmental concern. Hydrocarbon output (oil and gas) accounted for nearly 30% of gross domestic product (GDP), 75% of governmental revenues, and 90% of exports as of 2008[3]. Since 2004, the Government has therefore made efforts to diversify the economy by enhancing the business environment and facilitating private sector growth. It has also focused on improving the legal and institutional framework for financial management to boost long term fiscal sustainability.

The public expenditure and financial accountability assessment (PEFA) conducted in 2008 identified systemic weaknesses that undermine achieving overall fiscal discipline in budget execution, as evident in the relatively poor matching between aggregate expenditure estimates and budget estimates. These systemic weaknesses include: (i) a lack of predictability in budget releases; (ii) weak cash management in spite of many requisite elements for sound cash management being present; (iii) the non-uniformly implemented commitment controls; (iv) the less-than-fully effective salary expenditure controls; (v) the lack of value-for-money in procurement; (vi) the practice of ex-post approval of supplementary budget by parliament; and (vii) the accumulation of arrears without proper and complete tracking. Addressing these challenges is part of the Government's vision for overall reform and development.

Government Reform Program

Health improvements since the 1990s include increased immunization coverage and improved control of major diseases such as malaria and tuberculosis, in large part due to the expansion of primary health services related to communicable disease control. The First Five-Year Health Development Plan (HDP 1996-2000) had a focus on increasing investment in health services infrastructure, which resulted in imbalances in resource allocation as evident by relatively high investment spending and relatively low recurrent spending. Consequently, the Second (2001-2005) and Third (2005-2010) have increasingly targeted the focus of health sector reform on integrating poverty reduction and MDG improvement strategies into planning[2]. The Government's focus currently aims to accelerate health gains and scale up interventions.

The country's current Socioeconomic Development Plan for Poverty Reduction (DPPR) for 2006-2010 aims to: (i) move Yemen from the low to middle human development group by 2025 and (ii) and to halve poverty levels between 1998 to 2015 through accelerating economic growth. In terms of accelerating economic growth, the Government's target is to reach an average real GDP growth rate of 7.1% through 2015, keep its deficit below 3% of GDP, and keep debt below

60% of GDP[3]. By the same token, investment spending is targeted to reach 30% of expenditure with an inflation rate below 13.8%. The GoY has adopted a PFM reform strategy whose objectives include improving the level of priority setting; developing public finance management information systems and improving the system of bidding and procurement.[3]

In terms of improving human development, the current Fourth HDP (2010-2015) reflects the "Strategic Vision 2025" of the current DPPR that focuses on advancing human development. The DPPR advocates strengthening reproductive health services in order to achieve the following targets by 2025: (i) reduce annual population growth rate to 2.75% (ii) ensure health service coverage reaches approximately 90% of the population for primary health care, reproductive health services, immunization and health education; (iii) reduce maternal mortality ratio (MMR) to 65 per 100,000 live births and infant mortality rate (IMR) to 31 per 1,000 live births; and (iv) declare Yemen free of prevalent and endemic diseases such as malaria, schistosomiasis, tuberculosis and intestinal parasites.[4]

To meet these targets, the Government plans on implementing the following key reforms[3]: (i) strengthening technical capacity, gender parity and the geographic distribution of health care personnel through continuing education and improved incentives; (ii) improving planning and information systems; (iii) strengthening quality control and pricing management of medicines and equipment; (iv) improving financial coverage of health care costs; and (v) improving infrastructure compliance with quality standards.

Health System Organization

The main provider of health services is the Ministry of Public Health and Population (MoPHP), although the private sector accounts for nearly 20 percent of all health clinics and 40% of all hospitals[5]. The MoPHP oversees a largely publicly provided health system comprising central hospitals, district hospitals, health centers, and primary health units, as well as two independent tertiary hospitals[6]. The private sector mainly comprises population and reproductive health programs and medical goods provided by non-governmental organizations (NGOs). In addition, nearly one-third of out-of-pocket expenditures amongst the middle to upper-most economic quintiles were spent in 2005 by Yemenis on health services in Egypt, Saudi Arabia and other neighboring countries. As private sector has grown, it has increasingly attracted health care workers who might otherwise practice in the public sector.

Trends in Health Outcomes

Between 1998 and 2007, health status in Yemen has improved, although the burden of disease in Yemen remains higher than in other countries at a similar income level. Key social and demographic indicators for Yemen and other regions are shown in Table 1. Fertility rate is approximately twice that of the MENA average and higher than the low-income average. Although there have been gains in life expectancy over time owing to the ongoing eradication of many communicable diseases in Yemen such as malaria and tuberculosis, Yemen continues to lag behind countries of similar or lower income and health expenditure levels, such as Vietnam, Tajikistan and the Kyrgyz Republic as of 2007.

For example, Vietnam, Indonesia and the Kyrgyz Republic all spend approximately $39-$46 per capita on health, similar to that found in Yemen at $40 per capita. Yet levels of health outcomes in Vietnam, Indonesia and the Kyrgyz Republic are 2 to 6 times better than levels found in Yemen regarding the proportion of infants with low birth weight, the prevalence of malnutrition

amongst children, the rate of births delivered by skilled attendants, and the rate of coverage of antenatal services. Important factors such female educational level and community health care outreach likely play a large role in explaining these differences, as does the nature of health care expenditure and the choice of investments made in Yemen as compared to other contexts. Notably, the choice to invest in primary and preventative health services is recognized as highly cost-effective relative to improving health status and avoids unnecessary inpatient treatment.

Out of eight MDGs, Yemen is on track to meet only one indicator by 2015, with the remaining seven either off-track or potentially achievable if prevailing trends change (Annex 3). Notably, child mortality (U5MR) appears to be on track. The country faces risks regarding eradicating poverty and hunger (MDG 1), improving maternal health (MDG 4), and combating communicable conditions (MDG 5), as evident by trends observed between 1990 and 2008.

IMR and U5MR in Yemen are the highest in the MENA region. Approximately 50% of children are underweight and malnourishment appears to have been rising in recent years. Although MMR has declined by approximately 25% between 1985 and 2008, it remains the highest in the MENA region and among the highest in the world. Cardiovascular disease accounts for the most deaths in Yemen (Annex 4). Tuberculosis rates have been declining, although malaria and schistosomiasis continue to pose a substantial health burden, with nearly 1.2 million citizens affected by malaria and 3 million by schistosomiasis. HIV/AIDS prevalence is low at less than 0.1%.

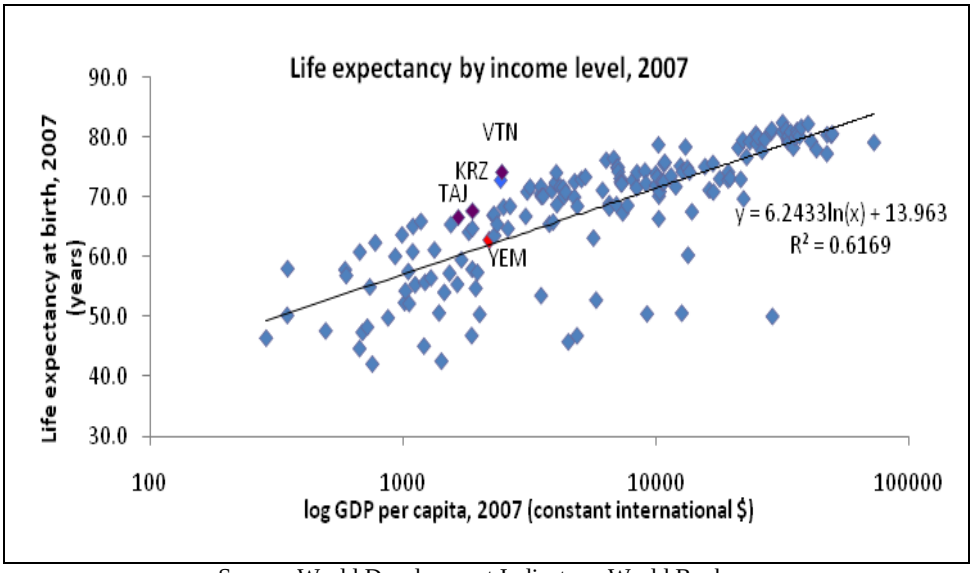
Yemen continues to face several health challenges including: (i) regional disparities in access to sanitation services; (ii) high malnourishment particularly among children; (iii) high maternal mortality and low access to antenatal care; and (iv) a high burden of communicable conditions such as malaria and schistosomiasis. Other countries have managed to achieve better health outcomes for the same or less health expenditure. While many other factors influence these outcomes, evidence from Yemen suggests that value for money in the health system could be improved all the same.

Table 1. Macroeconomic health outcomes versus expenditure, selected indicators, 2006.

	GDP per capita, PPP (constant 2006 international $) (1)	Health expenditure per capita, 2006 (current US$) (1)	% of infants with low birth weight 1999-2006 (2)	Malnutrition prevalence, underweight for age, 2000-2006 (% of children under 5) (2)	Skilled attendant at delivery (%), 2000-2006 (2)	Antenatal care coverage - at least one visit, 2000-2008 (%) (3)
Djibouti	1892	63	10.0	29.0	61.0	92
Yemen	2193	40	32.0	46.0	27.0	47
Vietnam	2291	46	7.0	25.0	88.0	91
Nicaragua	2366	92	12.0	10.0	67.0	90
Bangladesh	1123	12	22	48	20.0	51
Sri Lanka	3776	62	22.0	23.0	96.0	99
Indonesia	3335	39	9.0	28.0	72.0	93
Kyrgyz Republic	1765	35	5.0	3.0	98.0	97

Note: Intermediate health outcomes are presented which may be explained more closely by health expenditure than final health outcomes such as mortality rates. Source: Most recent data obtained from: 1. World Bank World Development Indicators, 2010. 2. UNICEF State of the World's Children Report, 2008. 3. World Health Organization World Health Statistics, 2009.

Figure 1. Global trends in life expectancy by income level, 2007



Source: World Development Indicators, World Bank

III. Health financing trends: an overview

Total Health Expenditure

Sources and Flow of Financing

Health financing derives mainly from public sources, external assistance and households as shown in Figure 2. The MoPHP receives the majority of its budget as direct transfers from the Ministry of Finance (MoF) based on historical trends. National health expenditures from both public and private sources accounts for nearly 5.2% of GDP as of 2007. Of this amount, households foot the majority of the health care bill (67%), followed by public sources (28%) and direct external sources (5%). However, external financing also contributes to public revenues and actually accounts for 25% of national health spending. Public spending on health accounts for nearly 4.1% of total governmental expenditures. The sustainability of health financing and the equity implications of a system heavily financed by household may increasingly become challenges as the population grows and health care needs multiply.

Risk Pooling and Payer Organization

Owing to the single-payor nature of the Yemeni health financing system, coverage of care is in principal provided directly by governmentally owned facilities open to all citizens as described in Table 2. Although the State and external donors assume some of the financial risk, citizens' direct out-of-pocket payments exist in the absence of risk-pooling mechanisms. The government is currently considering the introduction of social or community-based health insurance schemes, which would potentially reduce the extent of out-of-pocket payments if these payments were channeled through an effective risk-pooling scheme.

Strategic Purchasing

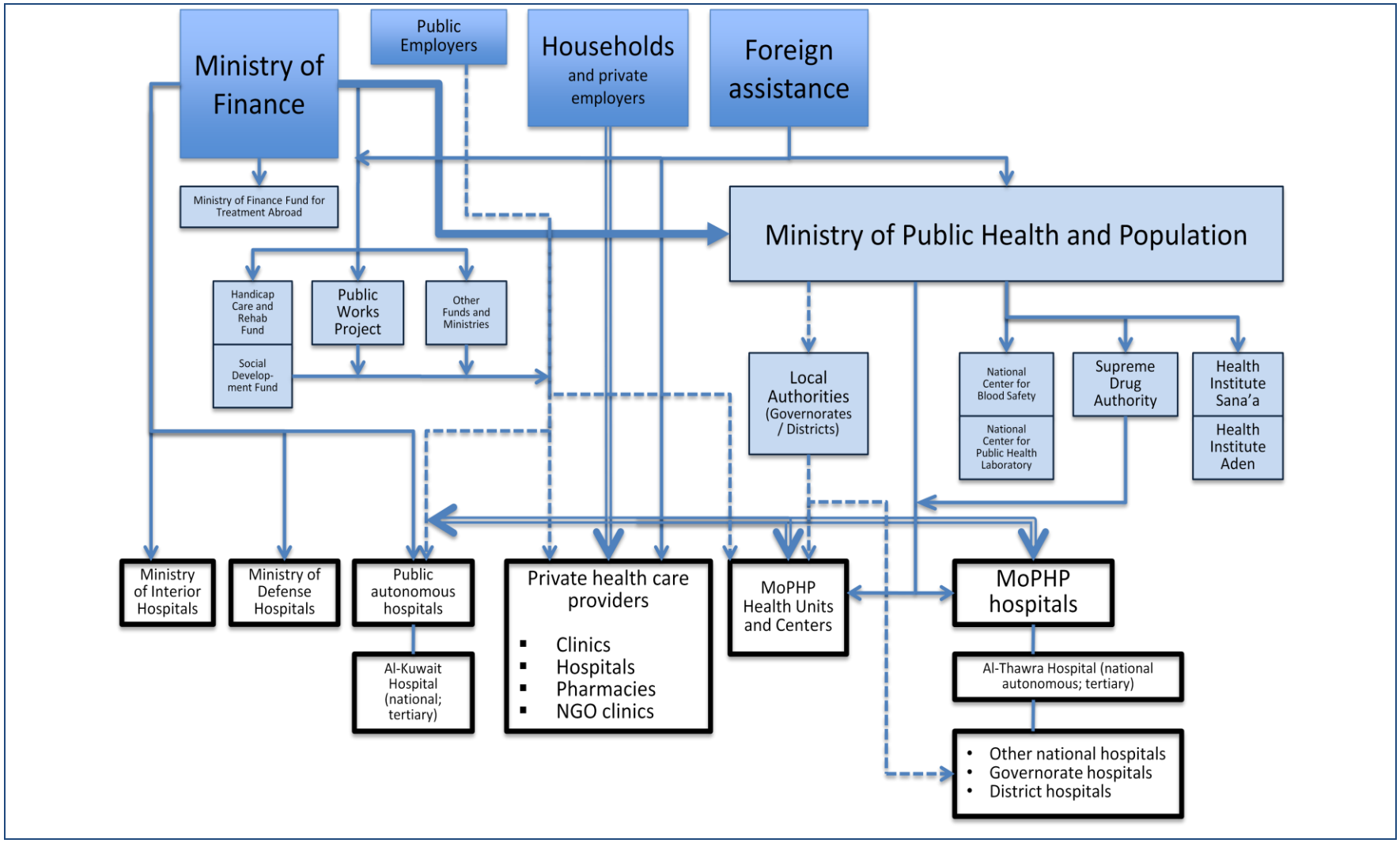
The Yemeni health system reflects a relative absence of the separation of payor, provider and regulatory functions. In terms of provider payment mechanisms to hospitals, most of the hospitals receive global budget transfers from the MoPHP, with two central hospitals receiving funds directly from the MoF, which may cover approximately 60% of total costs. Facilities can also generate revenues through from user fees to cover their revenue-cost gap, with health units and health centers receiving an estimated 17-28% of their total revenues from user fees. Governmental budget transfers are typically historically-based and defined by line-item spending, without any form of strategic purchasing or commissioning to provide incentives for quality or efficiency. Based on 2007 data from the MoPHP amongst a selection of general hospitals, average daily admission rates, average length of stay and bed occupancy rate vary widely for services such as obstetrics and gynecology and internal medicine. Although the data presented are not adjusted for case mix, the particularly wide range calls for a closer understanding of the way in which providers are paid at the macro level (facility) and the micro level (health care personnel).

Table 2. Key health financing policy trends in Yemen

	Country Profile	Key reforms or Issues
Revenues	Household resources; general governmental revenues; external resources.	Low total spending on health calls for more efficient and focused resource allocation mechanisms to prioritize public spending and reduce household burden.
Risk Pooling and Payer Organization	Largely fragmented payers, including MoF/MoH, vertical funding by other ministries and vertical non-governmental organizations (NGOs). Decentralized responsibilities for spending recurrent budgets. Centralized responsibility for capital investment.	MoH role as integrated provider may require shift in role to regulatory and legislative body. Feasibility recently conducted regarding introduction of social health insurance schemes on a limited basis.
Strategic Purchasing	Global transfers from MoH and other governmental authorities to providers.	Introduction of separation of provider and payor functions and gate keeping/referral system will be beneficial. Reforms currently do not include introduction of strategic purchasing.
Role of the Private Sector	Private health facilities, pharmacies and vertical programs managed by NGOs for primary health care services.	Future role of private sector to be defined. Integration of vertical programs and coordination amongst multiple NGOs is recommended.
Other Issues	Increasing revenues for health sector and sustainability in midst of macroeconomic and civil instability. Reducing need for health care abroad.	Strategy to more efficiently provide health services to underserved populations in remote regions.

Source: Compiled by author.

Figure 2. Flow of financing from original sources to intermediaries to health care providers, 2009



Source: Author's summary based on Yemen National Health Accounts 2000, 2003, 2007.

Governmental Health Expenditure

The share of governmental expenditures on health in relation to total gross domestic product (GDP) has been approximately 4.1-4.6% and declining gradually during 1998-2007, representing a relatively small proportion of GDP as shown in Table 3. Recurrent expenditures, comprising primarily utilities, wages, and salaries, account for approximately 70% of this spending. In relation to total governmental expenditure, health accounted for approximately one-fifth of governmental spending over this period. While modest in size, the trend in an increasing share of government spending represents policy reforms to increase allocation to both recurrent and capital investment in health. With the decentralization reforms that became effective in 2001, responsibility for executing budgets has been assumed by the governorate, local authorities, particularly for recurrent spending. The implementation of decentralized budget management has been considered lagging; between 2004 and 2007, central authorities have consistently executed the majority of the budget at nearly 70%, as compared to 30% by local authorities, notably for recurrent spending.

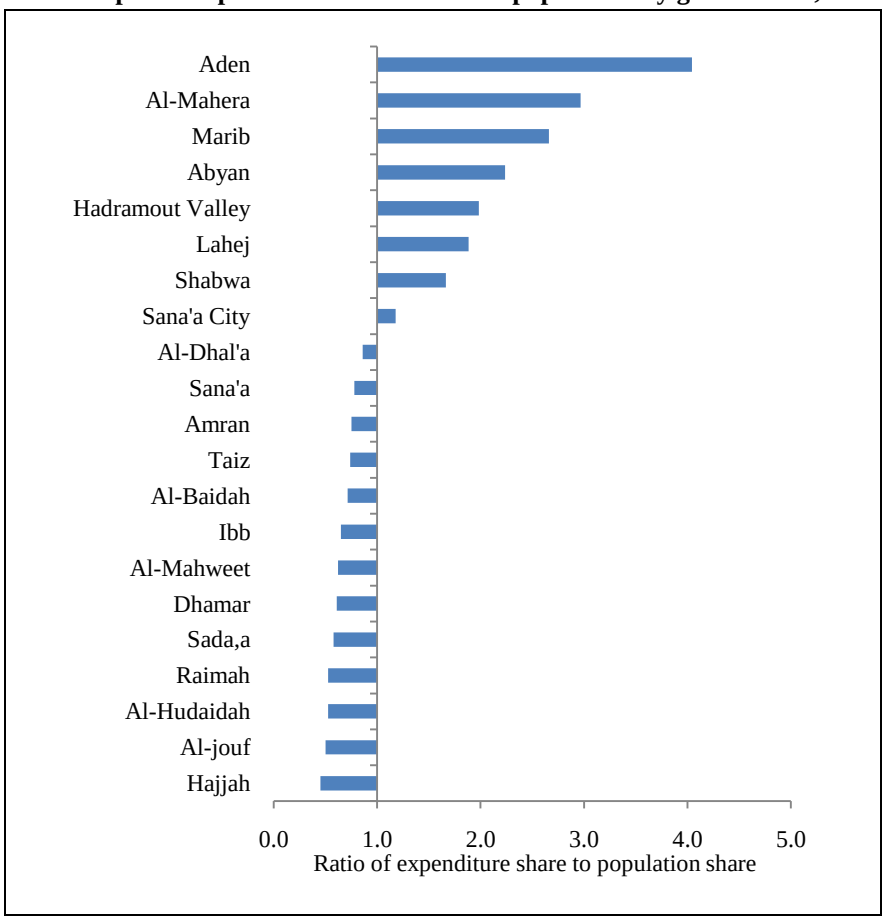
Information on the flow of financing and budget execution is currently unavailable, however, an analysis of public expenditure by governorate (Annexes 5 and 7). Overall public expenditure by the MoPHP amounted to nearly YR 1,432 (or approximately PPP $ 17) in 2007. Expenditure varies greatly by governorate, with some governorates accounting for a disproportionately higher expenditure relative to their share of the population (Figure 3). While Aden includes for 3% of Yemen's population, it accounted for 12% of public expenditure (or a ratio of 4.5). By contrast, while Hajjah includes nearly 8% of the population, it accounted for only 3% of public expenditure (or a ratio of less than 1). While the imbalances may not be as inequitable as they appear since private expenditures and inter-governorate travel for health services exists, these figures suggest that an examination of the causes and effects of disparities in public expenditure is warranted.

Table 3. Yemen: Total health expenditure relative to macroeconomic indicators, 1998, 2003 and 2007

	1998		2003		2007	
	Value	**%**	**Value**	**%**	**Value**	**%**
Population (millions)	16.37		19.14		21.24	
Gross Domestic Product, nominal (at mkt prices, YR millions)	844,240		2,081,640		4,923,687	
GDP per capita, nominal, YR	51,583		110,149			
Health Expenditures by Original Source of Funding						
(YR millions)						
Governmental health expenditure (GHE)	14,458	35	30,414	32	72,515	
Private health expenditure (PtHE)	23,670	57	70,536	60	172,226	
External resources	3,166	8	12,320	8	12,672	
TOTAL, YR millions	41,294	100	117,270	100	257,414	
GHE per capita	883		1,973		3,367	
PtHE per capita	1,446		3,686		7,996	
External resources per capita	193		469		588	
TOTAL health spending per capita	2,523		6,128		11,951	
TOTAL government expenditures	256,100		777,087		1,754,782	
Proportion of govt. spending on health		5.6		4.9		4.13
(as % of GDP)						
Public		1.7		1.8		1.47
Private		2.8		3.4		3.5
External resources		0.4		0.4		0.26
TOTAL		4.9		5.6		5.23

Notes: 1998 NHA estimates from Table 1, page 8, of report (Ministry of Public Health and Population 2000); *Yemen National Health Accounts: Estimate for 2003.* Bethesda, MD: The Partners for Health Reform*plus* Project, Abt Associates Inc, June 2006). Source for macroeconomic data: Central Statistical Organization, Republic of Yemen.

Figure 3 Share of public expenditure versus share of population by governorate, Yemen, 2007

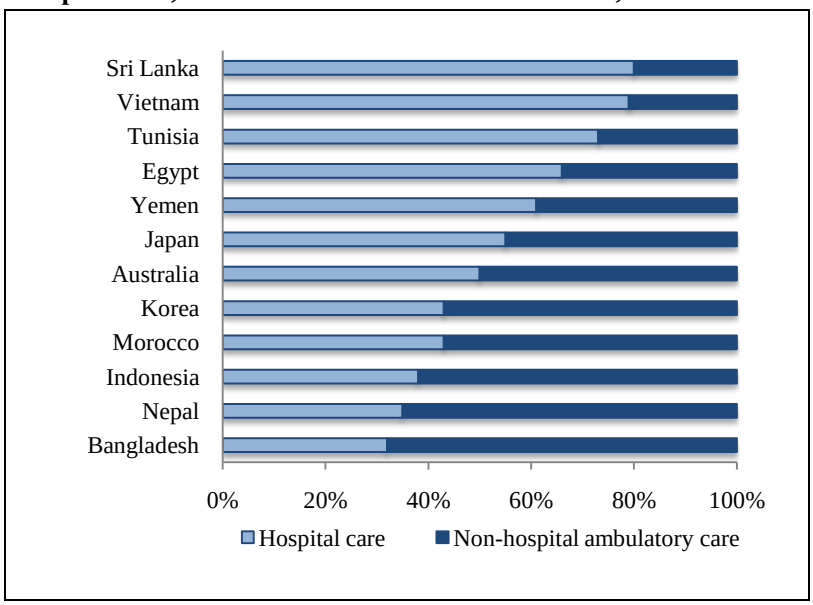


Source: Ministry of Finance, Governmental expenditures by governorate, 2007. Author's calculations

The Annex presents data on the distribution of total expenditures by the type of health care provider, both public and private. In 2007, the government health care bill amounted to approximately YR 79 billion, translated to a per capita expenditure level of $40 (international dollar). Similar to 2003, the majority of this expenditure was incurred on hospital-based health care, which may include both inpatient and outpatient services. Although overall governmental health expenditure increased by 34% between 1998 and 2003 and 23% between 2003 and 2007, the rate of increase on hospital-related expenditure increased more rapidly than did that of other health services.

Comparatively, the distribution of hospital versus ambulatory expenditures in Yemen is similar to that found in other MENA countries (Figure 4). Yet given the burden of disease in Yemen, a more proportionate pattern of spending that prioritizes preventative and primary health care largely met through ambulatory services would likely increase the rate of return on health care investment. Indeed, Indonesia, a country with a similar disease burden and a relatively decentralized health care system, spends considerably more on ambulatory care than on hospital-based services.

Figure 4. Public expenditure on hospital and ambulatory care as share of expenditures on health care providers, Yemen and international benchmarks, 2001-2007.



Sources: Yemen NHA 2007; Egypt NHA 2001-2; Morocco NHA 2006; Tunisia Ministry of Health data, 2009; Data for Sri Lanka, Vietnam, Japan, Australia, Korea, Indonesia, Nepal and Bangladesh: Fernandez, 2008.

Treatment Abroad

Health care services in neighboring countries continue to be important for Yemeni citizens to access health services. Each year a considerable segment of the population travels to neighboring Gulf Cooperation Council countries, Egypt, Jordan and others to seek outpatient and inpatient health care. Between 1997 and 2008, treatment abroad accounted for 11% to 29% of total health expenditure (Annex 5). Through earmarked central funds for treatment abroad for eligible applicants, the state covered approximately 9% of the costs of treatment abroad in 2007 and households mainly covered the remainder at 90% (private employers contributed 1%). The total amount spent by households has been captured to some extent by routine household surveys, although this amount may underestimate the true cost of seeking services abroad, comprising both direct and indirect costs, such as lost wages due to days out of the country, and family care while abroad.

Public Expenditure Financial Accountability

While the governmental budget process in Yemen takes into account policy considerations, public financial management faces a number of challenges in terms of strategic resource allocation and effective budget execution.[7] The challenges are particularly pronounced in the case of social services such as the health sector. First, the assessment has found that the poor matching of aggregate expenditure figures to budget estimates reflect a lack of fiscal discipline in budget execution. Through public expenditure tracking evaluations, difficulties have been particularly noted with respect to salary payments and weak bottom-up budget preparation processes, leading to a misalignment of resources. Actual expenditures, including for the heath sector, have consistently deviated from allocated budgets. Between 2004 and 2007, actual expenditures in the health sector were between approximately 86%-153% of budgets allocated per year. Recurrent expenditure tends to exceed allocated levels by up to 200% approximately, while capital expenditure has been on average nearly only 30% of allocations. Furthermore, over half of

capital investment resources were disbursed in the last quarter annually during this period. While line item and historic trends have largely been the basis of budget transfers to the MoPHP, current proposals to adopt policy-based budgeting are being considered as part of a multi-year budgetary framework.

Second, policies to decentralize public financial management in order to align resource utilization with strategic priorities at the governorate level have not been fully implemented. Technical capacity has been considered too weak for decentralization to be effective among the nearly 303 local authorities in 22 governorates. The lack of transparency in tracking funds has contributed to frequent reports that resources are not received by health facilities, forcing many to halt operations and personnel absenteeism to be rampant.

Third, in the case of the health sector, the fragmentation of public financial management, donor funding and vertical programs exacerbates inefficiencies and uncertainty in resource allocation. Financial accounting and reporting are relatively weak, and the lack of integration of foreign aid into programmatic budgeting raises may skew priority setting. The sustainability of such additional financing is further threatened by the absence of a long-term budget framework by which to institutionalize this additional funding and support.

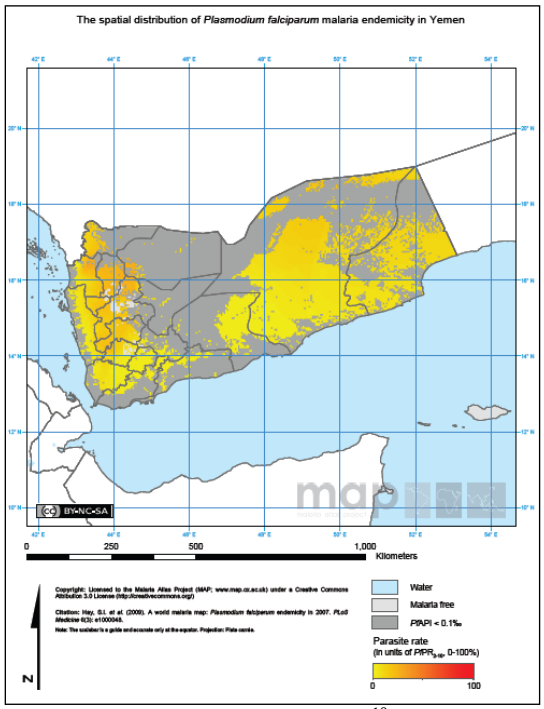
IV. Health system equity: geographic and socioeconomic perspectives

By global standards, the geographic divide in Yemen is striking; it has amongst the highest urban-rural gaps in underweight children in the world and the highest gap in MENA given its economic level. Although all Yemeni citizens are entitled to a basic set of benefits such as primary health care services, the benefits package covered by governmental services is in practice unclear since approximately 35% of the population does not receive access to health services when needed. A system of co-payments exists for certain services such as child birth and laboratory tests, but the extent to which tariffs are publically disclosed and adhered to is not well-documented. This section evaluates equity in health outcomes and access, particularly the spatial health divide in Yemen, and explores factors associated with such disparities.

Health Outcomes

In Yemen, the prevalence of communicable, maternal and nutritional conditions remain high throughout the country, with over sixty-percent of the population living outside of urban, industrialized centers. Figure 15 shows that the risk of malaria is moderate to high in nearly one-third to one-half of the country. Malaria, although eradicated in most of the MENA region, still poses a risk in some parts of Yemen (Figure 5), which has been attributed in part to migratory patterns of refugees and workers at this intersection of the Red Sea and Indian Ocean[8]. According to UNICEF, approximately 50% of children under five in Yemen were malnourished based on the incidence of stunting and wasting[9]. By global standards, the geographic divide in Yemen is striking; it has amongst the highest urban-rural gaps in underweight children in the world and the highest gap in MENA given its economic level.

Figure 5. Spatial distribution of malaria endemicity in Yemen, 2009



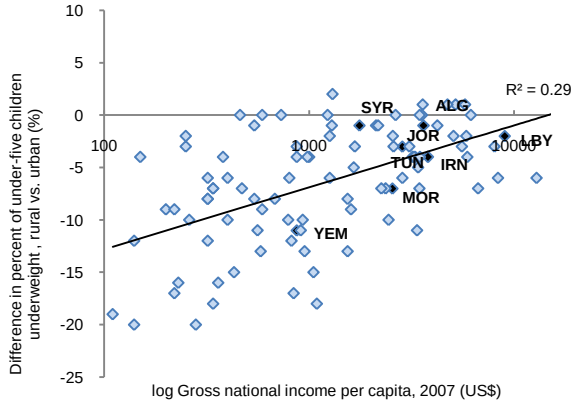
Source: Hay et al, 2009[10].

Existing data on maternal and child health status reveal that the degree of income inequality can vary by country, and that it can change over time. Data from the Demographic and Health Survey (DHS) program show maternal and child health status is relatively poor in Yemen, but a closer comparison to other countries in the region shows that socioeconomic disparities are not necessarily as great as that found in other countries (Annex 6). All of the concentration indices are negative (Annex 6), showing that for all countries, infant mortality rates are consistently higher amongst the poorer segments of the populations than amongst the wealthiest. However, with the exception of Yemen, infant mortality rates are relatively similar amongst the top 2-3 wealth quintiles across the countries. Inequality differences between countries generally widen when moving from the wealthiest to the poorest income groups. The differences in inequality between countries are especially apparent regarding the two poorest segments of the populations.

Although the MENA region is in the process of an epidemiologic shift from communicable to non-communicable conditions, certain countries reflect greater sub-national spatial variation in this transition than others. Overall, the gap between 'urban' and 'rural' undernourishment appears fairly similar to other countries at similar economic stages, as shown in Figure 6, with the exception of Morocco and Yemen**.** Relative to urban areas, the proportion of children who are underweight is nearly 8% and 12% higher in Morocco and Yemen, respectively, in rural areas. In these two countries, rural areas are still heavily burdened by lagging maternal and child health indicators, described as area deprivation, also reflected in the urban-rural gap in the utilization of appropriate care for birth deliveries (Figure 7). For Yemen, where over sixty percent of the population is considered to be rural, the implications of policy responses therefore extend beyond geographic targeting. While health resources influence such outcomes, the effect of these resources are often more impacting when combined with improved living conditions, educational levels, economic opportunities, strong social capital, and early childhood development, which are important social determinants of health.

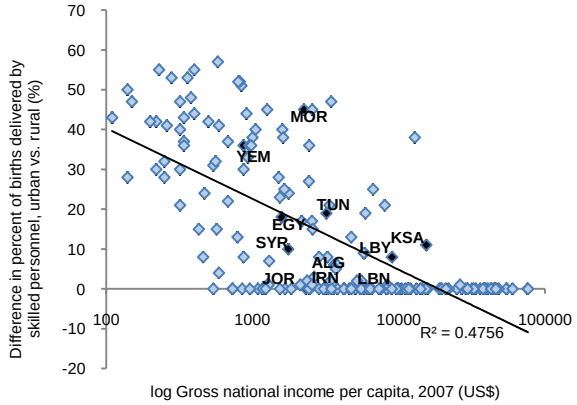
The confluence of health and space, however, is compounded by a third dimension, that of time. How spaces change over time and the effect of this change on health outcomes is captured in Figure 10, which depicts under-five mortality over time in three MENA cases. Although the mortality rates of both rural and urban regions in all of the countries have declined substantially, they have converged to a lesser extent in Egypt and Yemen than in Jordan (Figure 8). These levels of decline may not be as high as expected given improvement in access to health services, since access to assisted delivery and immunization coverage in rural areas have improved dramatically during the same periods, in some cases converging with rates in urban areas.

Figure 6. Urban-rural gap in underweight children



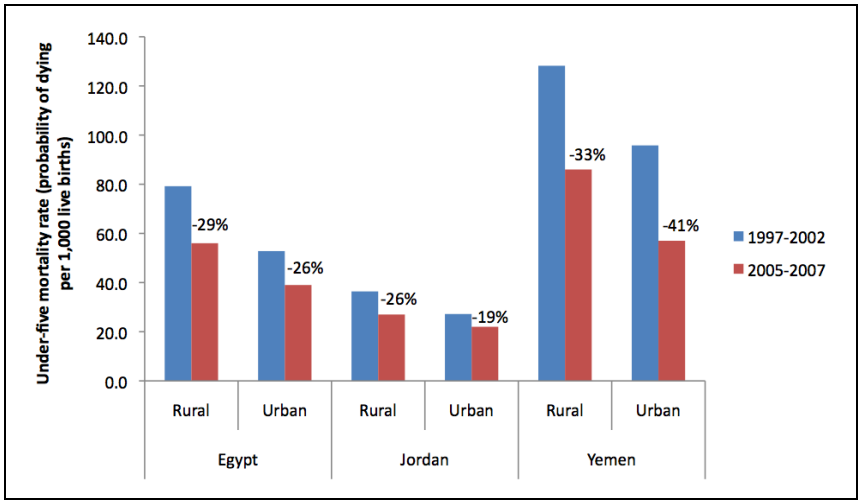
Source: Underweight Disparity Database, UNICEF, 2009.

Figure 7. Urban-rural gap in births attended by skilled health personnel



Source: State of the World's Children 2009, UNICEF, 2008.

Figure 8. Spatial disparities in child mortality over time, MENA countries



Source: World Health Organization Statistical Information System, 2009.

Yemen continues to face some of the highest infant and maternal mortality rates worldwide and the overall incidence of non-communicable chronic health conditions is similar to other MENA countries. The observed incidence is approximately 7% higher in urban areas than in rural zones, but after standardizing for age and gender, the gap doubles to become 13% higher in urban areas than in rural zones (Figure 9). Overall, nearly 13% more people in urban areas than in rural areas reported having a chronic health condition (6.1% versus 5.4%).

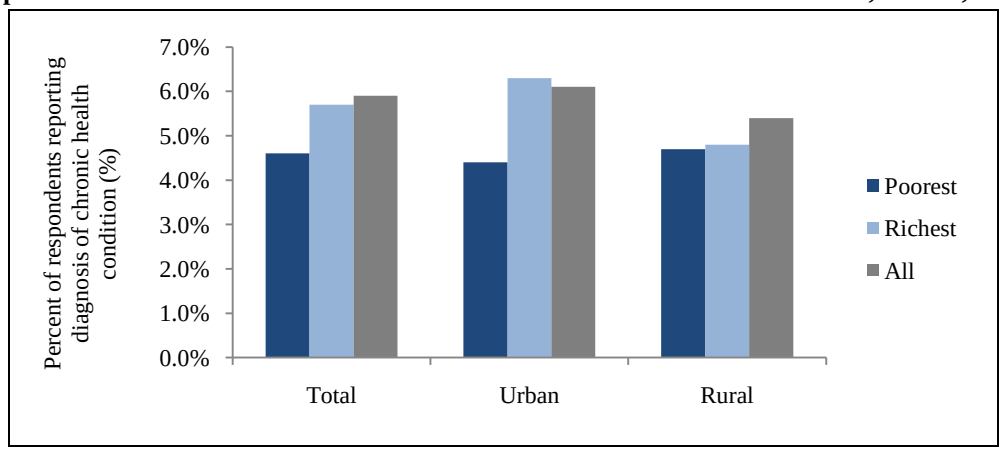
By wealth quintile, chronic health conditions appear to be concentrated amongst the higher-income groups, particularly in urban areas. In urban governorates, the incidence of chronic conditions is nearly 50% higher amongst the wealthiest four quintiles than the poorest quintile. In rural areas, it is the middle quintiles that report a higher incidence of chronic health conditions. Standardizing for age and gender do not substantially alter the incidence, although the prevalence is somewhat lower in the richer groups. These findings indicated that more information is needed to determine whether these inequities in health reflect genuine differences in epidemiologic patterns or in self-diagnosis rates due to differences in access to health care and information.

Among other determinants, the quality of health services may not have improved to the same extent over time throughout different areas of a given country. Evidence from Iran shows that although child mortality indicators have declined in rural areas substantially over time, rates of decline for neonatal and maternal mortality have lagged behind (Movahedi et al, 2009). This lag has been attributed to the fact that most neonatal and maternal deaths are due to complications and high-risk pregnancies that cannot easily be managed in rural health centers, which tend to lack specialist care found in secondary and tertiary centers, especially in southeastern regions close to the Indian Ocean. By contrast, the reduction in child mortality has largely been attributed to Iran's success at controlling infectious diseases.

While access to basic services can bridge a large part of the spatial divide, socioeconomic disparity within regions becomes more of an issue in access to more technologically complex and costly types of health care. Ensuring access to these types of health care, including pharmaceutical, diagnostic, and curative services, is largely dependent on building upon economies of scale and scope that may be difficult to achieve in remote and excluded regions. The relationship between health and space is therefore dynamic

and may change further as the demand increases for highly specialized, acute care and regular care for non-communicable conditions such as diabetes, heart disease and related risk factors, and mental health conditions. As the shift from communicable to non-communicable disease profiles occurs in MENA, broader health policies related to financial protection and quality of care are expected to play more of a role in bridging spatial divides within countries.

Figure 9. Spatial and economic differences in the incidence of chronic health conditions, Yemen, 2005/6



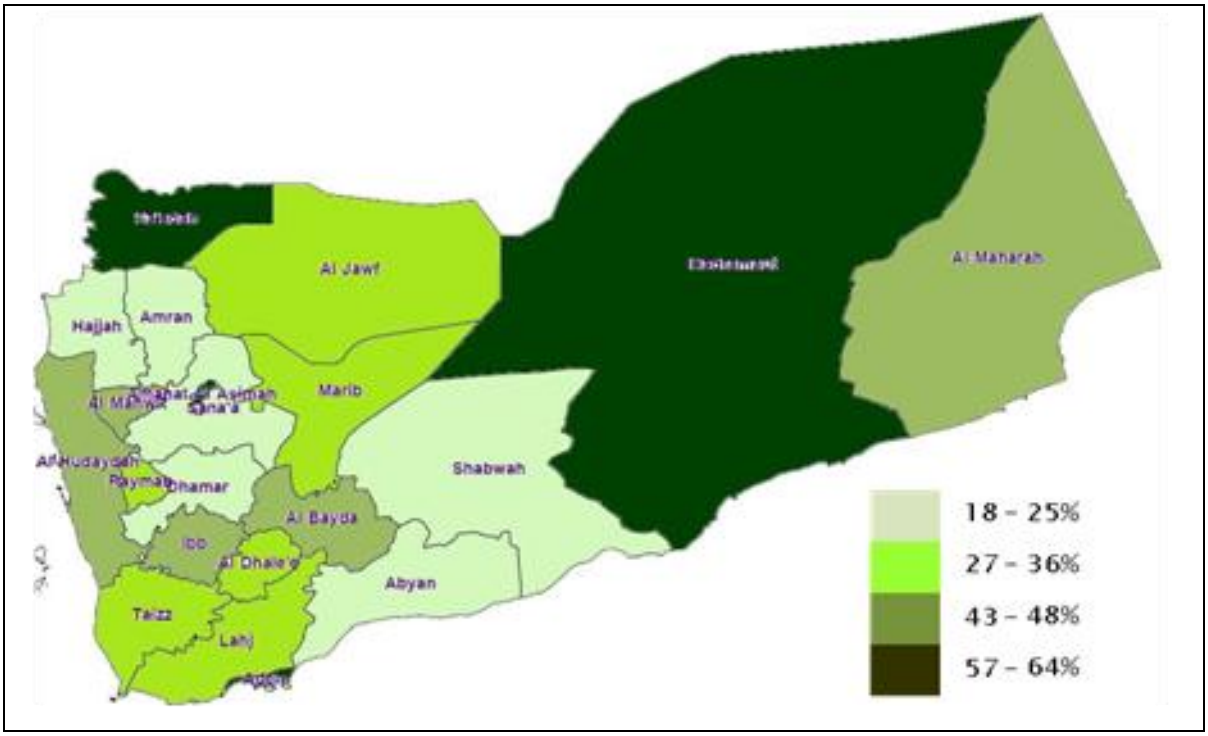
Source: Yemen Household Budget Survey, 2005/2006. Author's calculations.

Distribution of Health Services

The confluence of infrastructure, environmental, agricultural and societal challenges make a discussion of spatial disparities in Yemen particularly complex. Over 85% of the roads in Yemeni governorates remain unpaved (World Bank, 2007), and the typically long length of time needed to reach health facilities poses as a barrier to utilization. Overall, total health expenditures in Yemen account for nearly 4% of gross domestic product, but the sub-national allocation does not appear to be based on any type of needs-based assessment on the basis of age-standardized mortality rates, age, gender, or other appropriate factors. For example, although the eastern-most governorates are the most populated overall and health facilities appear to be distributed as per population trends (Annex 7), utilization rates vary greatly among women in different governorates (Figure 10). Similarly, households in some governorates pay more as a proportion of total household spending than households in other governorates (Figure 11). These patterns suggest that although citizens in theory should find the same availability of health services, actual utilization rates and the amount they pay do not appear to be correlated with the existence of health facilities, likely point to the quality of those facilities and other societal factors as key determinants. These determinants may include cultural mores and preferences, educational and awareness levels, mobility, transport and household ability to pay for health services.

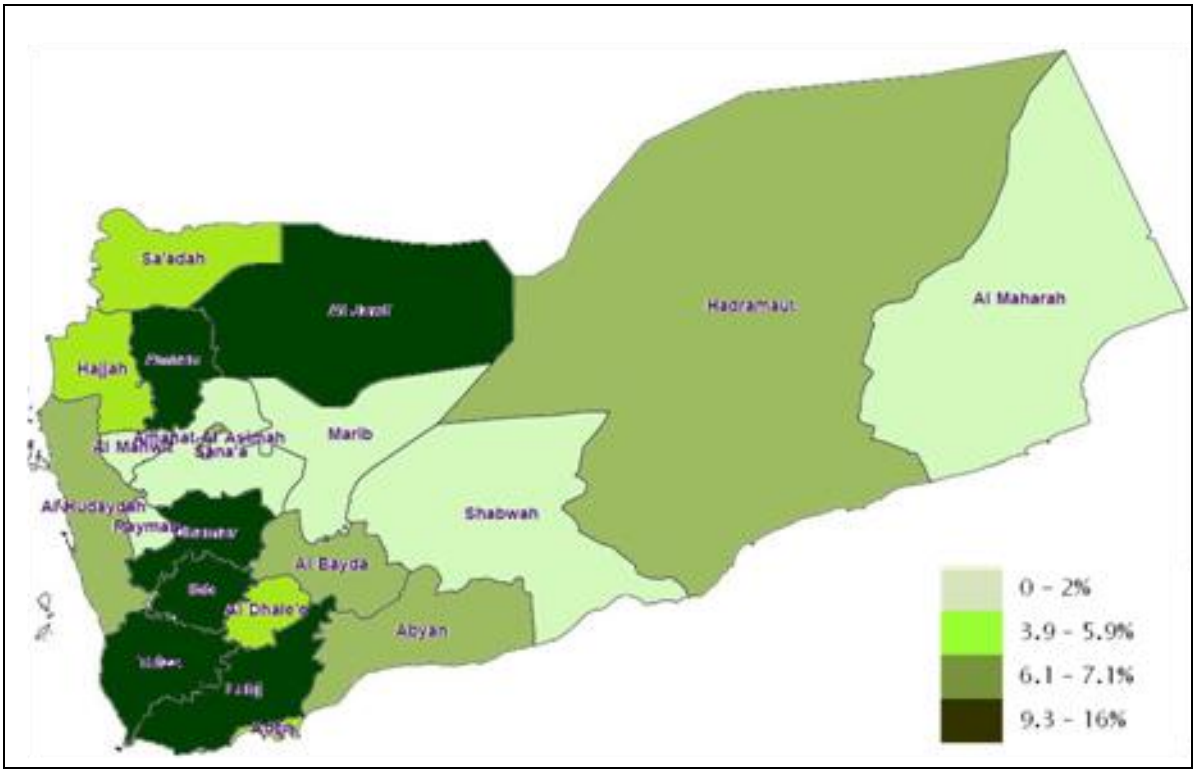
Although the existence of health facilities is relatively evenly distributed across the population, the operational status and quality of these facilities is highly variable. Annex 7 shows that although the availability of referral systems for emergency child births increases as poverty rates increase, the use of these systems and guides does not necessarily follow suit. In addition, the distribution of hospital services by governorate in Yemen reveals that the supply of beds varies greatly across governorate, but that productivity indicators such inpatient and outpatient utilization rates suggest under-utilization of health facilities (Table 4 and Annex 7).

Figure 10. Spatial distribution of antenatal service utilization rate, Yemen, 2005/6



Source: 2007 Health Facility Survey, USAID/Ministry of Health, Yemen. Author's calculations.

Figure 11. Spatial distribution of incidence of catastrophic expenditures, Yemen, 2005/6



Source: 2007 Health Facility Survey, USAID/Ministry of Health, Yemen. Author's calculations.

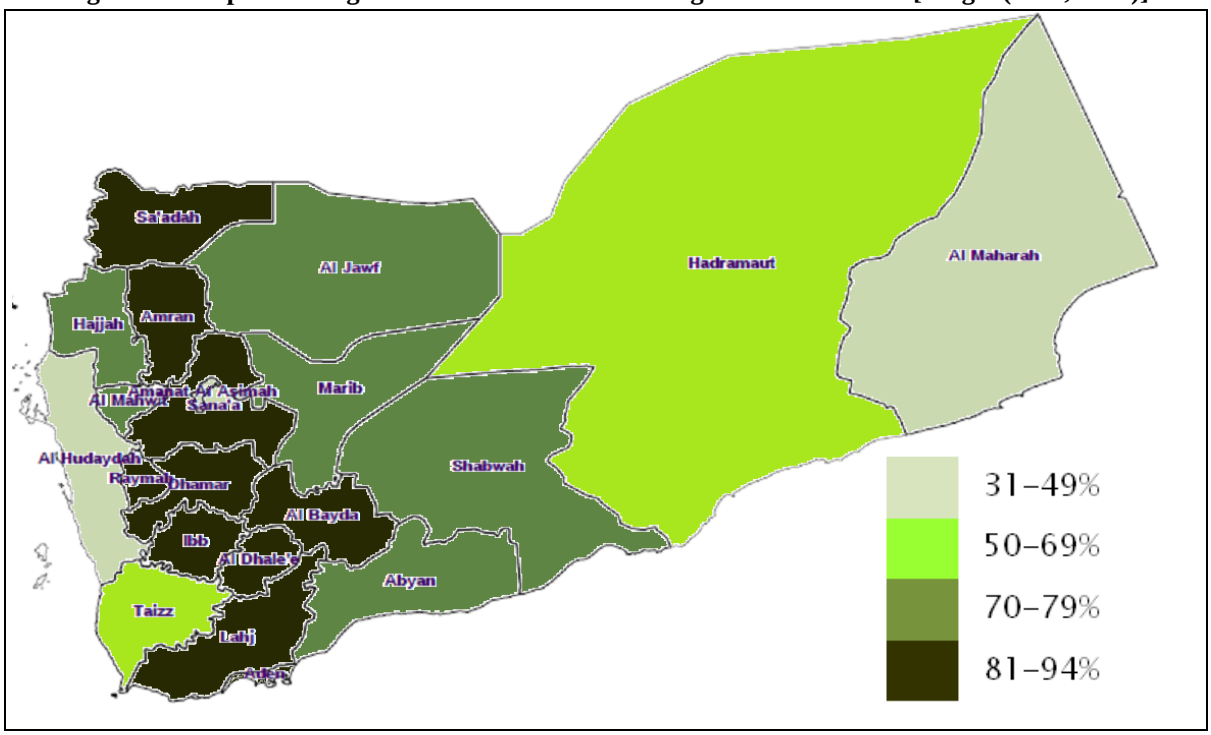
Table 4. Public hospital activity by specialty, selected indicators for general hospitals, 2007

Governorate	Aden	Dhamar	Hadramout Valley	Lahej	Sana'a	Sana'a City	Average Range
Hospital name	AL-WAHDAH ADEN	AL-WAHDAH DHAMAR	AL-QATN	IBN KHALDON	AL-THAWRA	Al-KUWAIT	
Total no. beds	252	112	104	872	785	304	(104, 872)
Internal medicine							
No. of beds	50	32	20	360	122	43	(20, 360)
Bed occupancy rate	5.75	45.8	27.1	68.1	91.8	41.3	(5.75, 91.8)
Average daily admission	0.4	1.6	1.2	24.5	11.1	1.7	(0.4, 24.5)
Average length of stay	8.1	9.4	4.7	10.2	10.1	10.6	(4.7, 10.6)
Obstetrics and gynecology							
No. of beds	122	12	21	125	66	22	(12, 125)
Bed occupancy rate	24.8	156.5	126.1	46.1	56.5	68.9	(24.8, 156.5)
Average daily admission	17.9	3.8	4.7	5.6	40.1	2.4	(2.4, 17.9)
Average length of stay	1.7	5	5.7	10	0.9	4.6	(0.9, 10)

Source: MoPHP Annual Statistical Health Report 2007 and author's calculations.

The availability of pharmaceuticals at health facilities ranges widely across governorates, with some governorates reporting as low as 31% of their health facilities having drugs available on-site based on data from the 2007 Health Facility Survey (USAID/Ministry of Health, Yemen) (Figure 12). Multivariate regression shows that the main positive determinants of pharmaceutical availability include governorate (Ibb and Aden have a higher likelihood); hospital facilities as opposed to health centers or units; and governmentally owned facilities as opposed to private or foreign facilities (Annex 7). By contrast, governorates with a lower likelihood of having pharmaceuticals available include Taiz, Hodeida, and Hadramut. The level of involvement of foreign assistance in pharmaceutical distribution in different governorates, local geopolitics determining intra-governorate resource allocation, and health personnel staffing at facilities may be associated with a greater availability of pharmaceuticals.

Figure 12. Proportion of governorate facilities with drugs available on-site [range: (31%, 94%)]



Source: 2007 Health Facility Survey, USAID/Ministry of Health, Yemen. Author's calculations.

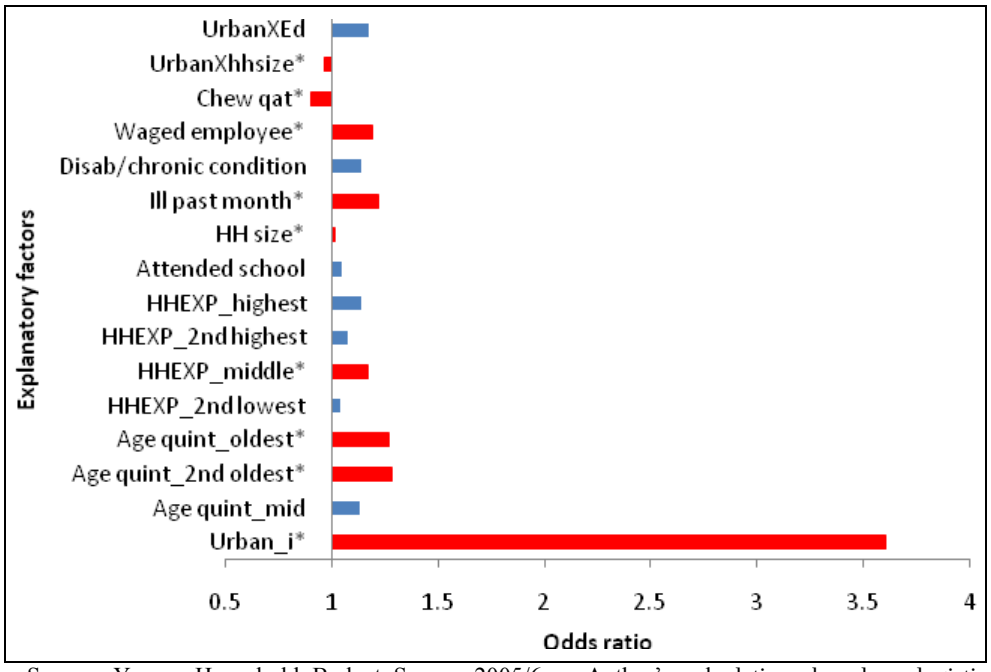
Utilization of Health Services

A substantial proportion of the population continues to face barriers to seeking health care in Yemen. According to national household survey data, approximately 37% of respondents reported not seeking health care due to financial barriers[11], as compared to 20% in Lebanon[12] and 12% in Egypt[12].

Spatial factors appear to play more of a role than socioeconomic status per se in determining access to health services in Yemen. Overall, approximately 10% of respondents in the Yemen Household Budget Survey report having suffered an acute illness or injury over the past month, of which the vast majority was able to receive treatment for this episode (Annex 8). Rates of acute treatment did not appear to differ by either geographic setting or socioeconomic status. On the other hand, for less acute, primary health care such as prenatal health services, the geographic divide is noticeable. Overall, approximately 40% of all Yemeni, recent mothers in the survey reported visiting prenatal health services at least once, but nearly twice as many urban as rural dwellers accessed prenatal care.

Results of multivariate regression analysis show that the likelihood of receiving care for acute illnesses or injuries is significantly higher for urban dwellers than for rural counterparts, holding all else constant (Figure 13). This disparity is more apparent in the case of prenatal care, where geographic location is the relatively the most influential factor determining the likelihood of receiving at least one prenatal health care visit. The annex further illustrates this point by showing the vast range of utilization rates across each of the governorates in Yemen.

Figure 13. Yemen: Overview of determinants of the prenatal health care utilization at any facility over past month



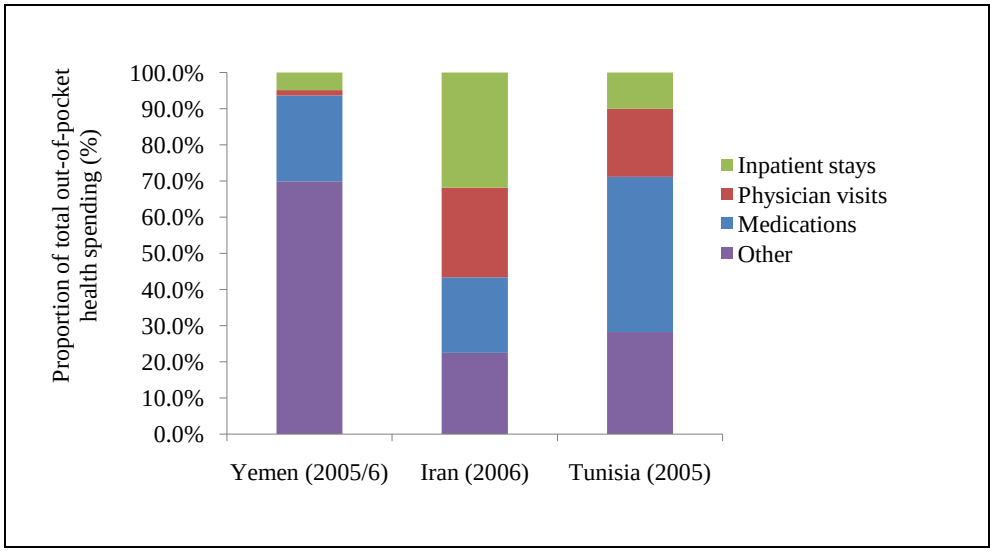
Source: Yemen Household Budget Survey 2005/6. Author's calculations based on logistic regression; number of obs. = 9051. *Indicates statistically significant at 95% confidence level. Dependent variable: Delivcare_i: Binary variable (BV), 1 = respondent sought prenatal health care prior to child delivery. Explanatory variables: Urban_i: BV, 1=respondent's household (HH) is urban. Age quint_mid/2nd oldest/oldest: BV, 1=respondent belongs to middle, 2nd oldest or oldest age group. HHEXP_2ndlowest/middle/2nd highest/highest: BV, 1=respondent's HH belongs to given income (HH expenditure) level. Attended school: BV, 1=if respondent attended at least primary school. HH size: Continuous variable (CV), number of HH members. Ill past month: BV, 1=respondent was ill in the past month. Disab/chronic cond.: BV, 1=respondent has a long-standing disability or chronic condition. Waged employee: BV, 1=respondent is a paid employee in the formal sector. Chew qat: BV, 1=respondent chews qat regularly. UrbanXHHsize: interaction term = whether effect of HH regional setting (urban/rural) on likelihood of utilizing services changes depending on HH size. UrbanXEd = interaction term = whether effect of HH regional setting (urban/rural) on likelihood of utilizing services changes depending on respondent's educational level.

Household Out-of-Pocket Health Spending

A relatively low share of household expenditure in Yemen is devoted to health care as compared to other MENA countries (Annex 9). This pattern suggests that the capacity to pay greater than 3% is constrained. The amount spent by households tends to increase as income levels increase, with the richest quintiles spending nearly double that of the poorest on health care. In terms of the equity of these expenditures as indicated in the last column using the Kakwani index, Yemen exhibits a relatively regressive OOP pattern. The burden of out-of-pocket payments falls disproportionately higher on lower-income households as evidenced by the negative sign of the index (Annex 9). In Yemen, citizens have reported having had to travel abroad for health care services due to the lack of availability or satisfaction with local services. Treatment abroad, for example, in Yemen accounts for approximately one-third of all out-of-pocket spending, although this is reported amongst the top three income categories.

The distribution of out-of-pocket spending reveals that spending patterns vary across countries (Figure 14). In Tunisia and Yemen, for example, the single largest component of household health care expenditures is medications, followed by physician visits and finally inpatient care. Expenses classified as 'other' several individual categories such as medical or pharmaceutical paraphernalia, laboratory tests, and dental care. In Iran, the largest component of health spending is inpatient hospital care, followed by physician visits and medications. These patterns reflect differences in supply and demand-side factors in health financing and organization, including differences in user fees for health care services in the private and public sectors, differences in eligibility criteria for various health benefits under public or private insurance schemes, and differences in the availability and distribution of health care providers and services that meet citizens' needs and preferences.

Figure 14. Out-of-pocket spending by health service in Yemen and MENA countries



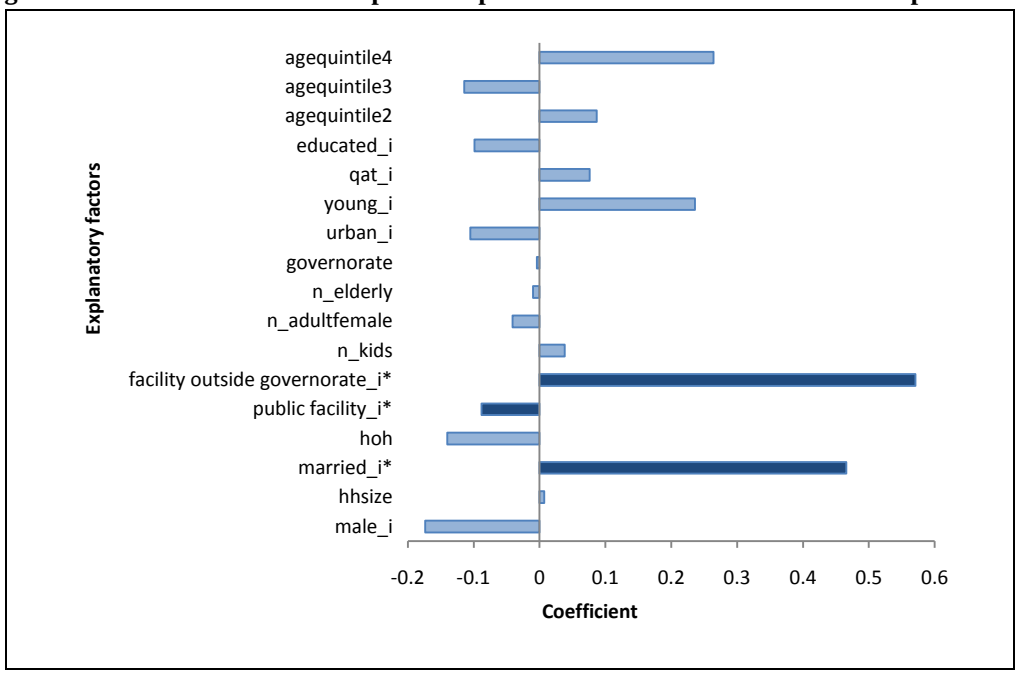
Source: Author's calculations using data from national surveys. Note: "Other" spending in Yemen includes 30% of total household expenditure on treatment abroad on average.

The burden on welfare that out-of-pocket payments pose throughout countries is related to the cycle of ill health and economic hardship. Households that incur excessively high out-of-pocket payments are most vulnerable to being plunged further into this cycle. These households are typically defined as those that pay greater than an internationally-recognized threshold as a proportion of total household expenditure, which may vary between 5% and 25% of total expenditure, or 15% and 40% of non-food expenditure. The proportion of households that incur such 'catastrophic' health care expenditures in Yemen is 7%, nearly equal in rural and urban households (Annex 9).

Generally, in countries where more than 5% of all households incur such catastrophic expenses, financial protection against the costs of health care may be considered insufficient or inadequate for certain services. Given that treatment abroad, medical supplies and medications, and inpatient care account for large proportion of household health spending in Yemen, insufficient coverage against the costs of these services contributes to high rates of catastrophic payments in these countries. A somewhat higher rate of catastrophic expenditures is found in urban areas, likely due to the availability of health services to purchase and capacity to pay. As a consequence, the rate of poverty in Yemen is influenced by the fact that households pay out-of-pocket for health services. Based on the 2005/6 Household Budget Survey, 8% more households are pushed into poverty as a result of having to pay for health care services (Annex 9).

To reduce these effects, determinants of out-of-pocket expenditures would need to be better addressed as alluded above. Based on available variables from the Yemeni survey, results from regression analysis as shown in Figure 15 suggest that factors which significantly increase the level of out-of-pocket expenditure include the use of health care facilities outside the governorate of domicile (likely an indicator of medical and travel fees), the use of private facilities (likely an indicator of higher user fees), and being married (likely an indicator of capacity to pay or available material or knowledge resources).

Figure 15. Determinants of out-of-pocket expenditure amount for acute care over past month



Source: Author's calculations based on Yemen HBS 2005/6. Note: zero-truncated negative binomial regression model; number of obs. = 353. *Indicates statistically significant at 95% confidence level. Dependent variable: continuous variable (CV) for amount of household (HH) expenditure on health care per month in Yemeni Reals. Explanatory variables: agequintile4/3/2: binary variable (BV) for age of health service user (respondent), second oldest (4) to second youngest (2) age group. Educated_i: BV for whether respondent has attended at least primary school level. Qat_i: BV for whether respondent is regular Qat chewer. Young_i: BV for whether respondent is younger than 18 yrs. Urban_i: BV for whether respondent's HH is urban. Governorate: categorical variable for governorate code identifier (1-21) of respondent's HH. N_elderly: continuous variable for number of respondent's HH members above 65 yrs. N_adultfemale: CV for number of respondent's female HH members above 18 yrs. n_kids: CV for number of respondent's HH members younger than 18 yrs. Facility outside governorate_i: BV for whether last health facility used by respondent was outside governorate of domicile. Public facility_i: BV for whether last health facility used by respondent public facility. HOH: for whether respondent is HOH. Married_i: BV for whether respondent is married. HHsize: CV for number of members in respondent's HH. Male_i: BV for whether respondent is male.

V. Policy Implications: improving the distributional effects of health financing

Overall, this analysis has demonstrated that health outcomes and equity in access to health services are lower in Yemen relative to health expenditure and national income level. This finding suggests that value for money in Yemen is relatively lower than in other comparable, low-income countries such as Vietnam, Indonesia and the Kyrgyz Republic. These inefficiencies are likely due in part to a relatively fragmented investment strategy, inefficient financial and human resources management, and social exclusion associated with educational, economic, geographic and cultural factors. Geographic disparities in health in Yemen are indicated by the distribution of child health outcomes and the use of prenatal health services, for example. The combination of persistent malnutrition and increasing rates of chronic health conditions amongst poorer groups in peripheral areas and urban slums pose as increasing barriers to future social and economic attainment in lagging areas. While the distribution of health care facilities appears to correlate to population density, the quality of these facilities is more variable. Middle and high income Yemeni households tend to pay out-of-pocket for health services, often by traveling abroad.

Experience in Yemen has demonstrated the efficacy of cross-sectoral interventions which focus on local community development. Globally, improving value for money in the health sector has largely been the result of a combination of systemic, cross-sectoral and targeted policies for integrating underserved populations (Box 1). For example, community-empowerment strategies in early childhood development have proven beneficial and cost-effective in tackling nutrition in under-five children. The Child Development Project (2000-2005) aimed to expand pilot-level, coordinated area-based programs (ABP) from 10 to 30 districts underserved in health and education services[13]. These ABPs involved the organization and mobilization of community-level committees to oversee health training, water distribution and educational access, and were associated with an improved enrolment rate for primary school girls by 20 percentage points and an increase in access to safe drinking water by 17% over five years, both important determinants of child nutrition.

To more effectively alleviate inequities and inefficiencies in health service delivery in Yemen, strategic policies are recommended for: (i) introducing prioritized resource allocation and (ii) developing innovative service delivery models to more efficiently connect rural communities. Globally, strategies that aim to expand education, better quality of care and health insurance have tended to alleviate spatial inequity in health to a greater extent than geographically targeted schemes alone conditional cash transfers[14]. Investing more proactively in prenatal health services represents a particularly cost-effective area for public resources in Yemen, given the high returns expected vis-à-vis early childhood development and macroeconomic growth. Ultimately, human resource investments that aim to expand health education and develop a cadre of local health care staff will likely alleviate inequity to a greater extent than health care infrastructure investments alone in Yemen.

Box 1. Five cross-sectoral policies for strengthening the distributional effects of health financing

- **Invest in Human Resources:** Build well-qualified health care workforce in rural areas, particularly women and local community members, as well as local educational and economic opportunities.
- **Reinforce Strategic Public Financial Management:** Improve incentives for citizens and providers to access cost-effective services through strategic budgeting, such as programmatic and performance-based financing and contracting systems with health facilities.
- **Improve Resource Distribution:** Strengthen routine needs-based resource allocation and traceability of acquisition and distribution of health care goods.
- **Enhance Service Mobility:** In conjunction with transportation and information technology solutions as well as public private partnerships, introduce interventions that routinely connect communities to health care centers.
- **Strengthen Governance:** Assess financial and non-financial incentives for health professionals to practice in lagging areas as well as options for cost-effective and routine monitoring and accounting systems of quality and responsiveness of health services.

Source: Compiled by author.

Statistical Annex

Annex 1. Data sources

Table 5. Sources of data and information

Information	Source
1. Public expenditure assessment	Public Expenditure Financial Accountability Assessment, 2008
2. Public expenditure data by economic classification	National Accounts for 2002-2007, Ministry of Finance (MoF)
3. Expenditure on amount of donor financing by vertical programs	MoF
4. Household health care consumption	Yemen Household Budget Survey 2005-6
5. Health facility data	Health Facility Survey 2007 Geographic Information Systems (GIS) Analysis, USAID/MoPHP
6. National Health Accounts and equity reports	*World Bank:* Health PER 1996 Five-Year Plan 2001 Health PER 2003, 1998-2003, 2003-2007 NHA 2000, 2007 HSR 2001 Country Social Analysis 2006 Socioeconomic Differences HNP 1997, 2000 Public Expenditure Review 1993-2006 (USAID) NHA 2006 (USAID)

Source: Author's summary.

Annex 2. Demographic and health indicators

Table 6. Yemen: Social and demographic indicators, 2007

Indicator	**Yemen**	Middle East & North Africa	World - Low income	World - Middle income	World - High income
GDP per capita, 2007 (current international dollar) (1)	**2,335**	7,208	1,520	6,095	36,237
Demographic Indicators (1)					
Fertility rate, total (births per woman)	**5.5**	2.8	4.2	2.2	1.8
Life expectancy at birth, total (years)	**62.7**	70.0	57.5	69.5	79.4
Life expectancy at birth, female (years)	**64.4**	71.9	58.6	71.9	82.4
Life expectancy at birth, male (years)	**61.1**	68.1	56.5	67.4	76.7
Population, total	**22,383,108**	313,249,333	1,295,785,124	4,258,198,721	1,056,272,785
Population ages 0-14 (% of total)	**45.0**	32.2	39.2	26.6	17.8
Population ages 15-64 (% of total)	**52.7**	63.4	57.2	66.6	67.2
Population ages 65 and above (% of total)	**2.3**	4.3	3.6	6.8	15.1
Age dependency ratio (dependents to working-age population)	**89.9**	58.7	76.5	50.7	49.0
Population density (people per sq. km)	**42.4**	36.2	61.1	56.8	31.5
Population growth (annual %)	**3.0**	1.7	2.2	1.0	0.7
Population, female (% of total)	**49**	49.7	49.8	49.3	50.6
Urban population (% of total)	**30.1**	57.2	31.7	48.1	77.5
Urban population growth (annual %)	**4.9**	2.2	3.6	2.1	1.0
Poverty headcount ratio at $1.25 a day (PPP) (% of population)	**18**	4	..	..	..
Improved sanitation facilities (% of population with access)	**46.0**	74.5	38.2	58.0	99.8
Improved sanitation facilities, rural (% of rural population with access)	**30.0**	58.6	33.3	43.2	99.2
Improved sanitation facilities, urban (% of urban population with access)	**88.0**	88.9	51.6	75.1	99.9
Human development index (HDI) (2)	**0.508**	0.699	0.570	0.776	0.936

(1) Source: Source: World Bank World Development Indicators, 2009. (2) Human Development Report, United Nations Development Program, 2005.

Table 7. Socioeconomic status indicators, Yemen and international benchmarks, 2007

	GDP per capita, PPP (constant 2005 international $)	Labor participation rate, female (% of female population ages 15+)	Literacy rate, adult female (% of females ages 15 and above)	Literacy rate, adult male (% of males ages 15 and above)	Literacy rate, adult total (% of people ages 15 and above)	Unemployment, total (% of total labor force)
Algeria	7210	35.6	66.4	84.3	75.4	12.3
Bahrain	28069	33.1	86.4	90.4	88.8	..
Djibouti	1892	58.1	..	..	..	..
Egypt	4530	23.5	57.8 (1)	74.6 (1)	66.4 (1)	..
Iran	9721	31.3	77.2 (1)	87.3 (1)	82.3 (1)	..
Iraq	..	14.1	..	..	..	..
Jordan	4627	15.7	87.0 (2)	95.2 (2)	91.1 (2)	..
Kuwait	45152	42.6	93.1	95.2	94.5	..
Lebanon	9402	24.7	86.0	93.4	89.6	..
Libya	12949	24.7	78.4	94.5	86.8	..
Malta	21387	31.7	93.5 (2)	91.2 (2)	92.4 (2)	7.1
Morocco	3822	25.8	43.2	68.7	55.6	9.7
Oman	20548	25.1	77.5	89.4	84.4	..
Qatar	..	39.9	90.4	93.8	93.1	..
Saudi Arabia	21372	18.6	79.4	89.1	85.0	6.3
Syria	4016	20.4	76.5	89.7	83.1	..
Tunisia	6743	26	69.0	86.4	77.7	..
United Arab Emirates	51586	38.7	91.5 (2)	89.5 (2)	90.0 (2)	..
West Bank and Gaza	..	14.4	90.3	97.2	93.8	23.6
Yemen	**2193**	**21.8**	**40.5**	**77.0**	**58.9**	**..**
Regional benchmarks						
Middle East & North Africa	6413	26	..	..	..	..
East Asia & Pacific	4235	66.6	..	..	..	..
Europe & Central Asia	10120	49.5	..	..	..	8.7
Euro area	30264	47.9	..	..	..	8.4
Latin America & Caribbean	9073	52.7	..	..	..	..
South Asia	2235	36.1	..	..	..	..
Sub-Saharan Africa	1808	59.6	..	..	..	..
Income-level benchmarks						
Low income	1180	64.6	..	..	..	..
Middle income	5094	50.6	..	..	..	..
High income	33657	52.1	..	..	..	5.9
International benchmarks						
Vietnam	2291	69.6	99.0	99.0	99.0	..
Nicaragua	2366	36.7	77.9 (2)	78.1 (2)	78.0 (2)	5.2
Bangladesh	1123	56.9	48.0	58.7	53.5	4.25
Sri Lanka	3776	42.6	89.1 (1)	92.7 (1)	90.8 (1)	6.5
Indonesia	3335	48.8	88.8 (1)	95.2 (1)	92.0 (1)	10.3
Kyrgyz Republic	1765	53.5	99.1	99.5	99.3	8.3

Source: World Bank World Development Indicators, 2010. Data shows most recent values (2007), except where noted: 1. Data for 2006. 2. Data for 2005.

Table 8. Primary health indicators, Yemen and international benchmarks, 2000-2006.

	GDP per capita, (constant 2006 PPP $) (1)	Immunization, measles, 2005 (% of children ages 12-23 months) (1)	% of infants with low birth weight 1999-2006 (2)	Malnutrition prevalence, underweight for age, 2000-2006 (% of children under 5) (2)	Skilled attendant at delivery (%), 2000-2006 (2)	Maternal mortality ratio, 2005 (deaths per 100,000 live births) (2)	Mortality rate, infant, 2006 (per 1,000 live births) (1)	Mortality rate, under-5, 2006 (per 1,000) (1)	Antenatal care coverage - at least one visit, 2000-2008 (%)(3)	Antenatal care coverage - at least four visits, 2000-2008 (%) (3)
Algeria	7210	91.0	6.0	4.0	95.0	180.0	33.4	38.0	89	41
Bahrain	28069	99.0	8.0	9.0	98.0	32.0	9.2	10.4	…	…
Djibouti	1892	67.0	10.0	29.0	61.0	650.0	86.2	130.2	92	7
Egypt	4530	98.0	14.0	6.0	74.0	130.0	31.3	38.0	74	65
Iran	9721	99.0	7.0	11.0	90.0	140.0	30.0	34.4	…	94
Iraq	..	69.0	15.0	8.0	89.0	300.0	36.3	44.8	84	…
Jordan	4627	99.0	12.0	4.0	100.0	62.0	21.4	25.2	99	94
Kuwait	45152	99.0	7.0	10.0	98.0	4.0	9.5	11.4	…	…
Lebanon	9402	53.0	6.0	4.0	98.0	150.0	26.2	29.7	96	76
Libya	12949	98.0	7.0	5.0	94.0	97.0	17.0	18.4	…	…
Malta	21387	94.0	..	..	100.0	..	4.5	5.6	..	..
Morocco	3822	95.0	15.0	10.0	63.0	240.0	34.2	37.2	68	31
Oman	20548	96.0	8.0	18.0	95.0	64.0	..	..	100	83
Qatar	..	99.0	10.0	6.0	99.0	12.0	12.7	15.4	…	…
Saudi Arabia	21372	95.0	11.0	14.0	91.0	18.0	20.6	25.4	…	…
Syria	4016	98.0	9.0	10.0	93.0	130.0	15.4	17.6	84	42
Tunisia	6743	98.0	7.0	4.0	90.0	100.0	19.0	22.6	92	68
United Arab Emirates	51586	92.0	15.0	14.0	99.0	37.0	7.5	8.2	…	…
West Bank and Gaza	~3500	99.0 (2)	7.0	3.0	99.0	..	20.0 (2)	22.0 (2)	99	98.8
Yemen	**2193**	**80.0**	**32.0**	**46.0**	**27.0**	**430.0**	**75.0 (2)**	**100.0 (2)**	**47**	**14**
Regional benchmarks										
Middle East & North Africa	6413	91.4	16.0	17.0	79.0	210.0	29.8	35.5	72.0 (2)	..
East Asia & Pacific	4235	89.9	6.0	14.0	87.0	150.0	..	..	89.0 (2)	..
Europe & Central Asia	10120	97.2	6.0	5.0	95.0	46.0	22.2	25.3	90.0 (2)	..
Euro area	30264	91.2		..		..	3.7	4.5		..
Latin America & Caribbean	9073	92.9	9.0	7.0	..	130.0	23.8	28.2	94.0	..
South Asia	2235	71.5	29.0	42.0	41.0	500.0	..	..	65.0	..
Sub-Saharan Africa	1808	70.6	14.0	28.0	43.0	920.0	..	..	69.0 (2)	..
Income-level benchmarks										
Low income	1180	77.3	17.0	35.0	38.0	870.0	..	..	61.0	..
Middle income	5094	81.5	16.0	26.0	59.0	450.0	..	..	75.0	..
High income	33657	92.9	7.0	..	99.0	8.0	5.2	6.3	..	..
International benchmarks										
Vietnam	2291	93.0	7.0	25.0	88.0	150.0	..	..	91	29
Nicaragua	2366	99.0	12.0	10.0	67.0	170.0	29.2	35.8	90	78
Bangladesh	1123	88.0	22	48	20.0	570.0	49.3	64.1	51	21
Sri Lanka	3776	99.0	22.0	23.0	96.0	58.0	..	..	99	…
Indonesia	3335	80.0	9.0	28.0	72.0	420.0	26.4	33.6	93	81
Kyrgyz Republic	1765	97.0	5.0	3.0	98.0	150.0	34.7	40.0	97	96.9

Source: Most recent data obtained from: 1. World Bank World Development Indicators, 2010. 2. UNICEF State of the World's Children Report, 2008. 3. World Health Organization World Health Statistics, 2009.

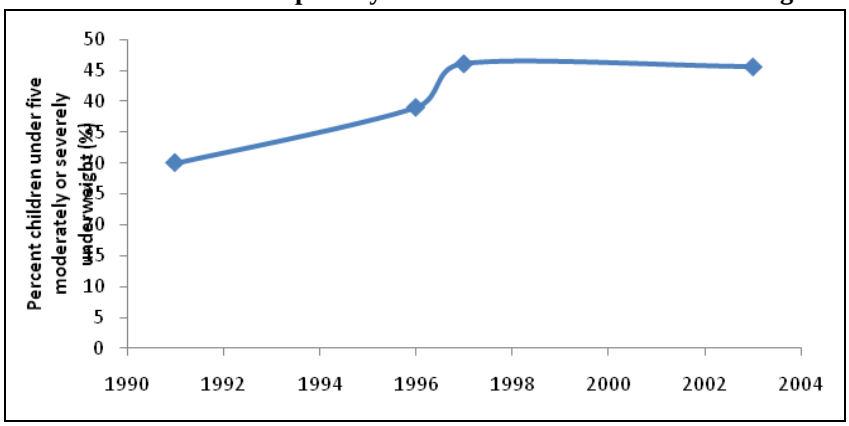
Annex 3. Millennium Development Goals indicators

Table 9. MDG Progress Summary for Yemen, 2010

MDG	*Achieved*	*Very likely on track*	*Possible with changes*	*Off Track*
(1) Eradicate extreme poverty and hunger				
(2) Achieve universal primary education				
(3) Promote gender equality and empower women				
(4) Reduce child mortality				
(5) Improve maternal health				
(6) Combat HIV/AIDS, malaria and other diseases				
(7) Ensure environmental sustainability				
(8) Develop a global partnership for development				

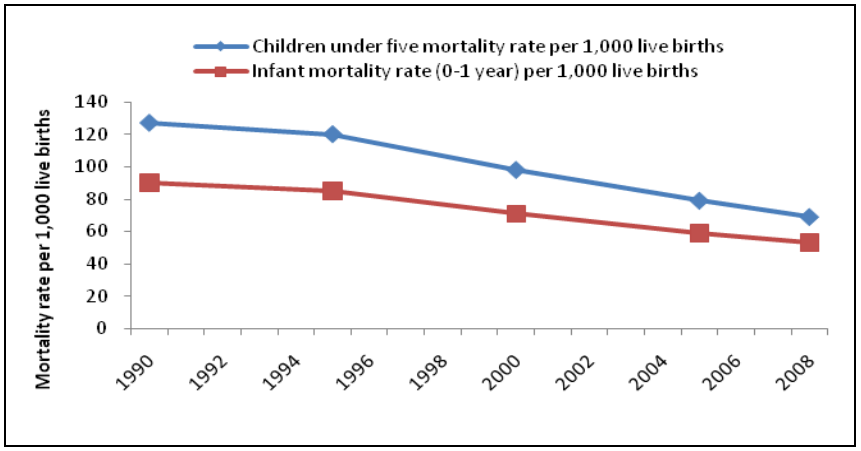
Source: For MDG 2 data is from Yemen MOE; for all except MDG 2 the source is Millenium Development Goals Database 2010, United Nations Statistics Division, Department of Economic and Social Affairs, United Nations. Available from: http://www.mdgmonitor.org/country_progress.cfm?c=YEM&cd=887

Figure 16. MDG 1: Eradicate poverty - Prevalence of malnutrition among children



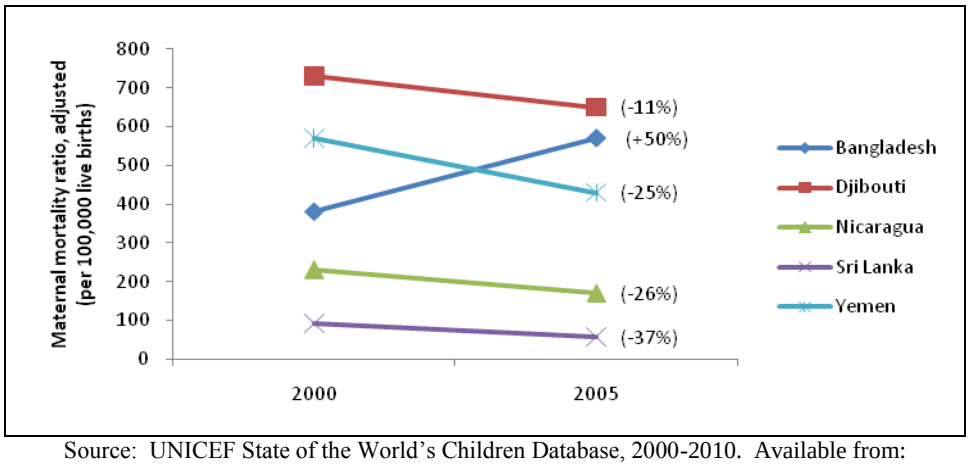
Millenium Development Goals Database 2010, United Nations Statistics Division, Department of Economic and Social Affairs, United Nations. Available from: http://mdgs.un.org

Figure 17. MDG 4: Reduce child mortality



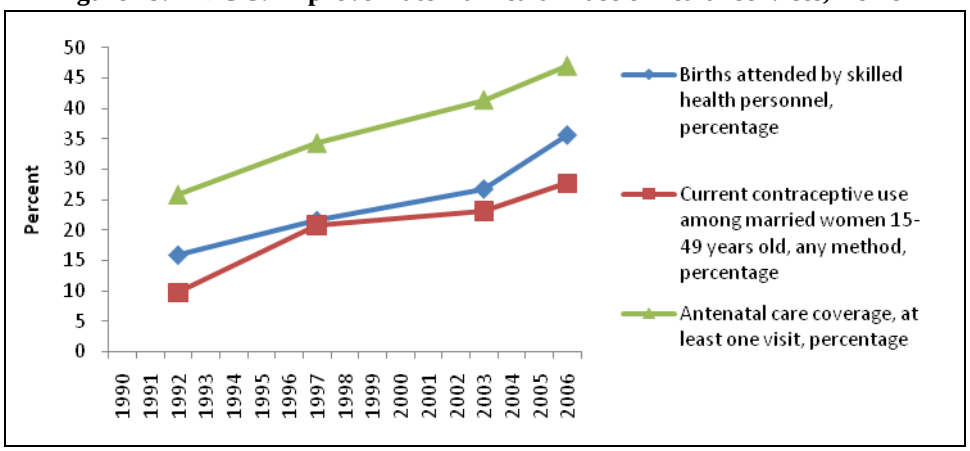
Millenium Development Goals Database 2010, United Nations Statistics Division, Department of Economic and Social Affairs, United Nations. Available from: http://mdgs.un.org

Figure 18. MDG 5: Improve maternal health - Maternal mortality rate, Yemen and international benchmarks



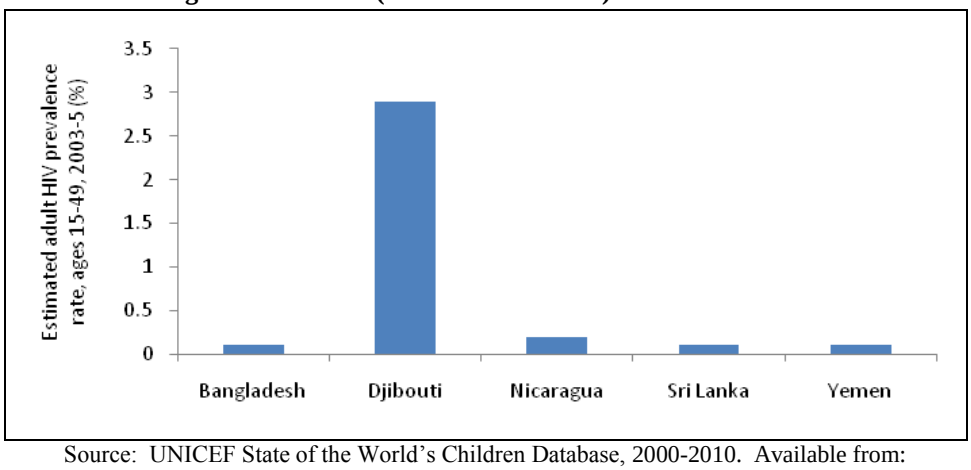
Source: UNICEF State of the World's Children Database, 2000-2010. Available from: http://www.unicef.org/statistics/index_step1.php

Figure 19. MDG 5: Improve maternal health - use of health services, Yemen



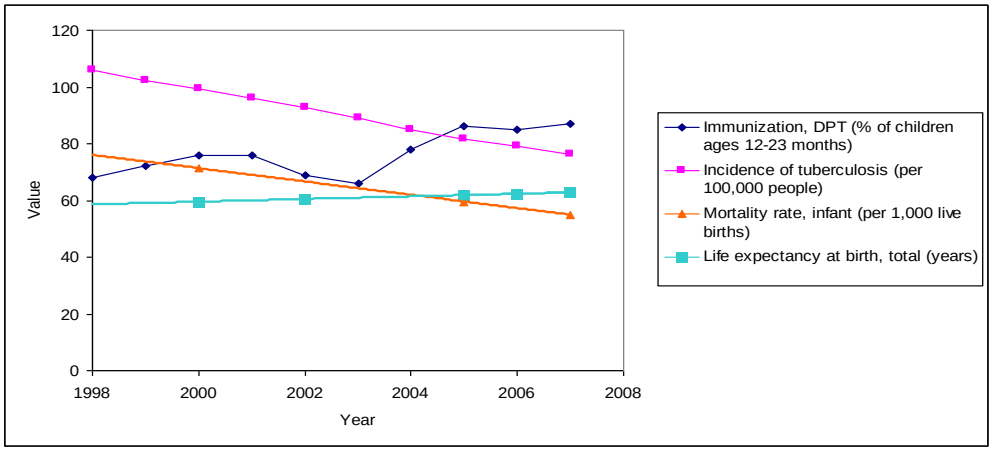
Source: Millenium Development Goals Database 2010, United Nations Statistics Division, Department of Economic and Social Affairs, United Nations. Available from: http://mdgs.un.org

Figure 20. MDG 6 (HIV/Malaria/other): HIV Prevalence



Source: UNICEF State of the World's Children Database, 2000-2010. Available from: http://www.unicef.org/statistics/index_step1.php

Figure 21. MDG 6 (HIV/Malaria/other): DPT Immunization and Tuberculosis, 1998-2007

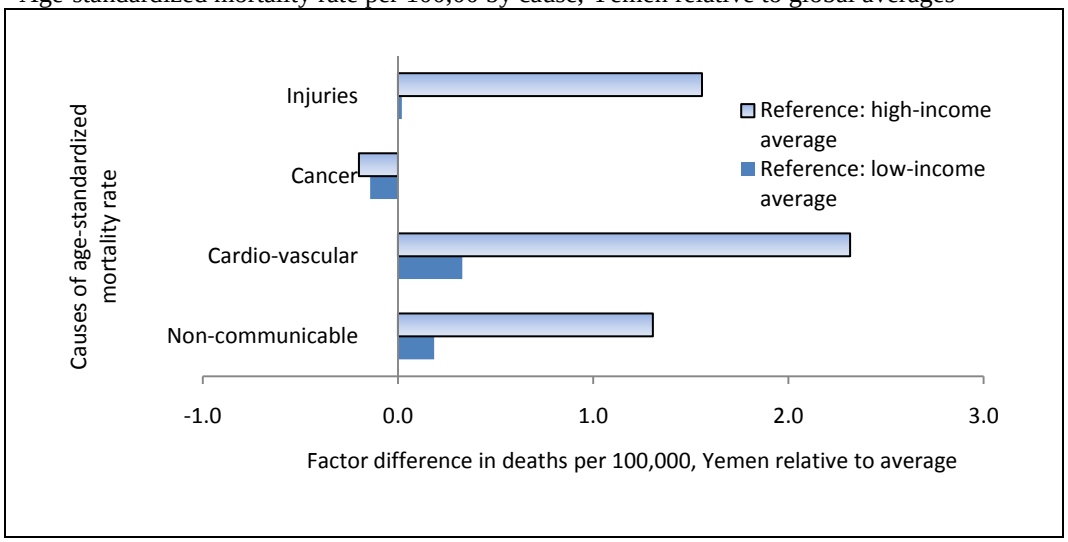


Source: World Development Indicators, World Bank

Annex 4. Burden of disease indicators

Figure 22. All mortality by cause, Yemen, 2004

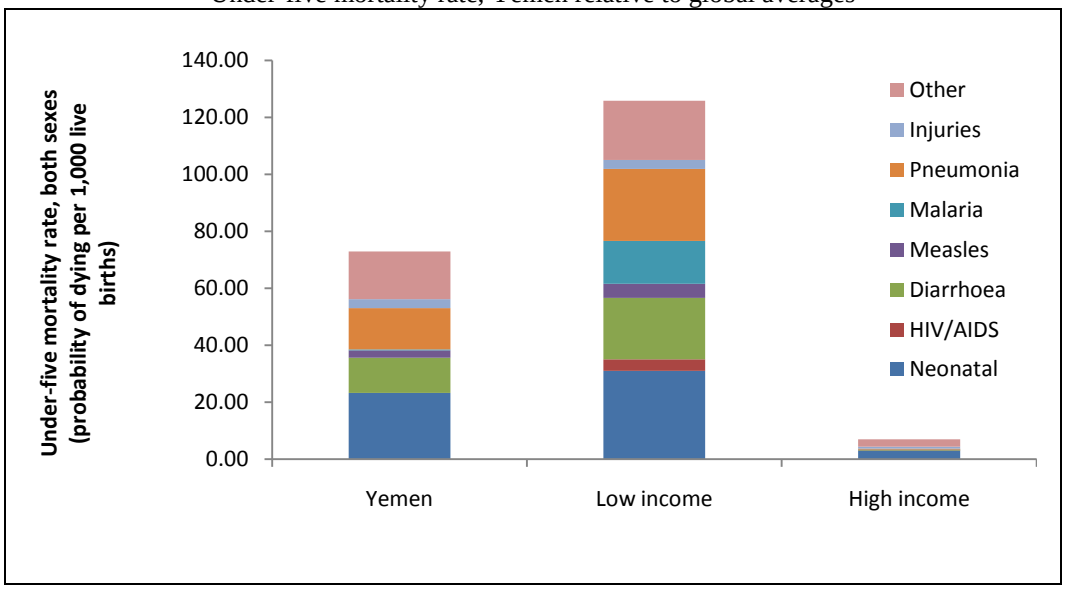
Age-standardized mortality rate per 100,00 by cause, Yemen relative to global averages



Source: World Health Report 2009, World Health Organization.

Figure 23. Under-five mortality by cause, Yemen, 2007

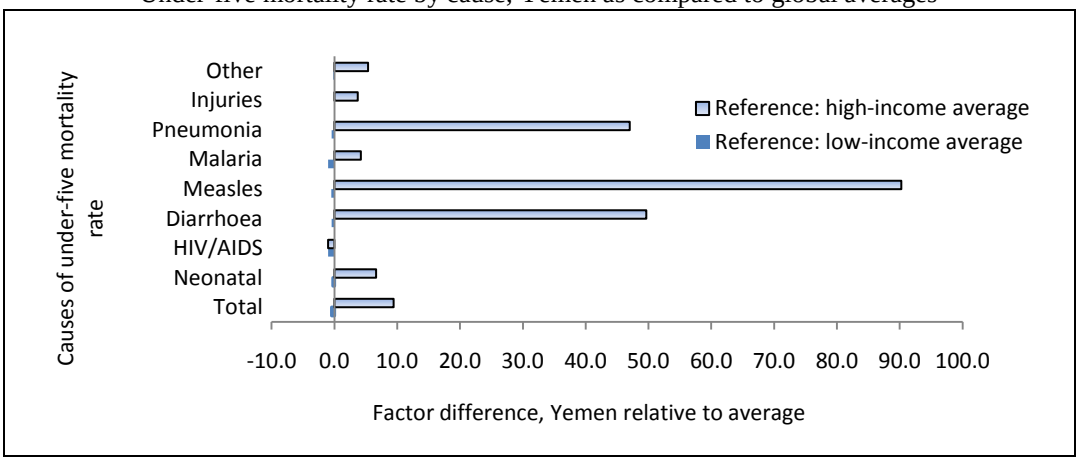
Under-five mortality rate, Yemen relative to global averages



Source: World Health Report 2009, World Health Organization.

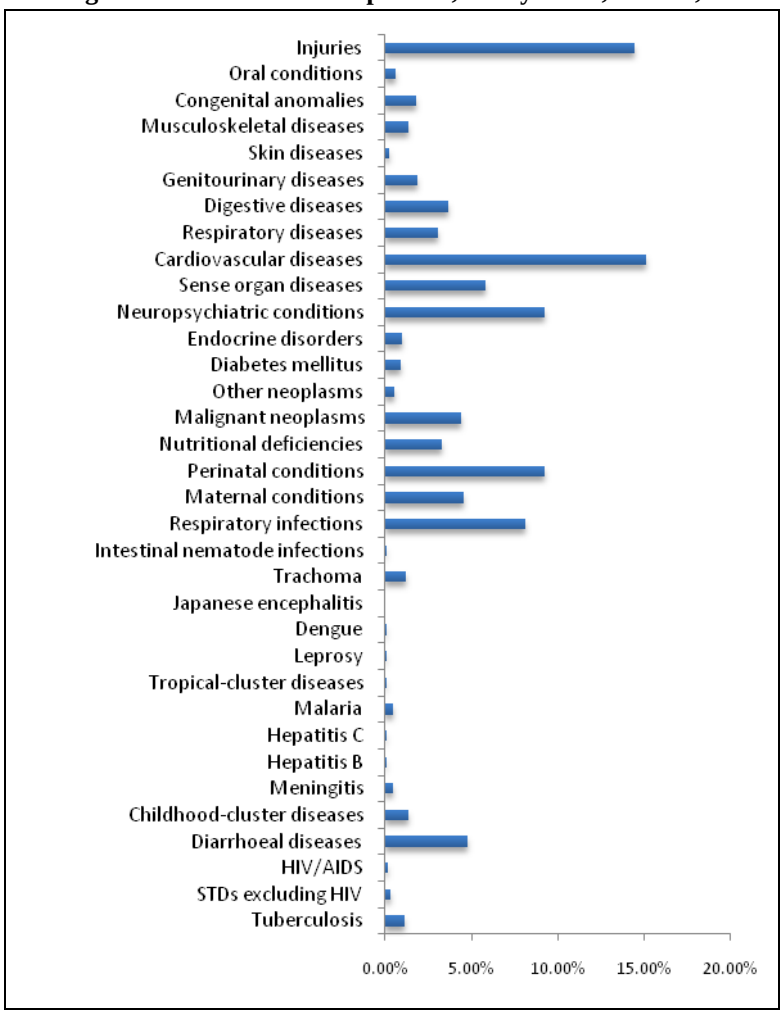
Figure 24. Relative differences in under-five mortality, 2007

Under-five mortality rate by cause, Yemen as compared to global averages



Source: World Health Report 2009, World Health Organization.

Figure 25. Age-standardized DALYs per 100,000 by cause, Yemen, 2004



Source: Mortality and global burden of disease estimates for WHO Member States in 2004, World Health Organization, 2009.

Table 10. Regional distribution of selected health conditions based on International Classification of Disease - Version 10 (ICD-10), 2007

Governorate	Population, 2007	Per capita MOPHP expenditure (YR)	Schistosomiasis (no. cases)	Incidence per 10,000	% of all cases	Malnutrition (no. cases)	Incidence per 10,000	% of all cases	Diarrhea/ Gastroenteritis (no. cases)	Incidence per 10,000	% of all cases	Diseases of upper respiratory tract (no. cases)	Incidence per 10,000	% of all cases
Abyan	465,261	3,205	349	7.5	0.6%			0.0%	14715	316.3	4.0%	25040	538.2	6.4%
Aden	658,644	5,788	506	7.7	0.9%			0.0%	7354	111.7	2.0%			
Al-Baidah	619,773	1,025	14	0.2	0.0%			0.0%	370	6.0	0.1%			
Al-Dhal'a	522,426	1,234	1761	33.7	3.1%	698	13.4	2.1%	10348	198.1	2.8%	22759	435.6	5.8%
Al-Hudaidah	2,374,990	753	0		0.0%	10308	43.4	30.5%	68012	286.4	18.3%	65876	277.4	16.9%
Al-jouf	477,110	717	343	7.2	0.6%			0.0%	284	6.0	0.1%	883	18.5	0.2%
Al-Mahera	101,134	4,248			0.0%			0.0%	5981	591.4	1.6%	4273	422.5	1.1%
Al-Mahweet	538,193	889	1107	20.6	1.9%	182	3.4	0.5%	9808	182.2	2.6%			0.0%
Amran	926,536	1,077	1878	20.3	3.3%	2872	31.0	8.5%	32657	352.5	8.8%	17739	191.5	4.5%
Dhamar	1,455,037	872	3740	25.7	6.5%	2539	17.4	7.5%	30292	208.2	8.1%	44093	303.0	11.3%
Hadramout Coast	656,401				0.0%			0.0%						
Hadramout Valley	492,285	2,838			0.0%			0.0%						
Hajjah	1,618,615	648	2474	15.3	4.3%			0.0%	40186	248.3	10.8%	0	0.0	0.0%
Ibb	2,293,860	931	24593	107.2	42.8%	0	0.0	0.0%	37936	165.4	10.2%	55582	242.3	14.2%
Lahej	781,154	2,697	7560	96.8	13.2%			0.0%		0.0	0.0%			
Marib	258,511	3,811			0.0%			0.0%						
Raimah	431,317	755	1388	32.2	2.4%			0.0%	14317	331.9	3.8%	15108	350.3	3.9%
Sada,a	774,356	829	2150	27.8	3.7%	2588	33.4	7.7%	19913	257.2	5.3%	21238	274.3	5.4%
Sana'a	977,692	1,118	5710	58.4	9.9%			0.0%	42958	439.4	11.5%	66133	676.4	17.0%
Sana'a City	2,055,158	1,689	3412	16.6	5.9%	9216	44.8	27.3%	14786	71.9	4.0%	12397	60.3	3.2%
Shabwa	507,200	2,384	483	9.5	0.8%	5386	106.2	15.9%	22402	441.7	6.0%	18055	356.0	4.6%
Taiz	2,575,014	1,061			0.0%			0.0%				20952	81.4	5.4%
Total	**21,538,651**	**1,432**	**57468**	**26.7**	**100.0%**	**33789**	**15.7**	**100.0%**	**372319**	**172.9**	**100.0%**	**390128**	**181.1**	**100.0%**

Source: Yemen Annual Statistical Health Report 2007. Note: Data based on all health facilities reporting by ICD-10 classification (public and/or private unknown).

Annex 5. Health expenditures

Table 11. National health expenditures (EXP) in Yemen as compared to MENA countries and regional averages, 2006

	GDP per capita, PPP (constant 2005 PPP $)	Health EXP per capita (current US$)	Health EXP, total (% of GDP)	Health EXP, public (% of GDP)	Health EXP, private (% of GDP)	Health EXP, public (% of govern-mental EXP	Health EXP, public (% of total health EXP)	External resources for health (% of total EXP on health)	Out-of-pocket health EXP (% of private EXP on health)
Algeria	7210	148	4.2	3.4	0.8	11.9	81.1	0.1	94.6
Bahrain	28069	788	3.6	2.5	1.1	9.5	68.2	0.0	68.0
Djibouti	1892	63	6.8	5.0	1.8	13.4	74.1	30.1	98.6
Egypt	4530	92	6.3	2.6	3.7	7.3	41.4	0.8	94.9
Iran	9721	215	6.8	3.4	3.4	11.5	50.7	0.1	94.8
Iraq	..	..	4.3	2.7	1.6	3.4	63.2	11.0	100.0
Jordan	4627	238	9.7	4.2	5.5	8.7	43.3	4.7	75.9
Kuwait	45152	803	2.2	1.7	0.5	4.9	78.2	0.0	91.6
Lebanon	9402	494	8.8	3.9	4.9	11.3	44.3	1.9	76.1
Libya	12949	219	2.4	1.6	0.8	5.4	66.3	0.0	100.0
Malta	21387	1308	8.4	6.5	1.9	14.7	77.0	0.0	90.4
Morocco	3822	113	5.3	1.4	3.9	4.8	26.2	2.5	77.3
Oman	20548	332	2.3	1.9	0.4	5.4	82.3	0.0	57.7
Qatar	..	2759	4.3	3.4	0.9	9.7	78.2	0.0	88.2
Saudi Arabia	21372	492	3.3	2.5	0.8	8.7	77.0	0.0	13.4
Syrian	4016	66	3.9	1.9	2.0	6.0	47.8	0.8	100.0
Tunisia	6743	156	5.1	2.3	2.8	6.7	44.2	0.9	81.7
United Arab Emirates	51586	1018	2.5	1.8	0.7	8.7	70.4	0.0	69.4
West Bank and Gaza	..	..	..	..	..	..	..	..	..
Yemen	2193	40	4.5	2.1	2.4	5.6	46.0	24.8	95.2
Middle East & North Africa	6413	134	5.7	2.8	2.8	9.4	50.8	1.8	90.7
East Asia & Pacific	4235	83	4.3	1.8	2.5	9.8	42.1	0.5	82.1
Europe & Central Asia	10120	299	5.4	3.6	1.9	10.3	65.7	0.3	85.5
Euro area	30264	3234	9.8	7.5	2.3	16.0	76.5	0.0	61.4
Latin America & Caribbean	9073	375	7.0	3.4	3.5	..	49.9	0.3	72.3
South Asia	2235	26	3.5	0.9	2.6	3.5	25.8	2.5	91.4
Sub-Saharan Africa	1808	53	5.7	2.4	3.4	..	41.5	9.8	46.4
Low income	1180	22	5.3	2.2	3.1	..	41.1	22.1	80.5
Middle income	5094	131	5.3	2.6	2.7	9.5	49.5	0.6	77.9
High income	33657	3998	11.2	6.9	4.3	17.0	61.6	0.0	36.9
Vietnam	2291	46	6.6	2.1	4.5	6.4	32.3	2.2	90.2
Nicaragua	2366	92	9.6	4.6	5.0	17.0	48.2	7.7	98.1
Bangladesh	1123	12	3.2	1.0	2.2	7.0	31.8	15.8	88.3
Sri Lanka	3776	62	4.2	2.0	2.2	8.3	47.5	1.1	86.7
Indonesia	3335	39	2.5	1.3	1.2	6.2	50.5	2.2	70.4
Kyrgyz Republic	1765	35	6.4	2.8	3.6	8.7	43.0	10.0	94.1

Source: World Development Indicators, World Bank, Accessed 5 June 2009. Data reflect 2006 values.

Table 12. Governmental health expenditure trends, 1998-2007

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Government Health Expenditure	11,661	15,234	20,790	23,642	24,211	30,832	55,980	59,077	71,337	78,866
Recurrent (million YR)	8,299	11,501	15,241	18,556	18,737	22,459	33,715	41,098	51,368	60,729
Capital & Development (million YR)	3,362	3,733	5,549	5,086	5,474	8,373	22,265	17,978	19,970	18,137
As % of Government Health Expenditure										
Recurrent (%)	71.2	75.5	73.3	78.5	77.4	72.8	60.2	69.6	72.0	77.0
Capital (%)	28.8	24.5	26.7	21.5	22.6	27.2	39.8	30.4	28.0	23.0
Government health expenditure as % of total governmental expenditure (%)	4.6	4.4	4.1	4.5	4.1	4.0	6.29	4.95	4.98	4.49
Government health expenditures as % of GDP at current market prices (%)	1.4	1.3	1.4	1.5	1.3	1.5	2.1	1.74	1.7	1.6
Population, total (millions)	17.1	17.7	18.2	18.7	19.3	19.9	20.5	21.1	21.7	22.4
PPP conversion factor, GDP (LCU per international $)	28.73	37.35	45.97	44.85	46.24	50.99	60.52	69.49	76.50	82.67
Governmental health expenditure per capita (YR)	680	863	1143	1262	1255	1551	2734	2800	3283	3523
Governmental health expenditure per capita (constant international $, PPP)	24	23	25	28	27	30	45	40	43	43
Treatment abroad as% of governmental health expenditure (%)	7					3.59				3.56

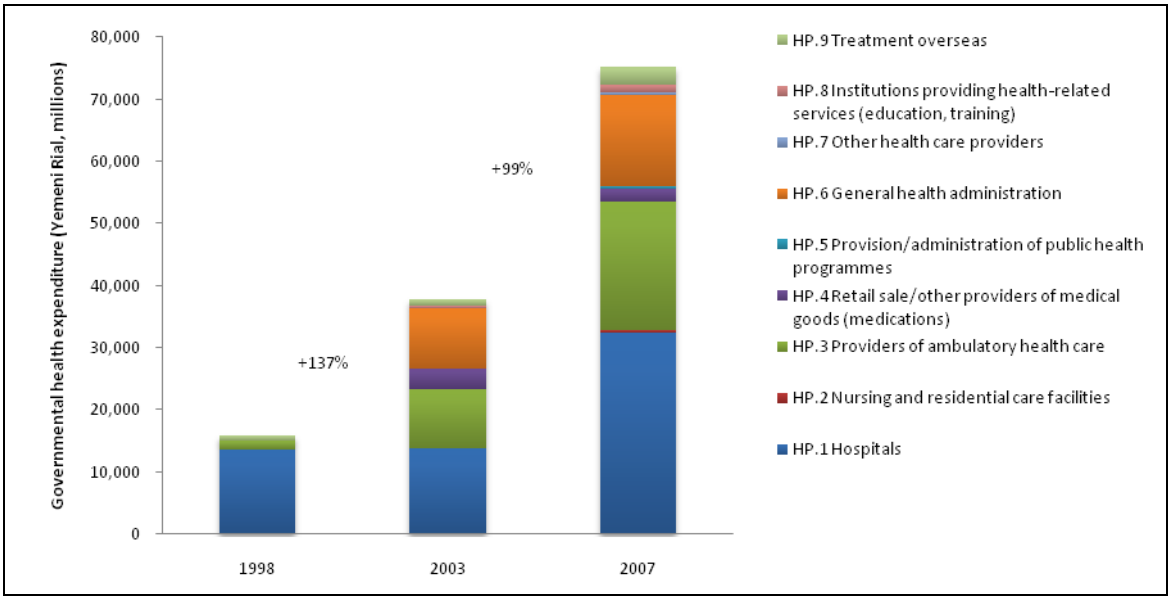
Source: MoF, CSO Annual Reports. Author's calculations.

Table 13. Annual percentage change in governmental health expenditures, 1998-2007

Year	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007
Government Health Expenditure (%)	30.6	36.5	13.7	2.4	27.3	81.6	5.5	20.8	10.6
Recurrent	38.6	32.5	21.8	1.0	19.9	50.1	21.9	25.0	18.2
Capital & Development	11.0	48.6	-8.3	7.6	53.0	165.9	-19.3	11.1	-9.2
As % of Government Health Expenditure (%)									
Recurrent	6.1	-2.9	7.1	-1.4	-5.9	-17.3	15.5	3.5	6.9
Capital	-15.0	8.9	-19.4	5.1	20.1	46.5	-23.5	-8.0	-17.8
Government health expenditure as % of total governmental expenditure (%)	-4.3	-6.8	9.8	-8.9	-2.4	57.3	-21.3	0.6	-9.8
Government health expenditures as % of GDP at current market prices (%)	-7.1	7.7	7.1	-13.3	15.4	40.0	-17.1	-2.3	-5.9
Governmental health expenditure per capita (% in YR)	26.8	32.5	10.4	-0.6	23.6	76.2	2.4	17.2	7.3
Governmental health expenditure per capita (% in constant international $, PPP)	-2.4	7.7	13.2	-3.6	12.1	48.5	-10.8	6.5	-0.7
Treatment abroad as % of governmental health expenditure (%)					-48.7				-0.9

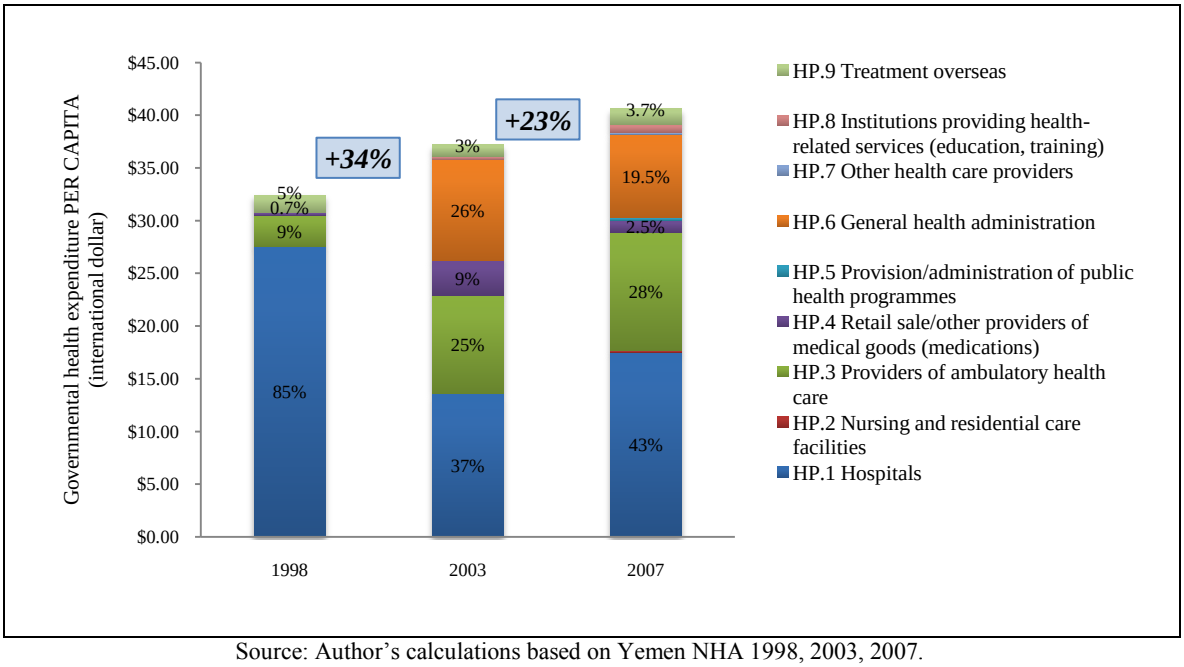
Source: MoF, CSO Annual Reports; Fairbank et al, NHA/PER 1999-2003 and 2004-2007.

Figure 26. Governmental health expenditures in Yemeni Rials by functional classification, 1998-2007



Source: Author's calculations based on Yemen NHA 1998, 2003, 2007.

Figure 27. Governmental health expenditures per capita in international dollar by functional classification, 1998-2007



Source: Author's calculations based on Yemen NHA 1998, 2003, 2007.

Table 14. Type of expenditure by governmental level following decentralization reforms.

Type of Expenditure	2004		2005		2006		2007	
Governmental level	YR (MM)	%	YR (MM)	%	YR (MM)	%	YR (MM)	%
Recurrent expenditure	**33,715**	**60%**	**41,098**	**70%**	**51,367**	**72%**	**60,729**	**77%**
Central authority	19,077	57%	23,207	56%	29,092	54%	34,074	56%
Local authority	14,638	43%	17,891	44%	22,275	41%	26,655	44%
Capital and investment expenditure	**22,266**	**40%**	**17,978**	**30%**	**19,969**	**28%**	**18,137**	**23%**
Central authority	19,393	87%	13,729	76%	16,441	82%	13,894	77%
Local authority	2,873	13%	4,249	24%	3,528	18%	4,243	23%
Total expenditure	**55,980**	**100%**	**59,077**	**100%**	**71,337**	**100%**	**78,866**	**100%**
Central authority	38,470	69%	36,937	63%	45,534	64%	47,968	61%
Local authority	17,510	31%	22,140	37%	25,803	36%	30,898	39%

Note: 'Central authority' denotes expenditure at the central level by the MoPHP agencies and other central administrations such as ministries and funds (Yemen NHA 2007).

Table 15. Average out-of-pocket spending on health care in Yemen and MENA countries

	GDP per capita, 2006 (current US $)	**OOP as % THE (%)**	**Average OOP as % HH Income (%)**		
Country			Total	Urban	Rural
Yemen	882	58	2.7	2.8	2.5
West Bank-Gaza	1,187	40	3.1	3.3	3.2
Egypt	1,489	62	8.9	9.2	8.5
Tunisia	3,072	56	4.6	4.4	4.8
Iran	3,152	44	5.1	4.9	6.1
Lebanon	6,060	75	6.6	n/a	n/a

Sources: GDP data: Current international dollar; World Economic Outlook, April 2009 Database, International Monetary Fund; West Bank-Gaza based on IMF West Bank-Gaza Staff Report February 25, 2009. Staff calculations based on national household survey data, Egypt figures based on HIECS 2004/5 for total expenditure and HIS 2006 for OOP; urban and rural figures estimated; West Bank-Gaza, Palestinian Consumption and Expenditure Survey, 2006; OOP as % THE from West Bank-Gaza Health Policy Note, World Bank, 2009[15]. Notes: GDP = Gross domestic product, purchasing power parity exchange rate. OOP = out-of-pocket expenditures on health care. THE = total health expenditures at country level. HH = household.

Table 16. Total health expenditures by health care providers and financing intermediary, 1998-2007

	1998					2003					2007				
Code / Health Providers	**Public**	**Households**	**Other Private**	**Rest of world**	**Total**	**Public**	**Households**	**Other Private**	**Rest of world**	**Total**	**Public**	**Households**	**Other Private**	**Rest of world**	**Total**
(YR millions)															
HP.1 Hospitals	13,517	6,153	828	0	20,498	13,825	3,125	140	0	17,090	32,470	34,937	241	6,494	74,142
HP.2 Nursing and residential care facilities					0	0	0	0	0	0	275	9	0	0	283
HP.3 Providers of ambulatory health care	1,454	720	95	0	2,269	9,367	7,019	315	0	16,701	20,730	33,779	433	842	55,783
HP.4 Retail sale/other providers of medical goods (medications)	109	14,180	0	0	14,289	3,372	26,107	1,175	0	30,654	2,149	75,705	163	0	78,017
HP.5 Provision/administration of public health programs					0	0	0	0	0	0	440	734	14	0	1,189
HP.6 General health administration					0	9,764	0	0	0	9,764	14,690	0	14	272	14,976
HP.7 Other health care providers	0	0	27	611	638	0	0	0	8,975	8,975	264	0	119	0	383
HP.8 Institutions providing health-related services (education, training)					0	325	0	0	0	325	1,397	0	0	0	1,397
HP.9 Treatment overseas	829	2,567	204	0	3,599	1,108	31,253	1,400	0	33,761	2,810	28,276	158	0	31,244
TOTAL	**15,908**	**23,620**	**1,155**	**611**	**41,294**	**37,761**	**67,504**	**3,030**	**8,975**	**117,270**	**75,224**	**173,440**	**1,142**	**7,608**	**257,414**
Percentage change						***137.4%***	***185.8%***	***162.4%***	***1368.4%***	***184.0%***	***99.2%***	***156.9%***	***-62.3%***	***-15.2%***	***119.5%***
(International $, millions)															
PPP conversion factor, GDP (LCU per international $)			28.7					51.0					82.7		
HP.1 Hospitals	471	214	29	0	714	271	61	3	0	335	393	422	3	79	897
HP.2 Nursing and residential care facilities	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3
HP.3 Providers of ambulatory health care	51	25	3	0	79	184	138	6	0	327	251	408	5	10	675
HP.4 Retail sale/other providers of medical goods (medications)	4	494	0	0	498	66	512	23	0	601	26	915	2	0	943
HP.5 Provision/administration of public health programs	0	0	0	0	0	0	0	0	0	0	5	9	0	0	14
HP.6 General health administration	0	0	0	0	0	191	0	0	0	191	178	0	0	3	181
HP.7 Other health care providers	0	0	1	21	22	0	0	0	176	176	3	0	1	0	5
HP.8 Institutions providing health-related services (education, training)	0	0	0	0	0	6	0	0	0	6	17	0	0	0	17
HP.9 Treatment overseas	29	89	7	0	125	22	613	27	0	662	34	342	2	0	378
TOTAL	**554**	**823**	**40**	**21**	**1,439**	**740**	**1,324**	**59**	**176**	**2,299**	**910**	**2,097**	**14**	**92**	**3,113**
Percentage change						***33.6%***	***60.8%***	***47.7%***	***726.3%***	***59.8%***	***22.9%***	***58.4%***	***-76.8%***	***-47.7%***	***35.4%***
(Per capita international dollar)															
Population (millions)			17.1					19.9					22.4		
HP.1 Hospitals	27.54	12.54	1.69	0.00	41.77	13.62	3.08	0.14	0.00	16.84	17.53	18.86	0.13	3.51	40.02
HP.2 Nursing and residential care facilities	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.15
HP.3 Providers of ambulatory	2.96	1.47	0.19	0.00	4.62	9.23	6.92	0.31	0.00	16.46	11.19	18.23	0.23	0.45	30.11

	1998					2003					2007				
Code / Health Providers	**Public**	**Households**	**Other Private**	**Rest of world**	**Total**	**Public**	**Households**	**Other Private**	**Rest of world**	**Total**	**Public**	**Households**	**Other Private**	**Rest of world**	**Total**
health care															
HP.4 Retail sale/other providers of medical goods (medications)	0.22	28.89	0.00	0.00	29.12	3.32	25.72	1.16	0.00	30.20	1.16	40.87	0.09	0.00	42.11
HP.5 Provision/administration of public health programs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.40	0.01	0.00	0.64
HP.6 General health administration	0.00	0.00	0.00	0.00	0.00	9.62	0.00	0.00	0.00	9.62	7.93	0.00	0.01	0.15	8.08
HP.7 Other health care providers	0.00	0.00	0.06	1.25	1.30	0.00	0.00	0.00	8.84	8.84	0.14	0.00	0.06	0.00	0.21
HP.8 Institutions providing health-related services (education, training)	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.32	0.75	0.00	0.00	0.00	0.75
HP.9 Treatment overseas	1.69	5.23	0.42	0.00	7.33	1.09	30.79	1.38	0.00	33.27	1.52	15.26	0.09	0.00	16.87
TOTAL	**32.41**	**48.13**	**2.35**	**1.25**	**84.14**	**37.21**	**66.51**	**2.99**	**8.84**	**115.55**	**40.61**	**93.63**	**0.62**	**4.11**	**138.96**

Source: Author's calculations based on Yemen NHA 1998, 2003, 2007 and Public Health Expenditure Review 1999-2003 and 2004-2007.

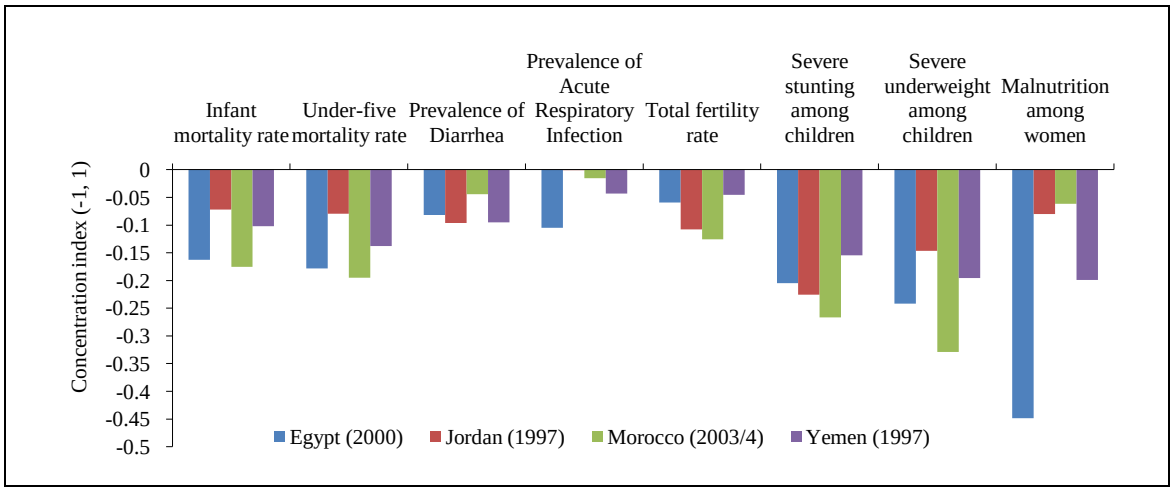
Table 17. Total health expenditures on treatment abroad, Yemen, 1998-2007

	1998			2003					2007				
Currency, millions	YR	US $ (PPP)	% of Total	YR	US $ (PPP)	% of Total	Percentage Change, % of total (%)	Percentage Change, $ spent (%)	YR	US $ (PPP)	% of Total	Percentage Change, % of total (%)	Percentage Change, $ spent (%)
Total health expenditure	41,294	1,439	100%	117,270	2,299	100%	n/a	60%	257,414	3,113	100%	n/a	
Total expenditure on treatment abroad	4,419	154	11%	33,761	662	29%	169%	330%	31,244	378	12%	-58%	35%
Governmental sources	1,017	35	*23%*	1,108	22	*3%*	-86%	-39%	2,810	34	*9%*	174%	-43%
Households	3,152	110	*71%*	31,253	613	*93%*	30%	458%	28,276	342	*91%*	-2%	56%
Other (private employers, charities)	250	9	*6%*	1,400	27	*4%*	-27%	215%	158	2	*1%*	-88%	-44%
Total governmental health expenditure (GHE)	14,458	504	35%	37,759	740	32%	-8%	47%	78,866	954	31%	-5%	-93%
Government treatment abroad as % GHE			*7%*			*3%*	-58%				*4%*	21%	29%
PPP conversion factor, GDP (LCU per international $)	28.7			51.0					82.7				

Source: Author's calculations based on Yemen NHA 1998, 2003, 2007 and Public Health Expenditure Review 1999-2003 and 2004-2007.

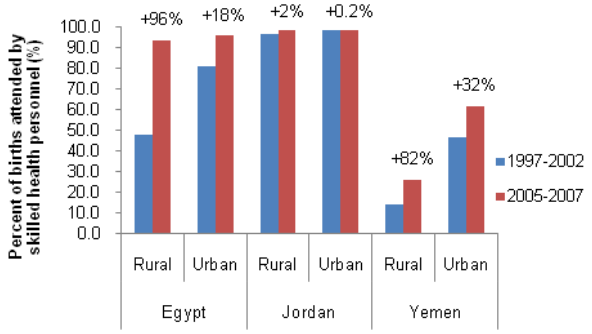
Annex 6. Health status inequalities

Figure 28. Income inequality in maternal and child health indicators in Yemen and selected MENA countries, 1997-2003.



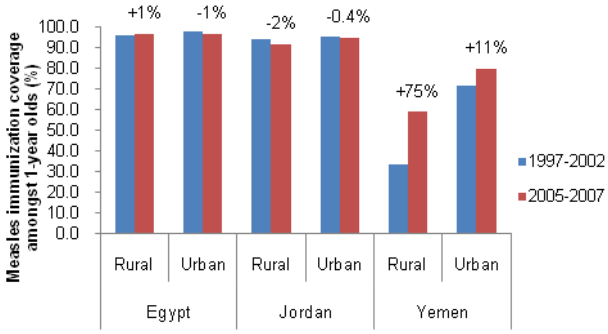
Source: Demographic and Health Surveys, Gwatkin et al, 2008. Notes: IMR = infant mortality rate; U5MR = under-five mortality rate. *'Concentration index' denotes degree of inequality across socio-economic status; a positive index indicates a pro-rich distribution, where the value of the indicator increases as income increases; a negative value indicates the reverse.

Figure 29. Spatial disparity in child delivery care over time, MENA



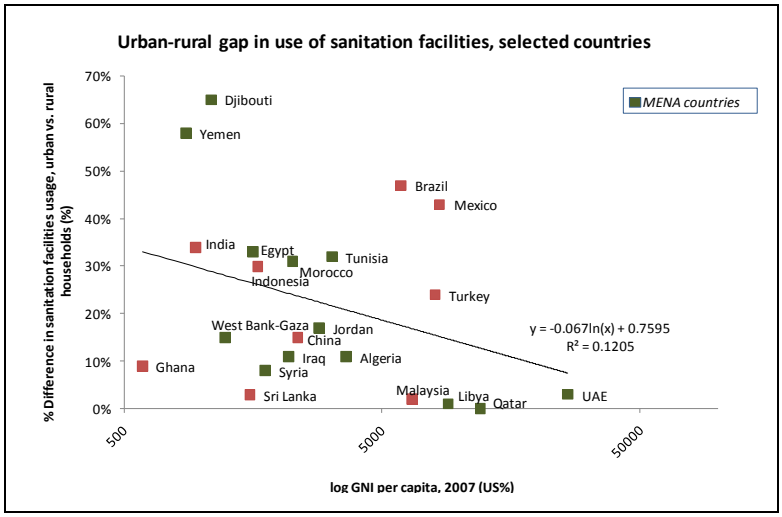
Source: World Health Organization Statistical Information System, 2009.

Figure 30. Spatial disparity in immunization coverage over time, MENA



Source: World Health Organization Statistical Information System, 2009.

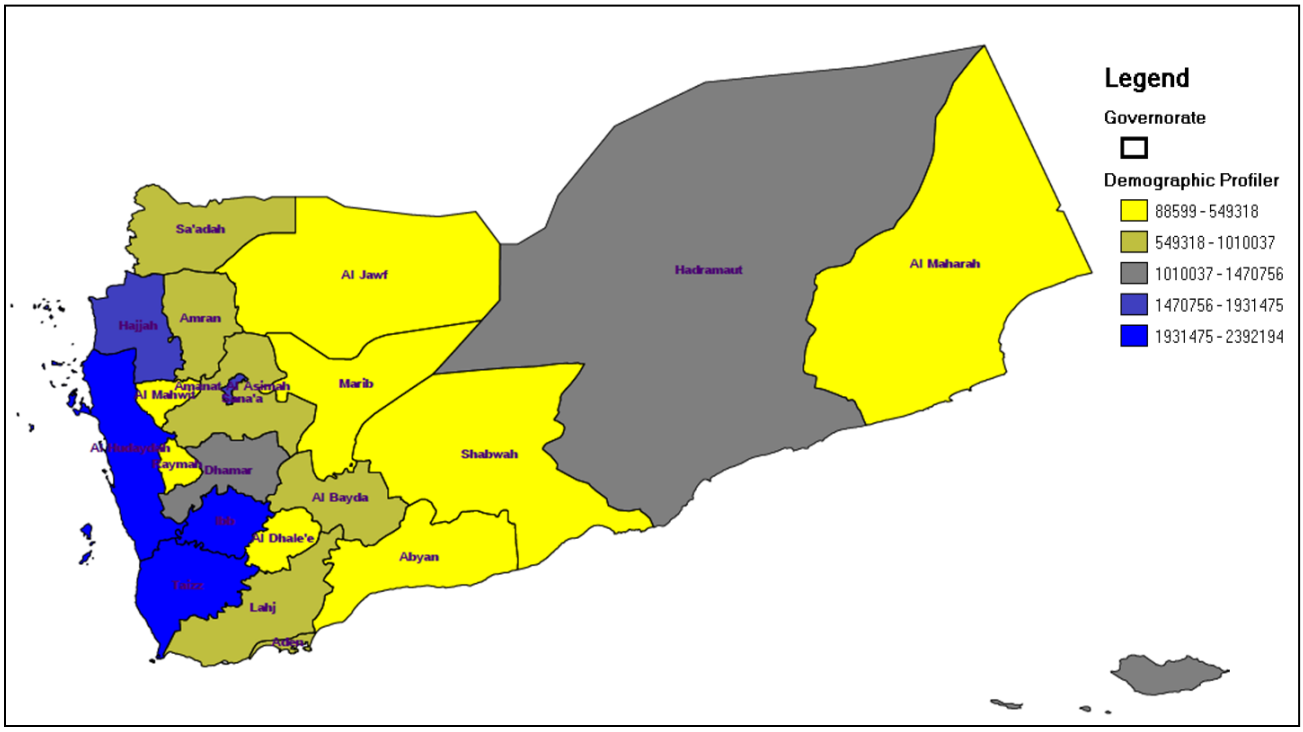
Figure 31. Urban-rural gaps in sanitation use by per capita income



Source: State of the World's Children 2009, UNICEF, 2008.

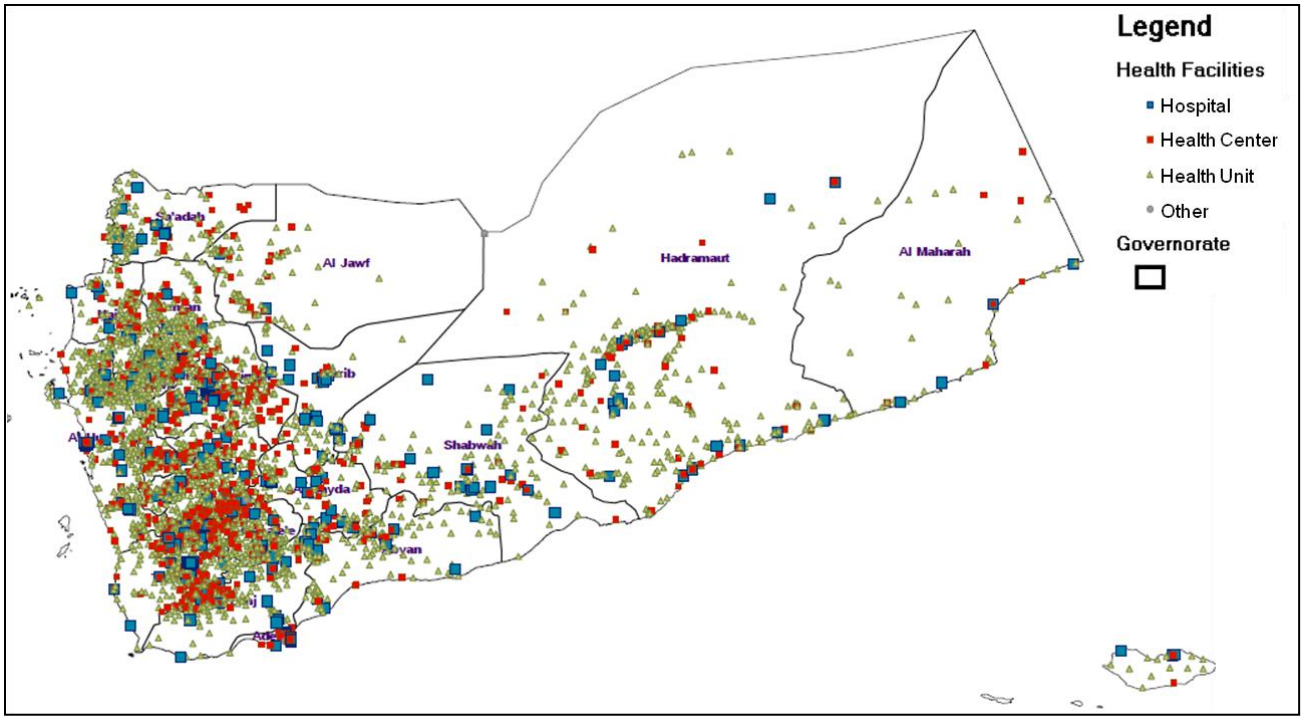
Annex 7. Geographic distribution of health services

Figure 32. Spatial distribution of total population, Yemen, 2008



Source: 2007 Health Facility Survey, USAID/Ministry of Health, Yemen.

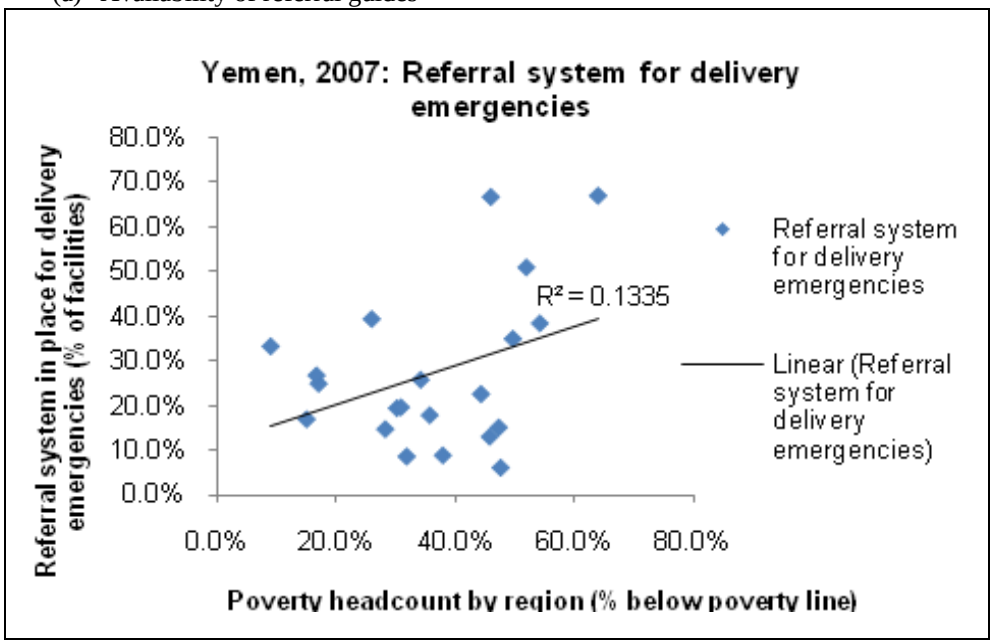
Figure 33. Spatial distribution of health facilities, Yemen, 2008



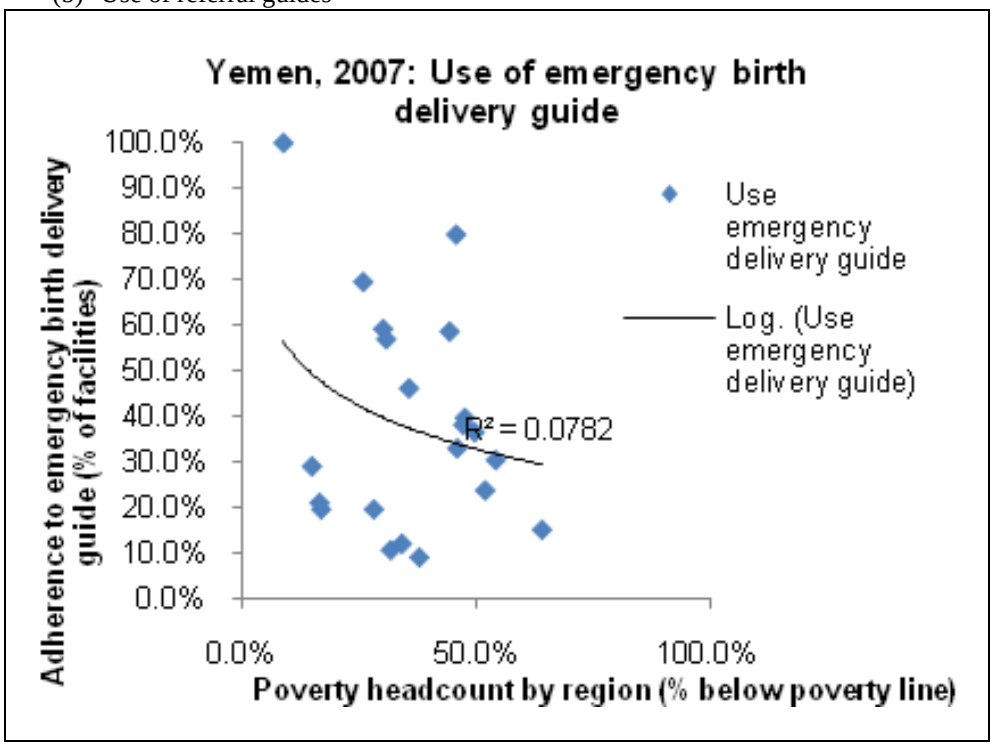
Source: 2007 Health Facility Survey, USAID/Ministry of Health, Yemen.

Figure 34. Management of emergency births by governorate, Yemen, 2007

(a) Availability of referral guides



(b) Use of referral guides



Source: 2007 Health Facility Survey, USAID/Ministry of Health, Yemen. Author's calculations.

Table 18. Determinants of availability of pharmaceuticals at health facilities, Yemen, 2007

Logistic regression Number of obs = 761 chi2(20) = 158.40 Prob > chi2 = 0.0000
Log likelihood = -327.49388 Pseudo R2 = 0.1947

havedrug_i	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
ibb_i	2.435576	1.157974	1.87	0.061	0.9591906	6.18441
abyan_i	1.579233	1.039734	0.69	0.488	0.4345431	5.739308
taiz_i	0.3248601	0.1036757	-3.52	0.000	0.1737978	0.6072234
hajja_i	2.105331	1.601898	0.98	0.328	0.4738712	9.353632
hodeida_i	0.2272234	0.0825523	-4.08	0.000	0.1114818	0.4631294
hadmt_i	0.3053754	0.1173435	-3.09	0.002	0.1437976	0.64851
dhamar_i	2.381736	1.332576	1.55	0.121	0.7955148	7.130814
sanaregion_i	1.123493	0.4673427	0.28	0.780	0.4971571	2.538909
aden_i	8.758668	7.143633	2.66	0.008	1.770892	43.31957
laheg_i	1.581876	0.9829602	0.74	0.460	0.4679994	5.34687
mahweet_i	0.773286	0.6083443	-0.33	0.744	0.1654625	3.613937
maharh_i	1.176006	1.115612	0.17	0.864	0.1831986	7.549133
dhale_i	0.8645011	0.5679659	-0.22	0.825	0.2385269	3.133241
factypehos~i	2.673038	1.238165	2.12	0.034	1.078262	6.626527
specgen_i	0.5789838	0.3448853	-0.92	0.359	0.1801475	1.860821
specspec_i	0.4373088	0.3221437	-1.12	0.262	0.1032168	1.852789
speced_i	0.1770066	0.172229	-1.78	0.075	0.0262883	1.191836
specmch_i	0.1380503	0.0931075	-2.94	0.003	0.0368085	0.5177583
sectorgovt_i	16.39954	9.307171	4.93	0.000	5.392032	49.87822
sectorfore~i	0.2244486	0.2894666	-1.16	0.247	0.0179201	2.81121

Source: 2007 Health Facility Survey, USAID/Ministry of Health, Yemen. Author's calculations. Note: All variables are binary variables. Dependent variable: havedrug_i: 1= facility has medications on-site. Explanatory variables: ibb_i through dhale_i: 1 = health facility located in given name of governorate, "Ibb" through "Dhale". Factypehos_i: 1=facility is a hospital type; 0 = clinic or pharmacy. Specgen_i: 1=facility is a general facility (type of specialization). Specspec_i: facility is a specialized facility. Speced_i: 1=facility is an educational facility (university-affiliated). Specmch_i: 1=facility specializes in maternal and child health. Sectorgovt_i: 1 = facilty is public. Sectorfore_i: facility is foreign-operated.

Table 19. Operational (functional) status by type of facility

Facility type	Operational	Partially operational	Permanently closed	Temporarily closed	Under construction	Not yet operational	Total	*n*
Hospital	85.6%	3.2%	1.1%	0.3%	7.2%	2.7%	100%	*375*
Health Center	78.4%	6.5%	1.2%	3.7%	6.7%	3.4%	100%	*1,146*
Health Unit	75.1%	2.9%	9.0%	10.3%	6.6%	4.1%	100%	*2,630*
Other	81.0%	4.8%	0.0%	0.0%	14.3%	0.0%	100%	*21*
Total	**77.0%**	**4.0%**	**1.0%**	**7.5%**	**6.7%**	**3.8%**	100%	*4,172*
n	*3,213*	*165*	*42*	*313*	*281*	*158*	*4,172*	*n/a*

Source: 2007 Health Facility Survey, USAID/Ministry of Health, Yemen. Author's calculations.

Table 20. Availability of selected medical services by type of facility

Facility type	Drugs available at facility	Test for HIV	Referral system for HIV test elsewhere	Referral system for delivery emergencies	Use emergency delivery guide	Use infection prevention and treatment guide
Hospital	90.2%	64.6%	26.2%	32.6%	48.1%	23.1%
Health Center	76.3%	39.3%	10.8%	23.5%	34.6%	16.0%
Health Unit	70.1%	0.0%	0.0%	20.9%	26.4%	12.1%
Other	38.9%	45.5%	10.0%	0.0%		11.1%
Total	***72.7%***	***50.5%***	***17.7%***	***23.6%***	***33.2%***	***14.3%***

Source: 2007 Health Facility Survey, USAID/Ministry of Health, Yemen. Author's calculations.

Table 21. Selected health facility and household characteristics by governorate, 2005-7

	Health facility characteristics (Proportion of facilities with following services, %)						*Household characteristics (%)*		
Governorate	**Drugs available on-site**	**Referral system for delivery emergencies**	**Use emergency delivery guide**	**Test for HIV**	**Referral system for HIV test elsewhere**	**Use infection prevention and treatment guide**	**Poverty incidence**	**Proportion of women with at least one prenatal visit**	**Incidence of household catastrophic health expenditures**
Hajja	70.0	6.3	40.0	62.7	14.3	2.8	47.5	18	4.9
Sana'a Region	81.3	14.9	20.0	13.3	3.6	6.9	28.1	18	0.0
Shabwah	74.5	38.5	30.8	27.3	6.8	15.5	54.1	21	0.7
Abyan	72.6	13.2	80.0	63.6	27.3	3.6	45.7	22	7.1
Dhamar	91.6	39.4	69.6	62.9	21.2	42.3	25.8	25	9.3
Amran	94.2	66.9	15.6	21.4	33.3	20.7	63.9	25	9.6
Mareb	79.2	66.7	33.3	24.0	12.0	21.6	45.9	27	1.8
Al-Jawf	69.6	35.0	36.8	0.0	7.7	15.2	49.6	29	16.0
Taiz	56.3	9.0	9.5	71.9	21.9	2.6	37.8	32	9.2
Al-Dhale	88.0	22.7	58.8	51.6	10.0	14.9	44.2	32	5.4
Laheg	89.2	15.2	38.5	81.0	28.6	33.7	47.2	32	11.0
Remah	88.9	25.9	12.5	33.3	0.0	2.0	34.1	36	0.0
Al-Mahweet	77.9	19.7	57.1	11.8	0.0	18.9	30.8	43	0.6
Al-Maharh	31.3	33.3	100.0	80.0	33.3	17.2	8.9	45	2.0
Hodeida	33.7	8.7	11.1	78.9	6.9	4.2	31.7	48	6.9
Ibb	91.6	19.5	59.4	47.5	11.5	15.7	30.1	48	11.0
Al-Baida	94.1	50.9	24.1	54.2	20.8	22.9	51.9	48	6.4
Sa'adah	87.1	26.8	21.4	11.5	7.7	18.1	16.6	57	3.9
Aden	87.2	25.0	20.0	42.1	27.0	29.7	16.9	61	5.9
Sana'a City	38.5	17.0	29.4	71.6	42.0	16.0	14.9	63	6.9
Hadramout	56.2	17.9	46.4	38.3	14.9	9.2	35.6	64	6.1
Total	**72.7**	**23.6**	**33.2**	**50.5**	**17.7**	**14.3**	**34.8**	**41**	**7.0**

Source: 2007 Health Facility Survey, USAID/Ministry of Health, Yemen. Poverty, health care utilization and catastrophic expenditure rates from Yemen Household Budget Survey 2005/6. Author's calculations.

Table 22. Overall health care supply and benefit incidence of expenditure by governorate, 2007

	Statistical data									Benefit incidence analysis				
Governorate	Beds per 10000	Nurses per 10000	General practitioners per 10000	Spec-ialists per 10000	Total of Beds	No. Nurses	No. GPs	No. Spec-ialists	Population, 2007	Per capita MOPHP expenditure (YR)	Total MoPHP expenditure (million YR)	% of Population	% of MoPHP expenditure	Ratio % Expenditure/% Population
Sana'a City	12.1	6.3	4.5	3.4	2477	1286	930	689	2,055,158	1,689	3,471	9.5%	11.3%	1.2
Sana'a	2.6	3.3	2.3	0.1	257	321	222	13	977,692	1,118	1,093	4.5%	3.5%	0.8
Aden	19.4	18.1	5.8	6.7	1275	1195	382	438	658,644	5,788	3,812	3.1%	12.4%	4.0
Taiz	8	3.5	2.1	0.3	2056	914	534	79	2,575,014	1,061	2,732	12.0%	8.9%	0.8
Al-Hudaidah	3	3.8	1.1	0.2	720	898	260	36	2,374,990	753	1,788	11.0%	5.8%	0.5
Lahej	14.3	11.5	2.8	1.1	1120	896	217	86	781,154	2,697	2,107	3.6%	6.8%	2.9
Ibb	3.4	3.1	1.3	0.2	783	706	290	38	2,293,860	931	2,136	10.6%	6.9%	0.7
Abyan	13.3	17.2	4.4	0.3	619	801	204	16	465,261	3,205	1,491	2.2%	4.8%	2.2
Dhamar	3.4	3.3	0.8	0.1	498	477	115	16	1,455,037	872	1,269	6.8%	4.1%	0.6
Shabwa	12.6	12.8	3	0.3	640	650	154	14	507,200	2,384	1,209	2.4%	3.9%	1.7
Hajjah	1.4	2.5	0.7	0	230	405	112	8	1,618,615	648	1,049	7.5%	3.4%	0.5
Al-Baidah	5.8	3.5	1.3	1	360	218	78	65	619,773	1,025	635	2.9%	2.1%	0.7
Hadramout Valley	13.6	10.1	3	0.9	669	496	149	42	492,285	2,838	1,397	2.3%	4.5%	2.0
Hadramout Coast	18.3	12.4	4.2	1.7	1200	813	277	110	656,401	n/a	n/a	3.0%	n/a	n/a
Sada,a	3.6	1.9	0.6	0.2	280	146	43	13	774,356	829	642	3.6%	2.1%	0.6
Al-Mahweet	3.5	4.6	1.1	0.1	188	245	57	7	538,193	889	478	2.5%	1.6%	0.6
Al-Mahera	20.6	36.2	6	0.4	208	366	61	4	101,134	4,248	430	0.5%	1.4%	3.0
Al-jouf	1.1	1	0.5	0	53	47	23	2	477,110	717	342	2.2%	1.1%	0.5
Amran	4.1	3.6	1.3	0.1	380	335	117	13	926,536	1,077	998	4.3%	3.2%	0.8
Al-Dhal'a	4	7.2	2	0.4	210	376	105	21	522,426	1,234	645	2.4%	2.1%	0.9
Raimah	4.2	3.1	0.1	0	182	132	4	0	431,317	755	326	2.0%	1.1%	0.5
Marib	21.9	8.9	1.4	0.3	565	231	35	8	258,511	3,811	985	1.2%	3.2%	2.7
Total	**7**	**5.6**	**2**	**0.8**	**14970**	**11954**	**4369**	**1718**	**21,538,651**	**1,432**	**30,843**	100.0%	100.0%	1.0

Source: Yemen Annual Statistical Health Report, Ministry of Public Health and Population, 2007, CSO 2007 (population, hospital beds, mortality data); MOF (governmental expenditures). Author's calculations.

Table 23. Supply of private and public health care facilities by governorate, selected indicators, 2007

Governorate	Abyan	Addala	Aden	Albaida'a	Hudaidah	Al-Jawf	AlMahera	Mahweet	Amran	Dhamar	Hadramout Coast	Hadramout Valley	Hajjah	Ibb	Lahej	Mareb	Raimah	Sada,a	Sana'a	Sana'a City	Shabwa	Taiz	Total
PRIVATE																							
Hospitals	0	4	7	11	13	-	-	-	1	5	5	1	4	16	0	1	-	3	5	71	1	18	166
Polyclinic	3	-	20	14	21	0	0	16	16	25	10	7	33	49	7	5	-	2	11	11	9	43	302
Health centers	3	-	16	15	16	2	2	10	18	12	24	1	22	6	5	2	-	20	24	112	3	13	326
GP clinics	36	-	45	-	51	8	16	6	23	35	42	24	15	46	24	5	-	5	7	443	1	215	1047
Specialist clinics	4	-	225	-	10	1	1	0	1	7	45	18	2	0	14	1	-	2	3	350	-	84	768
Dental clinics	5	-	55	-	14	2	4	8	5	25	18	17	5	17	6	7	-	3	10	250	-	46	497
Dental laboratories	3	-	10	-	9	1	2	0	5	4	10	6	4	0	0		-	-	-	53	-	28	135
Medical laboratories	50	-	153	-	130	4	20	6	11	17	91	38	41	27	34	8	-	3	11	265	-	103	1012
Radiological clinics	2	-	10	-	2	0	1	0	88	1	5	6	1	0	1	1	-	1	0	34	1	13	167
PHC	2	-	5	-	191	8	1	63	91	16	78	65	80	89	2	10	-	49	40	340	-	108	1238
Midwifery clinics	0	-	6	-	8	0	1	4	4	2	0	0	4	1	1	-	-	17	1	-	-		49
Opthalmological offices	6	-	26	-	11	0	2	0	-	2	10	7	2	3	0	-	-		-	47	1	17	134
Pharmacies	112	-	315	-	204	20	54	3	11	55	33	166	177*	97	10	8	-	17	11	800	-	398	2314
Pharmaceutical storage	8	-	87	-	329	0	-	39	111	233	198	-	-	123	154	44	-	-	106	46	-	453	1931
TOTAL	**234**	**4**	**980**	**40**	**1009**	**46**	**104**	**155**	**385**	**439**	**569**	**356**	**213**	**474**	**258**	**92**	**0**	**122**	**229**	**2822**	**16**	**1539**	10086
PUBLIC																							
Central hospitals - no.	1	1	5	2	4	1	1	1	1	2	3	1	2	5	3	2	0	2	1	8	1	8	55
Central hospitals - no. beds	240	100	1275	120	595	35	88	68	100	372	600	214	110	763	868	285	0	160	60	2447	120	1716	10336
District hospital - no	8	3	0	9	18	1	3	4	8	8	8	5	9	13	13	12	3	8	8	1	14	17	173
District hospital - no. beds	370	110	0	240	125	18	120	120	280	126	400	311	120	20	240	260	74	120	197	30	520	340	4141
HC with beds - no.	1										10	24			2	1	2						40
HC with beds - no. beds	9	0	0	0	0	0	0	0	0	0	200	144	0	0	12	20	108	0	0	0	0	0	493
Total no. beds	619	210	1275	360	720	53	208	188	380	498	1200	669	230	783	1120	565	182	280	257	2477	640	2056	14970
HC without beds	12	22	32	34	60	19	5	10	35	51	10	0	27	89	20	13	34	17	77	30	19	100	716
PHC units	120	105	0	89	275	64	37	152	165	153	148	121	185	175	157	66	77	87	136	4	120	173	2609
HC providing MCH	6	6	4		2	2	1	1	1	1		6	1	6	1						6	5	49
TOTAL no. facilities	**148**	**137**	**41**	**134**	**359**	**87**	**47**	**168**	**210**	**215**	**179**	**157**	**224**	**288**	**196**	**94**	**116**	**114**	**222**	**43**	**160**	**303**	
Total hospitals	9	4	5	11	22	2	4	5	9	10	11	6	11	18	16	14	3	10	9	9	15	25	228
Total HC	139	133	36	123	337	85	43	163	201	205	168	151	213	270	180	80	113	104	213	34	145	278	3414
Private health centers and polyclinics as % of all health centers	4%	0%	50%	19%	10%	2%	4%	14%	14%	15%	17%	5%	21%	17%	6%	8%	0%	17%	14%	78%	8%	17%	16%
Private hospitals as % of all hospitals	0%	50%	58%	50%	37%	0%	0%	0%	10%	33%	31%	14%	27%	47%	0%	7%	0%	23%	36%	89%	6%	42%	42%

Source: MoPHP Annual Statistical Health Report 2007 and author's calculations.

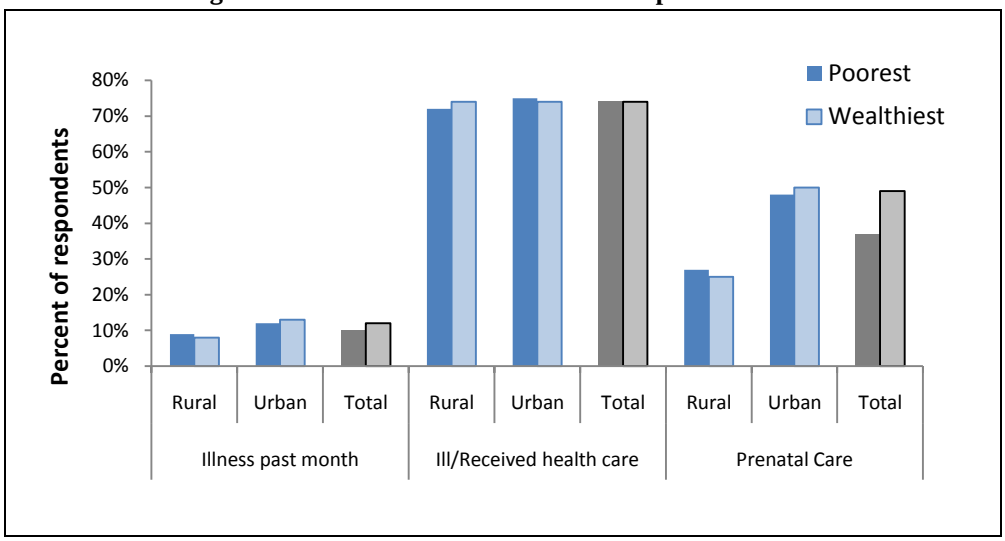
Table 24. Public hospital productivity indicators, 2007

Governorate	Abyan	Addala	Aden	Albaida'a	Al-hudaidah	Al-Jawf	AlMahera	Al-Mahweet	Amran	Dhamar	Hadramout Coast	Hadramout Valley	Hajjah	Ibb	Lahej	Mareb	Raimah	Sada,a	Sana'a	Sana'a City	Shabwa	Taiz	Total
Population (millions), 2007	465,261	522,426	658,644	619,773	2,374,990	477,110	101,134	538,193	926,536	1,455,037	656,401	492,285	1,618,615	2,293,860	781,154	258,511	431,317	774,356	977,692	2,055,158	507,200	2,575,014	**21,538,651**
Inpatient care																							
Hospital beds per 10,000	13.3	4.0	19.4	5.8	3.0	1.1	20.6	3.5	4.1	3.4	18.3	13.6	1.4	3.4	14.3	21.9	4.2	3.6	2.6	12.1	12.6	8.0	7.0
# Inpatient admissions	5891	3174	22767	2643	7805		3678	2489	5256	13142	57318	12033	2229	1044	16087	630	1234		931	89713	4326	28107	280497
Inpatient admissions per 10,000	1.3	0.6	3.5	0.4	0.3	0.0	3.6	0.5	0.6	0.9	8.7	2.4	0.1	0.0	2.1	0.2	0.3	0.0	0.1	4.4	0.9	1.1	1.3
# Discharges	5891	2365	18619	2442	7831		4312	2444	5035	13071	54423	11936	2194	1003	16525	110	224		643	68931	4205	18013	240217
Admission-to-Discharge ratio	1.0	1.3	1.2	1.1	1.0		0.9	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.0	5.7	5.5		1.4	1.3	1.0	1.6	1.2
Outpatient care																							
Number of public hospital outpatient visits, 2007	59960	35819	165191	72433	178529		41184	5251	100042	210721	365931	93006	105408	94792	352557	49170	9183	691146	61072	966966		291	49170
Number of public hospital outpatient visits per 10,000	12.9	6.9	25.1	11.7	7.5	0.0	40.7	1.0	10.8	14.5	55.7	18.9	6.5	4.1	45.1	19.0	2.1	89.3	6.2	47.1	0.0	0.0	0.2
Number of public hospital outpatient visits per capita	0.13	0.07	0.25	0.12	0.08	0.00	0.41	0.01	0.11	0.14	0.56	0.19	0.07	0.04	0.45	0.19	0.02	0.89	0.06	0.47	0.00	0.00	0.00

Source: MoPHP Annual Statistical Health Report 2007 and author's calculations.

Annex 8. Utilization of health services

Figure 35. Utilization rates for acute and prenatal care



Source: Yemen Household Budget Survey, 2005/2006. Author's calculations.

Table 25. Equity in utilization of acute and prenatal care

Concentration Index	Total	Rural	Urban
Illness during past month	0.001	0.007	0.003
Ill and received health care	0.012	0.002	0.029
Received prenatal care	0.076	0.003	0.007

Source: Yemen Household Budget Survey, 2005/2006. Author's calculations.

Table 26. Determinants of acute health care utilization at any facility over past month

Logistic regression Number of obs = 8965 Wald chi2(19) = 34.69 Prob > chi2 = 0.0152
Log pseudolikelihood = -5126.665 Pseudo R2 = 0.0033

usedhsvc_i	Odds Ratio	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
male_i	1.04172	.0508121	0.84	0.402	.9467426	1.146226
urban_i*	1.528532	.1669896	3.88	0.000	1.233906	1.893507
dis_chron	1.100243	.0888519	1.18	0.237	.9391796	1.288929
age	.9986892	.0039324	-0.33	0.739	.9910116	1.006426
agetile2	1.099926	.1095144	0.96	0.339	.9049271	1.336945
agetile3	1.074051	.1180523	0.65	0.516	.8658984	1.332243
agetile4	1.142414	.1501113	1.01	0.311	.8830328	1.477984
agetile5	1.125464	.2251262	0.59	0.555	.7604415	1.665701
hhsize	1.007486	.0053923	1.39	0.163	.9969723	1.01811
employed_i*	1.362637	.1457102	2.89	0.004	1.104992	1.680356
log_icons	.9805756	.1538382	-0.13	0.900	.7210075	1.33359
logcons2	1.10559	.0967632	1.15	0.251	.931312	1.31248
logcons3	.9481996	.0862714	-0.58	0.559	.7933296	1.133303
logcons4	1.004259	.1037365	0.04	0.967	.8201997	1.229623
logcons5	.8847007	.0966248	-1.12	0.262	.7142171	1.095879
ed_i	.1575329	.3486283	-0.84	0.404	.0020588	12.05379
edXlogcons	1.179169	.2213071	0.88	0.380	.8162479	1.703452
urbanXed*	.8178567	.0974371	-1.69	0.091	.6475413	1.032968
urbanXempl~d*	.7241227	.0901485	-2.59	0.010	.5673397	.9242324

Source: Yemen Household Budget Survey, 2005/2006. Author's calculations. *Indicates statistically significant at 95% confidence level. Dependent variable: Usedhsvc_i: Binary variable (BV), 1 = respondent used health service in past month.

Explanatory variables: Male_i: BV, 1=respondent is male. Urban_i: BV, 1=respondent's household (HH) is urban. Dis_chron.: BV, 1=respondent has a long-standing disability or chronic condition. Age: continuous variable (CV), respondent's age in years. Agetile2/3/4/5: BV, 1=respondent belongs to middle, 2nd oldest or oldest age group. HHsize: Continuous variable (CV), number of HH members. Employed_i: BV, 1=respondent is a paid employee in the formal sector. Log_icons: CV, respondent's HH monthly consumption expenditure (log). Logcons2/3/4/5: BV, 1=respondent's HH belongs to given income (HH expenditure) level, 2=second poorest/5=wealthiest. Ed_i: BV, 1=if respondent attended at least primary school. EdXlogcons: interaction term = whether effect of having primary education or above changes depending on HH expenditure level. UrbanXEd: interaction term = whether effect of HH regional setting (urban/rural) changes depending on respondent's educational level. UrbanXEmpld: interaction term = whether effect of HH regional setting (urban/rural) changes depending on respondent's employment status.

Table 27. Determinants of prenatal health care utilization at any facility over past month

Logistic regression Number of obs = 9051 Wald chi2(16) = 597.83 Prob > chi2 = 0.0000
Log pseudolikelihood = -5808.2171 Pseudo R2 = 0.0531

delivcare_i	Odds Ratio	Robust Std. Err.	z	P>z	[95% Conf.	Interval]
Urban_i*	3.607518	0.5203861	8.89	0	2.719082	4.786242
Age quint_mid	1.129894	0.0854732	1.61	0.106	0.9741974	1.310475
Age quint_2nd oldest*	1.282559	0.1010919	3.16	0.002	1.098969	1.49682
Age quint_oldest*	1.271045	0.1071867	2.84	0.004	1.077406	1.499486
HHEXP_2nd lowest	1.039375	0.0759184	0.53	0.597	0.9007376	1.19935
HHEXP_middle*	1.168611	0.0863451	2.11	0.035	1.011061	1.350712
HHEXP_2nd highest	1.077469	0.1098814	0.73	0.464	0.8822642	1.315865
HHEXP_highest	1.136324	0.1129351	1.29	0.198	0.9351999	1.380702
Attended school	1.047866	0.0949287	0.52	0.606	0.8773909	1.251463
HH size*	1.017476	0.0071929	2.45	0.014	1.003475	1.031672
Ill past month*	1.220612	0.0841014	2.89	0.004	1.066421	1.397096
Disab/chronic cond.	1.139668	0.0909527	1.64	0.101	0.9746463	1.33263
Waged employee*	1.193133	0.0598925	3.52	0	1.081336	1.316489
Chew qat*	0.9053872	0.0475854	-1.89	0.059	0.8167645	1.003626
UrbanXhhsize*	0.9682612	0.0086304	-3.62	0	0.9514929	0.985325
UrbanXEd	1.174667	0.1544763	1.22	0.221	0.9077713	1.520034

Source: Yemen Household Budget Survey, 2005/2006. Author's calculations. *Indicates statistically significant at 95% confidence level. Dependent variable: Delivcare_i: Binary variable (BV), 1 = respondent sought prenatal health care prior to child delivery. Explanatory variables: Urban_i: BV, 1=respondent's household (HH) is urban. Age quint_mid/2nd oldest/oldest: BV, 1=respondent belongs to middle, 2nd oldest or oldest age group. HHEXP_2ndlowest/middle/2nd highest/highest: BV, 1=respondent's HH belongs to given income (HH expenditure) level. Attended school: BV, 1=if respondent attended at least primary school. HH size: Continuous variable (CV), number of HH members. Ill past month: BV, 1=respondent was ill in the past month. Disab/chronic cond.: BV, 1=respondent has a long-standing disability or chronic condition. Waged employee: BV, 1=respondent is a paid employee in the formal sector. Chew qat: BV, 1=respondent chews qat regularly. UrbanXHHsize: interaction term = whether effect of HH regional setting (urban/rural) on likelihood of utilizing services changes depending on HH size. UrbanXEd = interaction term = whether effect of HH regional setting (urban/rural) on likelihood of utilizing services changes depending on respondent's educational level.

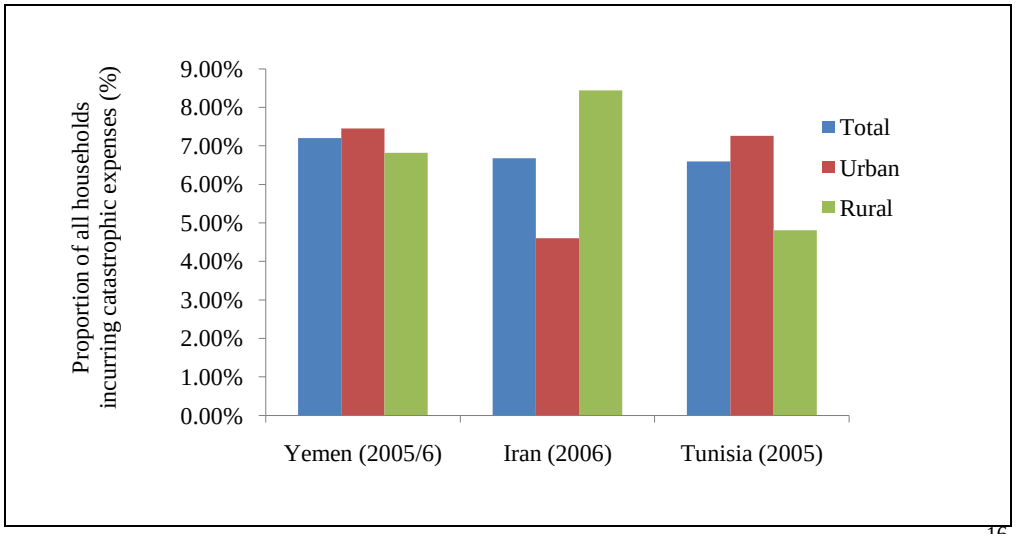
Annex 9. Out-of-pocket health expenditures

Table 28. Distribution of out-of-pocket health care spending by socioeconomic status, Yemen

	Proportion of total household expenditure spent on health care across income quintile (%)						Concentration Index	Kakwani Index of Progressivity
	Poorest	2nd Poorest	Middle	2nd Richest	Richest	Total		
Yemen	1.7	1.8	2.2	2.5	3.7	2.7	0.1970	-0.1830

Source: Yemen Household Budget Survey, 2005-6. Author's calculations.

Figure 36. Spatial distributions of catastrophic expenditures in Yemen and MENA countries



Source: Staff calculations using data from national surveys based on methods developed by Wagstaff et al[16]. Note: catastrophic spending is defined as at least 10% of household spending for Yemen and Tunisia and 25% of household spending in Iran.

Table 29. Spatial distribution of OOP-related impoverishment in Yemen

Country	*Poverty Headcount (%)*			*Poverty Gap (%)*		
	Pre-payment poverty	Post-payment poverty	Relative difference	Pre-payment	Post-payment	Relative difference
Yemen (2005/6)	20.30	21.90	7.88	5.85	6.32	8.03
Urban	14.90	16.40	10.07	3.99	4.37	9.52
Rural	31.10	33.25	6.91	9.48	10.22	7.81

Source: Author's calculations using data from Yemen HBS 2005/6.

Table 30. Determinants of out-of-pocket expenditure amount for acute care over past month (regression results)

Zero-truncated negative binomial regression Number of obs = 353 LR chi2(17) = 125.17 Dispersion = mean
Prob > chi2 = 0.0000 Log likelihood = -3258.3063 Pseudo R2 = 0.0188

Amount of OOP acute	Coef.	Std. Err.	Z	P>|z|	[95% Conf.	Interval]
male_i	-0.1736469	0.1627485	-1.07	0.286	-0.492628	0.1453343
hhsize	0.007219	0.0113383	0.64	0.524	-0.0150036	0.0294417
married_i*	0.4659461	0.1393541	3.34	0.001	0.192817	0.7390752
hoh	-0.1399693	0.2076102	-0.67	0.500	-0.5468778	0.2669393
public facility_i*	-0.08811	0.0377919	-2.33	0.020	-0.1621807	-0.0140393
facility outside gov_i*	0.570945	0.0564654	10.11	0.000	0.4602748	0.6816152
n_kids	0.0380786	0.0252045	1.51	0.131	-0.0113213	0.0874784
n_adultfemale	-0.0407553	0.0427999	-0.95	0.341	-0.1246416	0.0431311
n_elderly	-0.0100245	0.0878733	-0.11	0.909	-0.182253	0.162204
governorate	-0.0041436	0.0286273	-0.14	0.885	-0.0602521	0.051965
urban_i	-0.1050679	0.1554907	-0.68	0.499	-0.409824	0.1996881
young_i	0.2359119	0.1727065	1.37	0.172	-0.1025867	0.5744104
qat_i	0.0761806	0.137619	0.55	0.580	-0.1935489	0.3459102
educated_i	-0.0988228	0.1719363	-0.57	0.565	-0.4358117	0.2381661
agequintile2	0.0867755	0.2531812	0.34	0.732	-0.4094506	0.5830016
agequintile3	-0.1144783	0.2066651	-0.55	0.580	-0.5195345	0.2905779
agequintile4	0.2641515	0.2010063	1.31	0.189	-0.1298136	0.6581166
cons	7.125969	0.3305654	21.56	0.000	6.478073	7.773865
/lnalpha	0.0846966	0.0670558			-0.0467304	0.2161236
Alpha	1.088387	0.0729827			0.9543447	1.241256

Likelihood-ratio test of alpha=0: chibar2(01) = 2.3e+06 Prob>=chibar2 = 0.000

Source: Yemen Household Budget Survey, 2005/2006. Author's calculations. Note: sample includes households incurring out-of-pocket expenditures. * Indicates statistically significant at 95% confidence level. Dependent variable: continuous variable (CV) for amount of household (HH) expenditure on health care per month in Yemeni Reals. Explanatory variables: agequintile4/3/2: binary variable (BV) for age of health service user (respondent), second oldest (4) to second youngest (2) age group. Educated_i: BV for whether respondent has attended at least primary school level. Qat_i: BV for whether respondent is regular Qat chewer. Young_i: BV for whether respondent is younger than 18 yrs. Urban_i: BV for whether respondent's HH is urban. Governorate: categorical variable for governorate code identifier (1-21) of respondent's HH. N_elderly: continuous variable for number of respondent's HH members above 65 yrs. N_adultfemale: CV for number of respondent's female HH members above 18 yrs. n_kids: CV for number of respondent's HH members younger than 18 yrs. Facility outside governorate_i: BV for whether last health facility used by respondent was outside governorate of domicile. Public facility_i: BV for whether last health facility used by respondent public facility. HOH: for whether respondent is HOH. Married_i: BV for whether respondent is married. HHsize: CV for number of members in respondent's HH. Male_i: BV for whether respondent is male.

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