Working for God?

Evidence from a change in financing of not-for-profit health care providers in Uganda

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What motivates religious not-for-profit health care providers? This paper uses a change in financing of not-for-profit 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 not-for-profit providers are intrinsically motivated to serve (poor) people and that these preferences matter quantitatively.

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1 Introduction

Not-for-profit 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 2002). 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 not-for-profits continue to deliver a considerable share of health care (Chollet and Lewis 1997). Asia, especially China, had many missionaries in the past and some of their hospitals continue to give care as not-for-profits. In the Middle East *waqfs*, non-profit religious organizations provide many social services, including health care (Kuran 2001). In Sub-Saharan Africa not-for-profits have perhaps the biggest role in health 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 not-for-profit (Marek, Eichler and Schnabel 2005). However, despite its importance world-wide, except for the US, there is little systematic evidence on not-for-profit health care provision.

Recently – in response to problems in public health systems in many poor countries[1] – donors and others have argued for shifting more responsibility to the not-for-profit sector.[2] 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 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 not-for-profit 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 not-for-profit providers are intrinsically motivated to serve (poor) people, or alternatively that not-for-profit providers are captured by their managers and/or workers and behave

[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 percent in India. The number for Uganda may be as high as 50 percent (Björkman and Svensson, forthcoming). In Bangladesh Chaudhury and Hammer (2006) document an absenteeism rate of 74 percent among doctors.

[2] Annecdotal evidence that this shift in policy has already taken place is apparent from Overseas Development Assistance (ODA) data. The proportion of ODA channelled through not-for-profit 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 intrisic motivation of local not-for-profit organizations.

like for-profit actors, although they may not directly appropriate profits.[3] We focus on faith-based, or religious, not-for-profit organizations (RNFP).

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. A RNFP 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 not-for-profit provider's choice of price and quality.

We use a change in financing of the not-for-profit health care sector to distinguish between the aforementioned hypotheses.[4] In fiscal year 1999/2000, the government of Uganda initiated a program in which every not-for-profit primary health unit was to receive an untied grant. As this was a new and unanticipated program, and due to poor communications from 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 RNFP providers. To account for unobserved heterogeneity between early and late recipients, we use a difference-in-differences approach, exploiting that 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 not-for-profit providers are intrinsically motivated to serve (poor) people - - working for God seems to matter!

[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 not-for-profit firms. Thus capture by managers is not specific to not-for-profits in developing countries, although it seems plausible that boards in the U.S. not-for-profit 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 the Pauly and Redisch's (1973) view of hospitals as physicians' cooperatives.

[4] Duggan (2000) studies the diffential response of not-for-profit 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 not-for-profit hospitals varies with the share of nearby hospitals organized as for-profit firms: increased for-profit penetration makes not-for-profit hospitals more profit-oriented. The most common approach in the empirical literature on organizational behavior of the not-for-profit sector is to compare not-for-profit organizations in various dimensions with other provides (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.

This paper is related to a large literature on the behavior of not-for-profit firms in the developed world, especially in the United States.[5] Our work differs in several dimensions. First, we explicitly consider religious not-for-profit providers, rather than the more comprehensive notion of not-for-profits. Second, we use quantitative survey data of different aspects of service delivery from a poor developing country. Third, as not-for-profit 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.[6] Finally, we exploit a change in the financial incentives extended to the RNFP 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. Sections 3 presents a simple model of behavior of the religious not-for-profit 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-

[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 Malani, Philipson, and David 2002; Lakdawalla and Philipson 2001). With respect to the U.S. health sector, the empirical evidence is mixed (Malani, Philipson, and David 2002; McClellan and Staiger 2000; Philipson 2000; Rose-Ackerman 1996; Sloan and others 1998).

[6] The problem is that ownership type may be endogenous. A nonaltruistic entrepreneur may choose a not-for-profit 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.

profit and not-for-profit 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 with 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 not-for-profit). 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 percent) 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 not-for-profit health care sector in Uganda, carried out in 2001, indicated that autonomous dioceses and parishes own 70 percent of all private not-for-profit health facilities, which total 450 lower-level units and 42 hospitals (Republic of Uganda 2001b). The rest are owned by non-governmental organizations (16 percent), some of which are also religious, community-based organizations (6 percent), and by individuals (8 percent). The census also shows that most not-for-profit health facilities (82 percent) 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 percent of the facilities have ties to one of these umbrella organizations.[7]

The first religious not-for-profit health unit was established by missionaries in 1897 (Republic of Uganda 2001a). Thereafter local churches and missionaries have 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 major-

[7]The remaining 14 % are run by Seventh Day Adventist.

ity of dispensaries owned by religious providers were built between 1960 and 1990. In our sample, the median year of establishment is 1983.

Not-for-profit health care providers are self-governing. At the time of our survey, there was no certification of not-for-profit status (either by a medical bureau or government). Hence, the manager in charge of the not-for-profit health unit together with the unit-specific management committee were free to decide on the mix and prices of services provided by the facility.

The importance of external donations have been declining. In our sample of (religious) not-for-profit facilities, only 3 out of 44 not-for-profit dispensaries received donations from private sources and only 2 out of 44 facilities received funds from the donor community in 1999/2000.[8]

In the 1960s, government grants were an important source of revenues for the not-for-profit sector. While 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 not-for-profits 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 not-for-profit 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 not-for-profit behavior and study the effects of untied aid. The model is solved under two alternative assumptions of the preferences of the not-for-profit unit. The first set up assumes the religious not-for-profit 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 not-for-profit provider maximizes the total health impact of its activities, here conceptualized as the number of patients treated.[9]

[8] As stressed above, 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 not-for-profit facilities that had renovated their facility in the past, 14 had received financial support from private and/or donor sources.

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/profit maximizing not-for-profit 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

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

3.3 The altruistic not-for-profit facility

Consider next an altruistic not-for-profit 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 $P(x, q)x - c(q)x \geq 0$.

3.4 The effects of financial aid

Consider the case of untied financial support a. The total cash profits of facility i is then $\pi = P(x, q)x - c(q)x + a$. Since 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.

[9] Clearly, conceptualizing altruism in the health sector with the number of patients treated is not uncontroversial. See Malani, Philipson, and David (2002) for a review of altruism models that typically have quantity (and/or quality) of output in the not-for-profit's objective function.

The altruistic provider's maximization program would, however, be affected. Formally, with aid, the provider maximizes

$$\max_{x,q} L = x + \lambda \left(a + P(x,q)x - c(q)x \right) \ . \tag{2}$$

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 not-for-profit health providers spent time and effort monitoring the program. In our sample of facilities, 37 percent 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 suggest that the reason why 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.[10] 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.[11]

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

$$y_{jt} = \alpha_0 + \beta_1 \lambda_t + \beta_2 early_j + \beta_3 early_j \lambda_t + x_{jt}\beta_4 + \varepsilon_{jt} \quad , \tag{3}$$

where y_{jt} is outcome in health unit j at time t, α_0 is a constant, λ_t is a time dummy for fiscal year 2000, $early$ indicates whether the facility is a treatment facility (i.e., start 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 β_3.

A slightly more general specification allows for health unit fixed effects, μ_j:

$$y_{jt} = \pi_1 \lambda_t + \pi_2 early_j \lambda_t + x_{jt}\pi_3 + \mu_j + \varepsilon_{jt} \ , \tag{4}$$

In (4), we control for all unobserved fixed characteristics that could be correlated with grant receipt and outcomes. The estimate π_2 is the effects of untied aid.

We also estimate a version of (3), replacing λ_t with year-by-region fixed effects, in which case the effect is identified from the within-region variation in

[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 entitlments 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.

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.

While 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.[12]

Another concern with the financial aid experiment is that RNFP 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 below, we find no evidence of increased investment in the group of early recipients. Second, the financial aid program was designed to support not-for-profit 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 investments 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 since 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 are similar.

5 Data

The data that we use in this paper consists of two rounds (years 2000 and 2003) of survey data from 44 randomly selected not-for-profit facilities drawn from 10 randomly chosen districts in Uganda (see appendix and Lindelöw, Reinikka, and Svensson, 2003, for details).[13] The sample is restricted to

[12] In a previous working paper version we also exploited the variation across type of owners – focusing on the comparison between not-for-profit and for-profit providers. As reported in Reinikka and Svensson (2005), we show that religious not-for-profit 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.

[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_{jt}) for both years to be

dispensaries and dispensaries with maternity units in order to ensure a degree of homogeneity across facilities. The full data set (155 health stations) include facilities from the three main ownership categories: government, private not-for-profit, 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 β_3 [or π_2] in (3) [or (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 the 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.[14] 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 if 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 to communication infrastructure (rows 3-5); i.e., a late recipient is as likely as an early recipient to have access to telephone,

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.

newspapers, and radio at the facility. The two group of facilities are also indistinguishable with respect to source of water supply (if the main source is piped water, borehole, or protected spring), electricity,[15] and distance to district or health sub-district 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 outpatient), and the number of stool tests undertaken (for every 100 outpatient).[16]

Table 3 depicts the difference-in-difference estimates on the number of malaria blood slides. In columns 1-2, 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 (β_3 [π_2]) is significant in all four specifications and ranges from 12.1-14.0 additional patients tested. This is a large effect. As a point of reference, the control group tested on average 5.7 percent of the patients visiting the clinics in 2000.

The difference-in-difference 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 (OPD). The differences-in-differences estimates (β_3 [π_2]) range from -3.1 to -2.5 and is significantly different from zero at the 5 percent 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

[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.

control group in fiscal year 2000.[17]

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 while a rent-maximizing facility with a binding nondistribution constraint would spend aid on perquisites and wages. The last set of regressions look 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); one for the average salary of nursing aides (column 3).[18] We find no robust evidence of a relationship between grant receipt and staff remuneration.[19]

Are the effects reported in tables 3-5 quantitatively important? While 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 percent of the grant for the median facility.[20] In other words, a large share of the grant can be accounted for by the foregone revenues of the price cut and the increased cost of laboratory testing.

6.1 Robustness tests

Administrative bottlenecks at the Ministry of Finance and the district health administrations, rather 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

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

[18] *Qualified staff* include medical doctor, clinical officer, comprehensive nurse (A level and three years of medical training), registered nurse (A level and two-and-half years of medical training), laboratory assistant (O level and three years of medical training), and enrolled nurse and midwife (O level and two-and-half years of medical training).

[19] The estimates remain insignificant if we instead of a log-linear wage specification as in table 5 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 0.75 dollar per test.

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 program 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 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 (π_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 not-for-profit health care providers? This paper uses a change in financing of not-for-profit 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 not-for-profit 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 such a complicated set of services 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 tax payers 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. While not directly comparing them with the public sector providers, this paper reduces the information gap regarding the performance of religious not-for-profit providers and gives more confidence for governments (and tax payers and donors) who are interested in contracting out of health services.

Second, the findings also have implications for public investment decision; i.e., 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 RNFPs 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 not-for-profit 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 not-for-profit 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 non-profit sector proving health care, similarly unregulated as in Uganda. Poor countries in Asia and Latin America also have non-profit sectors providing health care. Where public health systems are weak, not-for-profits 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 not-for-profit 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 not-for-profit health care provision. While all not-for-profit 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.

A Appendix

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 (i.e. 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 not-for-profit 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 not-for-profit, 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 non-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.[21]

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 to December 2000. The second round of data collection was carried out in 2004. Data was collected for 2003, although for some variables information was also collected for 2001 and 2002.

[21]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.

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

Variable	Early recipient	Late recipient	F-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: (i) Mean values in columns (2) and (3). (ii) 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	F-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: (i) Mean values in columns (2) and (3). (ii) 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 3. Difference-in-difference estimates of early and late grant receipt on number of blood slides and stool tests for every 100 outpatient

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. variable	Blood slides for every 100 outpatient				Stool tests for every 100 outpatient			
Constant	16.2***	-2.8		9.6**	7.1***	5.3		9.9***
	(4.53)	(7.40)		(2.48)	(2.54)	(4.33)		(1.47)
Fiscal year 2000	-10.5*	-13.7***	-11.7**		3.6	3.8	1.25	
	(5.35)	(5.56)	(5.64)		(3.11)	(2.89)	(3.70)	
Early grant recipient	1.1	-2.7		4.5	-0.02	-0.79		-0.75
	(5.87)	(4.63)		(4.44)	(3.39)	(3.52)		(3.52)
Early grant recipient*2000	14.0**	12.7*	13.0*	12.1*	5.5	5.5	8.5*	5.0
	(6.86)	(6.94)	(6.85)	(6.32)	(4.66)	(4.65)	(5.17)	(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

Standard errors clustered by facility in parenthesis. * (**) [***] denotes significance at the 10 (5) [1] percent level. 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-difference 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***	4.8***		6.3***	6.0***	5.0***		5.8***
	(.90)	(1.16)		(.49)	(.25)	(.36)		(.20)
Fiscal year 2000	2.8***	2.8**	2.8***		-0.7***	-0.8*	-0.4*	
	(1.0)	(1.17)	(1.17)		(.21)	(.25)	(.19)	
Early grant recipient	1.3	1.3		0.7	0.3	0.18		0.17
	(1.02)	(1.05)		(.85)	(.30)	(.24)		(.27)
Early grant recipient*2000	-3.1**	-3.1**	-3.1**	-2.5**	0.21	0.11	0.06	0.31
	(1.26)	(1.28)	(1.35)	(1.01)	(.23)	(.29)	(.21)	(.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

Standard errors clustered by facility in parenthesis. * (**) [***] denotes significance at the 10 (5) [1] percent level. 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-difference estimates of early and late grant receipt on Remuneration (in logarithms)

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

Robust standard errors (col. 2) clustered by facility (cols. 1,3,4) in parenthesis. * (**) [***] denotes significance at the 10 (5) [1] percent level. 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 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)	Septrin (log)
Fiscal year 2000	-0.0	-0.3**	-4.1***	-3.8***
	(.01)	(.13)	(1.49)	(1.30)
Early grant recipient*2000	-0.0	0.1	1.3	0.2
	(.05)	(.12)	(1.77)	(1.57)
Controls	Yes	Yes	Yes	Yes
Health unit fixed effects	Yes	Yes	Yes	Yes
Facilities	76	80	78	78

Standard errors clustered by facility in parenthesis. * (**) [***] denotes significance at the 10 (5) [1] percent level. The control variables are number of dispensaries and health centers in the facility's catchment area; number of weighting scales; and number of staff.