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# Health Care on the Frontlines

*Survey Evidence  
on Public and  
Private Providers  
in Uganda*

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# Contents

Foreword .....	v
Abstract .....	vii
Acknowledgments .....	viii
Abbreviations and Acronyms .....	ix
<b>1. Introduction .....</b>	<b>1</b>
<b>2. Background: Health Care in Uganda .....</b>	<b>3</b>
<b>3. The Health Facility Survey .....</b>	<b>5</b>
Purpose of the Survey .....	5
Survey Design and Implementation .....	6
<b>4. Public and Private Health Care Providers .....</b>	<b>8</b>
Oversight, Management, and Competition .....	11
Inputs and Costs at Health Facilities .....	13
User Fees and Financing .....	24
Outputs and Efficiency .....	28
Client Perceptions .....	32
<b>5. Summary and Recommendations for Further Research .....</b>	<b>35</b>
Ownership and Health Facility Performance .....	35
Human Resources .....	36
User Fees and Financing .....	38
Drug Use .....	39
<b>Appendixes</b>	
A. Methodology and Data Issues .....	41
B. Consistency between Facility and District Records .....	44
Notes .....	46
References .....	50

## Tables

1. Number of Health Care Facilities by Ownership Category and Region . . . . .	8
2. Characteristics of Health Facilities by Ownership Category and Region . . . . .	9
3. Range of Health Services Provided at Facility by Ownership Category and Region . . . . .	10
4. Management of Health Facilities by Ownership Category and Region . . . . .	12
5. The “Competitive Environment” in Health Care by Ownership Category and Region . . . . .	13
6. Number of Staff by Ownership Category and Region . . . . .	14
7. Health Facility Staff by Position . . . . .	14
8. Staff Mix by Size of Facility, Ownership Category, and Region . . . . .	15
9. Median Salaries in Government Facilities by Position and Source of Financing . . . . .	17
10. Median Salaries and Sources of Financing for Government Facilities by Region . . . . .	17
11. Median Salaries in Private Facilities by Region . . . . .	18
12. Average Daily Supply of Selected Drugs to Facilities by Ownership Category and Region . .	19
13. Probit Analysis of Prescription of Antibiotics . . . . .	21
14. Average Monthly Supply of Vaccines to Government and Nonprofit Facilities . . . . .	22
15. Vaccination Stock-Outs and Resupply, Government and Nonprofit Facilities . . . . .	23
16. Availability of Equipment by Ownership Category . . . . .	24
17. User Fees by Ownership Category . . . . .	25
18. Proportion of Facilities That Exempt Specific Patient Groups by Ownership Category . . .	26
19. Payment for Services by Ownership Category and Region . . . . .	26
20. Amount Paid for Services, in Ugandan Shillings, by Ownership Category . . . . .	27
21. Number of Outpatients and Deliveries by Ownership Category . . . . .	29
22. Health Worker Productivity by Ownership Category and Region . . . . .	31
23. Unit Costs, Labor, by Ownership Category and Region . . . . .	32
24. Clients’ Reasons for Coming to the Facility by Ownership Category and Region . . . . .	33
25. Client Perceptions Regarding Services by Ownership Category and Region . . . . .	33
26. Clients’ Main Reason for Choosing a Specific Facility by Ownership Category . . . . .	34
27. Differences in Health Care Facilities across Ownership Categories . . . . .	37

## Figures

1. Reconciling District and Facility Staff Records . . . . .	15
2. Average Remuneration by Ownership Category . . . . .	19
3. Forms of Chloroquine Supply . . . . .	19
4. Calculating Total Drug Use . . . . .	20
5. Amounts of Drugs Prescribed per Patient, All Facilities . . . . .	20
6. Prescription Patterns for Drugs by Ownership Category . . . . .	21
7. Prescription Patterns for Drugs by Staffing and Ownership Category . . . . .	21
8. Vaccine “Wastage” (Polio and BCG Vaccines), Government and Nonprofit Facilities . . . . .	23
9. Proportion of Government Facilities Charging Fees, by Region . . . . .	25
10. Spending of User Fee Revenues by Ownership Category . . . . .	27
11. Composition of Outpatients by Ownership Category . . . . .	29
12. Number of Vaccinations per Month by Ownership Category . . . . .	30
B.1. Comparing District and Facility Output Data . . . . .	45

# Foreword

**H**ealth care is at the center of many poverty reduction strategies. Yet too often, health care services fail poor people. Budgetary allocations tend to favor the better-off, limiting poor people's access to services or preventing improvements in quality. Even when funding for primary health care is allocated in the budget, it may be captured by the politically and economically powerful. And the ability of medical staff to offer good care may have suffered severe blows as a result of persistent economic hardship or political conflict.

In many poor countries improvements in health care thus call for institutional—not merely managerial—reforms. Such reforms include bottom-up measures to give users a stronger voice and more power over providers. They also include top-down measures to ensure better monitoring of providers and introduce effective incentives for improving staff performance. Both types of reform depend on a body of systematic information on performance, incentives, and other aspects of frontline service delivery. This information is indispensable for catalyzing and guiding the institutional reforms needed to improve health care and health outcomes—yet little of this essential data are currently available.

To help fill this gap, the Development Research Group of the World Bank is carrying out, in collaboration with local institutions and the Bank's Africa Region, a multicountry study of health care provision in Africa. The research covers Chad, Madagascar, Mozambique, and Nigeria, as well as Uganda, the subject of this paper. The purpose of the research is to compare and contrast the behavior of frontline providers in different institutional and organizational contexts. The study pilots a new instrument, the Quantitative Service Delivery Survey (QSDS), in which the basic health facility is the primary unit of observation. Beyond its use in analyzing provider behavior and service delivery, the QSDS fits well into the larger goal of impact evaluation. When combined with household surveys, it allows exploration of interactions between frontline providers and users, and by adding surveys of local politicians and officials, it can also shed light on the political economy of service delivery and on interactions between providers and policymakers.

In the 1990s Uganda succeeded in reversing the deterioration of the health infrastructure that had occurred during the economic and political turmoil of the previous two decades. Most health indicators, except for life

expectancy related to the HIV/AIDS pandemic, have been improving since recovery began in 1986. Infant mortality, although still high, fell from 119 to 81 deaths per 1,000 live births between 1989 and 1995. But results from the 2000/01 Uganda Demographic and Health Survey suggest that these improvements have not been sustained, despite the country's major successes in economic growth, poverty reduction, and education. Part of the problem has to do with household behavior and characteristics of individuals, but the poor quality of health services also plays an important role.

The study reported in this paper sheds new light on various dimensions of primary health care delivery in Uganda, using a baseline survey of public and private dispensaries—the most common lower-level health facilities in the country. The findings are highly relevant for the emerging private-public partnerships in

health care that are being undertaken in many developing countries—including Uganda—with the goal of improving services. They are also relevant for civil service reform efforts, which need to focus on strengthening professionalism and to take account of the entire health labor market when making decisions on public sector remuneration. My hope is that by offering a new perspective from the frontlines of health care, this paper will make a useful contribution to the reform agenda for improving health services for poor people in Uganda and across Africa.

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## Abstract

**T**his report presents findings from a baseline survey of 155 primary health care facilities (dispensaries, with and without maternity units) that was carried out in Uganda in the latter part of 2000. By collecting data both from the dispensaries and from local governments, it was possible to validate the collected data and check for discrepancies in reporting. Data from client exit polls provided a qualitative measure of performance. The analysis compares service delivery performance in three ownership categories: government, private for-profit, and private nonprofit. Among the topics it explores at the facility level are staffing, availability of drugs and other inputs, remuneration, outputs, and financing.

The evidence suggests a close link between the three types of providers through the labor market for health workers. Government dispensaries, for example, pay higher salaries than private facilities, and for-profit facilities appear to pay more than nonprofits for qualified health staff. These salary differences affect the movement of staff between provider organizations. Several other dimensions of service delivery—mix of services, pricing, quality, use of drugs, and cost-efficiency—also vary among ownership categories. The findings are highly relevant for public policy in Uganda and in other countries in Africa that are undertaking civil service reform and promoting private-public partnerships in health care.

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# Abbreviations and Acronyms

BCG	Bacillus Calmette-Guérin (vaccine for tuberculosis)
DDHS	district director of health services
DHFDS	District Health Facility Data Sheet
DHTQ	District Health Team Questionnaire
DPT	diphtheria, pertussis, and tetanus (vaccine)
GDP	gross domestic product
FDS	Facility Data Sheet
HFQ	Health Facility Questionnaire
HUMC	health unit management committee
NGO	nongovernmental organization
ORS	oral rehydration salts
QSDS	Quantitative Service Delivery Survey



## Introduction

**T**his Working Paper on health care in Uganda reports on findings from a baseline survey, conducted in 2000, of dispensaries—the most common lower-level health facilities in the country—and of district administrations. The study represents an effort to gain a better understanding of incentives, motivations, and various aspects of service delivery at the level of frontline providers. This is particularly important in Uganda, where steady improvements in budgetary management and shifts in the composition of public spending in favor of health over the past decade have not been matched by corresponding improvements in the quality of health services or in health outcomes (Hutchinson 2001).

More generally, the survey was motivated by findings concerning the link between public spending and health outcomes. Cross-country evidence suggests that, on average, total public spending on health has had much less impact on health status than one might expect. (For a review, see Filmer, Hammer, and Pritchett 2000, 2002; Musgrove 1996.)<sup>1</sup> Socioeconomic characteristics, including income and female education, explain most cross-country variation in child mortality and life expectancy. Public expenditure on health as a share of

gross domestic product (GDP) tends to be a small and statistically insignificant determinant. Several studies have argued that the negligible effect of social sector spending on human development outcomes is likely to reflect the weak link between spending and public services. More spending does not necessarily imply more public services (Pritchett 1996; Reinikka 2001; Reinikka and Svensson 2001). Four general explanations of why this should be so have been advanced. First, as numerous incidence studies show, government spending tends to favor nonpoor people and private goods. Second, transfers of funds from the center to the frontline provider may suffer from leakage. Third, even if funds reach the frontline provider, the production of goods and services at that level may be low in efficacy because of incentive problems, absenteeism, or poor motivation of staff. Finally, even if services are delivered, household demand may be lacking (Devarajan and Reinikka 2002).

All this suggests that cross-country budget data are not sufficient for the analysis of service delivery. Microlevel tools are needed to understand the process by which public spending is translated into services. This paper applies a new survey tool, the Quantitative Service Delivery Survey (QSDS), to frontline

health service delivery in Uganda.<sup>2</sup> In the QSDS the facility or frontline service provider is typically the main unit of analysis, in much the same way as the firm is the unit of observation in enterprise surveys and the household in household surveys.<sup>3</sup> In the Uganda study, quantitative data were collected both through staff interviews and directly from the service providers' records. Three types of dispensaries were included: those run by the government, by private for-profit providers, and by private nonprofit providers (mainly religious). Facility data were triangulated by also surveying local (district) governments that oversee the health care providers.<sup>4</sup> In this way it was possible to verify and cross-check the information of interest (for example, reported patient numbers,

fees, and the divergence between the amounts of drugs supplied to the facility and those actually prescribed).

Section 2, which follows, provides a brief overview of health care in Uganda. The subsequent sections give a full description of the data collected and report on key diagnostic findings from the first round of analysis. Section 3 describes the survey of dispensaries and the sample. Section 4 presents key findings, covering, among other topics, oversight and management, inputs and costs, user fees and financing, outputs, and client perceptions. Finally, section 5 discusses key issues for policymaking and research. More detailed descriptions of the sample, the methodology, and data issues are contained in the appendixes.

## Background: Health Care in Uganda

Since 1986, the health sector in Uganda has been undergoing a process of rebuilding and renovating health infrastructure. Most health indicators, except those related to HIV/AIDS, have been improving. For example, between 1989 and 1995, infant mortality decreased from 119 deaths per 1,000 live births to a (still high) 81 deaths. But progress has not been completely smooth. Results from the 2000/01 Uganda Demographic and Health Survey show that by 2000, infant mortality had risen to 88 deaths per 1,000 live births, while under-five mortality rates increased from 147 deaths per 1,000 live births in 1995 to 152 in 2000. Although the differences in mortality rates are not statistically significant, the failure to sustain improvements is worrying and can be at least partly attributed to poor access to assistance during delivery and to declining immunization rates (Möller 2002; Republic of Uganda 2002).

Health spending now represents 7 percent of total public expenditure, one of the highest shares in Africa (Hay 1998; Republic of Uganda 2000), and is currently on the increase. Even so, the health sector has been facing many obstacles. The AIDS epidemic, which emerged in Uganda at about the time the coun-

try began its recovery in the mid-1980s, added another burden to the health system. Overall HIV prevalence is now in the 6 to 7 percent range, down from 9 to 12 percent in the early 1990s. (For a discussion of health problems in Uganda, see Hutchinson 2001.)

Despite measurable improvements in some areas, the available health services are still inadequate to meet the needs of the population. The capital investments of the past decade, which have increased the population's proximity to health facilities, have not been matched by improvements in quality. Partly for this reason, use of the public sector for curative care has remained remarkably constant since the late 1980s. According to evidence from household surveys, the poor and the nonpoor alike tend to prefer curative care from non-governmental organizations (NGOs) and private for-profit providers to the less expensive government care (Hutchinson 2001). Many government health units are faced with a situation of unused physical capacity, lack of trained staff, and supply shortages (Okello and others 1998). Until now, there has been little quantitative and representative information on the scope and nature of problems in government facilities or on the differences in performance across ownership categories.

The government's ongoing health sector reform has attempted to address these weaknesses. Since 1993, a process of decentralization of responsibility for provision of health services from the central Ministry of Health to local governments has been going on. The impact of decentralization on health service delivery and health outcomes is not yet clear. Although decentralization has reportedly increased public participation in the health sector, new problems have arisen. For example,

the decline in immunization rates between 1995 and 2000 can be at least partly attributed to the unintended consequences of decentralization. In particular, it has proved difficult to incorporate formerly vertical programs into a decentralized system, particularly where local priorities differ from national ones.<sup>5</sup> The lack of central control has also made it difficult to coordinate the response to the withdrawal of support for outreach activities by the United Nations Children's Fund (UNICEF).

## The Health Facility Survey

**A** first effort to survey frontline health facilities in Uganda was carried out in 1996, but at the time it was not possible to obtain systematic quantitative data on inputs and outputs due to the dominance of in-kind transfers and lack of records (Reinikka 2001). A rapid data assessment carried out in 1999, however, indicated that daily patient, user fee, and drug use data could now be compiled from most Ugandan health units, facilitating a detailed analysis of service delivery performance in primary health care (World Bank 1999). In response to these changing circumstances, a QSDS-type sample survey of dispensaries with and without maternity units was carried out during October–December 2000. The focus on dispensaries meant that the survey captured only part of the national health system, but the limited scope also permitted a larger sample, a more in-depth analysis, and the inclusion of private health care providers. This approach was motivated by the importance of primary health care for poverty reduction and the prominent role of the private sector in the health care market.<sup>6</sup>

### Purpose of the Survey

The survey differs from previous studies in that it (a) analyses health service delivery from a public expenditure perspective with a view to informing expenditure and budget decisionmaking, as well as sector policy; (b) collects microlevel data on service provision, thus making a contribution toward redressing the lack to date of systematic examination of incentives and other supply-side issues in frontline health care delivery in low-income countries; and (c) focuses on quantitative information—unlike some other performance evaluation techniques, which are typically surveys of perceptions.

In part, the survey was designed to provide baseline data for future evaluation of reforms and policies in the health sector and in public expenditure. More immediate objectives included:

- Measuring and explaining the variation in cost-efficiency across health units in Uganda, with a focus on the flow and use of resources at the facility level;
- Diagnosing problems with facility performance, including the extent of drug leakage, as well as staff performance and availability;

- Providing information on pricing and user fee policies and assessing the types of service actually provided
- Shedding light on the quality of service across the three categories of service provider—government, for-profit, and nonprofit
- Examining the patterns of remuneration, pay structure, and oversight and monitoring and their effects on health unit performance
- Assessing the private-public partnership, particularly the program of financial aid to nonprofits.

## Survey Design and Implementation

The survey was designed and implemented by the World Bank in collaboration with the Makerere Institute for Social Research and the Ugandan Ministries of Health and of Finance, Planning and Economic Development.<sup>7</sup> The sample design was governed by three principles. First, to ensure a degree of homogeneity across sampled facilities, attention was restricted to dispensaries, with and without maternity units (that is, to the health center III level). Second, subject to security constraints, the sample was intended to capture regional differences. Finally, the sample had to include facilities in the main ownership categories: government, private for-profit, and private nonprofit (religious organizations and NGOs). The sample of government and nonprofit facilities was based on the Ministry of Health facility register for 1999. Since no nationwide census of for-profit facilities was available, these facilities were chosen by asking sampled government facilities to identify the closest private dispensary (see appendix A). Of the 155 health facilities surveyed, 81 were government facilities, 30 were private for-profit facilities, and 44 were nonprofit facilities. An exit poll of clients covered 1,617 individuals. The fieldwork was carried out during October–December 2000.

The survey collected data at three levels: district administration, health facility, and client. In this way it was possible to capture central elements of the relationships between the provider organization, the frontline facility, and the user. In addition, comparison of data from different levels (triangulation) permitted cross-validation of information.

At the district level, a District Health Team Questionnaire (DHTQ) was administered to the district director of health services (DDHS), who was interviewed on the role of the DDHS office in health service delivery. Specifically, the questionnaire collected data on health infrastructure, staff training, support and supervision arrangements, and sources of financing. The District Health Facility Data Sheet (DHFDS) was used at the district level to collect more detailed information on the sampled health units for fiscal 1999/2000, including data on staffing and the related salary structures, vaccine supplies and immunization activity, and basic and supplementary supplies of drugs to the facilities. In addition, patient data, including monthly returns from facilities on total numbers of outpatients, inpatients, immunizations, and deliveries, were reviewed for the period April–June 2000.

At the facility level, the Health Facility Questionnaire (HFQ) collected a broad range of information relating to the facility and its activities. The questionnaire, which was administered to the in-charge, covered (a) characteristics of the facility (location, type, level, ownership, catchment area, organization, and services); (b) inputs (staff, drugs, vaccines, medical and nonmedical consumables, and capital inputs); (c) outputs (facility utilization and referrals); (d) financing (user charges, cost of services by category, expenditures, and financial and in-kind support); and (e) institutional support (supervision, reporting, performance assessment, and procurement). Each Health Facility Questionnaire was supplemented by a Facility Data Sheet (FDS). The FDS was designed to obtain data from the health unit



records on staffing and the related salary structure; daily patient records for fiscal 1999/2000; the type of patients using the facility; vaccinations offered; and drug supply and use at the facility. Finally, at the facility level,

an Exit Poll was used to interview about 10 patients per facility on the cost of treatment, drugs received, perceived quality of services, and reasons for using that unit instead of alternative sources of health care.

## Public and Private Health Care Providers

The final sample consisted of 155 primary health care facilities drawn from 10 districts in the central, eastern, northern, and western regions of the country. It included government, private for-profit, and private nonprofit facilities. The nonprofit sector includes facilities owned and operated by religious organizations and NGOs. Table 1 shows the distribution of the sample across ownership categories and regions.

Table 2 presents general characteristics of the facilities in the sample. Approximately one-third of the surveyed facilities are dispensaries without maternity units; the rest provide

maternity care. The facilities vary considerably in size, from units run by a single individual to facilities with as many as 19 staff members.

Table 2 also sets out some descriptive statistics relating to the facility's infrastructure and the distance to services and administrative centers. These variables provide a rough indication of the structural dimensions of quality and the geographic location of the health unit.

**INFRASTRUCTURE AND LOCATION.** For a large proportion of facilities, boreholes are the primary source of water, but other water sources, including piped water, springs, and collected

**Table 1. Number of Health Care Facilities by Ownership Category and Region**

Ownership	Region				Total
	Central	Eastern	Northern	Western	
Government	30	24	12	15	81
Private for-profit	10	9	4	7	30
Private nonprofit	17	12	7	8	44
Catholic Medical Services	8	3	6	8	25
Protestant Medical Bureau	5	5	1	0	11
Muslim Medical Bureau	1	0	0	0	1
Seventh-Day Adventist	2	0	0	0	2
Nongovernmental organizations	1	4	0	0	5
<b>Total</b>	<b>57</b>	<b>45</b>	<b>23</b>	<b>30</b>	<b>155</b>

Source: Health facility survey, 1999/2000.

**Table 2. Characteristics of Health Facilities by Ownership Category and Region**

	Ownership			Region				Total
	Government	Private for-profit	Private nonprofit	Central	Eastern	Northern	Western	
<b>Type of facility (percentage of total)</b>								
Dispensary	30.4	38.7	43.2	22.8	17.8	45.5	80.0	35.7
Dispensary with maternity unit	69.6	61.3	56.8	77.2	82.2	54.6	20.0	64.3
<b>Source of water (percentage of total)</b>								
Piped water	7.6	25.8	15.9	12.3	13.3	0.0	27.6	13.6
Borehole	45.6	29.0	47.7	29.8	60.0	78.3	13.8	42.9
Protected spring	13.9	22.6	9.1	14.0	20.0	8.7	10.3	14.3
Unprotected spring	17.7	9.7	4.6	8.8	6.7	4.4	34.5	12.3
Harvested rainwater	12.7	9.7	22.7	33.3	0.0	0.0	13.8	14.9
Purchased water	1.3	0.0	0.0	1.8	0.0	0.0	0.0	0.7
Other	1.3	3.2	0.0	0.0	0.0	8.7	0.0	1.3
<b>Waste disposal (percentage of total)</b>								
Public waste disposal	0.0	0.0	2.3	1.8	0.0	0.0	0.0	0.7
Pit (dumping)	41.3	30.0	36.4	37.5	37.8	60.9	20.0	37.7
Pit (burning)	51.3	66.7	54.6	57.1	57.8	39.1	60.0	55.2
Incineration	0.0	0.0	2.3	1.8	0.0	0.0	0.0	0.7
Other	7.5	3.3	4.6	1.8	4.4	0.0	20.0	5.8
<b>Distance to services and institutions (kilometers)</b>								
<i>To telephone</i>								
Less than 5	22.5	54.8	47.7	57.9	28.9	21.7	16.7	36.1
6–20	36.3	29.0	25.0	29.8	37.8	17.4	36.7	31.6
21–50	32.5	12.9	20.5	8.8	22.2	52.2	40.0	25.2
51–100	8.8	3.2	6.8	3.5	11.1	8.7	6.7	7.1
<i>To district headquarters</i>								
Less than 5	3.8	9.7	11.6	7.1	4.4	13.0	6.7	7.1
6–20	25.0	38.7	37.2	33.9	35.6	17.4	30.0	31.2
21–50	51.3	45.2	41.9	48.2	44.4	56.5	43.3	47.4
51–100	20.0	6.5	7.0	10.7	15.6	8.7	20.0	13.6
More than 100	0.0	0.0	2.3	0.0	0.0	4.4	0.0	0.7
<i>To health subdistrict headquarters</i>								
Less than 5	15.2	42.9	32.6	20.8	25.0	34.8	26.7	25.3
6–20	62.0	50.0	48.8	66.0	56.8	34.8	53.3	56.0
21–50	22.8	7.1	18.6	13.2	18.2	30.4	20.0	18.7
<i>To subcounty center</i>								
Less than 5	73.8	80.7	65.1	78.6	77.8	65.2	60.0	72.7
6–20	26.3	19.4	34.9	21.4	22.2	34.8	40.0	27.3
<i>To village center</i>								
Less than 5	98.7	100.0	97.7	98.2	97.8	100.0	100.0	98.7
6–20	0.0	0.0	2.3	1.8	0.0	0.0	0.0	0.7
21–50	1.3	0.0	0.0	0.0	2.2	0.0	0.0	0.7

Source: Health facility survey, 1999/2000 (Health Facility Questionnaire).

rainwater, are also important. Piped water is more prevalent in private facilities. There are also noteworthy regional differences. For example, facilities in the northern region have no access to piped water and rely more on dumping for waste disposal. With respect to location, the data suggest that government facilities are more remote and isolated than nonprofit facilities.<sup>8</sup> On average, government facilities have more limited access to telephones and are farther away from district and health subdistrict headquarters.

**SERVICES.** Although the sample is restricted to primary-level health care facilities, a broad range of services is represented. There are noteworthy variations between facilities and across ownership categories (see table 3). In general, government and nonprofit facilities are more likely than private for-profit facilities to offer a broad range of services. For example, the pro-

portion of for-profit facilities providing mental health care, dental care, immunizations, and training of health workers is smaller than for the other two types. Similarly, only 60 percent of the nonprofit facilities provide family planning services, compared with over 90 percent for government and private for-profit facilities. This difference most likely reflects, at least in part, the religious affiliation of some facilities. Laboratory services are an important exception to the general pattern of broader service provision in government facilities: only 16 percent of government facilities offer these services, compared with over 50 percent for private for-profit and nonprofit providers. This clearly has implications for the diagnostic capabilities of the facility and hence for the quality of care provided.

**Table 3. Range of Health Services Provided at Facility by Ownership Category and Region**  
(percentage of facilities)

Service	Ownership			Region				Total
	Government	Private for-profit	Private nonprofit	Central	Eastern	Northern	Western	
Outreach	96.2	16.1	84.1	82.1	80.0	73.9	63.3	76.6
Outpatient care	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Inpatient care	53.2	63.3	79.6	52.6	77.3	56.5	65.5	62.8
Medical care	90.0	93.6	97.7	100.0	91.1	87.0	86.7	92.9
Eye care	50.0	13.3	40.9	52.6	28.9	60.9	17.2	40.3
Mental health care	20.5	3.3	11.6	15.8	4.6	13.0	29.6	14.6
Dental health	25.0	13.3	18.2	29.8	8.9	39.1	6.9	20.8
Minor surgery	90.0	64.5	84.1	80.7	80.0	73.9	100.0	83.2
Deliveries	85.0	61.3	70.5	89.5	84.4	60.9	50.0	76.1
Laboratory services	16.3	51.6	53.5	36.8	13.3	45.5	50.0	33.8
Preventive care								
Health education	100.0	77.4	97.7	96.5	93.3	100.0	89.7	94.8
Immunizations	97.5	31.0	81.8	91.2	77.3	65.2	75.0	80.3
Antenatal care	98.7	73.3	88.6	98.3	91.1	73.9	89.3	90.9
Family planning	96.3	90.0	60.5	89.5	86.4	82.6	75.9	85.0
Training								
Nursing aides	32.9	20.0	34.1	8.9	47.7	60.9	23.3	30.7
Community health workers	21.9	3.2	32.6	17.0	31.8	30.4	3.7	21.1

Source: Health facility survey, 1999/2000 (Health Facility Questionnaire).

## Oversight, Management, and Competition

Both government and private health facilities operate within an institutional context that affords at least some degree of oversight, supervision, and regulation and that, in the case of government and private nonprofit facilities, provides resources for the operation of the facilities. Supervision and other monitoring activities are clearly an important means by which local and central governments can seek to improve the performance of front-line health providers. Data on various aspects of external incentives of this nature were collected through the District Health Team Questionnaire (DHTQ) and the Health Facility Questionnaire (HFQ).

### Oversight by Local Government

The data from the DHTQ indicate that the district plays an active role in supporting and supervising health facilities. Indeed, in all the districts covered by the survey, respondents report that staff from the district, the health subdistrict, and the central Ministry of Health provide support and supervise government facilities. In addition, most district authorities reportedly have a supportive and supervisory role with respect to private for-profit and nonprofit providers.<sup>9</sup> According to the respondents, supervision covers service quality, management, and record-keeping. Other institutional mechanisms exist whereby the district administration seeks to hold the facility and its staff accountable. The most important of these are staff assessments and audits. In all districts, according to the reports, the performance of staff in government facilities is formally assessed, sometimes leading to the promotion, demotion, or firing of staff. In four districts, staff members in private nonprofit and for-profit facilities are also reportedly assessed. In 8 of the 10 surveyed districts, the district reports that it regularly audits inputs, incomes, and expenditures for all facilities.

The districts do not exercise functions of supervision, staff assessment, and audit consistently across all facilities. Indeed, the HFQ provides evidence that, from the facility perspective, monitoring and oversight are patchy. According to the responses by dispensary in-charges, 70 percent of government and private nonprofit facilities are supervised regularly (monthly or “at any time”) by the district, subdistrict, or subcounty. A much lower proportion of for-profit facilities is regularly supervised by the district administration. In half of the government facilities, staff are assessed frequently (monthly, weekly, daily, or “at any time”). The percentage is much lower in private for-profit and nonprofit facilities (10 and 38 percent, respectively). Half of the government facilities report that audits are regularly carried out, whereas the proportions for for-profit and nonprofit facilities are 17 and 52 percent, respectively.

### Management of Facilities

Most government and private nonprofit facilities have a health unit management committee (HUMC) or a governing board that is typically made up of seven to eight members drawn from the facility, the community, and the subcounty administration (see table 4). In most cases the HUMC meets three to four times a year. The main topics addressed include remuneration and other staff issues, the physical condition of the facility, the utilization of user charges levied by the facility, and drug supply.

### Competition

In general, health facilities do not operate in isolation but, rather, in a complex health care provision market. Indeed, the data provide evidence that facilities are exposed to considerable competition and that they are aware of the other providers operating in their catchment area. Table 5 shows that the degree of competition—proxied by the number of other providers in the catchment area and the dis-

**Table 4. Management of Health Facilities by Ownership Category and Region**

	Ownership <sup>a</sup>		Region				Total
	Government	Private nonprofit	Central	Eastern	Northern	Western	
Number of facilities in subsample	81	44	47	36	19	23	125
Facility has HUMC (percent)	97.5	100.0	100.0	100.0	94.7	95.7	98.4
<i>Number of HUMC members</i>							
Mean	7.5	8.7	8.0	8.4	8.2	7.3	8.0
Median	7.0	8.0	7.0	7.0	7.0	7.0	7.0
<i>Number of HUMC meetings per year</i>							
Mean	3.9	4.0	4.6	4.1	3.3	2.8	3.9
Median	3.0	3.0	4.0	3.0	2.0	2.0	3.0
<i>Issues addressed by HUMC (percent)</i>							
Drug supply	58.4	58.0	58.7	69.7	38.9	54.6	58.0
Allowances/remuneration	24.7	30.8	37.0	39.4	27.8	8.7	30.8
Transport	11.7	14.2	19.6	12.1	11.1	8.7	14.2
Staff issues	80.5	78.3	71.7	87.9	94.4	65.2	78.3
Physical condition of facility	74.0	72.5	80.4	81.8	61.1	52.2	72.5
Relations with district	10.4	10.8	6.5	21.2	11.1	4.4	10.8
Mobilization of donor and other support	19.5	25.8	28.3	15.2	38.9	26.1	25.8
Utilization of user charges	72.7	65.8	58.7	81.8	55.6	65.2	65.8
<i>Representation on HUMC/board (percent)</i>							
In-charge	100.0	90.7	93.6	100.0	100.0	95.5	96.7
Other facility staff	96.2	65.9	85.1	88.6	88.9	78.3	85.4
District officials	2.6	11.4	6.4	2.9	5.6	9.1	5.7
District politicians	2.5	11.4	6.4	5.7	5.6	4.4	5.7
Health subdistrict officials	2.5	9.1	6.4	2.9	11.1	0.0	4.9
County officials	1.3	2.3	2.1	0.0	5.6	0.0	1.6
Subcounty official	48.1	20.5	38.3	28.6	27.8	60.9	38.2
Parish official	42.3	34.1	51.1	23.5	55.6	26.1	39.3
Village official	98.7	59.1	76.6	94.3	88.9	82.6	84.6
Community representative	87.2	75.0	73.9	88.6	94.4	82.6	82.8
Religious leaders	59.0	93.0	73.3	65.7	44.4	95.7	71.1
Teacher representative	71.8	61.4	50.0	68.6	94.4	82.6	68.0
<i>Mode of selection of HUMC/board members (percent)</i>							
Appointment by district	3.9	2.4	2.3	2.9	11.1	0.0	3.4
Appointment by subcounty	84.6	0.0	61.4	48.6	44.4	63.6	55.5
Appointment by village	10.3	9.8	9.1	2.9	33.3	4.6	10.1
Locally elected	23.1	29.3	2.3	51.4	61.1	0.0	25.2
Volunteer	2.6	14.6	2.3	2.9	22.2	9.1	6.7
By virtue of employment	71.8	61.9	60.0	51.4	94.4	90.9	68.3

Note: HUMC, health unit management committee.

a. According to the data, only two private for-profit facilities have governing boards. Private for-profit facilities are therefore not considered in this table.

Source: Health facility survey, 1999/2000 (Health Facility Questionnaire).

tance to the closest provider—varies substantially across regions and ownership categories.

## Inputs and Costs at Health Facilities

Efficient delivery of primary health care services depends on the availability of capital and recurrent inputs at the facility level. The range of capital inputs depends on the type of services provided but typically includes buildings, vehicles, refrigerators, sterilizers, and other equipment. Important recurrent inputs include personnel; supplies (food, drugs, vaccines, syringes, and so on); and requirements for operation and maintenance of vehicles (fuel, lubricants, spare parts, and insurance) and buildings (electricity, water, fuel, telephone, cleaning, and repairs).

In the case of government facilities, the inputs into the production of health services are not generally procured directly by the facility. Rather, financial resources are allocated to different cost centers upstream, which are responsible for the procurement, payment, and distribution of the inputs. The complex institutional structure that governs budget execution makes it difficult to get a comprehensive pic-

ture of the link between public spending in the health sector and the availability of inputs at the facility level.

This survey collected extensive information on key inputs in the production of health services at the facility level. The information was collected at both district and facility levels. The existence of comparable data from different sources made it possible to assess the validity of the collected data and the operations of the internal management information systems. This section discusses the evidence from these data, focusing primarily on staffing, drugs, and vaccines, but with some attention to other inputs.

## Staffing

Data on facility staffing were collected primarily through the Facility Data Sheet (FDS) and the District Health Facility Data Sheet (DHFDS). Some additional information concerning training and staff assessments was collected through the complementary instruments. In general, one would expect the most detailed information about the number of frontline staff, their positions, and their remuneration to be available at the facility level.<sup>10</sup>

**Table 5. The “Competitive Environment” in Health Care by Ownership Category and Region**

	Mean number of other providers in catchment area		Distance to closest other provider (kilometers) <sup>c</sup>
	Provider type A <sup>a</sup>	Provider type B <sup>b</sup>	
<i>Ownership</i>			
Government	7.8	3.6	2.3
Private for-profit	10.9	5.7	0.8
Private nonprofit	11.1	5.4	1.4
<i>Region</i>			
Central	11.5	5.3	1.2
Eastern	9.4	4.9	1.1
Northern	5.2	2.7	2.4
Western	8.5	3.9	3.3
<b>All regions</b>	<b>9.4</b>	<b>4.5</b>	<b>1.7</b>

a. Includes aide post/subdispensary, dispensary, health center/hospital, clinic, and drug shop/pharmacy.

b. As in note a, but excludes drug shop/pharmacy.

c. Excludes drug shop/pharmacy.

Source: Health facility survey, 1999/2000 (Health Facility Questionnaire).

At that level, the enumerators were also able to verify the presence of the staff members. For these reasons, the staff data from the FDS form the primary basis for the analysis. Data collected from facilities are also compared with those obtained from the district headquarters. In total, data were collected on 1,087 health facility staff.<sup>11</sup>

**STAFF NUMBERS AND STAFF MIX.** The number of staff varies considerably among the sampled facilities, ranging from 1 to 19. The sample mean and median are both 7. As can be seen from table 6, government and private nonprofit facilities have more staff, on average, than private for-profit facilities. Indeed, most private facilities tend to be small; only a small number of them have more than five staff members. It is more difficult to generalize about staffing patterns for private nonprofit facilities, where the distribution is considerably flatter. The largest facilities in this group are run by Catholic Medical Services.

The survey distinguishes nine categories of staff. On the basis of the nature of their work and their average salaries, these categories can be consolidated into five broad groups: (a) medical doctor, (b) qualified nurse or clinical officer, (c) basic nurse, midwife, or lab assistant, (d) nursing aide, and (e) other. Together,

nursing aides and “other” staff make up more than half of facility staff (see table 7).<sup>12</sup>

According to government policy, a health center III is not expected to have a medical doctor, but it is supposed to be managed by a clinical officer. Yet, as table 8 shows, many facilities operate without either a doctor or a clinical officer. Almost 10 percent of the facilities in the sample have only nonmedical staff. Not surprisingly, staff composition is closely related to the size of the facility; facilities with more staff are also likely to have qualified staff (a doctor, nurse, or clinical officer). Government facilities are less likely to operate with only nonmedical staff or without a doctor or clinical officer. Substantial regional differences in staff composition can be seen—in particular, the greater likelihood that facilities in the central region will have doctors or clinical officers.

Almost all (92 percent) of the facility staff in the sample reportedly work full time. The use of part-time workers is more common in private facilities. In government facilities the use of part-time staff is largely restricted to incidental “other” staff; in private facilities doctors, clinical officers, nurses, and lab assistants are often contracted part time.

**Table 6. Number of Staff by Ownership Category and Region**

	Minimum	Mean	Median	Maximum
<i>Ownership</i>				
Government	2	7.8	7	19
Private for-profit	1	4.2	3	12
Private nonprofit	2	7.7	6	19
<i>Region</i>				
Central	1	8.0	7	18
Eastern	1	5.8	5	14
Northern	3	8.2	8	19
Western	1	6.1	5	19
<b>All regions</b>	<b>1</b>	<b>7.0</b>	<b>7</b>	<b>19</b>

Source: Health facility survey, 1999/2000 (Facility Data Sheet).

**Table 7. Health Facility Staff by Position**

Position	Frequency	Percentage of total <sup>a</sup>
Medical doctor	20	1.8
Qualified nurse or clinical officer	95	8.7
Clinical officer	71	6.5
Comprehensive nurse	2	0.2
Registered nurse	22	2.0
Basic nurse/midwife	272	25.0
Enrolled nurse	122	11.2
Enrolled midwife	121	11.1
Lab assistant	29	2.7
Nursing aide	298	27.4
Other	402	37.0
<b>Total</b>	<b>1,087</b>	<b>100.0</b>

a. Numbers may not sum to total because of rounding.

Source: Health facility survey, 1999/2000 (Facility Data Sheet).



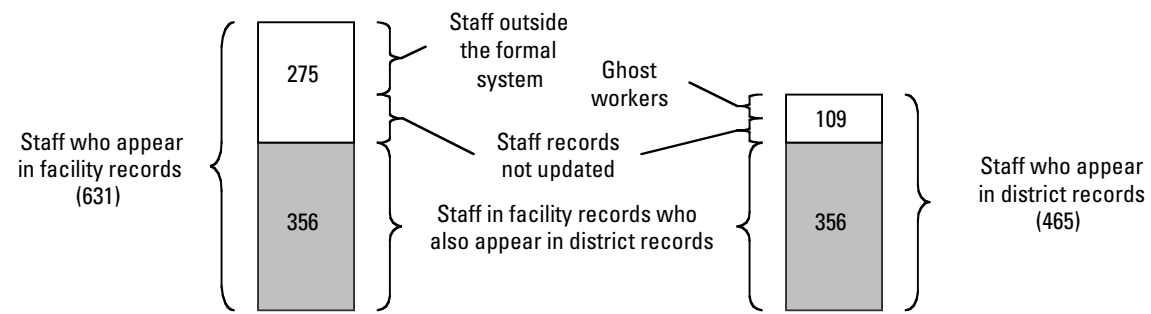
**Table 8. Staff Mix by Size of Facility, Ownership Category, and Region**

	Frequency	No doctor or clinical officer (percent)	Assistant or nonmedical staff only (percent)
<i>Facility size (number of staff)</i>			
Small (1–5)	57	79	19
Medium (6–8)	56	46	5
Large (9–19)	42	21	0
<i>Ownership</i>			
Government	81	38	6
Private for-profit	30	58	16
Private nonprofit	44	73	9
<i>Region</i>			
Central	57	30	4
Eastern	45	73	13
Northern	23	52	9
Western	30	60	13
<b>Total (all facilities) or average</b>	<b>155</b>	<b>52</b>	<b>9</b>

Source: Health facility survey, 1999/2000 (Facility Data Sheet).

COMPARISON OF FACILITY AND DISTRICT DATA ON STAFFING IN GOVERNMENT FACILITIES. To complement the staffing data collected at the facility level, information on staff in the sampled facilities was also collected at the district level. The district administration does not, in general, keep records of staffing in private for-profit or nonprofit facilities, but it does keep detailed records of staff in government facilities.<sup>13</sup> In principle, district and facility data on staffing should correspond. In reality, the situation is far more complicated. The staffing data collected at the facility level sum to 631 staff

working in the government facility subsample, but only 356 of these (56 percent) are to be found in the district records.<sup>14</sup> In other words, there are large numbers of staff working in government facilities about whom the district authorities appear to have no information. These staff members can be considered “ghost workers” from the district’s perspective. There are also 109 individuals for which the reverse situation holds: they appear in the district records but not in the corresponding facility records. These are “ghost workers” in the more traditional sense (see figure 1).

**Figure 1. Reconciling District and Facility Staff Records**

Source: Health facility survey, 1999/2000.

Of the 275 health workers who appear only in the facility records, 60 percent fall into the category “other.” Another 20 percent are nursing aides, and 15 percent are enrolled nurses or midwives. It is not surprising that in most cases the salary of these staff members is low, with a median of only 40,000 Ugandan shillings (USh).<sup>15</sup> According to the information collected at the facility level, the district finances 38 percent of these staff. The rest are financed by the facility (27 percent), the subcounty (26 percent), or another source (9 percent).

How can the lack of consistency between facility and district records be explained? As noted above, many of the staff who appear only in the facility records are actually financed by the district or subcounty. In fact, in many cases the presence in a facility of a “district-level ghost” (an individual who appears only in the district record) is matched by the existence of a “facility-level ghost” (an individual who is reportedly financed by the district but appears only in facility records). This suggests that part of the answer probably lies in poorly updated district records: a staff member may have been replaced, but the district-level records were not updated. Given the discrepancies in numbers, however (109 staff appear only in district records, whereas 275 appear only in facility records), there seems to be more to the story. Most likely, there is a large number of elementary health workers, financed by the subcounty, for whom the district does not keep records. There is also a considerable group of staff financed either by the facility or by some other source (such as an NGO or a donor), and these staff may not be recorded at the district level. All in all, it appears that approximately 20–25 percent more staff are working at the facility level than would be expected on the basis of district records.

To sum up, it is difficult to establish from the data whether there are many “ghost workers” on the district payroll. At first glance, it looks as though there is a consider-

able number of staff listed in district records who do not appear to be working in the corresponding facility. It is plausible, however, that these staff members have simply been replaced by others and that the new staff are now receiving the salary of the apparent “ghosts.” Similarly, there are many more staff working at the facility level than would appear to be the case from the aggregated (district-level) payroll data. A considerable proportion of these staff is paid from user fee revenues. These issues clearly merit further attention and will be addressed in future analysis of the survey data.

**STAFF REMUNERATION AND FINANCING: GOVERNMENT FACILITIES.** This section takes a closer look at remuneration for different categories of staff, how remuneration differs across facilities according to ownership and geographic location, and staff financing. In principle, the conditions of employment of staff in government facilities are clearly established in the form of a salary scale.<sup>16</sup> In addition, in fiscal 1999/2000 staff in government facilities were entitled to a lunch allowance. All established staff in hospitals and lower-level units should have received USh 66,000 per month as a lunch allowance, while most support staff should have received USh 44,000.<sup>17</sup> Formally, these conditions apply only to staff in established positions (that is, on the payroll).

As table 9 shows, the salary scale is not necessarily a good guide to salaries as reported by the facilities, in particular for staff not financed by the central government or the district. Staff financed by the subcounty receive less than staff in equivalent positions financed by the district. This is particularly true for staff in the heterogeneous “other” category. Staff financed from facility revenues—lab assistants, nursing aides, and others—receive only a proportion of the salary that they would receive if they were on the district payroll.

Seventy-seven percent of the staff financed by the subcounty or the facility do not appear

**Table 9. Median Salaries in Government Facilities by Position and Source of Financing**  
(Ugandan shillings)

Position	Source of financing								Government salary scale	Government salary for grade (midpoint)
	District		Subcounty		Facility		Other			
	<i>n</i>	Salary	<i>n</i>	Salary	<i>n</i>	Salary	<i>n</i>	Salary		
Medical doctor	2	125,489	—	—	—	—	—	—	U3–U5A	354,063
Clinical officer	48	143,881	—	—	—	—	1	360,000	U6	126,688
Comprehensive nurse	1	79,776	—	—	—	—	—	—		
Registered nurse	7	125,549	—	—	—	—	—	—		
Enrolled nurse	62	113,255	—	—	—	—	5	113,824	U7	105,605
Enrolled midwife	74	113,255	—	—	—	—	6	143,412		
Lab assistant	3	84,040	—	—	3	35,000	1	113,824		
Nursing aide	137	59,902	39	56,930	10	30,000	2	85,546	U8	82,601
Other	89	102,225	54	27,500	54	15,000	14	37,500	n.a.	n.a.

— Not available.

n.a. Not applicable.

Note: *n* denotes number of staff.

Source: Health facility survey, 1999/2000 (Facility Data Sheet).

to receive any lunch allowance. By contrast, staff financed from “other” sources appear to have conditions broadly similar to staff financed by the district. Thus, differences in sources of financing can lead to inefficient and inequitable staffing patterns across facilities and to inequities within facilities.

Finally, two dimensions of regional variation in government facilities are of particular interest (see table 10):

- Median salaries in the central region are higher than in the other regions.
- User fee revenues are most important as a source of financing of staff salaries in the central and eastern regions.

**STAFF REMUNERATION AND FINANCING: PRIVATE FACILITIES.** Staff in for-profit facilities appear to be exclusively financed by the facility, through funds raised from user charges. The situation is

**Table 10. Median Salaries and Sources of Financing for Government Facilities by Region**

	Central	Eastern	Northern	Western
Number of staff	269	145	104	104
<i>Median salary (Ugandan shillings)</i>				
Doctor/clinical officer	193,000	140,209	135,161	135,660
Nurse	170,000	108,251	113,824	113,000
Assistant/other	71,000	58,941	56,930	59,530
<i>Source of financing (percentage of staff)</i>				
District/government	75.6	68.1	53.9	68.3
Subcounty	8.0	14.6	33.7	15.4
Facility (user fees)	13.0	17.4	1.0	7.7
Other	3.4	0.0	11.5	8.7

Source: Health facility survey, 1999/2000 (Facility Data Sheet).

similar in private nonprofit facilities, although some of them benefit from financial support (contributions or public subsidy) and certain staff members in nonprofit facilities receive their salaries from the district.

Table 11 suggests that there are regional differences in salaries in both for-profit and nonprofit private facilities. For-profit facilities show a bias in favor of the central region, in particular for more qualified staff. In nonprofit facilities there appears to be a slight bias in favor of the northern and western regions.

Preliminary analysis indicates that staff in for-profit and nonprofit facilities tend to be paid less than staff in government facilities and that there are also differences within the private sector. Nonprofit facilities pay significantly less for staff at the highest qualification levels than for-profit facilities do. Finally, most staff in private facilities do not receive a lunch allowance, and if they do, it tends to be lower than the allowance in government facilities.<sup>18</sup>

**SUMMARY OF PAY CONDITIONS.** As is clear from figure 2, even without the lunch allowance, staff in government facilities are, on average, better paid than staff in private for-profit and nonprofit facilities. This is true at all levels of

the salary spectrum. If the lunch allowance is added, the difference is even more pronounced. But although salaries are higher in government facilities, there is also evidence that government staff are more likely to experience delays in payment of salaries. The facility in-charges were asked about the “average length of delays (in weeks) in staff salaries (excluding salaries paid from user fees).” It is clear from the responses that delays in payment are a considerable problem in some facilities. In only 28 percent of government facilities are salaries normally received on time, as against 72 percent in for-profit and 39 percent in nonprofit facilities. In 20 percent of government facilities the delay is reportedly more than 16 weeks.

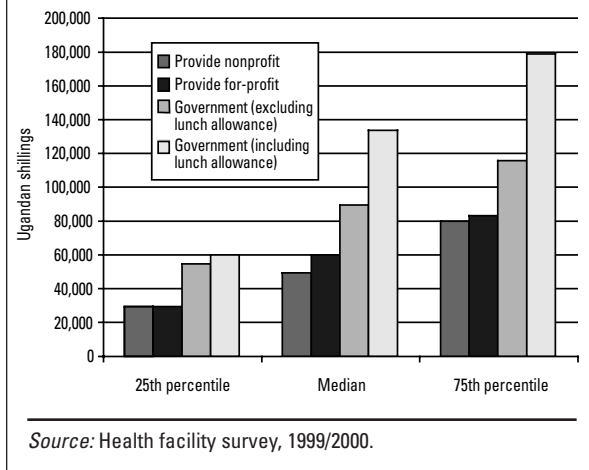
**STAFF ATTENDANCE.** Finally, at the time of the visit by the survey enumerator, most facility staff were reported to be present. Of those who were not present, the majority were on leave or off duty. Unauthorized leave (absenteeism) in the sample appears to be low, at 3.1 percent; it is slightly higher (4.4 percent) in government facilities. Although these findings are encouraging, they should be interpreted with care. First, it is possible that the respondent was covering for staff members who were absent with-

**Table 11. Median Salaries in Private Facilities by Region**  
(Ugandan shillings)

Ownership and staff position	Central	Eastern	Northern	Western
<i>Private for-profit</i>				
Number of staff	53	23	23	22
Position				
Doctor/clinical officer	205,000	100,000	80,000	100,000
Nurse	70,000	127,500	50,000	70,000
Assistant/other	50,000	30,000	25,000	35,000
<i>Private nonprofit</i>				
Number of staff	133	83	62	57
Position				
Doctor/clinical officer	150,000	140,000	176,952	—
Nurse	85,000	113,000	70,000	100,000
Assistant/other	30,000	30,000	29,000	50,000

— Not available.

Source: Health facility survey, 1999/2000 (Facility Data Sheet).

**Figure 2. Average Remuneration by Ownership Category**

out leave and that absenteeism was therefore underestimated. Also, the fact that facility staff had prior warning of the survey visit casts some doubt on the validity of the estimates.

## Supply and Use of Drugs

**DRUG SUPPLY TO FACILITIES.** Detailed information on the supply of drugs to facilities was collected at both district and facility levels. The district data are based on stock cards from the district medical store and cover both kit supplies and supplementary supplies of specific drugs. Data were collected on six drugs: chloroquine, Septrin (a combination of antibiotics), procaine penicillin fortified, Paracetamol (acetaminophen), ergometrine, and oral rehydration salts (ORS). Corresponding data were collected from the facility stock cards.

Table 12, based on facility stock cards, shows the average daily supply of chloroquine and Septrin to government and nonprofit facilities.<sup>19</sup>

The stock cards also provide information on the form and source of supply of each drug. Taking chloroquine as an example, figure 3 demonstrates that kit supply is the most important form of supply for government facilities (except in the western region), while nonprof-

**Table 12. Average Daily Supply of Selected Drugs to Facilities by Ownership Category and Region (number of tablets)**

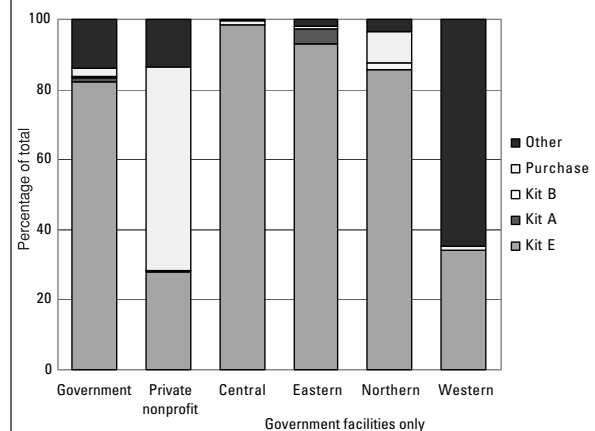
	Chloroquine	Septrin
<i>All facilities</i>		
Government	88.2	42.9
Private nonprofit	45.3	40.1
<i>Government facilities by region</i>		
Central	73.3	35.1
Eastern	72.3	54.8
Northern	119.4	44.3
Western	116.2	41.3

*Note:* The average daily supply is calculated by taking total supply to the facility over an extended period (237 days, on average) and dividing that total (excluding supply on the final day) by the number of days covered.

*Source:* Health facility survey, 1999/2000 (Facility Data Sheet).

its rely in large part on purchased drugs. These differences are mirrored in the source of supply; government facilities are almost exclusively supplied by the district administration, whereas private nonprofit facilities rely largely on both district supplies and private sources, including the joint medical store operated by the religious provider organizations.

**DRUG USE AT THE FACILITY LEVEL.** Detailed information was collected at the facility level on the use and distribution of drugs. Again, the

**Figure 3. Forms of Chloroquine Supply**

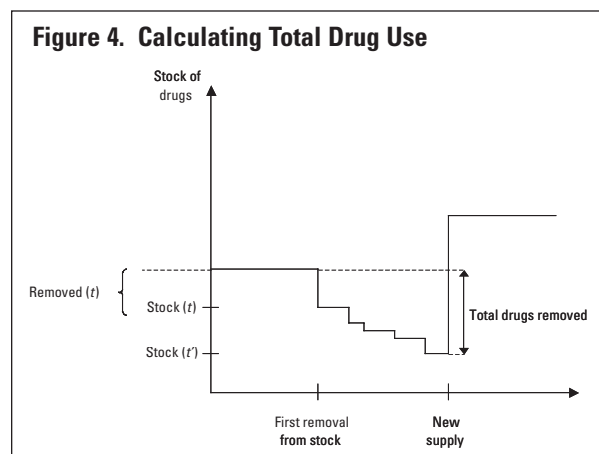
*Source:* Health facility survey, 1999/2000.

survey focused on chloroquine, Septrin, procaine penicillin fortified, Paracetamol, ergometrine, and oral rehydration salts. The survey tools were designed to capture stock movements for a period of approximately one month in early 2000 during which no new supplies were received and the facility experienced no stock-outs. Total removals of drugs from stocks for such a period can be easily calculated from stock levels at the beginning and end of the period. For each type of drug, the analysis focuses on two main variables: the amount of drugs removed from stocks, and the number of patients. The amount of drugs removed from stocks in period  $t$  to  $t'$  is calculated as

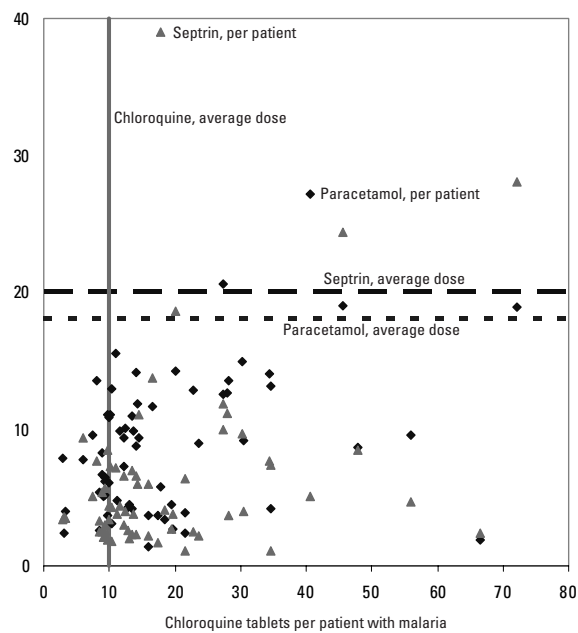
$$\text{Total drugs removed} = \text{removed}(t) + \text{stock}(t) - \text{stock}(t').$$

The logic of this calculation is illustrated in figure 4. Patient registers were reviewed for the same period, and the number of patients was counted, distinguishing between adults and children and counting separately the number of patients diagnosed with malaria.

The simplest way of assessing how drug use relates to patient numbers is to look at the number of tablets given to patients.<sup>20</sup> Figure 5 plots the numbers of Paracetamol and Septrin tablets used (removed from stock) per patient against the number of chloroquine tablets used per patient with malaria for each facility. Clearly, we do not expect Paracetamol or Sep-



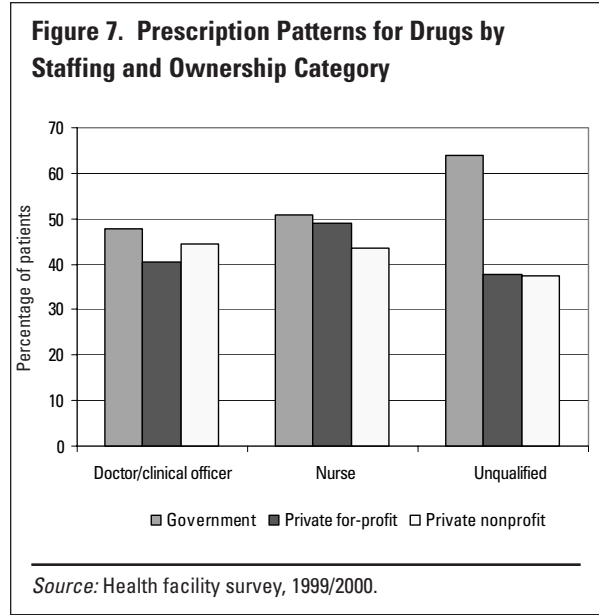
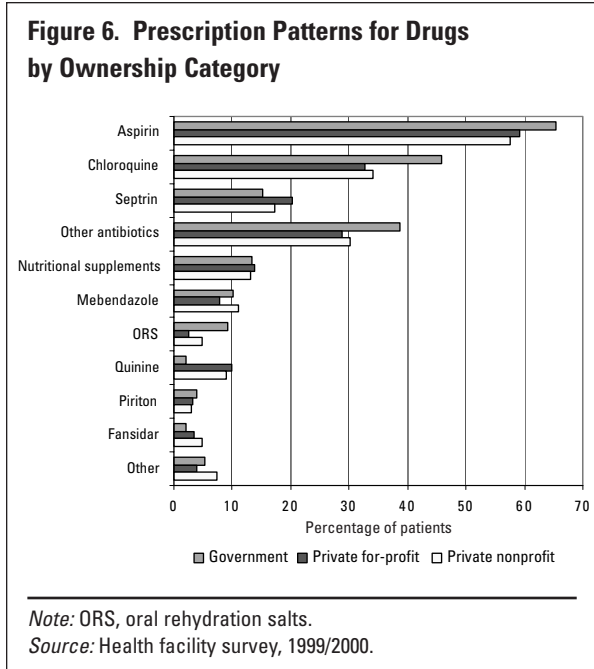
**Figure 5. Amounts of Drugs Prescribed per Patient, All Facilities**  
(number of tablets, adult equivalents)



Source: Health facility survey, 1999/2000.

trin to be prescribed for all patients, so the average number of tablets per patient (averaged over all patients, whether they receive a prescription or not) should be lower than the recommended dose. As expected, Paracetamol appears to be prescribed more liberally than Septrin. Drug use per patient is very high in some facilities, and high use per patient of one drug appears to be related to high use of other drugs. The reasons for high drug use per patient may include high need, overprescription, and leakage.<sup>21</sup>

**EVIDENCE FROM THE EXIT POLL.** On the basis of interviews with clients leaving the facility, it appears that most clients received some drugs following the consultation—in many cases, more than one type of drug (see figure 6). The differences across ownership categories are surprisingly small. On average, more than 60 percent of patients receive aspirin or Paracetamol, and 40 percent receive chloroquine. What



is perhaps more surprising is the high proportion of clients who receive Septrin or another form of antibiotic. More than 46 percent of patients report receiving an antibiotic, and in 5 percent of the cases they receive both Septrin and another type of antibiotic. Of seven specific drugs—chloroquine, Fansidar, quinine, Septrin (or other antibiotics), mebendazole, and Piriton—25 percent of patients receive two types of drugs, and 6 percent receive three or more types.

Government facilities exhibit systematic differences in prescription practice, depending on the staffing of the facility. The proportion of patients receiving some form of antibiotic is over 60 percent in government facilities without a qualified nurse, clinical officer, or doctor but less than 50 percent in facilities with qualified staff (see figure 7). The results from a probit analysis (table 13) suggest that the effect of the interaction between staffing pattern and ownership is statistically significant in a multivariate framework.

There is some regional variation in the pattern of drugs received by patients in government facilities, which may reflect differences in prescription practices or in access to drugs in

government facilities in different regions. This issue will be explored further in future analysis of the survey data.

All but one of the sampled government facilities report carrying out immunizations, and so do 36 of the 44 private nonprofit facilities. By contrast, only 31 percent of the for-profit facilities perform immunizations. Both government and nonprofit facilities rely primarily on the district or health subdistrict for vaccine supplies. Indeed, since the supply of vaccines is a

**Table 13. Probit Analysis of Prescription of Antibiotics**

Variable	Received antibiotic	z statistic
Total number of staff (staf_num)	0.017	-1.82
Only unqualified staff (unqual) (0/1)	-0.193	-0.96
Ownership/staffing interaction (gov_facility*unqual)	0.791	(2.87)**
Ownership/staffing interaction (pri_facility*unqual)	-0.104	-0.37
Eastern region (region 2)	0.165	(1.96)*
Northern region (region 3)	0.129	-1.3
Western region (region 4)	-0.840	-0.87
Constant	-0.259	(2.78)**
Number of observations	1,516	

\* Significant at the 5 percent level.

\*\* Significant at the 1 percent level.

Note: Figures in parentheses are the absolute values of z statistics.

Source: Health facility survey, 1999/2000 (Exit Poll).

vertical (national) program, the facilities that receive vaccines from the government are the ones that carry out immunizations.

Data were collected at the district level on the total amount of vaccines supplied to the sampled facilities in the last six months of fiscal 1999/2000 (January–June 2000). Information collected from the records of the district medical store focused on five vaccines: Bacillus Calmette-Guérin (BCG), for tuberculosis; polio; measles; tetanus toxoid; and diphtheria, pertussis, and tetanus (DPT). The records distinguish between regular supplies and vaccines supplied for national and district immunization days.

As is shown in table 14, facilities receive only a limited supply of vaccines for immunization days. With the exception of measles vaccine, the average monthly supply is less than five doses. In fact, there are no supplies for immunization days in the central and northern regions, and only one facility in the western region receives these supplies.<sup>22</sup> In general, the regular supply is a more important source of vaccines than special supplies for immunization days. The “regular” supply,

however, varies considerably from month to month, and some facilities reportedly received no supplies during the six-month period. The number of doses of vaccines supplied to government and nonprofit facilities is very similar for most vaccine types (see table 14).

At the facility level, data were collected on vaccine stock-outs. Approximately 40 percent of government and nonprofit facilities report having run out of some or all vaccines in fiscal 1999/2000. Most facilities are reportedly resupplied without much delay (see table 15), but in some cases stock-outs last for a considerable period, ranging from 1 to 12 weeks.

Comparison of the supply of vaccines over six months with the number of vaccinations carried out during the same period is possible, although it is difficult because of a lead in supply and a lag in actual vaccinations. The relationship in any given period will always be tenuous. Subject to these limitations, figure 8 shows that there is frequently a big discrepancy between the two numbers.<sup>23</sup> In some facilities the supply is three to four times greater than the actual number of vaccinations carried out. This could reflect a national policy of

**Table 14. Average Monthly Supply of Vaccines to Government and Nonprofit Facilities**

Facility ownership and vaccine	For immunization days (doses)				Regular supplies (doses)			
	Mean	Minimum	Median	Maximum	Mean	Minimum	Median	Maximum
<i>Government (n=63)</i>								
BCG	1	0	0	67	131	0	117	467
Polio	4	0	0	167	172	0	140	1,033
Measles	306	0	0	1,933	60	0	50	210
Tetanus toxoid	0	0	0	0	111	0	100	533
DPT	1	0	0	67	147	0	143	340
<i>Nonprofit (n=28)</i>								
BCG	2	0	0	67	139	0	125	425
Polio	2	0	0	67	146	0	133	400
Measles	46	0	0	983	61	0	67	200
Tetanus toxoid	4	0	0	67	105	0	100	250
DPT	2	0	0	67	142	0	137	383

Note: BCG, Bacillus Calmette-Guérin vaccine; DPT, diphtheria, pertussis, and tetanus vaccine. For facilities with missing data for one or more months, the average supply is calculated as a mean of the months for which data are available.

Source: Health facility survey, 1999/2000 (Facility Data Sheet).



**Table 15. Vaccination Stock-Outs and Resupply, Government and Nonprofit Facilities**

	Percentage of facilities with immediate supply		Average number of weeks to resupply other facilities	
	Government	Private nonprofit	Government	Private nonprofit
BCG	45	36	4.3	4.1
Polio	54	73	3.5	4.7
Measles	74	82	2.3	3.0
Tetanus	88	—	1.7	—
DPT	40	73	2.5	2.3

— Not available.

Note: BCG, Bacillus Calmette-Guérin vaccine; DPT, diphtheria, pertussis, and tetanus vaccine.

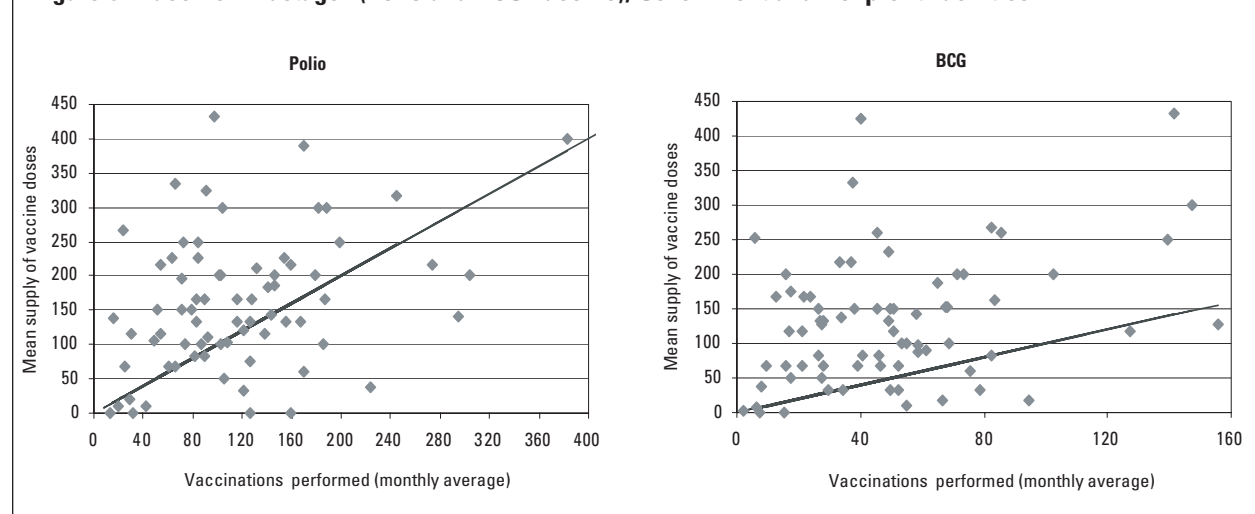
Source: Health facility survey, 1999/2000.

opening vaccine vials even for small numbers of patients, but other factors may also be at work, and the issue deserves further attention.

### Other Inputs

Data were collected at the facility level on the supply and availability of other inputs. Questions focused on four areas: medical consumables (bandages, cotton wool, syringes, gloves, and the like); contraceptives, by type; nonmedical consumables (fuel, kerosene, utilities, uniforms, detergents, and so on); and capital inputs (furniture, equipment, and means of transport).

**MEDICAL CONSUMABLES.** The data suggest that not only do all government facilities receive free supplies but that so too do large proportions of private for-profit and nonprofit facilities (14 and 65 percent, respectively). More detailed data on quantities and sources of supplies for private facilities, especially for-profit facilities, are incomplete. More than 40 percent of the government facilities report having run out of supplies in the course of fiscal 1999/2000. In many cases the facilities were restocked within a week, but some facilities report waiting several weeks and in some cases up to 20 weeks. A reflection of this situation is

**Figure 8. Vaccine "Wastage" (Polio and BCG Vaccine), Government and Nonprofit Facilities**

Source: Health facility survey, 1999/2000.

that almost 40 percent of government facilities report occasionally buying their own medical consumables. The supply of syringes appears to be particularly problematic.

**CONTRACEPTIVES.** As with medical consumables, almost all government facilities receive free contraceptive supplies from the district or subdistrict, primarily in the form of pills, injectable contraceptives, and condoms. Many private for-profit and nonprofit facilities also report receiving free supplies. More than half of the government facilities experienced stock-outs in fiscal 1999/2000, sometimes for considerable periods. Almost 30 percent of government facilities purchased their own supplies at some point.

**NONMEDICAL CONSUMABLES.** Many government facilities (65 percent) receive free supplies of nonmedical consumables, although there appear to be some regional imbalances. (The share is 90 percent in the central region but only 33 percent in the western region.) In general, for-profit facilities do not receive free supplies, while approximately 50 percent of private nonprofit facilities do. Kerosene, detergents, and, to some extent, fuel appear to be particularly important items in this category. Many government facilities report long periods of stock-outs, particularly of kerosene.

**CAPITAL INPUTS.** A majority of facilities in all categories report having some means of transport, but almost 30 percent do not. Only 5

percent of government facilities and 15–20 percent of private facilities have a truck, minibus, or car. For government facilities, motorcycles are more common (33 percent), and almost 70 percent of facilities report having a bicycle. The differences in the availability of equipment across ownership categories (see table 16) reflect in large part differences in the range of services. For example, many for-profit facilities do not offer immunizations and hence do not need refrigerators.

## User Fees and Financing

This section discusses the size, scope, and utilization of user fees. It also looks at other sources of funds and at facility budget practices and expenditure patterns.

### User Fees

In fiscal 1999/2000 all facilities charged user fees for some services. In 2001 user fees were abolished in the public sector. Before that, fee structures for government facilities were set by the district, the health unit management committee (HUMC), or both. By contrast, in most private for-profit facilities, the fee structure appears to be the responsibility of the in-charge, although staff and the HUMC are sometimes involved. In private nonprofit facilities, fees are set either by the in-charge or by the HUMC. With the exception of some private for-profit

**Table 16. Availability of Equipment by Ownership Category**  
(percentage of facilities)

Type of equipment	Government	Private for-profit	Private nonprofit
Sterilization equipment	100	83	100
Refrigeration equipment	90	13	66
Weighing scales	94	77	93
Height measurement equipment	41	13	16
Blood pressure machine	90	100	86
Microscope	44	50	61
Sets of protective clothing	43	43	45

Source: Health facility survey, 1999/2000 (Health Facility Questionnaire).

**Table 17. User Fees by Ownership Category**  
(Ugandan shillings)

	Government			Private for-profit			Private nonprofit		
	Low	Median	High	Low	Median	High	Low	Median	High
OPD (new patient)	500	500	600	1,000	2,500	5,000	300	1,000	3,000
OPD (reattendance)	0	200	500	0	0	0	0	0	0
Bed per day	0	0	0	0	0	0	0	0	500
Minor surgery	0	500	800	250	1,000	3,000	0	750	1,500
Antenatal care	300	500	500	0	1,000	1,000	500	500	1,000
Family planning	0	0	500	0	500	1,000	0	0	0
Medical care	300	500	500	1,500	3,000	5,000	250	1,250	3,500
Eye care	0	0	500	0	0	0	0	0	0
Mental health care	0	0	0	0	0	0	0	0	0
Dental health care	0	0	0	0	0	0	0	0	0
Delivery	1,000	2,000	3,000	0	5,000	8,000	0	3,500	6,000

Note: OPD, outpatient day. Low refers to the 25th percentile; high refers to the 75th percentile.

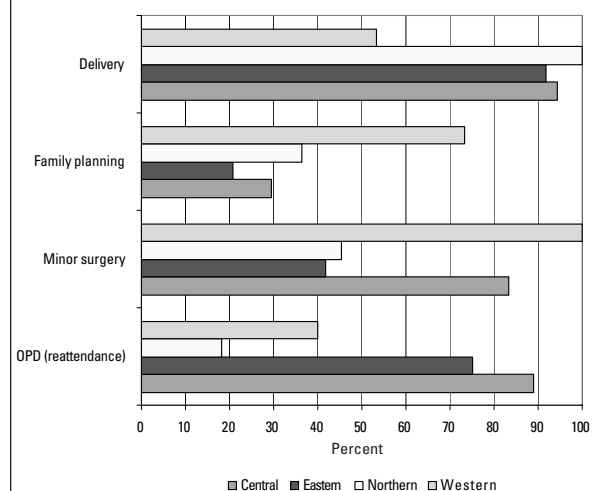
Source: Health facility survey, 1999/2000 (Health Facility Questionnaire).

facilities, facilities report keeping records of user fee revenues. As table 17 shows, there is sometimes a great deal of variation between facilities, even within the same ownership category.

Differences in user fees across ownership categories are not very surprising, but there are also considerable differences among government facilities. This is partly reflected in regional differences as to whether facilities charge for specific interventions (see figure 9). For example, most facilities in the eastern and central regions report charging for reattendance of outpatients; in the western and northern regions the shares are considerably smaller. Most government facilities report not charging for drugs. For-profit and nonprofit facilities typically do charge.

The pattern of exemptions differs across ownership categories. In general, exemptions are less common in nonprofit facilities than in government facilities and are even rarer in for-profit facilities. The exception is the exemptions in many facilities for facility staff and their relatives (see table 18). On average, according to the in-charges at the sampled facilities, of every 100 patients, approximately 16 in nonprofit and in government facilities are exempted from payment, compared with 7 in for-profit facilities.

Most patients (89 percent) interviewed in the exit polls report paying for the services received. Interestingly, the proportion of clients paying is higher in government than in private nonprofit facilities (see table 19). Over 92 percent of patients report receiving some drugs following the consultation. In most cases—in particular, in government facilities—the patients did not pay separately for the drugs received.

**Figure 9. Proportion of Government Facilities Charging Fees, by Region**

Note: OPD, outpatient day.

Source: Health facility survey, 1999/2000.

**Table 18. Proportion of Facilities That Exempt Specific Patient Groups by Ownership Category**

Patient group	Government	Private for-profit	Private nonprofit
Patients with chronic diseases (e.g., tuberculosis)	71.8	0	23.8
Elderly	59.3	13.3	40.9
Very poor	75.3	33.3	59.1
Facility staff	75.3	73.3	81.8
Relatives of staff members	30.9	50.0	40.9
Local government officials	12.4	0	6.8
Relatives of local government officials	6.2	0	2.3
Local government politicians	12.4	0	4.6
Relatives of local government politicians	3.7	0	2.3
Members of the health unit management committee	26.3	0	27.9

Source: Health facility survey, 1999/2000 (Health Facility Questionnaire).

The pattern of total payments, including consultation and drugs, is shown in table 20. Although a higher proportion of clients in nonprofit facilities is treated free of charge, the mean and median payments are lower in government facilities, where almost 65 percent of clients pay US\$ 500 or less. By contrast, private for-profit and nonprofit providers are able to charge 40 to 50 percent of their clients more than US\$ 2,000. It is important to note

that the information in table 20 is not controlled for the type of services provided or for subsidies received. The higher prices in private facilities may therefore partly reflect a different service range than in government facilities or a different financing structure (without subsidies). The data on actual payments as reported by clients appear broadly consistent with the charges and exemption patterns reported by facility managers.

**Table 19. Payment for Services by Ownership Category and Region**

	Paid for service	Received drugs	Paid separately for drugs
<i>Ownership category</i>			
Government	90.2	94.1	3.1
Private for-profit	94.3	92.2	13.6
Private nonprofit	81.5	90.6	16.7
<b>Total (all facilities)</b>	<b>88.5</b>	<b>92.7</b>	<b>8.7</b>
<i>Government facilities by region</i>			
Central	93.6	95.0	3.6
Eastern	92.1	91.3	5.1
Northern	91.7	95.0	0.0
Western	83.1	96.0	0.8
<i>Private (for-profit and nonprofit) facilities by region</i>			
Central	78.8	90.4	7.9
Eastern	89.7	86.8	3.8
Northern	88.1	92.7	6.7
Western	96.0	97.3	46.3

Source: Health facility survey, 1999/2000 (Exit Poll).

**Table 20. Amount Paid for Services, in Ugandan Shillings, by Ownership Category**  
(percentage of clients)

	Government	Private for-profit	Private nonprofit	Total (all facilities)
No payment	9.1	5.0	17.5	10.7
1–500	55.7	19.7	17.8	38.4
501–1,000	20.6	11.1	10.7	16.1
1,001–2,000	10.3	13.3	15.6	12.3
2,001–5,000	4.2	34.1	23.0	15.0
5,000+	0.1	16.9	15.4	7.5

Source: Health facility survey, 1999/2000 (Exit Poll).

## Utilization of User Fee Revenues

Approximately half of the government and nonprofit facilities report preparing a budget for use of revenues; the remaining facilities report “spending the funds as they arrive.” Private for-profit facilities have more independence in the management of revenues. User fee revenues are the main source of financing for these facilities, and it is surprising that only 17 percent of them report preparing a budget. Budgets for government facilities are approved by the HUMC, the district, or both. The HUMC appears to have the primary responsibility for approving the budgets of nonprofit facilities, although donors or the village may occasionally play a role.

As figure 10 shows, the way in which user fee revenues are utilized differs somewhat across ownership categories, but as a general rule, allowances, staff wages, and drugs and medical expenditures account for about 60–70 percent of expenditures. It should be kept in mind that the importance of user fee revenues as a source of financing varies considerably across ownership categories, and this has implications for the composition of spending.

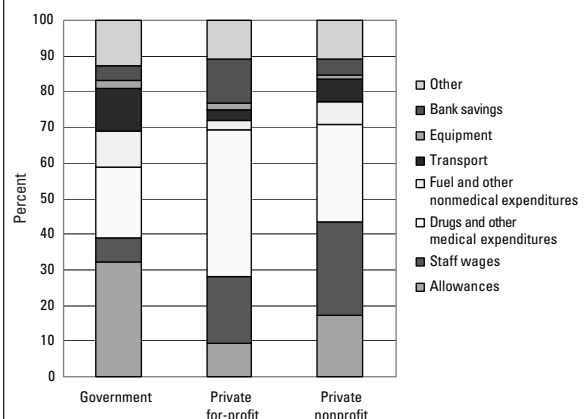
## Other Financing Sources and Facility Expenditures

General data on financing were collected at both district and facility levels. At the district level, questions focused primarily on donor

support. Seven of the 10 sampled districts report receiving financial or other assistance from donors for health provision at the facility level. Financial support to the districts ranges from US\$ 175 million to US\$ 545 million. In addition, many districts reportedly receive in-kind support, including drugs, supervision, means of transport, rehabilitation, and equipment (for example, laboratory equipment, generators, or computers).

At the facility level, the in-charge was asked whether the facility received any money apart from allowances and user fees for its operations in fiscal 1999/2000.<sup>24</sup> Sixty-eight percent of the government facilities and 84 percent of the nonprofit facilities report receiving some money. Only one private for-profit facility

**Figure 10. Spending of User Fee Revenues by Ownership Category**



Source: Health facility survey, 1999/2000.

receives funds from an outside source. For the facilities that do receive money, the district is the most important source for 89 percent of the subsample, although some facilities report receiving money from the subcounty, the health subdistrict, a donor, or an NGO.

The total amount of reported financial aid varies considerably across facilities. In the case of government facilities, the amounts are small, with a median of US\$ 245,000. By contrast, the median for nonprofit facilities is US\$ 3,150,000. In most cases facilities report that they receive all or a substantial proportion of their financing from the district.

The data on expenditures are less complete, particularly for nonprofit providers, and there may be differences across facilities in the expenditures covered. Keeping these caveats in mind, we estimate that median spending is US\$ 283,200 for government facilities and US\$ 2,637,300 for nonprofit facilities. This is broadly consistent with the financing data. Spending by government facilities is almost exclusively on allowances. For nonprofit facilities, the most important categories of expenditure are wages, drugs, and fuel.

## Outputs and Efficiency

The survey collected detailed information on facility outputs at both facility and district levels. A summary of this information is presented here and is followed by a discussion of efficiency in health care facilities.

### Facility Outputs

Data on outpatients and deliveries were collected for a 12-month period, July 1999–June 2000. More disaggregated data on patient composition and inpatient numbers were collected for the period April–June 2000. These data include (a) outpatient visits—children (new cases); (b) outpatient visits—adults (new cases); (c) outpatient visits—reattendance;

(d) deliveries; and (e) inpatient days. Corresponding data were collected for the same three months from the district level, making it possible to verify the reliability of the facility-level data.<sup>25</sup> Data on the number of vaccinations carried out by the sampled facilities were also collected, for BCG, polio, measles, tetanus toxoid, and DPT. At the facility level, these data covered the last six months of fiscal 1999/2000 and are calculated from the daily records (tally sheets) for vaccinations. Corresponding data were collected at the district level but only covered the last three months of fiscal 1999/2000 (April–June 2000).

**OUTPATIENTS AND DELIVERIES.** The number of outpatients seen per month varies considerably across facilities, from 15 to nearly 2,000.<sup>26</sup> The average number of outpatients per month, for all facilities, is 419; the median is 368. The average monthly number of deliveries per facility is 6.75 (median, 5). As can be seen from table 21, the number of outpatients is higher in government facilities, in part reflecting the larger size of these units. Government facilities in the central region see fewer outpatients, on average, than facilities in other regions but perform more deliveries.

Individual facilities sometimes exhibit notable variation from month to month. To a large extent, this variation appears to be idiosyncratic, although there is some evidence of seasonal trends in the data, in particular in the number of outpatient visits. Specifically, utilization appears to increase in November–January, possibly due to increased prevalence of malaria.<sup>27</sup> The number of deliveries appears to be lower for November–January; the numbers surge in May and June.

Turning to the disaggregated data for the period April–June 2000, we note that approximately 75 percent of all outpatients are new patients. As figure 11 shows, the proportion of reattenders is particularly low in government facilities but is as high as 40 percent in for-profit facilities. The difference may reflect

**Table 21. Number of Outpatients and Deliveries by Ownership Category**

	Number of outpatients			Number of deliveries		
	Low	Median	High	Low	Median	High
<i>All facilities</i>						
Government	301.8	474.9	617.1	1.8	4.5	8.5
Private for-profit	127.0	204.6	351.4	3.3	7	11.3
Private nonprofit	152.1	251.7	510.9	1.5	4.3	9.8
<b>Total (all facilities)</b>	<b>203.2</b>	<b>367.9</b>	<b>569.3</b>	<b>1.8</b>	<b>4.5</b>	<b>9.6</b>
<i>Government facilities</i>						
Central	240.9	325.7	474.9	2.4	5.4	9.5
Eastern	347.3	608.5	836.0	1.8	4.8	9.9
Northern	421.3	519.9	782.6	1.8	2.6	4.1
Western	385.3	541.3	607.0	0.6	1.7	7.3
<b>Total (all government facilities)</b>	<b>301.8</b>	<b>474.9</b>	<b>617.1</b>	<b>1.8</b>	<b>4.5</b>	<b>8.5</b>

*Note:* Monthly figures are based on facilities for which data were available for at least 6 out of 12 months. Facilities that do not offer maternity services were not considered in compiling the number of deliveries. A small proportion (approximately 10 percent) of the sampled facilities was excluded because of lack of data. These were primarily private for-profit facilities. Low refers to the 25th percentile; high refers to the 75th percentile.

*Source:* Health facility survey, 1999/2000 (Facility Data Sheet).

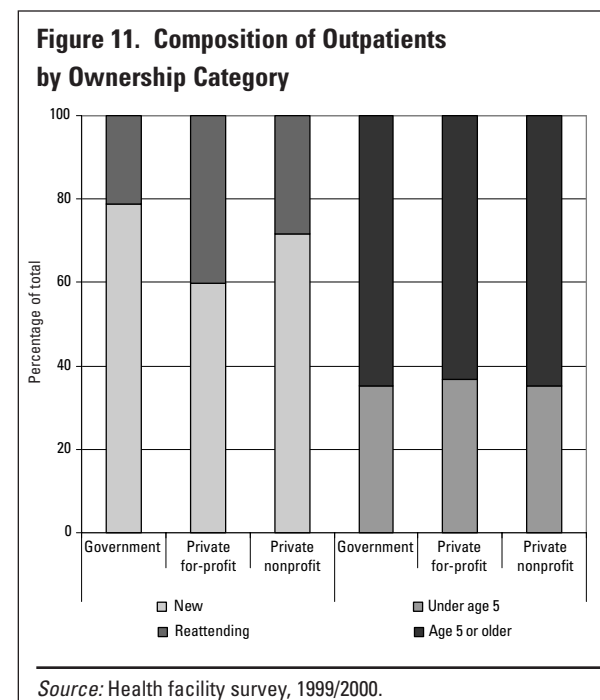
differences in patient mix or the fact that for-profit and nonprofit facilities do not usually charge reattending clients, as government facilities do.

Approximately 35 percent of outpatients are children. The proportions of new and reattending patients and of patients under and over age five vary considerably among facilities. Government facilities also show some regional patterns in patient composition. For example, in the eastern region more than 45 percent of outpatients are under age five, as against 35 percent nationally.

**INPATIENT CARE.** According to the information gathered from the facility in-charges, over 60 percent of facilities provide inpatient care. This percentage is higher for nonprofit and for-profit facilities and slightly lower for government facilities. In the subsample of facilities for which data are available, the median number of inpatient days is 21.

**VACCINATIONS.** Data on vaccination numbers are based on aggregations of daily tally sheets. On average, facilities carry out per month

approximately 40 tetanus, measles, and BCG vaccinations and 115 DPT and polio vaccinations. (These averages exclude data on measles vaccinations from three facilities that conducted vaccination campaigns during the period under consideration.)<sup>28</sup> There is considerable



variation in vaccination activity for different ownership categories (see figure 12) and across facilities of different types. For government facilities, the average number of vaccinations carried out is substantially higher in the eastern region, for all types of vaccines.

## Costs and Efficiency

Broadly speaking, the concept of efficiency has to do with the relationship between inputs and outputs.<sup>29</sup> In modern efficiency measurement it is customary to distinguish between technical and allocative efficiency (Farrel 1957).<sup>30</sup> *Technical efficiency* refers to the maximization of output using a given set of inputs; *allocative efficiency* reflects substitution between inputs with different prices to achieve minimum costs. These two measures can be combined to provide a measure of total *economic efficiency*.

Application to the public sector of the concept of allocative efficiency is often fraught with methodological difficulties. First, the choice of inputs is often beyond the control of the individual facility, (at least in the public sector), and where the facility can exercise discretion, price signals may be weak. Second, cost

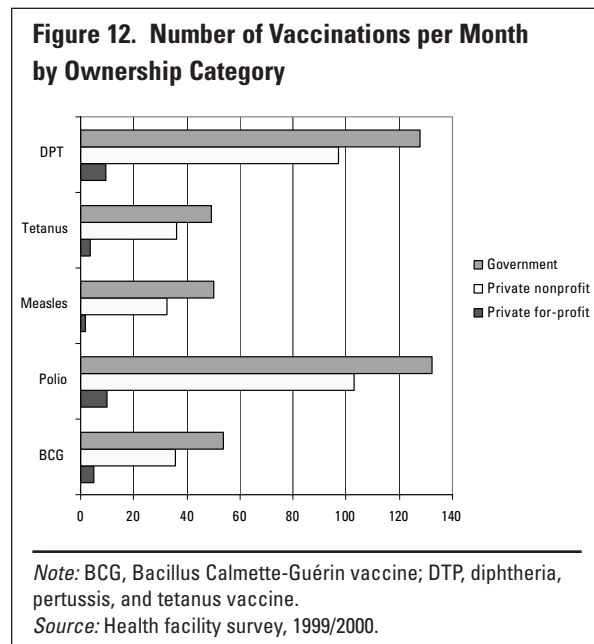
minimization may not be an appropriate behavioral assumption; for example, staff allocation may be driven by a policy of ensuring minimum service standards. Consequently, we should not necessarily expect to observe allocative efficiency in the public sector, and many studies of efficiency in the public sector therefore restrict attention to technical efficiency.<sup>31</sup>

There are several techniques for analyzing efficiency in service delivery (see, for example, Barnum and Kutzin 1993; Fried, Lovell, and Schmidt 1993). Many of them, such as data envelopment analysis and the econometric analysis of cost functions, make intensive use of both data and analytical input. The scope of this section is limited to an analysis of output per worker and labor cost per unit of output. Even in this limited analysis of efficiency, the methodological limitations have to be kept in mind. Most important, there is considerable heterogeneity in service outputs:

1. Quality may differ substantially across health care facilities and even between individual cases at a given facility. For example, a thorough outpatient consultation with a doctor is a very different service from a rushed consultation with a poorly trained nursing aide. The equipment and amenities of the facilities may not be of equal quality. In principle, it is possible for the analysis to control for quality differences, but this has proved difficult in practice.

2. Within a particular service category, there can be a noticeable variation in case mix and case complexity (severity) across facilities, and this too causes problems for comparability. For example, “inpatient days” can range from cases involving simple interventions and limited monitoring to highly complex cases that require a broad range of material and human resources. Differences in case mix can arise from the socioeconomic characteristics of the population in the provider catchment area, or more complex cases may seek out providers with particular characteristics.

3. Finally, in addition to problems relating to the comparability of output measures in specif-





ic categories, most health care providers provide a wide range of services. Even with a small number of aggregated categories of interventions and services (for example, inpatient days and outpatient visits), the issue arises of how to compare quantities of output across facilities with different service mixes. A standard technique for dealing with multioutput production is to construct an output index using market prices as weights. In the health sector, where output prices do not exist or are administratively set, we must rely on ad hoc weights.

**CONSTRUCTING AN OUTPUT INDEX.** The survey was restricted to primary health care facilities, but even at this basic level many facilities deliver a wide range of services. We construct an output index based on the amount of staff time required to perform particular tasks. This outpatient-number-equivalent service unit (SU) index is defined as:

$$SU = 9 \times \text{inpatient days} + 12 \times \text{deliveries} + 0.5 \times \text{immunizations} + 1 \times \text{outpatient numbers}.^{32}$$

**OUTPUT PER HEALTH WORKER AND UNIT COSTS.** Using this definition of output, table 22 presents outputs per health worker for different categories of facility.<sup>33</sup> Some patterns are evident:

- Across the total sample there are considerable differences, ranging from 10.9 to 583.8 outpatient-equivalent service units per worker.
- Output per worker varies to some extent across ownership categories, with low numbers for nonprofit facilities.<sup>34</sup>
- There appear to be notable regional differences, with low output per worker in the central region for both government and private facilities.

The reasons for these observed differences are complex and cannot be explored fully here.<sup>35</sup> It is, however, possible to conclude that workloads in facilities in the central region are lower than in other regions. Looking at output per worker in a multivariate framework, it also appears that, overall, the presence of staff with higher qualifications does not have a positive

**Table 22. Health Worker Productivity by Ownership Category and Region**  
(output per worker, including immunizations, expressed in service units)

	Minimum	25th percentile	Median	75th percentile	Maximum
<i>Ownership type</i>					
Government	28.5	63.9	92.5	145.5	326.3
Private for-profit	17.8	58.7	79.6	124.1	583.8
Private nonprofit	10.9	52.2	69.0	106.8	210.3
<b>Total (all facilities)</b>	<b>10.9</b>	<b>58.4</b>	<b>86.7</b>	<b>129.9</b>	<b>583.8</b>
<i>Government facilities by region</i>					
Central	28.5	44.6	60.6	78.4	145.5
Eastern	50.8	100.0	147.2	169.5	236.9
Northern	67.9	88.6	92.7	127.6	195.0
Western	85.4	92.9	123.3	164.6	326.3
<i>Private (nonprofit and for-profit) facilities by region</i>					
Central	10.9	50.0	64.3	76.8	272.5
Eastern	21.3	52.2	66.0	84.0	583.8
Northern	17.8	44.1	89.4	160.6	206.2
Western	68.2	88.7	106.8	138.0	286.5

Source: Health facility survey, 1999/2000 (calculations based on Facility Data Sheet).

impact. Clearly, no general conclusions can be drawn from this finding, and higher-qualified staff may have a considerable effect on quality and on the range of services offered. Still, the issue of optimal staffing patterns, given the costs of different types of worker, needs to be explored in greater detail.

Labor cost per output (that is, unit cost) is clearly related to productivity but also depends on the staff mix and the level of remuneration. As noted above, average remuneration is higher in government than in nonprofit and for-profit facilities, and we would expect unit costs to reflect this difference. Indeed, as can be seen from table 23, the higher average remuneration in government facilities appears to more than offset their higher productivity; unit costs are higher in government than in for-profit and nonprofit facilities. (The difference between government and nonprofit facilities is statistically significant.) This difference is largely driven by the very high unit costs in government facilities in the central region, a finding consistent with the higher-than-average remuneration and lower-than-average labor productivity in that region.

neration and lower-than-average labor productivity in that region.

## Client Perceptions

The great majority (88 percent) of the exit poll respondents report that they normally seek care at the facility at which the interview took place. Most of these individuals came to the facility to receive treatment, although a considerable share was seeking preventive care—that is, immunizations and antenatal care (see table 24). There are notable differences across ownership categories and regions in the reasons given for attending a specific facility. In particular, it is clear that nonprofit facilities have an important role in immunizing children. The proportion of clients who report having come to the clinic to receive antenatal care is substantially higher for for-profit than nonprofit facilities.

Clients were also asked about the care received at the facility.<sup>36</sup> Overall, patients reported that the service was friendly (see table 25). In

**Table 23. Unit Costs, Labor, by Ownership Category and Region**  
(remuneration per output, including immunizations; Ugandan shillings)

	Minimum	25th percentile	Median	75th percentile	Maximum
<i>Ownership type</i>					
Government	234.5	754.2	1,188.4	2,118.8	6,424.7
Private for-profit	147.5	505.0	740.2	1,686.3	4,009.5
Private nonprofit	140.6	427.2	670.8	1,365.6	4,036.7
<b>Total (all facilities)</b>	<b>140.6</b>	<b>614.1</b>	<b>893.9</b>	<b>1,821.8</b>	<b>6,424.7</b>
<i>Government facilities by region</i>					
Central	805.3	2,002.1	2,457.2	3,783.4	6,424.7
Eastern	410.9	532.1	736.6	1,142.2	2,266.7
Northern	673.9	820.6	888.9	1,242.7	1,807.0
Western	234.5	590.5	965.8	1,174.9	1,409.1
<i>Private (nonprofit and for-profit) facilities by region</i>					
Central	330.2	632.9	911.2	1,904.1	4,036.7
Eastern	147.5	547.6	692.5	1,365.6	1,801.5
Northern	140.6	225.0	423.4	1,201.0	4,009.5
Western	254.8	414.3	614.1	680.6	874.9

Source: Health facility survey, 1999/2000 (calculations based on Facility Data Sheet).

**Table 24. Clients' Reasons for Coming to the Facility by Ownership Category and Region**  
(percent)

	Receive treatment	Immunize child	Antenatal care	Family planning	Delivery	Minor surgery	Lab results
<i>Ownership type</i>							
Government	89.4	6.1	9.6	0.8	0.4	0.4	1.3
Private for-profit	84.3	1.8	16.0	1.1	1.1	0.4	1.8
Private nonprofit	88.0	7.1	7.1	0.7	0.9	0	3.5
<b>Total (all facilities)</b>	<b>88.1</b>	<b>5.6</b>	<b>10.1</b>	<b>0.8</b>	<b>0.7</b>	<b>0.3</b>	<b>2.0</b>
<i>Government facilities by region</i>							
Central	92.5	4.4	15.8	1.4	0.7	0.7	3.0
Eastern	90.0	6.3	4.6	0	0.4	0	0.4
Northern	88.4	4.1	5.8	0.8	0	0.8	0
Western	83.2	10.7	8.1	0.7	0	0	0
<i>Private (nonprofit and for-profit) facilities by region</i>							
Central	88.8	7.2	7.6	0	0.8	0.4	7.6
Eastern	81.7	5.6	20.8	1.5	2.5	0	0
Northern	90.8	0	2.8	2.8	0	0	0.9
Western	86.0	4.0	8.0	0	0	0	0

Source: Health facility survey, 1999/2000 (Exit Poll).

**Table 25. Client Perceptions Regarding Services by Ownership Category and Region**

	Friendly service	Information about ailment	Advice on medication	Prompt attention	Information about charges
<i>Ownership type</i>					
Government	96.9	64.9	93.1	79.8	39.0
Private for-profit	99.3	76.3	95.6	94.6	49.6
Private nonprofit	99.1	77.2	93.3	84.8	51.0
<b>Total (all facilities)</b>	<b>97.9</b>	<b>70.4</b>	<b>93.6</b>	<b>83.9</b>	<b>44.2</b>
<i>Government facilities by region</i>					
Central	96.0	81.0	96.6	82.4	62.9
Eastern	99.2	73.3	96.6	92.9	19.5
Northern	93.4	43.8	77.4	50.4	57.0
Western	98.0	34.1	93.1	77.0	5.6
<i>Private (nonprofit and for-profit) facilities by region</i>					
Central	99.2	85.8	93.0	90.3	74.2
Eastern	99.0	89.3	95.3	94.9	34.1
Northern	98.2	58.7	91.1	79.6	78.5
Western	100.0	57.6	97.1	84.6	16.8

Source: Health facility survey, 1999/2000 (Exit Poll).

some cases information about the clients' ailments appears to be limited, in particular in government facilities in the northern and western regions. Most patients report having received directions for using the medicine prescribed, but enumerators claimed that in many cases the clients did not sound sure. Attention was in general prompt, although the situation again appears worse in the northern and western regions. Similar regional disparities can be observed with respect to information provided

to clients about charges, although in this case it is the eastern and western regions that had the lowest scores.

Finally, clients were asked why they had chosen to visit the particular facility (see table 26). Proximity is the most important factor overall, particularly for government facilities. Good treatment and staff characteristics are more important considerations for individuals attending for-profit and nonprofit facilities.

**Table 26. Clients' Main Reason for Choosing a Specific Facility by Ownership Category**

	Government	Private for-profit	Nonprofit	Total
Proximity	48.6	30.2	39.2	42.8
Good treatment and service	32.1	48.5	38.9	36.9
Good health workers	5.3	13.4	11.7	8.5
Less expensive	12.7	5.5	7.3	10.0
Other	1.3	2.5	2.9	1.9

*Note:* Numbers may not sum to 100 percent because of rounding.

*Source:* Health facility survey, 1999/2000 (Exit Poll).

## Summary and Recommendations for Further Research

**T**his paper has presented descriptive statistics from a baseline survey of 155 primary health care facilities carried out in Uganda in 2000. It has given an overview of the survey and the sample, discussed oversight, management, and competition in Ugandan frontline health care, and explored inputs, costs, user fees, financing, outputs, and efficiency issues. It has also provided a client perspective, using data from the exit poll of patients. Although the nature of the data makes exact measurement difficult, the survey has demonstrated that it is possible to collect data of sufficient quality to arrive at ballpark estimates and bounds for important variables such as pricing, income, infrastructure, and human resources. At this stage, the analysis of the survey data is largely diagnostic, yielding sample averages for a number of variables. This section discusses issues that emerged from the first round of analysis, focusing on four that are considered of particular importance: ownership and health facility performance, human resources, user fees and financing, and drug use.

### **Ownership and Health Facility Performance**

There is no doubt that private for-profit and nonprofit health care providers are important in Uganda. Indeed, Hutchinson (2001) finds that the government, for-profit, and nonprofit sectors account for roughly equal shares of the country's health care. On the basis of data from household surveys, it appears that government facilities are the most important providers of immunizations, modern deliveries, and reproductive health care, while the private sector provides the bulk of curative care. The importance of the private sector is in part a consequence of the almost total collapse of the government system during the 1970s. But private sector provision has also been increasingly encouraged, and in a recent sector strategy the government proposed that new forms of collaboration with the private sector be explored (Ministry of Health 2000). The move toward increased reliance on the private sector is consistent with policy trends in many other countries and is seen as a means of addressing what some consider to be endemic problems with public sector service delivery (see Birdsall and James 1993).

Weaknesses in the delivery of health services in Ugandan government facilities are well documented (and are similar to those in other developing countries). They include lack of drugs, equipment, and materials; lack of incentives for staff; staff shortages and absenteeism; and inappropriate staff attitudes (Ministry of Health 1998). These problems lead to low levels of utilization and effectiveness, as well as to high costs. Indeed, according to a Ministry of Health study (1997), the costs of basic services are at least 50 percent higher in government than in nonprofit facilities.

It is often argued that these problems can be at least partly overcome in the private sector. The for-profit sector is assumed to have the advantage of the profit incentive, while nonprofit providers are viewed as benefiting from greater organizational autonomy and flexibility and from an organizational culture that promotes good performance. These are, of course, highly stylized arguments. The profit motive, in combination with limited consumer information, may just as easily lead to overprovision of health care or to provision of inappropriate care. Similarly, organizational autonomy and lack of accountability in the nonprofit sector can result in poor coordination, duplication, operational inefficiency, and the provision of services that are not cost-effective.

These arguments raise a number of important empirical questions. What is the current policy and institutional framework for private sector operations? What services are currently being provided by various types of provider? What differences in quality and efficiency can be observed across ownership types, and what is driving these differences? What are the implications of the existence of the private sector for the overall planning and coordination of health services and the efficiency of the health sector as a whole?

This study can by no means answer all of these questions. Nonetheless, the data presented in section 4 (and summarized in table 27) do yield a general picture of the differences

between government, for-profit, and nonprofit providers at the micro level.

As can be seen from table 27, it is difficult to draw firm conclusions concerning the relative merits of the different types of facility. A multivariate analysis is required (and is in fact currently under way). The survey captured some dimensions of quality that need to be analyzed further. Unobserved aspects of quality such as staff attitudes may be important in explaining the preference for private providers that has been revealed in Ugandan household surveys (Hutchinson 2001). Another issue that emerges clearly from the survey is the complex interdependencies between the government and the private sector. This is clear in the area of human resources, where salary levels in the government sector are creating what some would call an uneven playing field.

## Human Resources

The survey finds that government facilities tend to have larger staffs, with higher qualifications. Even so, over 60 percent of staff are nursing aides or “other staff.” This is consistent with administrative data for 2000 showing that only 33 percent of established health positions were filled by qualified staff, with the remainder either vacant or filled by unqualified nursing aides or other staff (Hutchinson 2001). There are some clear regional differences in this regard; government facilities in the central region are more likely to have qualified staff, and facilities in the eastern and western regions are more likely to lack qualified staff.

The evidence suggests a close link between the three types of provider through the labor market for health workers. Government dispensaries pay higher salaries than private facilities, and for-profit facilities appear to pay more than nonprofits for qualified health staff. The observed salary differences affect the movement of staff between provider organizations and are highly relevant to Uganda’s civil

**Table 27. Differences in Health Care Facilities across Ownership Categories**

Issue	Description
Mix of services	In general, government dispensaries offer a broader range of services than do private for-profit facilities. For example, for-profit facilities tend not to provide immunizations. Government facilities, however, are considerably less likely to offer laboratory services than are for-profit or nonprofit providers. Except for laboratory services, there appear to be no consistent differences in service range between government and nonprofit facilities.
Staffing	Government and nonprofit facilities are similar in size. For-profit facilities tend to have fewer staff.
Salary level	In general, government facilities pay staff more than do for-profit or nonprofit facilities. For-profit facilities appear to pay more than nonprofit facilities for qualified staff.
User fees	Exit polls clearly show that fees are higher in the private sector. Charges are, in general, higher in for-profit than in nonprofit facilities. Nonprofit facilities are at least as likely as government facilities to exempt clients from payment.
Activity level	The activity level is, in general, higher in government facilities, partly reflecting higher staffing levels. Specifically, the numbers of outpatients and inpatients are higher in government facilities than in for-profit or nonprofit facilities. Government facilities also perform more vaccinations, in particular in comparison with for-profit facilities, mainly because of the vertical programs of vaccine supply. Numbers of deliveries are similar for government and nonprofit facilities. The proportion of patients who are reattending for the same ailment is higher in private facilities. A considerable proportion of clients in for-profit facilities (16 percent) report coming to the facility for antenatal care.
Output per health worker	Output per health worker is higher in government than in private facilities. This is particularly true if government facilities in the central region, where staffing levels are comparatively high, are excluded. Due to higher average remuneration in government facilities, their unit labor cost per output is higher (if the central region is excluded). It should be noted that this information is difficult to interpret. For example, do high levels of output per worker represent efficiency, or do they indicate excessive workload and insufficient patient time and hence lower quality of service?
Drug use	There is considerable similarity across ownership types in the provision of drugs to clients. Apparent "overuse" of drugs does not appear to be restricted to government facilities, but there is some evidence of "overprescription" of antibiotics in government facilities run by staff with low or no qualifications.
Client perceptions	Clients are more likely to report "good treatment" or "good health workers" as a reason for attending private facilities, in particular for-profit facilities. In the case of government facilities, proximity is the most important reason for choosing a particular facility.

service reform. They highlight the importance of looking at the entire health care labor market and point to the need to compare civil service pay not only within the public sector but also with its private counterparts (competitors).

Although staff in government dispensaries earn more than staff in the private sector, they are much more likely to experience delays in salary payments, particularly in comparison

with for-profit facilities. Inequalities in remuneration among and within government facilities are also striking. There is a regional pattern, with noticeably higher compensation in the central region, for all categories of staff. But differences are also driven by the source of financing. For example, staff financed by the subcounty or the facility receive considerably less than staff in the same category who are financed by the district. The analysis shows

that there are several different payrolls for health staff at the facility level, including staff originally employed by the central government; staff recruited by district administrations prior to decentralization; staff recruited under the conditional grant for primary health care from the central government; and staff recruited by subcounties and by facilities themselves (and paid for with user fees, until the fees were abolished in 2001). This fragmentation in personnel management is bound to have an effect on incentives and service quality at the facility level and hence should be brought into the debate on civil service reform.

The analysis shows a striking discrepancy between facility and local government (district) staff records. Only 56 percent of staff working in dispensaries (with and without maternity units) were included in the district records. This observation has major implications for personnel management in health care and for the assessment of health management information systems.

## User Fees and Financing

User fees have figured prominently in the policy agenda in Uganda (and other countries) for many years. The issue has gained importance in Uganda following the abolition of user fees for primary health care in 2001. The available data provide valuable information on charging practices and the utilization of user fee revenues. The survey of dispensaries also serves as a baseline for analyzing the impact of the policy change in 2001 on both government and private providers.

On the basis of information provided by the facility in-charges, considerable differences in fees can be observed across and within ownership categories. Government facilities have been charging fees since the late 1980s. Government facilities report charging US\$ 500 for most services and approximately US\$ 2,000

for deliveries. They do not generally charge for drugs.

Charges are higher in for-profit facilities, and there is also more variation among facilities in this category, perhaps reflecting quality differences. Nonprofit facilities charge more than government facilities but generally less than for-profit facilities. They exempt approximately the same proportion of clients from payment as do government facilities. Unlike government facilities, many private providers charge per ailment, and reattendance is generally free. Moreover, private providers tend to charge for drugs, whereas government facilities do not.

In general, the information reported by the facility in-charges appears to be consistent with the data collected through the exit poll. This is somewhat difficult to reconcile with earlier evidence that illicit charging is widespread in government facilities in Uganda (Jitta 1996; McPake and others 1999; Mwesigye 1996).

As a rule, user fees can be expected to have an impact on utilization of health services. In a context such as Uganda, where “frivolous” use of health services is likely to be limited, the reduction in access may have an impact on health outcomes. User fees do, however, have potential for relaxing the financial constraint in the public sector, giving health workers and managers a financial stake in the facility and its activities and making households and communities more demanding as to the services provided. Through these channels, user fees may result in expanded activity, improved quality, and greater efficiency (Griffin 1992; Shaw and Ainsworth 1994; Vogel 1991; World Bank 1987).<sup>37</sup>

Currently, little evidence exists on the impact of user fees on utilization in Uganda. Despite some methodological concerns, studies on other countries do provide considerable evidence that increases in user fees lead to a reduction in utilization and, conversely, that a reduction in fees leads to an increase in utiliza-



tion. (For a review of the issues, see Reddy and Vandemoortele 1996.) It is to be hoped that ongoing analysis of household data will yield evidence on this issue that is specific to Uganda. The effect of the policy change regarding user fees could also be assessed on the basis of a second round of the facility survey. This would permit an analysis of how both user fee and activity levels have changed in government and private providers in the two years following the policy change.

User fees are also expected to have an impact on the supply side. Here, the survey identifies some reasons for concern. The abolition of user fees can be expected to lead to an increase in utilization, but how will it affect quality and resource availability at the facility level? Many government facilities in the sample report using revenues from user fees to procure important supplies such as condoms, contraceptives, detergents, and syringes. In a context where stock outages are common, a reduction in user fee revenues could have a deleterious impact on facilities' capacity to deliver services. In addition, a considerable proportion of staff in government facilities was financed by user fees in 2000. What happened to these staff following the abolition of fees? If the reduction in fees led to a reduction in the number of staff, what has been the impact on service delivery? These issues merit more study. Further analysis of the data will seek to estimate the level of user fee revenues in different categories of facility at the time of the survey, as well as the subsidies to government and nonprofit facilities.

## Drug Use

The survey highlights a number of important issues in relation to drug use and management. Most important, it provides evidence, from two sources, of excessive drug use in Uganda in both government and private facilities. First, high and variable drug use per patient is appar-

ent from a comparison of drug use (measured by removal from stock) and patient numbers. This observation can have many explanations, including high need (patient or case mix), overprescription, and leakage of drugs. Further analysis of the data may provide additional information on what is driving this observation, but more detailed studies may also be required.

Second, evidence from the exit poll indicates that drugs (in particular, antibiotics) are overprescribed in both government and private facilities.<sup>38</sup> The survey did not include consultation observations or "gold-standard" examinations to assess "true" client need for drugs. Still, the number and nature of the drugs actually received by patients suggest excessive and inappropriate drug prescription. This problem is by no means unique to Uganda. For example, Gilson and others (1993), reporting findings from Tanzania based on both retrospective data (from patient registers) and prospective data (from consultation observation), cite evidence that patients often receive a large number of drugs, including one or more types of antibiotics.<sup>39</sup> Moreover, 46 percent of all prescriptions issued for general consultations were incorrect according to national treatment guidelines. Problems included unnecessary or incorrect antibiotics, underprescription, and incorrect dosage. Similar findings are reported from other countries (see Foster 1993).

There are many possible reasons for inappropriate or excessive prescription of drugs.<sup>40</sup> Incorrect or inadequate diagnosis may be the consequence of poor skills of health workers, lack of effort, or lack of diagnostic equipment and materials. Profit- or revenue-raising motives can lead to overprescription. Indeed, Gilson and others (1993) find that facilities run by religious organizations prescribed more drugs per visit across all conditions in Tanzania than did other types of facility, and they suggest that this practice may stem from the need to raise revenues. Finally, prescription out-

comes may be influenced by pressure from clients with poor knowledge about health and health care. A common example is the demand for injectable drugs when oral preparations or no drugs at all would have been appropriate. Underprescription can have similar sources but may also result from a shortage of drugs.

These findings are important for two reasons. First, they suggest that although drug stock-outs may be important in certain areas or at certain times, there are a lot of drugs in the Ugandan health system. Second, excessive and inappropriate drug use is not only inefficient but can also be harmful. In other words,

this is a case in which quality improvements can lead to cost reductions. Many studies have called for better training and supervision to improve the situation. The evidence on the effectiveness of this type of intervention is at best mixed (Loevinsohn, Guerrero, and Gregorio 1995; Ofori-Adeji and Arhinful 1996; Paredes and others 1996; Rowe and others 2001), but it does suggest the need for a mix of interventions, including measures to address the overall incentives of health workers. Although this study does not provide firm answers regarding these issues, it has demonstrated that the area merits further attention.

## Appendix A. Methodology and Data Issues

**T**his appendix describes the sample design, the implementation of the survey, and the sources of the information collected, with attention to staff, drugs, vaccines, and outputs.

### Sample Design

The starting point in designing the sample was the Ministry of Health health facility register for 1999. The register includes government, private for-profit, and private nonprofit facilities but is known to be inaccurate with respect to the latter two. On the basis of existing information, it was decided that the sample of 155 facilities (dispensaries with and without maternity units) would include 81 government, 30 private for-profit, and 44 private nonprofit facilities. In the first stage in the sampling process, 8 districts (out of 45) had to be dropped from the sample frame due to security concerns.<sup>41</sup> Ten districts were randomly selected from the remaining districts, implying that roughly one-quarter of the eligible districts were sampled.<sup>42</sup>

From the selected districts, a sample of government and private nonprofit facilities was drawn randomly from the Ministry of Health

register. A reserve list of replacement facilities was also drawn from the sample frame. Because of the unreliability of the register for private for-profit facilities, it was decided that for-profit facilities would be identified on the basis of information from the government facilities sampled.<sup>43</sup> The administrative records for facilities in the original sample were first reviewed at the district headquarters, where some facilities that did not meet selection criteria and data collection requirements were dropped from the sample. These were replaced by facilities from the reserve list. Overall, 30 facilities were replaced.<sup>44</sup>

The sample was designed in such a way that the proportion of facilities drawn from different regions and ownership categories broadly mirrors that of the universe of facilities. Because no nationwide census of for-profit health facilities is available, it is difficult to assess the extent to which the sample is representative of this category. A census of health care facilities in selected districts, carried out in the context of the Delivery of Improved Services for Health (DISH) project supported by the U.S. Agency for International Development (USAID), suggests that about 63 percent of all facilities operate on a for-profit basis, while government and nonprofit providers run 26

and 11 percent of facilities, respectively. This would suggest an undersampling of private providers in the survey. It is not clear, however, whether the DISH districts are representative of other districts in Uganda in terms of the market for health care. Also, any characterization of the health care market is dependent on the definition of a “facility” or “provider.”

## Survey Implementation

The survey was designed and implemented by the World Bank in collaboration with the Makerere Institute for Social Research and the Ugandan Ministry of Health. The survey team consisted of a team leader, five supervisors, and five research assistants. Together they formed five separate teams for the fieldwork. One team was assigned to each region; the fifth team acted as a support group to the central region team, which had the largest number of health facilities to cover. The team leader supervised the teams during the survey period. Each team spent at least two days in its district interviewing the district health official and extracting data from the district records. On average, each team also spent another one and a half days interviewing the in-charge at each facility and reviewing facility records. The total number of days spent by each team in the field depended on the number of facilities in the region. The fieldwork was carried out during October–December 2000. A total of 155 health facilities (dispensaries without and with maternity units) was surveyed. For the exit poll, exactly 10 interviews per facility were carried out in approximately 85 percent of the facilities. In the remaining facilities the target of 10 interviews was not met, as a result of low activity levels.

Before taking the survey to the field, the entire research team was trained for over three weeks by the Ugandan team leader and World Bank staff. The training acquainted enumerators with the instruments and techniques to be used in data collection. Following the training,

the instruments were pretested in Mukono and Mpigi Districts. The purposes of the exercise were to assess the feasibility of the survey tools in data collection and to provide a basis for review and finalization of the instruments. Notwithstanding the training and considerable field testing of the survey instruments, enumerators sometimes encountered problems in the field; these typically stemmed from poor record-keeping or the unreliability of existing records, although minor problems in instrument design also occurred.

## Specific Data Issues

**STAFFING AND STAFF REMUNERATION.** The most complete source of data on facility staffing is the Facility Data Sheet. Through this instrument, information about all the staff members working at the facility was collected, including names, positions, remuneration, and source of finance. Because of occasional nonresponse or data recording errors, data for some staff are incomplete. (For example, data on salaries are not available for 10 percent of the facility-level staff.)

The analysis of staff remuneration focuses on staff for whom data were provided in the facility-level questionnaire. In order to calculate the facility-level wage bill and staff costs, it is necessary to impute salary payments and lunch allowances for those observations where these data are missing. Salaries are predicted from a simple regression of salary on dummy variables for position, source of financing, and the ownership and regional location of the facility in question. In cases where missing values remain because of missing values in the regressors, predicted values are derived from a simpler model. To allow for the heterogeneous nature of “other” staff, salaries for this category are estimated separately for government facilities on the basis of data on the source of finance. In nongovernment facilities the median salary for “other” staff is used. For lunch

allowances, values can be imputed from the implicit rules in the data: the allowance is assumed to be (a) zero for nongovernment facilities; (b) USh 66,000 for more qualified staff in government facilities; (c) USh 44,000 for staff with lower qualifications; and (d) zero for “other” staff.

**DRUGS.** Drug supply data are based on facility stock cards. In the case of private for-profit facilities, stock cards were typically missing, and no reliable information could be collected. In private nonprofit facilities, records pertained only to drugs received from the district and did not reflect sources of drugs, dates, new stocks, and stock balances.<sup>45</sup> In government facilities, records were more consistent, although sometimes incomplete. In particular, very few facilities kept records on ergometrine and oral rehydration salts. Because of these data limitations, the analysis in the report includes only a small proportion (about 30 percent) of nonprofit facilities and no private for-profit facilities. Data are available for approximately 75 percent of government facilities.

**VACCINE SUPPLY.** Data were collected on vaccine supply for six months. This information is far from complete. Despite reports from some private facilities that they receive vaccination supplies from the district, no corresponding data could be collected at the district level. The analysis in this report is therefore restricted to the subsample of government and private nonprofit facilities that actually perform immunizations and for which data were available. Observations were excluded if there were not data for at least two out of six months for the respective vaccines. In practice, this meant excluding approximately 20 percent of the facilities in the subsample.

**OUTPUTS.** Output data were collected for 12 months; more detailed data were collected for 3 months. For some facilities, data were partly or completely lacking, typically as a result of

poor record-keeping. For outpatient data, complete facility-level data (that is, data for all months) are available for approximately 75 percent of government and nonprofit facilities. For the remaining facilities, data are missing for some or all months. For facilities that offer maternity services, data on number of deliveries are missing for approximately 10 percent of government and nonprofit facilities. Some of the surveyed facilities began offering maternity services only recently, which partly explains the lack of historical data. In the remaining facilities, data are available for some or all months. Again, data are less complete for private for-profit providers. The analysis of the number of outpatients and deliveries is restricted to the subsample of facilities for which data are available for at least 6 out of 12 months.

Data on vaccinations are based on aggregations of daily tally sheets. For approximately 10 percent of relevant government and private nonprofit facilities, no data on vaccination numbers are available for any month. For for-profit facilities, data are missing for three out of eight facilities. In addition, data are missing for most months for some facilities. The analysis is restricted to facilities for which data are available for at least four out of six months; it excludes facilities for which data are not available or are available for only one month. The resulting subsample comprises about 80 percent of the government and private nonprofit facilities that perform vaccinations and 60 percent of the for-profit facilities.

Patient composition is analyzed using monthly average number of patients in various categories. The averages are based on disaggregated data for three months. These data are reasonably complete, although less so for private for-profit facilities. For the disaggregation by age category, data in some facilities refer only to new patients. Assuming that the age composition of reattending patients is broadly similar to that of new patients, this fact should not bias the findings.

## Appendix B. Consistency between Facility and District Records

**D**ata on the number of outpatients, deliveries, and vaccinations for the three months April–June 2000 were collected at both facility and district levels, permitting analysis of the consistency between the two sources.

### Outpatient Numbers and Deliveries

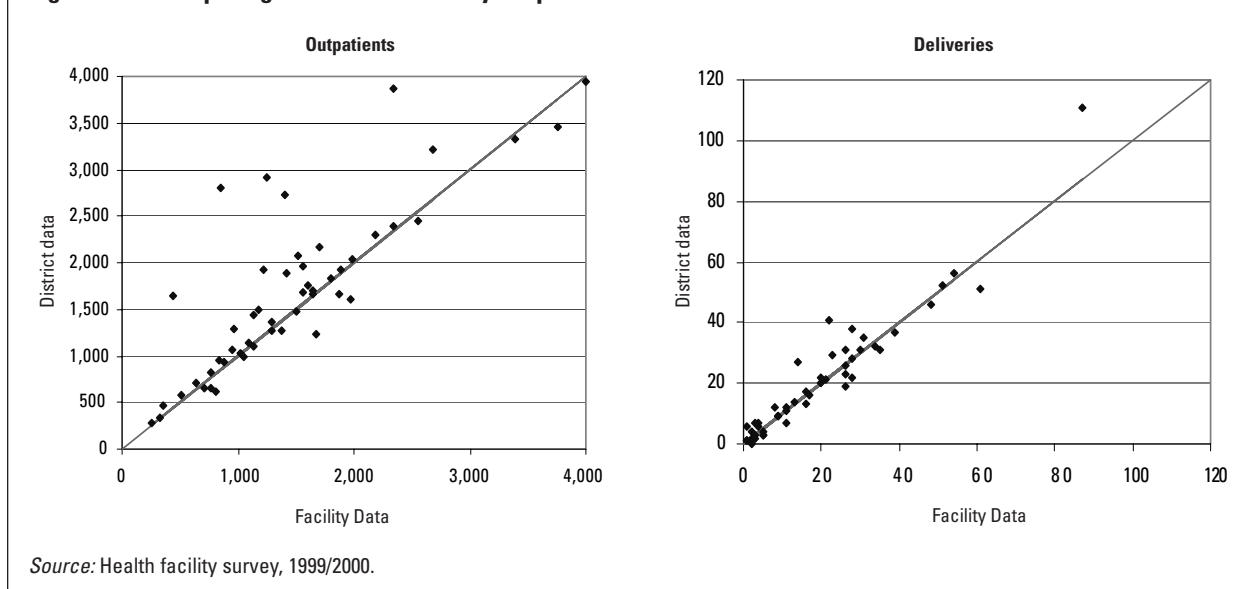
Here, attention is restricted to government facilities for which comparable data are available for all three months. Figure B.1 shows the average number of outpatients and deliveries per month for April–June 2000, as recorded at the facility level, against the corresponding data as recorded at the district level. As is clear from the figure, consistency between the two sources is fairly poor. Although there is no clear pattern, at least for outpatient numbers there appears to be a tendency for facilities to overreport output statistics to districts, in relation to the data recorded in patient registers. In some cases this overreporting is considerable.

Patient registers appear to be the most reliable source, as they are for the facility's use only. Taking these numbers as given, there are several possible explanations for the discrepancy with the data recorded at the district level.

First, health facility staff may believe that reported patient numbers will not have any real effect on the activities and resources of the facility and that the numbers will not be checked. In that case, they may decide that it is not worth expending effort on accurately reporting patient numbers. Second, if resources are allocated on the basis of reported patient numbers, or if these records are used to define user fee revenue targets for which the facility is held accountable, there may be incentives to over- or underreport patient numbers. The seemingly poor reliability of patient data at the district level also casts some doubt on official statistics on utilization. From the perspective of information management, data quality is not the only concern; it is also worrying that complete information is available at the district level for only 60 percent of the government facilities in the sample.

### Vaccinations

Like outpatient and delivery data, vaccination records exist at both facility and district levels. Facility staff record vaccinations on a tally sheet, and monthly totals are communicated to the district. The general impression from the

**Figure B.1. Comparing District and Facility Output Data**

data is that there is a considerable discrepancy between facility and district data for many facilities. Indeed, consistent data are available for only a minority of government and non-profit facilities. For most vaccinations, there is a tendency toward overreporting. In particular, there is a long tail of a small number of facilities that overreport by several hundred percent. For example, for BCG vaccinations, the median discrepancy for overreporting facilities

for the three months considered is approximately 33 percent, and the mean is over 100 percent. Conversely, for underreporting facilities, the median discrepancy is approximately 15 percent, with a similar mean. On average, it appears that for both government and non-profit facilities, district-level data overstate vaccination numbers compared with what is recorded at the facility level.

# Notes

- 1 Bidani and Ravallion (1997) do find that public spending has a large effect on the health status of the poor, but only a small effect on the aggregate health status of the poor and the nonpoor taken together.
- 2 The public expenditure tracking survey (PETS) is another variant of this tool (Reinikka and Svensson 2002).
- 3 Provider or facility surveys are not entirely new. The Living Standards Measurement Study (LSMS) surveys have included health facility modules on an ad hoc basis (see, for example, Alderman and Lavy 1996). A number of the Demographic and Health Surveys (DHSs) carried out in over 50 developing countries have included service provider components. The Family Life Surveys implemented by the RAND Corporation have combined health provider surveys with surveys of households. These surveys, however, rarely collect information on public and other expenditures. For a review of health facility surveys, see Lindelöw and Wagstaff (2003).
- 4 The survey instruments can be found under “Tools” at <[www.publicspending.org](http://www.publicspending.org)>.
- 5 For a discussion of the evidence on the divergence between local and national priorities in the allocation of resources in the health sector, see Akin, Hutchinson, and Strumpf (2001).
- 6 The facility survey was not linked to a household survey. Hence, the data do not permit an analysis of interactions between the demand and supply sides (for example, the impact of facility characteristics on household-level behavior and outcomes). Such a linkage is, however, possible and could be considered in future facility surveys.
- 7 The sample design and the survey implementation are discussed in greater detail in appendix A. See also Asiiimwe (2001).
- 8 Given that for-profit facilities were selected on the basis of proximity to the sample of government facilities, as described in appendix A, it is not possible to draw any general conclusions about their location.
- 9 In many districts, donors also perform similar supervisory functions.
- 10 This is particularly true for private facilities, for which only limited information is available at the district level.
- 11 This count is based on staff member names, which is the most complete variable. Issues relating to staffing data are discussed in detail in appendix A.
- 12 The other category includes porters, watchmen, records assistants, and sweepers. In most cases no information is available about the exact positions of these staff, but approximately 21 percent receive a monthly wage of more than 70,000 Ugandan shillings (US\$), suggesting that a proportion of them may be considered “qualified.”
- 13 In cases where staff in private facilities are financed by the district, records may exist. No records were available for staff in the sampled for-profit facilities. For private nonprofit facilities, district-level records



- existed for approximately 20 percent of the staff.
- 14 The matching of facility and district records is based on the names of health workers.
  - 15 Exchange rate as of November 1, 2000: 1 U.S. dollar (US\$) = 1,770.00 Ugandan shillings (USh).
  - 16 Schedule B for medical personnel applies. Within each of the 10 categories of staff, there is a gradation of salaries corresponding to the experience of the staff member.
  - 17 In the salary structure for fiscal 2000/2001 the lunch allowance was integrated into the salary payment. This consolidation does not apply to nonmedical staff deployed in the health service.
  - 18 Private nonprofit staff financed by the district receive lunch allowances in accordance with the rules that apply in government facilities.
  - 19 Stock cards were not generally available in private for-profit facilities. Due to incompleteness or lack of records in government and nonprofit facilities, the averages are calculated on the basis of a subsample of facilities—approximately 90 percent of government facilities and 45 percent of private nonprofit facilities.
  - 20 There is considerable variation in reported dosage across facilities, in particular for children.
  - 21 Apparent “overuse” of drugs does not appear to be restricted to government facilities. Although some variation is to be expected due to differences in need and to measurement error, the observed differences are greater than what can be explained by these factors alone.
  - 22 Nineteen of the 91 facilities in the subsample report receiving supplies for measles immunization days. These supplies primarily benefited the central region.
  - 23 The figure presents data for polio and BCG vaccines. Similar patterns can be observed for other vaccines.
  - 24 For government facilities, most expenditures on facility inputs—including the most important inputs, staff and drugs—are made at administrative levels higher than the actual facility. In general, therefore, we would not expect substantial financial transfers to government facilities.
  - 25 Appendix B presents a discussion of consistency between data from the facility and district levels.
  - 26 Data for some facilities were incomplete or missing, typically because of poor record-keeping. The discussion here of the numbers of outpatients and deliveries focuses primarily on monthly averages for the 12 months for which data are available. The analysis is restricted to the subsample of facilities for which data are available for at least 6 out of 12 months. Data issues are discussed in further detail in appendix A.
  - 27 For the sample as a whole, the average monthly number of outpatients ranges from 354 (April 2000) to 488 (November 1999).
  - 28 The analysis here excludes facilities for which no data are available or where data are available for only one month. The resulting subsample comprises about 80 percent of the government and private nonprofit facilities that perform vaccinations and nearly 60 percent of the for-profit facilities that do so. See appendix A and B for further details.

- 29 In the broadest sense, efficiency can be viewed as concerning the relationship between inputs and outcomes. Using this broad concept of efficiency would, however, require data that are not typically available.
- 30 The efficiency concepts were originally developed in relation to firm performance. See Fried, Lovell, and Schmidt (1993) for a comprehensive treatment.
- 31 Where allocative efficiency in the health sector has been addressed, this has typically been done by comparing the ratio of marginal products to the ratio of remuneration for the respective staff categories. Marginal products are calculated on the basis of an estimated production function with different categories of staff among its arguments.
- 32 The weights in the output index are based on the index used in the health sector in Mozambique. The general findings of this section are robust to changes in the weights applied.
- 33 Needless to say, these findings are sensitive to the definition of output, as well as to the category of workers used as the denominator. The findings, however, do not change substantively if only output per medical worker is considered.
- 34 The difference in mean output per worker between private nonprofit and government facilities is statistically significant; other differences in average output per worker for different ownership categories are not.
- 35 Low output per worker may be attributable to shirking (low effort) by staff but also to demand factors related to charging practices, quality, the demographic and socio-economic characteristics of the catchment area, the availability of substitutes, and the like. Conversely, high output per worker may reflect excessive workloads rather than “productivity.”
- 36 These perception-based variables must be interpreted with caution because the criteria used in assessing care may differ in non-random ways across individuals and because clients may fear that a negative response may create problems for health facility staff or the respondent.
- 37 It should be noted that there are few cases in which the expected positive impact of user fees has materialized.
- 38 Our initial analysis shows that overprescription is associated with the presence of unqualified staff and with government facilities. More detailed analysis is required to explore this linkage further (for example, to examine its association with availability of labs and frequency of testing).
- 39 Forty-two percent of prescriptions included chloroquine and 36 percent an antibiotic drug; 29 percent were per injection.
- 40 Separate from the issue of prescription is the question of patient compliance. As a consequence of low levels of education, rushed consultations, and inappropriate staff attitudes, compliance can be expected to be low in developing countries, including Uganda.
- 41 The eight districts were Bundibugyo, Gulu, Kabarole, Kasese, Kibaale, Kitgum, Kotido, and Moroto.
- 42 The study districts were Mpigi, Mukono, and Masaka in the central region; Mbale, Iganga, and Soroti in the east; Arua and Apac in the north; and Mbarara and Bushenyi in the west.

- 43 Specifically, the  $x$  private facilities in region  $y$  were identified by the in-charges in the first  $x$  randomly drawn government facilities in region  $y$ ; each in-charge was asked to identify the closest private dispensary or private dispensary with a maternity unit.
- 44 The specific reasons for dropping facilities are discussed in Asimwe (2001).
- 45 These facilities also had other drug use records that listed the quantity of drugs bought and removed from stock but not stock balance and drug use per day.

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