

# WORKING FOR GOD? EVIDENCE FROM A CHANGE IN FINANCING OF NONPROFIT HEALTH CARE PROVIDERS IN UGANDA

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## Abstract

What motivates religious nonprofit health care providers? This paper uses a change in financing of nonprofit health care providers in Uganda to test two theories of organizational behavior. We show that financial aid leads to more laboratory testing, lower user charges, and increased utilization. These findings are consistent with the view that religious nonprofit providers are intrinsically motivated to serve (poor) people and that these preferences matter quantitatively. (JEL: L31, I11, O15)

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## 1. Introduction

Nonprofit organizations—both religious and secular—are important health care providers across the world. In developed countries, the United States has an important not-for-profit hospital sector (Malani, Philipson, and David 2003). In the developing world, the first medical care in Latin America came from the *santa casas* (saint houses) that tended to the sick. In Brazil today nonprofits continue to deliver a considerable share of health care (Chollet and Lewis 1997). Asia, especially China, has had many missionaries in the past and some of their hospitals continue to give care as nonprofits. In the Middle East *waqfs*, nonprofit religious organizations provide many social services, including health care (Kuran 2001). In sub-Saharan Africa nonprofits have perhaps the biggest role in health

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care provision. According to household survey evidence from several countries, even among the poorest quintile about half of those who seek care for a sick child visit a non-governmental facility, often a nonprofit (Marek, Eichler, and Schnabel 2004). However, despite its importance world-wide, except for the U.S., there is little systematic evidence on nonprofit health care provision.

Recently, in response to problems in public health systems in many poor countries,<sup>1</sup> donors and others have argued for shifting more responsibility to the nonprofit sector.<sup>2</sup> Their proposition is to rely more on service providers with intrinsic motivation—that is, on workers who are sufficiently motivated to do a good job even when monitoring is weak or absent. Religious organizations that provide basic services are often cited as an example, even though there is little systematic evidence that these providers actually provide a better and more cost-effective service.

In this paper we attempt to partly fill the gap by exploiting a change in financing of the nonprofit health care sector in Uganda. The variation induced by the change in financing allows us to test two theories of organizational behavior: Workers and managers of nonprofit providers are intrinsically motivated to serve (poor) people, or alternatively that nonprofit providers are captured by their managers and/or workers and behave like for-profit actors, although they may not directly appropriate profits.<sup>3</sup> We focus on faith-based, or religious, nonprofit organizations (RNPO).

To guide the empirical work, we start by studying the effects of financial aid in a simple model of service provision. We show that price setting and quality choice depend crucially on the assumption of the provider's objectives. An RNPO facility that cares about the number of (poor) people treated would reduce user fees and increase the quality of care in response to untied financial aid, but aid would not affect a perquisite-maximizing nonprofit provider's choice of price and quality.

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1. Adverse effects of weak accountability and lack of effective monitoring have been widely documented. For example, Chaudhury et al. (2006) find that the degree of absenteeism among health workers is 40% in India. The number for Uganda may be as high as 50% (Björkman and Svensson 2009). In Bangladesh Chaudhury and Hammer (2004) document an absenteeism rate of 74% among doctors.

2. Anecdotal evidence that this shift in policy has already taken place is apparent from Overseas Development Assistance (ODA) data. The proportion of ODA channelled through nonprofit and non-government organizations has more than doubled over the last decade. Agg (2006) argues that underlying the shift in delivery of foreign aid is the belief in the intrinsic motivation of local nonprofit organizations.

3. Glaeser (2002) argues that weak board control may be just as important as differential tax privileges, donations, and nondistribution constraint in explaining the behavior of nonprofit firms. Thus capture by managers is not specific to nonprofit organizations in developing countries, although it seems plausible that boards in the U.S. nonprofit sector have better control than those in the Ugandan primary health care sector (see discussion in Section 2). The capture argument is also related to Pauly and Redisch's (1973) view of hospitals as physicians' cooperatives.

We use a change in financing of the nonprofit health care sector to distinguish between the aforementioned hypotheses.<sup>4</sup> In fiscal year 1999–2000, the government of Uganda initiated a program in which every nonprofit primary health unit was to receive an untied grant. As this was a new and unanticipated program, and due to poor communications on the government's part, some facilities did not receive their grant until the following year. This *de facto* phasing-in of the aid program provides a source of variation that we can exploit to identify the objectives of RNPO providers. To account for unobserved heterogeneity between early and late recipients, we use a difference-in-differences approach, exploiting the fact that in fiscal year 2000–2001 and forward, all surveyed health units received the grant.

We find that financial aid leads to more testing of suspected malaria cases, lower prices, and increased utilization. Aid has no effect on remuneration. The estimated effects are quantitatively important. These findings are consistent with the view that religious nonprofit providers are intrinsically motivated to serve (poor) people—working for God seems to matter!

This paper is related to a large literature on the behavior of nonprofit firms in the developed world, especially in the United States.<sup>5</sup> Our work differs in several dimensions. First, we explicitly consider religious nonprofit providers, rather than the more comprehensive notion of nonprofits. Second, we use quantitative survey data of different aspects of service delivery from a poor developing country. Third, as nonprofit health care providers in Uganda are not regulated; have no obvious tax advantages over private for-profit firms; and, until the government grant program was initiated in 1999–2000, benefited only marginally from donations or other financial support, we circumvent an important identification problem that has rendered it difficult to test altruistic models using U.S. data.<sup>6</sup> Finally, we exploit

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4. Duggan (2000) studies the differential response of nonprofit versus for-profit hospitals to a natural experiment induced by a government subsidy program. He examines hospitals affected by California's Disproportionate Share program and shows that the behavior of nonprofit hospitals varies with the share of nearby hospitals organized as for-profit firms: Increased for-profit penetration makes nonprofit hospitals more profit-oriented. The most common approach in the empirical literature on organizational behavior of the nonprofit sector is to compare nonprofit organizations in various dimensions with other providers (private for-profit and/or government providers), controlling for other confounding observable characteristics. A concern with such an approach is that there may be unobserved (by the econometrician) quality differences across owners.

5. The theoretical work has mainly evolved around three types of models: altruism models, which have quantity and quality of output in the firm's objective function; physician cooperative models that are analogous to earlier cooperative firm theories (Pauly and Redisch 1973); and non-contractible quality models, where for-profit firms have an incentive to shirk on the quality of service to cut costs (for a review, see Lakdawalla and Philipson 2005; Malani, Philipson, and David 2003). With respect to the U.S. health sector, the empirical evidence is mixed (Sloan et al. 1998; Rose-Ackerman 1996; McClellan and Staiger 2000; Philipson 2000; Malani, Philipson, and David 2003).

6. The problem is that ownership type may be endogenous. A nonaltruistic entrepreneur may choose a nonprofit status and locate in a poor neighborhood if she expects to benefit, for example, from charitable donations as a consequence of this ownership/location choice. Due to the absence of regulation and tax benefits, and minimal donations, such incentives should not play an important role in Uganda. Of course, the lack of regulation and monitoring still raises the concern that preferences of the owner (say, a Catholic parish) and the manager may differ.

a change in the financial incentives extended to the RNPO facilities to identify the objectives of religious providers.

The rest of the paper is organized as follows. Section 2 briefly describes the institutional setting of health care in Uganda. Section 3 presents a simple model of behavior of the religious nonprofit health facility. In Section 4 we discuss identification and Section 5 briefly describes the survey data. Section 6 presents the evidence and Section 7 concludes.

## 2. Institutional Setting

It is commonly held that Uganda had well-functioning health services in the 1960s. Health care was provided free of charge, and access to care was relatively good. Steady improvements were experienced in most health indicators. However, as a result of the political and military turmoil of the 1970s and 1980s, the government *de facto* retreated from funding and providing public services. In health care the burden was taken up by the private for-profit sector and faith-based providers. Despite efforts by the private for-profit and nonprofit sectors, health indicators fell dramatically (Republic of Uganda 2001a).

Following restoration of peace in the late 1980s, the government implemented a major program of health infrastructure rehabilitation. However, recurrent funding for health facilities remained low (Jeppson 2001). As a result the quality of public services did not improve at the same pace as health infrastructure, which is reflected in the continued high demand for privately provided care (Hutchinson 2001). Some health indicators have improved, but others have not (Moeller 2002).

The modern health sector in Uganda has four types of facilities (hospitals, health centers, dispensaries, and aid posts) and three types of actors (government, private for-profit, and nonprofit). The health facility survey we exploit in this paper has the dispensary as the unit of observation. Dispensaries are the most common health unit in Uganda and are in the lowest tier of the health system where a professional interaction between users and providers takes place. Most dispensaries are rural (89%) and are expected to serve a population of around 20,000. According to the government health sector strategic plan, the standard for dispensaries includes preventive, promotional, outpatient care, maternity, general ward, and laboratory services (Republic of Uganda 2000).

The census on the nonprofit health care sector in Uganda, carried out in 2001, indicated that autonomous dioceses and parishes own 70% of all private nonprofit health facilities, which total 450 lower-level units and 42 hospitals (Republic of Uganda 2001b). The rest are owned by nongovernmental organizations (16%), some of which are also religious, community-based organizations (6%), and by individuals (8%). The census also shows that most nonprofit health facilities (82%) are coordinated by one of three national umbrella organizations (Uganda Protestant Medical Bureau, Uganda Catholic Medical Bureau, and

Uganda Muslim Supreme Council). In our sample, 86% of the facilities have ties to one of these umbrella organizations.<sup>7</sup>

The first religious nonprofit health unit was established by missionaries in 1897 (Republic of Uganda 2001a). Thereafter local churches and missionaries set up hospital and health centers throughout the country. At their departure, missionaries handed over the management to the local church (diocese or parish). In the last three decades, as new parishes were established, they routinely set up their own social services, particularly health care. Typically, parishioners contributed to the investment cost, sometimes aided by donations from the medical bureau or outside sources. The majority of dispensaries owned by religious providers were built between 1960 and 1990. In our sample, the median year of establishment is 1983.

Nonprofit health care providers are self-governing. At the time of our surveys, there was no certification of nonprofit status (either by a medical bureau or government). Hence, the manager in charge of the nonprofit health unit, together with the unit-specific management committee, was free to decide on the mix and prices of services provided by the facility.

The importance of external donations has been declining. In our sample of (religious) nonprofit facilities, only 3 out of 44 nonprofit dispensaries received donations from private sources and only 2 out of 44 facilities received funds from the donor community in 1999–2000.<sup>8</sup>

In the 1960s, government grants were an important source of revenue for the nonprofit sector. Although public subsidies continued after independence, over time the relations between religious providers and the government deteriorated, as there was competition and a perceived difference in pay and privileges (Republic of Uganda 2001a). In the 1970s and 1980s subsidies to nonprofits dwindled and eventually ceased altogether. The government reinstated financial aid to hospitals in 1997. In fiscal year 1999–2000, a new program extended a similar subsidy to lower-level health units. The financial aid program prescribed that every nonprofit unit was to receive a fixed-amount grant for the fiscal year. The amount of the grant varied according to the level of the health facility. Each dispensary was to receive the same amount, namely, 2.5 million shillings (US\$ 1,400) a year. Each dispensary with a maternity unit was to receive 3.4 million Ush (US\$ 1,900).

### 3. Conceptual Framework

In this section we develop a simple model of nonprofit behavior and study the effects of untied aid. The model is solved under two alternative assumptions

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7. The remaining 14% are run by the Seventh Day Adventist Church.

8. As stressed earlier, donations were more important in the 1970s and 1980s, as well as at the start-up phase of a new health facility, when raising funds for construction. We have some indirect evidence for the latter. Of the 29 nonprofit facilities that had renovated their facility in the past, 14 had received financial support from private and/or donor sources.

of the preferences of the nonprofit unit. The first set-up assumes the religious nonprofit facility is captured by a nonaltruistic manager(s) (or that the owner has no altruistic concerns). The manager may face a nondistribution constraint, in which case profits must be spent on perquisites. The second set-up instead assumes that the religious nonprofit provider maximizes the total health impact of its activities, here conceptualized as the number of patients treated.<sup>9</sup>

### 3.1. Basics

Consider the following simplified version of the model in Reinikka and Svensson (2004b). A manager for a not-for-profit facility (NFP)  $j$  faces the problem of determining the price and quality of a given health service. The inverse-demand function is  $p = P(x, q)$  where  $p$  is the price,  $q$  is effort (quality),  $P_x < 0$ ,  $P_q > 0$ , and  $P_{xq} > 0$ . Marginal cost is  $c(q)$ , where  $c_q > 0$  and  $c_{qq} > 0$ . The facility is assumed to be a local monopolist.

### 3.2. The Rent- or Profit-Maximizing Nonprofit Facility

Total cash profits of facility  $j$  is  $\pi = P(x, q)x - c(q)x$ . Following Glaeser and Shleifer (2001) we assume that if the nondistribution constraint binds, the manager is forced to spend profits on perquisites, denoted by  $z$ . The utility of spending profits on perquisites is  $v(z) = \alpha z$ , where  $\alpha \leq 1$  is a constant. If  $\alpha = 1$ , the manager's problem is identical to that of a profit-maximizing firm.

The manager's problem is to maximize

$$\max_{x,q} \alpha [P(x, q)x - c(q)x]. \quad (1)$$

### 3.3. The Altruistic Nonprofit Facility

Consider next an altruistic nonprofit provider that maximizes the total health impact of its activities. The total health impact could be defined in a variety of ways. Here we choose to operationalize it as the number of (poor) patients treated. That is, the provider maximizes  $x$ , subject to the constraint that  $P(x, q)x - c(q)x \geq 0$ .

9. Clearly, conceptualizing altruism in the health sector with the number of patients treated is not uncontroversial. See Malani, Philipson, and David (2003) for a review of altruism models that typically have quantity (and/or quality) of output in the nonprofit's objective function.

### 3.4. *The Effects of Financial Aid*

Consider the case of untied financial support  $a$ . The total cash profit of facility  $i$  is then  $\pi = P(x, q)x - c(q)x + a$ . Because untied aid does not affect the marginal cost or revenue schedules, a rent/profit-maximizing provider's price and quality choices would be unaffected. That is, a rent/profit-maximizing provider will set the same price and quality with and without untied aid. Aid will only lead to increased rents, taking the form of higher profits or more perks, depending on if the nondistribution constraint binds or not.

The altruistic provider's maximization program would, however, be affected. The Lagrangian corresponding to the maximization problem in Section 3.3. taking aid into account, is

$$\max_{x,q} L = x + \lambda(a + P(x, q)x - c(q)x), \quad (2)$$

where  $\lambda$  is the Lagrange multiplier associated with the budget constraint.

Solving the problem we can show (see Reinikka and Svensson 2004b) that for an altruistic provider, aid will lead to lower prices and to higher quality care. These results are intuitive. The altruistic provider cares about the number of (poor) people treated and this number can be increased by either lowering prices or increasing the quality of care. Both strategies are costly. Aid relaxes the provider's budget constraint and at the margin it is optimal to increase the number of people treated using both strategies.

To sum up, an altruistic provider will respond to the inflow of untied aid by lowering prices and increasing quality. As a result, more patients will be treated. The price and quality choices of a rent/profit maximizing provider are unaffected by the inflow of untied aid. These results form the basis for the empirical test of the NFP sector.

## 4. Identification

The administrative design of the financial aid program involved three main actors, the NFP facility, the district health administration, and the Ministry of Finance (MoF). The financial aid program was under the authority of the MoF. Based on the register of NFP facilities and requests made by the district health administrations, the MoF was assigned to determine and approve the list of facilities entitled to funds. Once approved, funds were transferred to the local governments (districts), which in turn distributed the funds to the units concerned once the NFP facility's request for financial support and its workplan had been approved.

In theory, all NFP facilities should have received the funds in 1999–2000. In practice, however, there was variation in receipts. This was in spite of the fact that the umbrella organizations for nonprofit health providers spent time and effort

monitoring the program. In our sample of facilities, 37% of the NFP facilities did not receive their entitlement. Instead their first grant reached them the following fiscal year. Thus, de facto the grant program was phased in. It is this variation in receipts that we exploit to estimate the behavior of the NFP facilities.

Anecdotal evidence suggests that the reason not all facilities received aid in 1999–2000 had to do with delays and administrative bottlenecks at both the MoF and the district health administrations. If these delays and administrative problems are idiosyncratic to the facilities, we could treat the incidence of aid receipt as random and link receipt of aid to outcomes.

However, it is plausible that the incidence of receipts is correlated with unobserved factors that may have an independent effect on outcomes. This would be the case if well-connected units (for example, units that the health administration staff use and that may receive other types of support or are supervised more closely) or well-managed units (for example, units with managers that can articulate its case to district officials) are more likely to be treated expeditiously.<sup>10</sup> Cross-sectional estimates will then produce biased conclusions about the effects of the aid transfer. A bias would also occur if the district administrations or the MoF made an effort to first provide aid to the facilities in most need.<sup>11</sup>

Our approach to deal with this omitted variables problem is to exploit the time dimension and the fact that in the following fiscal year all sampled facilities received the grant. If well-connected units, well-managed units, or units in most need of support were also well-connected or poor in the year following the intervention (financial aid), we can estimate the causal effects of aid through a difference-in-difference approach. Thus, we estimate

$$y_{jt} = \alpha_0 + \beta_1 \lambda_t + \beta_2 \text{early}_j + \beta_3 \text{early}_j \lambda_t + x_{jt} \beta_4 + \varepsilon_{jt}, \quad (3)$$

where  $y_{jt}$  is outcome in health unit  $j$  at time  $t$ ,  $\alpha_0$  is a constant,  $\lambda_t$  is a time dummy for fiscal year 2000, *early* indicates whether the facility is a treatment facility (i.e., starts receiving the grant in 1999–2000), and  $x$  is a vector of control variables that vary over time and across facilities. The estimate of interest is  $\beta_3$ .

A slightly more general specification allows for health unit fixed effects,  $\mu_j$ :

$$y_{jt} = \pi_1 \lambda_t + \pi_2 \text{early}_j \lambda_t + x_{jt} \pi_3 + \mu_j + \varepsilon_{jt}. \quad (4)$$

10. This is consistent with the finding in Reinikka and Svensson (2004a). They study the disbursements of grants across schools in Uganda and show that there are important school-specific effects that explain why some schools manage to claim their entitlements while other do not. They also show that schools in better-off communities are more likely to be able to claim funds from the center.

11. This is consistent with the argument in Rosenzweig and Wolpin (1986). They show that if the allocation of public resources across localities (e.g., health units) is systematically related to factors determining the outcome, and these factors are unobserved by the researchers but known to the local provider, simple cross-sectional estimates will produce misleading conclusions about the program effectiveness.



In equation (4) we control for all unobserved fixed characteristics that could be correlated with grant receipt and outcomes. The estimate  $\pi_2$  is the effects of untied aid.

We also estimate a version of equation (4), replacing  $\lambda_t$  with year-by-region fixed effects, in which case the effect is identified from the within-region variation in outcomes in each year. This specification controls for differential expectations of poverty rates or health outcomes across regions that may be correlated with the incidence of receipts.

Whereas both incidence of financial aid in 1999–2000 and timing may be correlated with other important variables, the key identification assumption we make is that the combination of the two is not. The counterfactual assumption we make is thus that if all NFP facilities would have received the funds the first year,  $y_{jt}$  would change at the same rate in the group of early and late recipients. The exclusion restriction will fail if, for example, facilities differ in the early period and this difference is correlated with the likelihood of receiving aid early. We turn to this in the next section.<sup>12</sup>

Another concern with the financial aid experiment is that RNPO facilities may be credit-constrained. If that is the case, financial assistance, by relaxing a binding credit constraint, may result in changed behavior also for a rent or profit maximizing provider. We do not believe this is a serious concern. Foremost, as discussed subsequently, we find no evidence of increased investment in the group of early recipients. Second, the financial aid program was designed to support nonprofit providers' current expenditures (not for capital investment). Finally, to the extent that construction and/or procurement of capital goods take time, this would tend to work against finding an effect. For example, if investment decisions in fiscal year 2000 change the stock of capital in 2001 (and provided that the choice of prices and quality is a function of the capital stock), then because we compare outcomes in 2000 and after 2001 and all facilities received aid in either 2000 or 2001, then both in 2000 and in years 2001 +  $t$  the group of facilities is similar.

## 5. Data

The data that we use in this paper consist of two rounds (years 2000 and 2003) of survey data from 44 randomly selected nonprofit facilities drawn from 10 randomly chosen districts in Uganda (see the Appendix and Lindelöw, Reinikka,

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12. In a previous working paper version we also exploited the variation across type of owners – focusing on the comparison between nonprofit and for-profit providers. As reported in Reinikka and Svensson (2004b), we show that religious nonprofit providers hire qualified medical staff below the market wage; are more likely to provide pro-poor services and services with a public good element; and charge lower prices for services than for-profit facilities, although they provide a similar (observable) quality of care.

and Svensson (2003) for details).<sup>13</sup> The sample is restricted to dispensaries and dispensaries with maternity units in order to ensure a degree of homogeneity across facilities. The full data set (155 health stations) includes facilities from the three main ownership categories: government, private nonprofit, and private for-profit. The subsample of nonprofits (44 observations) we exploit here all have religious affiliations. The sample was designed so that the proportion of facilities drawn from different regions and ownership categories broadly mirrors the population of facilities.

## 6. Evidence

In order to interpret estimates of  $\beta_3$  (or  $\pi_2$ ) in equation (3) (or equation (4)) as evidence in favor (or not) of the “altruistic” model, it is important to rule out the alternative explanations of pre-grant differences across units (correlated with the likelihood of early grant receipts) or binding credit constraints.

We do not have data on investments. However, we have data on equipment (number of) and the working area (in square meters) of the facility at the end of fiscal year 2000. If financial assistance relaxed a binding credit constraint and thereby increased investment, presumably the group of early recipients would differ in available infrastructure at the end of the year. In Table 1 we report average values for a set of important inputs for both types of facilities, columns (2) and (3). The fourth column reports the  $F$ -statistic of the null hypothesis that the average values are equal. We cannot reject the joint hypothesis that the early and late grant recipients have, on average, the same number of examination beds, sterilization equipment, refrigeration equipment, blood pressure equipment, microscopes, sets of protective clothing, weighting scales, height measurement, and working area.<sup>14</sup> Looking at the individual inputs, only the number of weighting scales is significantly different between the two groups. These findings are difficult to reconcile with a credit constraint story.

We next turn to the question of whether the group of early grant recipients (treatment group) is systematically different (on observables) from the group of late recipients (control group). Table 2 reports average values for a set of observable characteristics for both types of facilities. Row 2 shows that the treatment and control group do not differ significantly in age (i.e., the year the facility was established). The treatment and control groups are similar with respect to access

13. Three of these facilities did not have accurate data on grant receipt (or not) in fiscal year 2000. We drop one facility from the sample due to incompleteness and inconsistencies in the reported data. As an additional filtering rule for the difference-in-differences analysis, we require facilities to have information on outcomes ( $y_{it}$ ) for both years to be included in the sample.

14. The Wald statistic for testing the null hypothesis that all averages (of the  $n$  variables listed in Table 1) across early and late recipients are equal is distributed as  $\chi^2(n)$ . The test statistic is 8.50 with  $p$ -value of 0.49.

TABLE 1. Infrastructure (investment) of early and late grant recipients at the end of 2000.

Variable	Early recipient	Late recipient	<i>F</i> -test (early = late)
Examination beds	1.54	1.64	0.08 [.78]
Sterilization equipment	2.77	2.21	1.27 [.27]
Refrigeration equipment	0.65	0.71	0.12 [.73]
Blood pressure equipment	1.31	1.07	0.79 [.38]
Microscopes	0.81	0.57	1.29 [.26]
Sets of protective clothing	1.50	1.07	0.54 [.47]
Weighting scales	2.54	1.5	6.51 [.02]
Height scales	0.24	0.07	1.58 [.22]
Working area (square meters)	314	242	1.35 [.25]
Wald statistic			8.50 [.49]

Notes: Mean values in columns (2) and (3). *F*-statistic of the null hypothesis that the average values are equal with *p*-values in brackets in column (4). The Wald statistic is the test statistic for testing the null hypothesis that all averages across early and late recipients are equal.

TABLE 2. Characteristics of early and late grant recipients.

Variable	Early recipient	Late recipient	<i>F</i> -test (early = late)
Established (year)	1978	1981	0.35 [.56]
Access to telephone	0.04	0.00	0.53 [.47]
Access to newspaper	0.23	0.21	0.01 [.91]
Access to radio	0.58	0.64	0.05 [.83]
Access to safe water supply	0.69	0.79	0.38 [.54]
Distance to district HQ (km)	27.3	29.6	0.07 [.80]
Distance to health sub-district HQ (km)	12.2	9.5	0.63 [.43]
Wald statistic			2.15 [.95]

Notes: Mean values in columns (2) and (3). *F*-statistic of the null hypothesis that the average values are equal with *p*-values in brackets in column (4). The Wald statistic is the test statistic for testing the null hypothesis that all averages across early and late recipients are equal.

to communication infrastructure: rows (3)–(5) (i.e., a late recipient is as likely as an early recipient to have access to telephone, newspapers, and radio at the facility). The two groups of facilities are also indistinguishable with respect to source of water supply (if the main source is piped water, borehole, or protected spring), electricity,<sup>15</sup> and distance to district or health subdistrict headquarters: rows (6)–(8). Thus, there is no (observable) evidence suggesting that the treatment and control groups differ on observable characteristics.

In order to assess the effects of financial aid one must identify which potential variables might be affected by the inflow of money in a short time interval (no longer than a year). We look at three sets of variables that the facilities can easily adjust in the short run: testing procedures (as a proxy for quality), prices, and staff remuneration.

One important component in prescribing the correct treatment for malaria and intestinal worm cases is laboratory testing. We have information on the number of malaria blood slides carried out (for every 100 outpatients), and the number of stool tests undertaken (for every 100 outpatients).<sup>16</sup>

Table 3 depicts the difference-in-differences estimates on the number of malaria blood slides. In columns (1) and (2), we report simple difference-in-differences estimates with and without controlling for time-varying health facility characteristics. The estimates of equation (4) are reported in column (3), and in column (4) we add region-by-year fixed effects. The treatment effect ( $\beta_3$  [ $\pi_2$ ]) is significant in all four specifications and ranges from 12.1 to 14.0 additional patients tested. This is a large effect. As a point of reference, the control group tested on average 5.7% of the patients visiting the clinics in 2000.

The difference-in-differences estimates on the number of stool-tests for every 100 suspected intestinal worm cases are reported in columns (5)–(8). Early grant recipients performed significantly more stool tests in fiscal year 2000 and the difference-in-differences estimates are positive. However, the estimates are imprecisely estimated.

In the model, a provider with preferences defined over the number of (poor) people treated would not only improve quality but also cut prices in response to untied financial assistance. In Table 4, columns (1)–(4), the dependent variable is the logarithm of user-fees of general outpatient service. The differences-in-differences estimates ( $\beta_3$  [ $\pi_2$ ]) range from  $-3.1$  to  $-2.5$  and are significantly different from zero at the 5% level in all four specifications. Again, this is an economically large effect and corresponds to a 37–54% reduction in user fees compared to the average facility in the control group in fiscal year 2000.<sup>17</sup>

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15. All NGO facilities were either connected to the grid or had their own generator.

16. Data on number of patients were collected from daily patient records. Number of blood slides and stool tests were collected from daily laboratory records.

17. The estimates remain significant if, instead of a log-linear user-fees specification as in Table 4, we estimate a linear user-fees model (results available upon request).

TABLE 3. Difference-in-differences estimates of early and late grant receipt on number of blood slides and stool tests for every 100 outpatients.

Regression Dep. variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Blood slides for every 100 outpatients			Stool tests for every 100 outpatients				
Constant	16.2*** (4.53)	-2.8 (7.40)		9.6** (2.48)	7.1*** (2.54)	5.3 (4.33)		9.9*** (1.47)
Fiscal year 2000	-10.5* (5.35)	-13.7*** (5.56)	-11.7** (5.64)		3.6 (3.11)	3.8 (2.89)	1.25 (3.70)	
Early grant recipient	1.1 (5.87)	-2.7 (4.63)		4.5 (4.44)	-0.02 (3.39)	-0.79 (3.52)		-0.75 (3.52)
Early grant recipient × 2000	14.0** (6.86)	12.7* (6.94)	13.0* (6.85)	12.1* (6.32)	5.5 (4.66)	5.5 (4.65)	8.5* (5.17)	5.0 (4.56)
Controls	No	Yes	Yes	No	No	Yes	Yes	No
Health unit fixed effects	No	No	Yes	No	No	No	Yes	No
Region-by-year fixed effects	No	No	No	Yes	No	No	No	Yes
Observations	81	80	80	81	69	69	69	69

Notes: Standard errors clustered by facility in parentheses. \*Significant at 10%; \*\*Significant at 5%; \*\*\*Significant at 1%. The control variables are number of dispensaries and health centers in the facility's catchment area, number of weighting scales, and number of staff.

TABLE 4. Difference-in-differences estimates of early and late grant receipt on user-fee for general outpatient service and number of outpatients treated per month.

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Years			Log of user-fees			Log of outpatients per month		
Constant	4.7*** (.90)	4.8*** (1.16)	4.8*** (1.16)	6.3*** (.49)	6.0*** (.25)	5.0*** (.36)		5.8*** (.20)
Fiscal year 2000	2.8*** (1.0)	2.8** (1.17)	2.8*** (1.17)		-0.7*** (.21)	-0.8* (.25)	-0.4* (.19)	
Early grant recipient	1.3 (1.02)	1.3 (1.05)		0.7 (.85)	0.3 (.30)	0.18 (.24)		0.17 (.27)
Early grant recipient × 2000	-3.1** (1.26)	-3.1** (1.28)	-3.1** (1.35)	-2.5** (1.01)	0.21 (.23)	0.11 (.29)	-0.06 (.21)	0.31 (.23)
Controls	No	Yes	Yes	No	No	Yes	Yes	No
Health unit fixed effects	No	No	Yes	No	No	No	Yes	No
Region-by-year fixed effects	No	No	No	Yes	No	No	Yes	Yes
Facilities	73	73	73	73	81	79	79	81

Notes: Standard errors clustered by facility in parenthesis. \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%. The control variables are number of dispensaries and health centers in the facility's catchment area, number of weighting scales, and number of staff.

TABLE 5. Difference-in-differences estimates of early and late grant receipt on remuneration (in logarithms).

Regression Dep. variable	(1) All	(2) Qualified	(3) Nursing aides
Constant	11.0*** (.38)	10.7*** (1.0)	10.4*** (1.1)
Fiscal year 2000	-0.4*** (.13)	-0.0 (.61)	1.0 (1.60)
Early grant recipient $\times$ 2000	-0.2 (.17)	-0.9 (.97)	0.7 (1.62)
Controls	Yes	Yes	Yes
Health unit fixed effects	Yes	Yes	Yes
Facilities	69	60	60

Notes: Robust standard errors, column (2), clustered by facility, columns (1), (3), (4), in parentheses. \*\*\* Significant at 1%. The control variables are number of dispensaries and health centers in the facility's catchment area, number of weighting scales, and number of staff.

The price cut is also associated with an increase in patient numbers (columns (5)–(8), Table 4). The point estimates suggest a 9–50% increase in outpatients served per month as compared to the mean facility in the control group in fiscal year 2000. The difference-in-differences estimates, however, are imprecisely estimated.

An altruistic provider will respond to the inflow of untied aid by lowering prices and increasing quality whereas a rent-maximizing facility with a binding nondistribution constraint would spend aid on perquisites and wages. The last set of regressions looks at this prediction. The dependent variable in Table 5 is the full-time equivalent salary plus lunch allowances per month. Because staff composition may differ across units, we estimate three regressions, one for the average salary of all staff (column (1)), one for the average salary of qualified staff (column (2)), and one for the average salary of nursing aides (column (3)).<sup>18</sup> We find no robust evidence of a relationship between grant receipt and staff remuneration.<sup>19</sup>

Are the effects reported in Tables 3–5 quantitatively important? Although it is difficult to provide a firm answer, a back-of-the-envelope calculation shows that the sum of the foregone revenues of the price cut and the increased cost of testing for malaria and intestinal worms account for approximately 83% of the grant for the median facility.<sup>20</sup> In other words, a large share of the grant can be

18. *Qualified staff* include medical doctor, clinical officer, comprehensive nurse (A level and 3 years of medical training), registered nurse (A level and 2.5 years of medical training), laboratory assistant (O level and 3 years of medical training), and enrolled nurse and midwife (O level and 2.5 years of medical training).

19. The estimates remain insignificant if instead of a log-linear wage specification as in Table 5 we estimate a linear wage model (results available upon request).

20. The calculation is based on the average treatment effects (across the various specifications) in Tables 3 and 4, assuming that the grant was received with no delay and a cost (including wage costs) of US\$ 0.75 per test.

TABLE 6. Placebo tests: Supply of drugs and vaccines.

Regression	(1)	(2)	(3)	(4)
Years	ALL	ALL	ALL	ALL
Dependent variable	Vaccines	Drug supplies	Chloroquine (log)	Septirin (log)
Fiscal year 2000	-0.0 (.01)	-0.3** (.13)	-4.1*** (1.49)	-3.8*** (1.30)
Early grant recipient $\times$ 2000	-0.0 (.05)	0.1 (.12)	1.3 (1.77)	0.2 (1.57)
Controls	Yes	Yes	Yes	Yes
Health unit fixed effects	Yes	Yes	Yes	Yes
Facilities	76	80	78	78

Notes: Standard errors clustered by facility in parentheses. \*\*Significant at 5%; \*\*\*Significant at 1%. The control variables are number of dispensaries and health centers in the facility's catchment area, number of weighing scales, and number of staff.

accounted for by the foregone revenues of the price cut and the increased cost of laboratory testing.

*Robustness.* Administrative bottlenecks at the MoF and the district health administrations, rather than the health unit specific characteristics, caused the delays in grant disbursements. Thus, there are reasons to believe that, controlling for unit fixed effects and time effects, the interaction between the starting year of the grant program and indicator variable for early grant receipt will reflect factors outside the health unit's control. One concern is that the administrative bottlenecks not only affected the implementation of the grant program but adversely, and systematically, influenced the function of various other financial and in-kind support programs for health providers.

Table 6 reports a set of placebo tests on these other support programs. We have data on whether the health unit received vaccines during the year for which it did not pay or whether it received free drug supplies. We also have detailed data on the number of doses (tablets) of chloroquine and septrin received for free during the year. Table 6 depicts the difference-in-differences estimates. The treatment effect ( $\pi_2$ ) is insignificant in all four specifications and the point estimates are small. Thus, the implementation of the other main support programs (which have been in place for several years) do not follow the same pattern as the grant program considered here.

## 7. Discussion

What motivates religious nonprofit health care providers? This paper uses a change in financing of nonprofit health care providers in Uganda to test two theories of organizational behavior. We show that financial aid leads to more laboratory testing, lower user charges, and increased utilization, but we find no correlation between aid and remuneration of staff. These findings are consistent



with the view that religious nonprofit providers are intrinsically motivated to serve (poor) people. A number of specification checks support the causal interpretation of these estimates.

So, why does this matter? There are a number of reasons. First, the results of the paper have implications for contracting of service provision, specifically in the health sector. Any contract for a complicated set of services such as health care is necessarily incomplete as a variety of aspects cannot be specified in the contract or easily monitored. Therefore, if the contracted party can be trusted not to shirk or benefit itself, policymakers—and taxpayers or donors—can be more confident that services will be delivered according to their preferences even if the contract cannot be detailed or monitored. In many developing countries, policymakers tend to be hesitant to go beyond public provision. Although not directly comparing them with the public sector providers, this paper reduces the information gap regarding the performance of religious nonprofit providers and gives more confidence for governments (and taxpayers and donors) who are interested in contracting out of health services.

Second, the findings also have implications for public investment decisions—that is, to make sure that public investment will have the greatest net effect (net of non-government service displacement). Given that the government knows where the RNPOs are located, it can refrain from expanding into the areas where they are already operating. A higher priority for government investment would be in areas where there is no service at all or where available services are for-profit only, rather than duplicating the nonprofit capacity. In other words, better information on the alternatives that are substitutes for public health service expansion can help make better investment decisions.

Do the results translate to other contexts? As mentioned earlier, apart from this study, there is precious little empirical evidence on religious nonprofit health-care provision in developing countries. Hence, it is not possible to answer this question definitively. However, in Africa, where health is a major development issue, many if not most countries have a large religious nonprofit sector providing health care, similarly unregulated as in Uganda. Poor countries in Asia and Latin America also have nonprofit sectors providing health care. Where public health systems are weak, nonprofits have an important role to play, particularly for poor people who may not be able to afford private for-profit care.

Are non-religious NGOs different? Using survey data, Barr, Fafchamps, and Owens (2005) document the activities, resources, and governance structure of non-religious NGOs operating in Uganda. They find that the secular NGO sector is indeed very different. It is funded primarily by international non-governmental organizations and bilateral donors. There are large differences in size and funding across NGOs, with only a few NGOs attracting most of the funding. Unlike the religious nonprofit health providers, most NGOs focus on raising awareness and advocacy rather than on service delivery.

This paper is only a first attempt to evaluate religious nonprofit health care provision. While all nonprofit providers in our sample have religious affiliations, future research should explore whether the objective to serve (poor) people is driven by some deeper motivation, such as converting people. Distinguishing between these two objectives would require data also on non-religious service providers and a theory of conversion. Given the need to improve health care in the developing world, we believe that this is a worthwhile area for future research.

## **Appendix A**

### ***A.1. Data***

Tools to collect data and analyze service provider behavior include facility modules in household surveys and empirical studies to estimate facility cost functions. The approach used here, a quantitative service delivery survey (QSDS), is distinct from these other tools in a number of respects (Dehn, Reinikka, and Svensson 2003). A QSDS is similar to a firm-level survey. The key difference is that it explicitly recognizes that agents in the service delivery system may have a strong incentive to misreport (or not report) key data. To this end, data are obtained directly from the records kept by facilities for their own need (daily patient registers, stock cards, etc.) rather than from administrative records submitted to the local government. The former, often available in a highly disaggregate format, are considered to suffer the least from any incentive problems in record-keeping.

### ***A.2. Sample***

The sample design was governed by three principles (see Lindelöw, Reinikka, and Svensson 2003 for details). First, attention was restricted to dispensaries and dispensaries with maternity units to ensure a degree of homogeneity across sampled facilities. Second, subject to security constraints, the sample captured regional differences. Finally, the sample included facilities from the main ownership categories: government, private nonprofit, and private for-profit providers.

These three considerations lead to a stratified random sample. The sample was based on the Ministry of Health (MoH) facility register for 1999. The register includes government, private nonprofit, and private for-profit facilities. A total of 155 health facilities were surveyed. On the basis of existing information, it was decided that the sample would include 81 government facilities, 44 private not-for-profit facilities, and 30 private for-profit facilities.

As a first step in the sampling process, 8 districts (out of 45) had to be dropped from the sample frame due to security concerns. From the remaining districts, 10 districts, stratified according to geographical location, were randomly sampled in

proportion to district population size. Thus, three districts were chosen from the Eastern and Central regions and two from the Western and Northern regions.<sup>21</sup>

From the selected districts, a sample of government and private nonprofit facilities was drawn randomly from the MoH register.

The field work for the first round was carried out during October–December 2000. The second round of data collection was carried out in 2004. Data were collected for 2003, although for some variables information was also collected for 2001 and 2002.

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