MEASURE *Evaluation* Bulletin

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MEASURE *Evaluation*

Evaluation of the Impact of Population and Health Programs

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MEASURE *Evaluation* Bulletin, Number 6: Evaluation of the Impact of Population and Health Programs

» Do programs have an impact on the health status and health behaviors of a country population?

» What is the relative impact of different program components (e.g., logistics, training, IEC)?

» Given program influence on availability, price, and quality of health services, what is the relative effect of these factors on health service utilization, and ultimately, on health status?

These are key questions of interest to governments, donors and program managers who want to know whether the resources spent in programs are producing the expected benefits in the population. Despite the importance of these questions, however, relatively few evaluation studies have been conducted in an effort to answer them. One of the reasons for the paucity of evaluation studies is the lack of data that relates information on individual-level health outcomes and behaviors to information on community-level characteristics and information on program activities. This limitation can, however, be overcome by incorporating both an appropriate evaluation design that links these three levels of data and a plan for coordination of data collection activities into an overall plan for monitoring and evaluating programs.

This issue of *MEASURE Evaluation Bulletin* presents summaries of impact evaluation studies carried out by the project using data from Tanzania, Paraguay, India, Indonesia, the Philippines, Uganda, and Peru. These studies were possible because household surveys were linked to community and health facilities surveys. The Indonesia and Tanzania studies further benefited from the availability of multiple data at various points in time, providing for an analysis of change.

Previous MEASURE *Evaluation* Bulletins

2001, No. 1 Monitoring the Quality of Care in Family Planning
2001, No. 2 Indicators for Monitoring and Evaluation of AIDS Programs
2001, No. 3 Monitoring Population and Health Program Efforts with Composite Indices
2002, No. 4 A New Tool to Focus and Monitor AIDS Prevention Efforts: The PLACE Method
2003, No. 5 Investing in Population, Health and Nutrition Monitoring and Evaluation: Lessons Learned

Each issue of the MEASURE *Evaluation* Bulletin addresses a specific theme, and the contents are summary papers based on research and technical assistance supported by MEASURE *Evaluation*.

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A Comparative Multi-Level Analysis of Health Program Effects on Individual Use of Reproductive and Sexual Health Services

Amy Tsui, Festus Ukwuani, David Guilkey, and Gustavo Angeles

- √ **This study investigates the influence of health system factors on the likelihood of individual women using family planning and other reproductive health services in Paraguay, Uganda, Tanzania, and northern India.**
- √ **Health-system factors, such as distance to a facility, types of services provided, and individuals' exposure to health messages, significantly influence use of services for contraception, maternity care, and sexual health services.**
- √ **In low-income settings, household and individual socioeconomic status is the primary influence on women's consumption of health services.**
- √ **Individual women located farther away from maternal services are less likely to use them.**
- √ **The findings suggest that resource investments in the main health system components will appreciably raise the level of service utilization. In turn, increased use can result in improved health status.**

Introduction

The aims of this study are to assess the effects of health program inputs on the likelihood of individual use of family planning and other reproductive health (FP/RH) services and to identify which access, quality and educational aspects of programs are effective. The performance of health systems significantly influences the provision and consumption of services and the efficient and effective use of the resources allocated therein. Health resources of manpower, facilities, commodities and knowledge are an important component of the health system that enables the simultaneous provision of family planning, maternal and child and sexual health services (Roemer, 1991). Both public and private health service infrastructures provide the context in which formalized family planning and other reproductive health care occur and can be assessed at the community level through health facility surveys.

Despite the disproportionate share of the disease burden in low-income countries, longitudinal data on health system inputs at the community level and linkages to individual-level behaviors have been largely absent for developing countries. While it is possible to locate cross-national statistics on health status (e.g., WHO, 1996, 1998; World Bank, 2001), comparative national statistics on health system inputs, even for conventional programs, are virtually nil (see Newbrander et al., 1994). The absence of adequate measurement has limited the quality and extent of comparative investigations of health system impact on individual utilization behaviors. The absence of panel observations of health system inputs also restricts the analysis of measurement bias arising from non-random allocation of public health resources (Angeles et al., 1998) .

This article focuses on service delivery at the community level in both the public and private health sectors in Paraguay, Uganda, Tanzania, and northern India. Based on the notion that health results are achieved in part through care seeking or individual utilization of FP/RH services, this paper attempts to empirically assess the association between the supply of health services at the community level and individual women's utilization of them. Of specific interest are the use of modern contraceptive methods; clinical methods of contraception, antenatal services from a trained provider, facility-based delivery care, delivery by a trained attendant, and HIV/AIDS testing. The study focuses on two pathways of influence: health information and education (health messaging) and service utilization. If these effects, net of those from other relevant factors, are negligible, one could conclude that the health system is performing suboptimally and not reaching client populations with the necessary information about health risks and available services nor providing accessible, quality health care.

Data and Method

Data are taken from several national or large-area surveys of health facilities and households in Paraguay, Uganda, Tanzania, and northern India. For Tanzania, two rounds of surveys, 1991 and 1996, are used. A single survey for a single year is used for Paraguay, Uganda, and northern India (see Refereces: Data Sources). The health facilities surveys are community-based samples used to select households and individual women meeting any age and marital status criteria. Facility-level factors include health manpower in terms of the number, type, and family planning, sexual, and reproductive health service capabilities of facility staff. Health facilities are also characterized in terms of the extent of services, distance from the sample community, and the operating authority of the facility. Commodities are measured by the availability of requisite drugs and supplies. Health knowledge refers to levels of staff and to dissemination through community outreach. In addition, a number of individual- and household-level variables are considered in the analyses, including respondent's age, education, parity, household electricity, household cumulative number of assets, place of residence, and exposure to family planning, STD/HIV, and antenatal care media messages.

Data analysis is based on multilevel statistical methods, which are appropriate for evaluating public health interventions where individuals in a given area are assumed to be equally exposed to locally introduced improvements in health care and a randomized experiment is absent (see Angeles and Mroz, 2001).

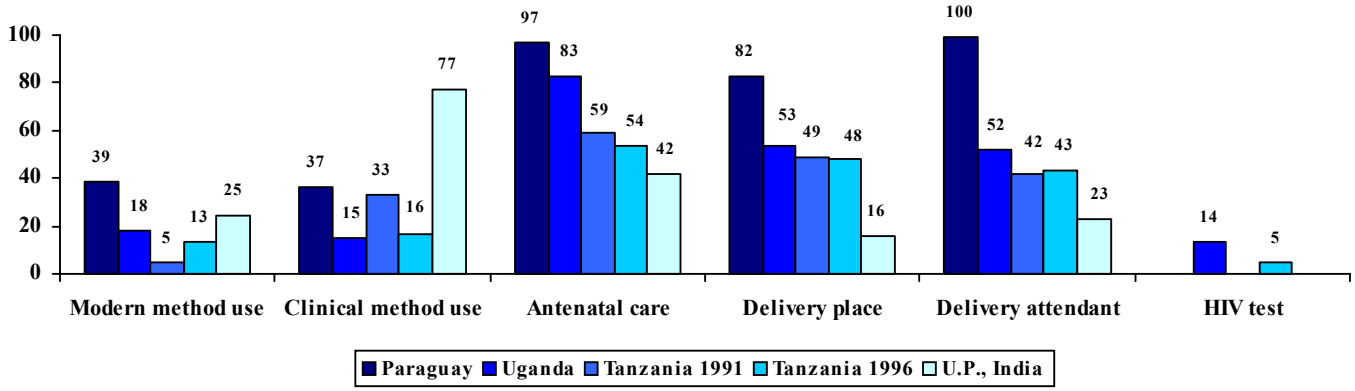
Demand for Health Services

Health improvements are achieved in part through individual utilization of family planning and reproductive health services. As shown in Figure 1, current use of modern contraceptives among women ranges from a low of 5% in Tanzania in 1991 to a high of 39% in Paraguay. The proportion of use that involves a clinical method, due to female sterilization, is as high as 77% in Uttar Pradesh and as low as 15% in Uganda and 16% in Tanzania in 1996. Such variation suggests contraceptive service inputs may play a significant role in the utilization of clinical methods. The proportion of mothers who received antenatal care for their last birth is nearly universal in Paraguay (97%), but only 42% for Uttar Pradesh. Tanzania's levels are 59% in 1991 and 54% in 1996. Health facility-based deliveries occur for just under half of Tanzanian mothers in either 1996 or 1991. Just over half of Ugandan mothers (53%) delivered their last births in facilities, and a skilled health provider attended nearly the same proportion (52%). Facilities are delivery sites for over four-fifths (82%) of Paraguayan mothers, although virtually all have a trained provider at attendance. The lowest level of use of maternity services is seen in Uttar Pradesh, where only 16% of mothers deliver at facilities and 23% have a skilled attendant. Ever having been tested for HIV/AIDS, measured in both Uganda and Tanzania (1996), is used as the sexual health care outcome. In Uganda, 14% of women report ever being tested; and in Tanzania, 5%. The availability of STD and HIV services was not assessed in every survey. Respectively, 78%, 91%, and 28% of facilities in Uganda, Tanzania (1996), and Uttar Pradesh report providing such services.

Supply of Health Services

The levels of health system and of economic development among countries differ considerably. Some general patterns, however, can be identified. For example, over four-fifths of facilities across the four countries offer family planning services (data not shown). Contraceptive services appear to be more accessible than some basic maternal and child health services. The pill and condom are the methods most frequently found in family planning facilities, with 80% or more offering both. The injectable is almost equally as common as the pill in Uganda and Tanzania (1996) and is offered in almost 80% of facilities surveyed in Paraguay. Access to clinical methods, such as the IUD and male or female sterilization, is more limited and variable. A fifth of Ugandan family planning facilities, compared to 88% in Uttar Pradesh, offer the IUD. Female sterilization services are usually available in about one-fifth of family planning facilities in these countries. As for male sterilization, it is available less frequently than female sterilization, except in Uttar Pradesh where both are equally accessible.

Figure 1. Levels of Family Planning, Sexual and Reproductive Health Service Use in Paraguay, Uganda, Tanzania (1991 and 1996) and Uttar Pradesh, India (%)



Antenatal care and immunizations are the next most common type of service, found in 83% to 94% of facilities, followed by delivery and postnatal care. The availability of delivery care appears to have a negative relationship with the probability of mothers using it. About four-fifths (82%) of Paraguayan mothers deliver in facilities, although less than half of facilities surveyed offer delivery care. Maternity care in Paraguay is probably located in the clinics or maternity homes that most women use. In contrast, only 16% of recent births in Uttar Pradesh took place in a health facility, although 83% of health facilities report providing such services. In Uganda and Tanzania (1991 and 1996), about half of mothers deliver in a facility and about three-quarters of facilities offer such care.

There is also great variation in health services among countries. For example, the average number of health staff varies considerably by type (doctors, nurses, and paramedics) and across settings. In Paraguay, the average number of doctors at the 144 health facilities was 7.4, the highest among all surveys, with the lowest being 0.5 for Uganda. In Tanzania (1991 and 1996) and Uttar Pradesh, a health facility has access to an average of 1 to 1.5 doctors. The average number of nurses reaches as many as 12.9 in 1996 Tanzanian health facilities and as few as 1.1 and 1.5 for Uttar Pradesh and Paraguay; and paramedics range from 1.7 in Uganda to 6.2 and 6.7 in Tanzania.

Individual- and System-Level Determinants of Service Use

Using multilevel multivariate modeling, an individual woman's probability of using the family planning/reproductive health services for specific values of the significant health system predictors is estimated. The predicted probabilities illustrate the potential and net impact of the different types of program resources across the countries, from the estimated models. That is, the effects of all other predictors in the models are held constant.

Individual

Among the individual-level predictors of FP/RH service utilization, across all country surveys, education and urban residence have predominant influence, not surprisingly. Age and parity have strong positive effects on the use of modern or clinical methods of contraception but no effect on use of formal maternity care use. Older women are more likely than younger ones to have ever had an HIV test. Household well-being factors, such as asset possession and presence of electricity, are strong predictors of the use of formal antenatal and delivery care, both in terms of type of delivery attendant and place.

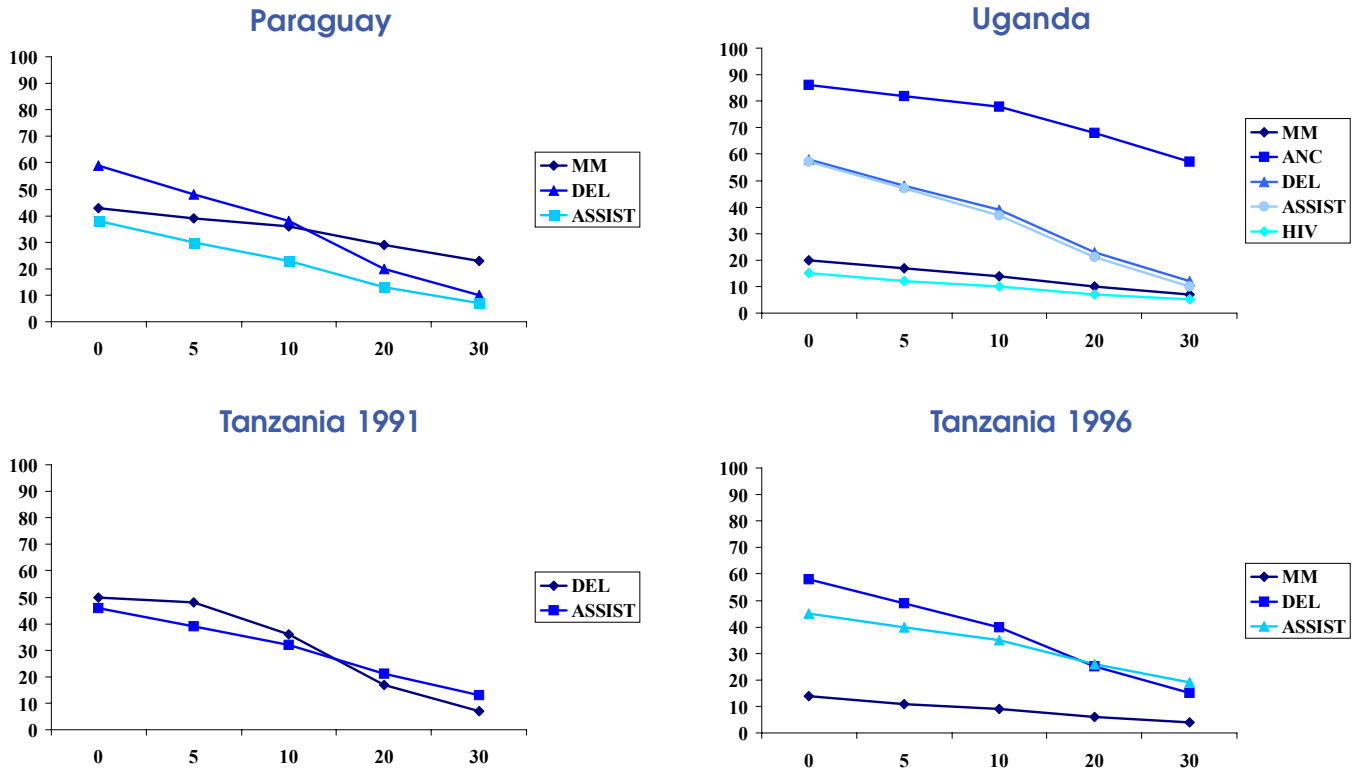
Facilities

Except in Uganda, private health facilities are associated with higher probabilities of use, as compared to public ones. There was a clear pattern of reduced utilization of maternity care, contraceptive, and sexual health services as distance increased. Figure 2 presents the predicted probabilities of a woman using a health professional at delivery in Paraguay, Tanzania (1991 and 1996), and Uganda based on how far a facility is from the community. In these three countries, as distance increases, it is less probable that a woman will have a trained attendant at delivery. This means access to services has an inverse relationship with a woman's likelihood of having safe delivery care.

Commodities

Commodities are measured by the availability of requisite drugs and supplies. The numbers of contraceptive methods

Figure 2. Predicted Proportions of Women/Recent Mothers Using FP/RH Services at Selected Distances from the Nearest Health Facility, from Four Surveys



MM=Modern Method Use; ANC=Antenatal Care; DEL=Delivery Place; Assist=Delivery Assistance

or maternal and child health services available at the facilities proximate to the respondent's community had varied effects on women's use of services. For example, the relationship for all service use was positive in Tanzania (1991 and 1996), as it was for contraceptive method use in Paraguay. But for maternity service use in Paraguay, it was negative, as it was in Uttar Pradesh for contraceptive method use and in Uganda for trained attendant at delivery. In Uganda, Tanzania (1991), and Uttar Pradesh, women's use of modern contraception was inversely related with stock outs of supplies. In Paraguay, having facility-based deliveries was negatively related to drug stockout. In Tanzania (1996), predicted levels of use of a clinical method declined from 21% to 11% as the number of methods out of stock increased. In Uttar Pradesh, where sterilization predominates, the decline was very marginal (from 78% to 75%).

Knowledge

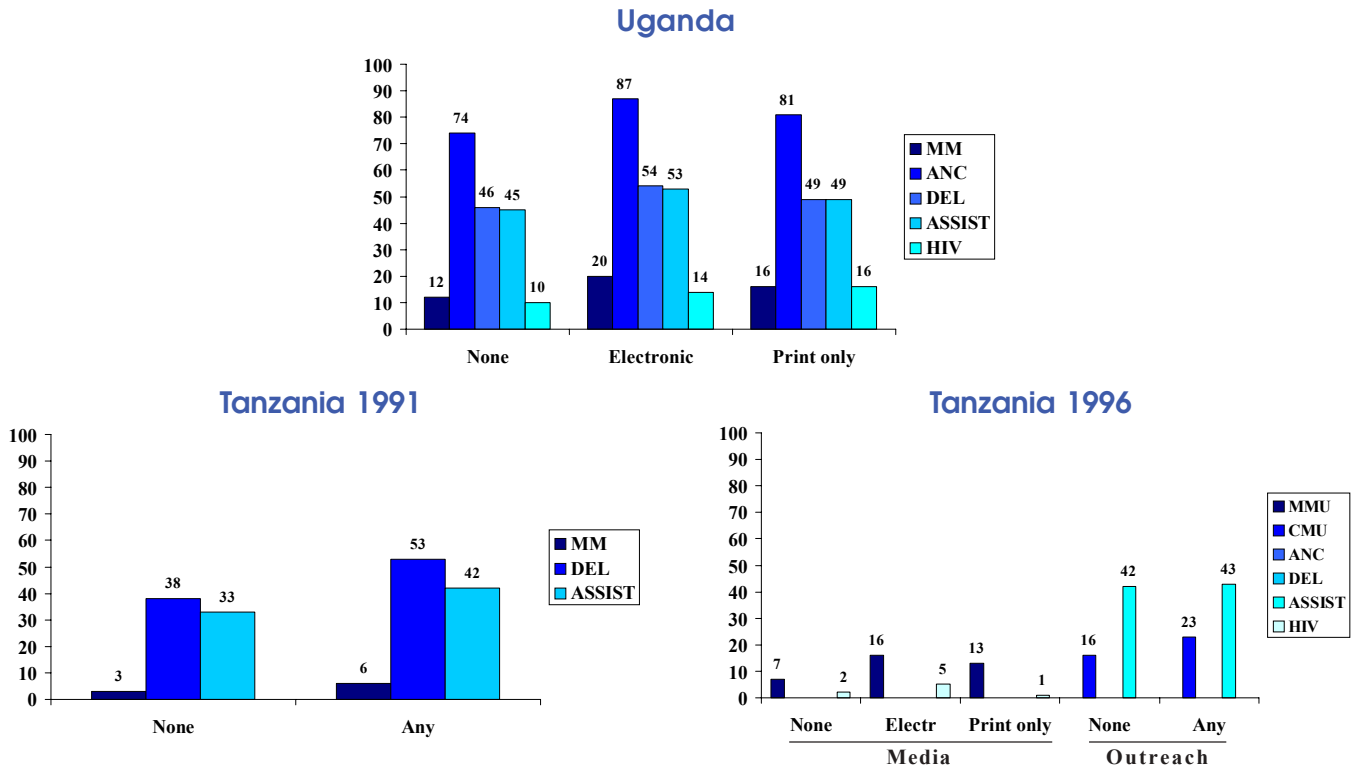
Figure 3 depicts the relationship between facility outreach activities or message exposure and individual use of services. Exposure to health messages via electronic media significantly increases the likelihood of FP/RH service use in most country settings. Health education outreach activities are measured in terms of whether the proximate facilities conduct them. Positive, significant associations with contraceptive, maternity, and sexual health care are observed in Uganda and in Tanzania for both survey rounds.

For example, predicted levels of antenatal care use, observed at 83% overall, can reach 87% if all women reported hearing or seeing antenatal care messages on the radio or TV or be as low as 74% in the absence of such exposure. In Tanzania (1991), the predicted use of facility-based delivery care by recent mothers is 38% if all local facilities conducted no outreach activities, as compared to 53% if all did.

Manpower

The patterns of association of health staff with the various use outcomes were equivocal. In some cases, the measures of the number of trained providers in the community, either for general health or family planning, show a statistically significant (and positive) net association with modern contraceptive use in Paraguay, Tanzania (1996), and Uttar Pradesh. In most cases, however, the odds associated with trained provider measures are insignificant.

Figure 3. Predicted Proportions of Women/Recent Mothers Using FP/RH Services by Type of Media Exposure for Health Message and Any Facility Outreach Activity, from Four Surveys



MM=Modern Method Use; CMU=Clinical Method Use; ANC=Antenatal Care; DEL=Delivery Place; ASSIST=Delivery Assistance; HIV=HIV Test

Conclusion

This study documents individual- and health-system–level determinants of health service use across five surveys. The individual-level factors are social, economic, and demographic in nature, e.g., education, urban residence, household wealth, parity, and age. When restricted to these determinants, the results from modeling use outcomes confirm well-established influences on health-care–seeking behavior. In these low-income settings, where the burden of disease is greatest, the use of formal reproductive health care appears to depend strongly on household or personal resources. The inclusion of health program resources usually shows a statistically significant contribution to health service utilization.

In examining specific pathways by which health resources in the woman's local environment might influence her use of family planning or reproductive health care, only manpower did not consistently show a net influence on the probability of use. The strongest independent associations between health resources and individual use are with distance and in a negative direction. On the other hand, a high density of public sector facilities locally is associated with declining family planning or reproductive health service use. Commodity stock-out situations also had a relatively modest impact on use in both a positive and negative direction. Last, educational outreach or promotion activities to expand health knowledge independently and positively had an influence on health care use.

In sum, this comparative multilevel analysis finds evidence of important influences from health system-level resources on the probability of an individual woman's utilization of key family planning and reproductive health services. Furthermore, findings here suggest generally that resource investments in the main system components will appreciably raise the level of service utilization. This, in turn, should result, all else being equal, in improved health status.

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Data Sources

Paraguay. Designed to assess health care decentralization, the MEASURE *Evaluation* project conducted the health facility survey in 1998 (see Angeles et al., 1999). The Centro Paraguayo de Estudios de Poblacion (CEPEP) conducted the population-based survey, the Encuesta Nacional de Salud Materna Infantil (ENSMI), during the same year.

Uganda. The Delivery of Integrated Services for Health (DISH) project carried out the health facility and population surveys in 1997. Pathfinder International implemented them (see Katende et al., 1999).

Tanzania. The Bureau of Statistics, Planning Commission, of the Government of Tanzania conducted two rounds of national surveys in 1991 and 1996. These population-level surveys were national in scope and carried out in conjunction with the Demographic and Health Survey program (Bureau of Statistics, 1997 a and b).

India. In 1995, the State Innovations in Family Planning Services Agency (SIFPSA) conducted, and the Center for Population and Development Studies (CPDS) in Hyderabad coordinated, the PERFORM Survey of Uttar Pradesh state in northern India, covering 150 million people or 17% of the country's population (see SIFPSA et al., 1996).

Changes in Use of Health Services During Indonesia's Economic Crisis

Elizabeth Frankenberg, Bondan Sikoki, Wayan Suriastini, and Duncan Thomas

Introduction

After several decades of strong economic growth, 1998 was a year of economic reversal in much of Asia. In Indonesia, the economic changes were large and unexpected. While in 1997 economic growth reached almost 5%, by 1998 per capita GDP declined by 15%. Over the course of twelve months prices for food and for other goods and services rose steeply, while wages did not keep pace. In the health sector, service quality was expected to deteriorate sharply in the face of rising costs of imported goods. Moreover, there was the potential for crowding out of the poorest Indonesians as the middle class shifted from private health services to highly subsidized public sector services.

Using data from the Indonesia Family Life Survey (IFLS), we examine changes in health care experienced during the economic crisis of 1998. Two rounds of the survey, conducted right before (in 1997) and during (in 1998) the recession have been used to address several issues:

(1) to examine whether in 1998 individuals maintained the levels of investments in use of health care they were making in 1997

(2) to characterize changes in the health sector

(3) to link levels and changes in use of health care at the individual level to individual and household characteristics and to characteristics of the health service environment

These analyses help determine which population subgroups, in terms of individual and household characteristics, were relatively more affected by the economic crisis, and how individuals responded to changes in the health service environment.

Indonesia Family Life Survey (IFLS)

The IFLS is an on-going longitudinal survey of individuals and households representing 83% of the Indonesian population. This study compares data on the same individuals and households from two waves of IFLS data: IFLS2 in late 1997 and IFLS2+ one year later in 1998. IFLS2+ households were a representative subsample of the original IFLS households. These households are of central interest for this study as they are the only households for which we can contrast patterns of health care use before the crisis with those patterns during the crisis.

The IFLS data are not limited to households and individuals. Information on community characteristics was gathered through interviews with community leaders and by visits to markets, health care providers and schools. A sample of health facilities was created based on responses from the household surveys. The health facility questionnaires address the availability, price, and quality of services.

The three types of health services considered in this study are the public health center (puskesmas), the private practitioner, and the health post (posyandu). The public health center is the backbone of Indonesia's health system and is a basic source of subsidized outpatient care. Private practitioners, also an important source of health care, are generally more available in urban areas. The health posts, monthly activities established to meet the special needs of women of reproductive age and children under five, offer mostly preventive services.

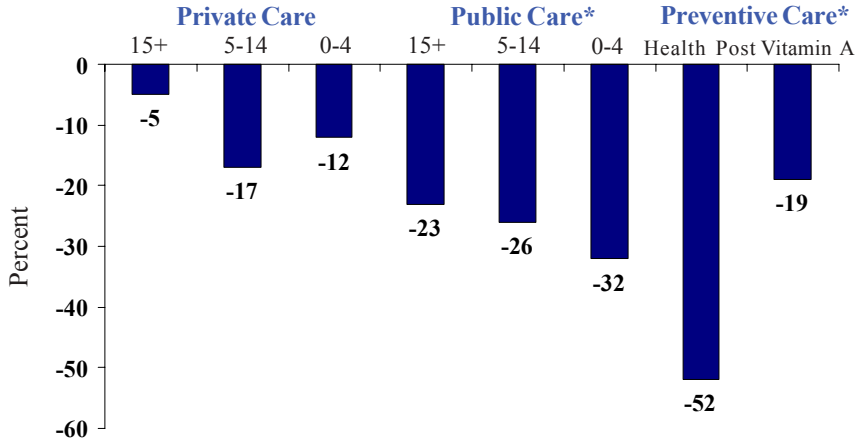
Because it was not only fielded right before and during the economic crisis but also collected information on the same individual in both rounds, the IFLS offers many advantages for this study design. The survey provides very rich community-level information on health services, allowing considerable scope in the construction of variables that measure service price and quality. At the same time, the results are less subject to the criticisms that differences over time result from changes in sample composition.

Overall Findings

Changes in Use of Health Services

Using IFLS data providing information on use of health care for individuals, this study looks at all outpatient visits that took place in the month before the survey for adults and children. Additionally, for children under five, visits to the health post and receipt of Vitamin A were tracked. Figure 1

Figure 1. Declines in Use of Care between 1997 and 1998, by Age Group and Type of Care



* changes statistically significant at 5%, preventive care results for children 0-4 only

shows the percentage changes in use of care between 1997 and 1998: use of care declined across all age groups and service types. While the declines for use of private services were not statistically significant, both use of public care and use of preventive care showed significant declines. Changes in use of public services ranged from a decrease of 23% for adults to a 32% decrease for children 0 to 4 years of age, and visits to health posts fell by 52% among children under five.

Health Facility Characteristics

Tables 1 and 2 illustrate the changes in characteristics of health facilities. At public health centers, there was a decline in availability of both laboratory tests of hemoglobin and Vitamin A. Vitamin A also declined in availability at private providers. At both public and private providers, the price of most services rose dramatically between 1997 and 1998. While drug prices did not increase significantly at public facilities, as they did at private providers, the frequency of stock outages rose for a number of medications. The ability of health posts to offer preventive services declined between 1997 and 1998 as the fraction of health posts offering supplementary feeding, health cards, oral rehydration solution, and Vitamin A all fell. These results provide evidence of changes in the average characteristics of facilities interviewed between 1997 and 1998.

Linked Results

Method

Methodological issues in relating facility characteristics to use of services are a concern. At a given facility, a change in one service or drug is likely to be correlated with similar changes in other services or drugs. As an alternative to including only one arbitrarily chosen characteristic or including a quality measure consisting of correlated characteristics that may dilute the estimates, three index variables were created to summarize (1) service prices, (2) stock outages at public facilities, and (3) medical supply availability at health posts. To account for the fact that individuals typically have access to more than one facility within a community, a community-level average of each of the three index variables was created.

Index Variables

The means for the index variables on service prices, stock outages and supply availability (Table 3) show results similar to those seen in Tables 1 and 2. The index of service prices at both public and private facilities rose significantly between 1997 and 1998. The index of drug stock outages increased significantly at public facilities, and the index of availability of supplies at health posts fell. Thus, at the community- and facility-level, prices of private and public sector care increased, while the quality of services at public facilities and health posts declined.

Cross-Sectional and Transitions Models

Two perspectives for the analyses of use of care are considered in this study. The first is cross-sectional; in a given year, individuals choose whether to use private care, public care, or no care. This choice is modeled for both years with a multinomial logistic regression in which the reference category is use of no care. Visits to health posts and receipt of Vitamin A for children under five are also modeled. The second perspective is that of changes in patterns of service use over time. For these models a multinomial logistic regression is used in which the reference category, no change in use between 1997 and 1998, is compared to four possible alternatives: transitioning into use of public care or private care, and transitioning out of use of public care or private care. For respondents under five, this transition model of care for public and private use is not used. Instead, transitions in visiting a health post and in receiving Vitamin A are examined.

Table 1. Characteristics of Public and Private Health Facilities, 1997 and 1998

	Public Health Centers			Private Practices		
	Level in 1997	Level in 1998	Change	Level In 1997	Level in 1998	Change
Percent that offer/have:						
Curative care including medicine	99	99	0	83	88	5*
Wound stitching	92	92	0	58	60	2
BCG vaccine	77	75	-2	31	27	4
Test of hemoglobin level	61	45	-16*	14	15	1
Vitamin A	88	73	-15*	55	35	20*
Service Costs (mean, Rupiah)						
Curative care including medicine	847	966	120	6448	10056	3608*
Wound stitching	2239	2651	412*	5954	8707	2753*
BCG vaccine	460	615	245*	4727	6152	1425*
Test of hemoglobin level	670	944	274*	3029	4357	1328
Ampicillin (500 mg tablet)	33	38	5	587	923	336*
Tetracycline (250 mg tablet)	19	19	0	379	557	178*
Antalgin (500 mg tablet)	16	21	5	549	731	182*
Acetosol (500 mg tablet)	15	24	9	701	1102	401*
Oral Rehydration Solution (5 200 ml packets)	160	231	71	4179	5703	1524*
Percent with stock outages, past six months						
Ampicillin	23	42	19*	16	21	5
Tetracycline	16	21	5	10	16	6*
Antalgin	10	13	3	8	12	4
Acetosal	7	16	9*	6	13	7
Cough syrup	11	27	16*	8	0	8
Oralit	6	11	5*	8	11	3
Iron tablets	4	5	1	7	9	2
N	260	237		524	479	

* p <=.05

The indexes of service prices and drug outages are included in the models of use of public and private sector care. Measures of supply availability and supplementary food are included in the models of visits to health posts and receipt of Vitamin A. To capture which groups of individuals were most likely to experience changes in use of health care, measures of individual and household characteristics in 1997 were also included in the regression models. Using characteristics measured as of 1997 allows for contrasting change in health care use over time by pre-crisis level of socioeconomic status, enabling the assessment of whether patterns for health care use were most disrupted for those of relatively low socioeconomic status in 1997.

Next, we turn to the question of how the characteristics of individuals, their households, and the facilities in their communities relate to individual use of health services. Respondents were divided into two groups: those aged five years and older and those under five. Use of public and private care is considered for both and, for children under five, visits to health posts and receipt of Vitamin A are also considered.

Individuals Five Years and Older

For respondents five and older, males appear to be somewhat less likely to use public care and considerably less likely to use private care than females. This finding reflects lower use among males 15 and older rather than lower use among male children and adolescents.

Use declines significantly with age for individuals under 15 with the exception of use of private care in 1998. Because overall use of private care fell between 1997 and 1998, this exception can be interpreted as evidence that between 1997 and 1998 relatively younger children were more likely to stop using private care, so that by 1998 the chance of using private care was about the same for any child in the 5-14 age group. Among older individuals (age greater than 15), the relationship between age and use of care is generally positive, although not always significant.

Table 2. Characteristics of Health Posts, 1997 and 1998

	Level in 1997	Level in 1998	Change by 1998
Number of Health Worker Visits in Previous Year	10.0	9.6	-0.4
Percent that have:			
Supplementary feeding	84	72	-12*
Baby Scales	95	96	1
Child Health Card	93	78	-15*
Oral Rehydration Solution	79	87	-12*
Iron Supplementation	59	53	-6
Vitamin A	82	49	-33*

* p<=.05

Household per capita expenditure was used as an indicator of socio-economic status. This variable was broken into intervals as was done with age. Per capita expenditure was classified as either in the lower third (poor and near-poor) or the upper two-thirds (better-off).

In 1997, for the poor and near-poor, there is a strong positive relationship between economic status and use of both public and private care. As spending level of the household increases, so too does use of public and private care among individuals within the household. By 1998, the positive association for use of public care has disappeared. In the transitions model, these results are largely replicated. Among the poor and near-poor, rising levels of expenditures are associated with a greater likelihood of transitioning out of use of public care. This last result likely reflects the fact that in 1997 they were more likely to use public care in the first place.

For the relatively better-off group, as expenditure levels rise the chance of using private care increases in both 1997 and 1998. The relationship between additional expenditures and use of public care, however, is negative in 1997 and has disappeared by 1998. Generally, expenditure levels have a much weaker association with patterns of use for those in this group than for the poor and near-poor.

For individuals older than five years of age, the choice to use public care in 1997 is somewhat more likely as prices in the private sector rise and substantially less likely when the public sector stock outage index is high. Thus, relatively high prices in the private sector encourage use of the public sector, whereas low quality, as measured by drug stock outages, decreases utilization of public sector services. None of the facility characteristics are related to choice of private sector use in 1997.

In the models for use of services in 1998, none of the facility characteristics are significantly related to public care use in 1998. In 1998, however, use of private facilities rises as drug stock outages at public facilities increase. This result appears in the transitions model as well. None of the facility characteristics are associated with transitions out of use of private care in 1998.

Children Under Five

For this group, panel data are available for only 494 individuals, and since levels of public and private care are so low, the sample size is insufficient to precisely estimate the transitions model; therefore, only the cross-sectional results are presented.

Among children under five years old in 1997, boys are considerably more likely to use private care than are girls. This relationship does not emerge for private care in 1998 or for public care in either year. Gender is not related to the use of preventive services (at health posts) in either year.

In neither 1997 nor 1998 is child's age related to use of public care for children under five. In 1997, older children (within this age group) are less likely to use private services, but by 1998 this relationship has weakened, suggesting that between 1997 and 1998 use of private services fell most for the relatively younger children. In terms of preventive care, it appears that use changed most for the older children. In 1998, they were significantly less likely to have visited a health post, and were no longer more likely to receive Vitamin A.

Table 3. Measures of Facility Quality at the Community Level

	1997	1998	Difference
Index of Service Costs at Public Facilities	1242 Rp.	1573 Rp.	330* (102)
Index of Service Costs at Private Practices	5506 Rp.	7813 Rp.	2307* (459)
Index of Drug Stock Outages at Public Facilities	12.2%	20.0%	7.8* (3.0)
Index of Drug Stock Outages at Private Practices	10.1	13.5	3.4 (2.0)
Index of Supply Availability at Health Posts	3.1 items	2.5 items	-0.6* (0.1)
Index of Availability of Supplementary Food at Health Posts	83.7%	72.4%	-11.3* (5.0)
N	80	80	

* p<=.05

The relationship of maternal education to use of public and private care and preventive services is also considered. Historical evidence has shown that maternal education is positively related to children's health status and negatively related to mortality risks. This study finds that although level of maternal education is not strongly related to use of either public or private facilities in 1997, by 1998 a significant positive relationship has emerged here as well as with use of health posts. It appears that during an economic downturn, mothers with relatively more education were better able to protect use of care by their young children than were mothers with less education. The only behavior for which maternal education does not appear to offer a protective benefit is receipt of Vitamin A.

It is sometimes argued that the positive relationship between maternal education and children's health outcomes arises in part because maternal education proxies for socioeconomic status. The measure of expenditure level used in this analysis, however, is a much more direct indicator of socioeconomic status than maternal education. For children in the poor and near-poor households, increasing levels of spending are unrelated to use of public health care in 1997, but positively associated with use of private care. By 1998, this relationship has disappeared. As was true for older Indonesians, for children in the relatively better-off households the association between expenditure level and use of care is much weaker. Among this group in 1998 the use of private care rises with expenditure levels. Expenditure levels are not related to use of preventive services (which are largely free) in either year, or to transitions in use of preventive care. The declines in use of preventive services apparently occurred across the economic spectrum.

Among children under five years old, the use of public and private care was associated with stock outages and prices. In 1997, use of private care is more likely as stock outages at public facilities increase. In 1998, high prices for private care discouraged use of private services. The availability of supplies at health posts and the fraction that offer supplementary food show relationships with use of preventive care. The availability of supplementary food is positively associated with the chance that a child received Vitamin A in 1997, and with use of health posts in 1998. Neither characteristic of the health post is related to receipt of Vitamin A.

Communities in which a high proportion of health posts offers supplementary food appear better able to attract mothers and children to the posts. This result is unlikely to arise solely because of a correlation between supplementary food and other aspects of quality and organization, however, since the availability of supplies does not have the same strong association.

Conclusions

The factors underlying changes in patterns of health care use that occurred in the first year of Indonesia's economic crisis are complex and operate at the community level, as well as at the individual and household level. Between 1997 and 1998, both the price and quality of available health services changed. Prices for basic services rose at both public and private facilities, while quality, as measured by the frequency of drug stock outages, declined at public facilities. Health posts also experienced declining quality as, on average, fewer posts offered supplementary feeding in 1998 and basic supplies were less available as well.

Measures of socioeconomic status show interesting patterns with respect to use of care:

- Among the youngest children, household expenditure level is not related to use of public services, but is associated with use of private services. In 1997, financial resources make a difference for the children in the poor and near-poor households as use of private care increases as expenditure levels rise. In 1998, this positive relationship appears for the children in relatively better-off households.
- For older children and adults, the relationship between use of private care and expenditure level is positive for both 1997 and 1998, but larger for the poor and near-

poor household. Use of public sector services in 1997 is positively associated with spending for the poor and near-poor, but negatively associated for the better off.

It is apparent that demographic variables and individual characteristics influence the way in which health care is utilized. With respect to facility characteristics, we find that high prices for private services encouraged use of public care among older individuals in 1997 and discouraged use of private care for the youngest children in 1998. Drug stock outages at public facilities in 1997 discouraged use of public care for the older group and encouraged use of private care for the younger group. By 1998, these outages were not related to patterns of care use by the young children, but did encourage reliance on the private sector by the older age group. Interestingly, a paper on the effects of the crisis on contraceptive use found that, even with declines in the service environment, there was no significant changes in contraceptive prevalence or method mix. [1]

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Based on MEASURE *Evaluation* Working Paper WP-01-42: Elizabeth Frankenberg, Bondan Sikoki, Wayan Suriastini, and Duncan Thomas. 2001. Contraceptive Use in a Changing Service Environment: Evidence from the First Year of Indonesia's Economic Crisis. Available at www.cpc.unc.edu/measure/.

1. MEASURE Evaluation WP-01-42: Elizabeth Frankenberg, Bondan Sikoki, Wayan Suriastini, and Duncan Thomas. 2001. Contraceptive Use in a Changing Service Environment: Evidence from the First Year of Indonesia's Economic Crisis.

Health Facility Characteristics and the Decision to Seek Care

Eric Jensen and John Stewart

- √ **This study examines whether the decision to seek care depends on the perceived benefits that will be received.**
- √ **A facility quality score and a measure of facility staffing are used as proxy measures of benefits in a model of health care utilization.**
- √ **Higher staffing levels at facilities is a positive determinant of the likelihood that parents will seek care for their ill children.**

Introduction

In the Philippines, as in many developing countries, health care utilization is low. Theory suggests that a parent's decision to utilize care will depend on both the cost of obtaining care and the perceived benefits that will be derived from that care. While much work has been done on the relationship between the cost of care and the decision to seek it, relatively little research has focused on whether the decision to seek care depends on the perceived benefits that will be received. Employing data from the Philippines, this study uses a facility quality score and a measure of facility staffing as proxy measures of benefits in a model of health care utilization. While the facility quality score does not seem to be related to health care utilization, higher staffing levels at proximate health facilities is a positive determinant of the likelihood that parents will seek care for their ill children.

Setting

While Southeast Asia as a whole showed clear signs of social and economic development during the two decades preceding the surveys we employ, the Philippines did not. During the 1980s, per capita income declined due largely to political instability, capital flight, and continuously high levels of population growth. Furthermore, structural transformation of the economy has been slow, as evinced by a constant or declining proportion of the labor force employed in manufacturing since the 1970s.

Data and Methods

In assessing the overall effect quality of care and services have on parental choice to seek care for a child, this study uses two data sources: the 1993 Philippines National Demographic Survey (NDS) and the Demographic and Health Surveys (DHS). The NDS is a nationally representative survey in the Demographic and Health Surveys (DHS) series, which interviewed 15,029 women. Of these women, 8,961 were married at the time of the survey, and those with children were asked about the recent health of their children. Detailed data on the health of the 8,803 children born in the five years preceding the survey were collected. Mothers were asked if they had experienced diarrhea, cough or fever in the two weeks preceding the survey and if so, what treatments the children were given.

The full sample of 8,803 children, however, was not used. Because of interest in resource constraints, including the intra-household effects of competition among siblings, only children with at least one surviving sibling were included. In the estimation subsample used, 35% of children experienced Acute Respiratory Infection (ARI) symptoms (fever or cough) and 7% experienced diarrhea in the two weeks preceding the mother's interview.

The Philippines facilities survey of Stewart et al. (1997) provides information regarding the amount of resources and quality of health care service in the barangay (village-level

Table 1. Selected Determinants of Treatment

		ARI treatment		Diarrhea treatment	
		Actual expenditures and facility scores	Instrumented expenditures and facility scores	Actual expenditures and facility scores	Instrumented expenditures and facility scores
Facility characteristics	Labor expenditure	.002	.004	.006	.010
		(.05)	(.01)	(.04)	(.22)
	Facility quality	.003	.011	-.035	-.015
		(.73)	(.31)	(.63)	(.88)
	Travel time	-.0004	-.0004	-.003	-.003
		(.14)	(.11)	(.01)	(.10)
Family characteristics	Permanent income	.068	.068	.097	.117
		(.01)	(.01)	(.19)	(.29)
	Mother's education	.009	.009	-.002	-.005
		(.05)	(.03)	(.87)	(.73)
	Number of siblings	.001	-.001	.018	.025
		(.71)	(.75)	(.22)	(.34)
Child characteristics	Male child	.0001	.003	.077	.123
		(.95)	(.83)	(.18)	(.21)
	Wanted Birth	.010	.008	-.140	-.197
		(.78)	(.76)	(.18)	(.15)

Notes: The body of the table presents marginal effects, evaluated at sample means, of a unit change in covariates on the probability of a child receiving treatment. The marginal effects are based upon the coefficients from the treatment regressions in a two-equation model of treatment, conditioned on illness. Probability values are presented in parentheses and are appropriate for a two-tailed alternative hypothesis. A reported *p*-value of .01 means that the calculated *p*-value is less than .01. The underlying standard errors are robust and based on a clustering correction reflecting the multilevel nature of the data.

clinic system) containing the DHS cluster and the surrounding municipality. The survey was conducted in the fall of 1996, covering 253 facilities in 40 of the 750 clusters in the 1993 DHS. This study allowed the total expenditure on staff, a rough proxy for the amount of public health care available in a mother's municipality, to be calculated for each municipality surveyed.

Of course, the merged data have some disadvantages. Narrowing the facilities survey after merging these data with the DHS, for example, significantly reduces the sample size to just over 800 children or about 10% of the total DHS coverage. Identical models of treatment for the full DHS sample and our subsample are estimated. They are not conclusive on this point, but the similarity in the estimated marginal effects between samples suggests the subsample is representative.

When estimating the likelihood of receiving treatment, only staffing levels at public facilities were considered. In doing so, we are making the following assumptions: (1) a public alternative to a private provider always exists for any given location; (2) public provision points must be less costly to use; (3) parents must view sites operated by the public sector as the lower quality providers. Given these assumptions, parents who could not afford a private facility would not automatically rule out a public facility unless its quality was sufficiently low. That is, the decision not to treat is based on the perception of low quality at the provider of last resort (which is, by assumption (3), operated by the public sector). Therefore, the relevant measure of quality is the labor or capital public providers employ, for which there are data.

A potential problem in the study was the gap between the two surveys. Nonetheless, there was very little evidence of change between the 1993 NDS and the 1998 DHS. For instance, the NDS reported infant and under-five mortality rates of 33.6 and 54.3, respectively; comparable figures from the DHS were 35.1 and 48.4. Staffing levels were also assumed to remain fairly static, and standard techniques to account for differences between facilities were used.

General Results

There were two main findings. First, per capita expenditure on the staffing of public provision points is an important determinant of whether parents seek care for their ill children. Parents living in municipalities with relatively high per-capita labor expenditures on clinic staff are those, all else constant, who are relatively likely to take children with ARI or diarrhea to be treated at a health facility. The quality of physical facilities, crudely measured using a factor score based on rudiments like running water and working electricity, does not appear to play a role in the decision to treat either disease. Second, though the magnitude of parents' responses to differences in travel times to the nearest health facility differs for ARI and diarrhea treatment, the effect for both diseases is consistent with the hypothesis that increasing travel cost decreases the likelihood that treatment will be sought.

Acute Respiratory Infection (ARI)

Table 1 illustrates three clear determinants of treatment for fever or cough. At the facility level, labor expenditures matter; within the family, income and the mother's educational attainment affect treatment probabilities. Notably, no child characteristics influence the chance of receiving treatment.

Comparing the relative impact of different determinants yields interesting policy observations. For example, the estimated impact of a labor expenditure improvement of one standard deviation on treatment probability is approximately 7%. A standard deviation decrease in travel time, however, would have an insignificant effect. Thus the results of the model provide, in the case of fevers and coughs, an empirically grounded argument for the greater efficacy of increased labor expenditures relative to the competing policy priority of reducing travel time.

Diarrhea

For diarrhea treatment results, there are some similarities and some differences compared to ARI treatment. Both labor expenditures and travel time are statistically significant. A one standard deviation increase in labor expenditures would yield an increase of 11.7% in the mean probability of diarrhea treatment. A one standard deviation decrease in travel time is associated with a 36.9% increase in treatment probabilities. Thus, in contrast to the fever and cough results, the observed effect is greater for facility quantity increases than for quality enhancements.

Nonetheless, an increase in labor expenditures, although difficult, is somewhat more realistic than a comparable improvement in travel time. A standard deviation improvement in travel time would mean reducing travel time from 33.4 to 4.9 minutes. A standard deviation improvement in treatment quality, however, would mean increasing labor expenditure per capita from 12.5 to 23.2 pesos. Although it would be difficult to reach that level of spending, it would be impossible to reduce travel time to the same extent.

Finally, it should be noted that because following the treatment protocol places few demands on family resources, it seems reasonable that a variation in family or child characteristics would not affect treatment. This assumes, of course, that parents do in fact adhere to the protocol.

Conclusion

The results of this study support the contention that staffing levels affect parents' perceptions and therefore affect health care utilization. While travel time plays a part in the decision to seek care, the scale that is probably required for a positive effect is implausible. On the other hand, small improvements in staffing and quality may cause noticeable improvements. In general, not only is access a factor in seeking care, but quality and staffing issues are imperative as well.

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Based on MEASURE *Evaluation* Working Paper WP-02-59: Eric R. Jensen and John F. Stewart. 2002. Health Facility Characteristics and the Decision to Seek Care. Available at www.cpc.unc.edu/measure/.

The Determinants of Fertility in Rural Peru: Program Effects in the Early Years of the National Family Planning Program

Gustavo Angeles, David Guilkey, and Thomas Mroz

- √ **Peru's National Policy on Population was enacted in 1985 after several attempts over a 20-year period. This paper explores the impact of this policy by examining the determinants of fertility in Peru before and after 1985.**
- √ **There was a notable reduction in fertility in the late 1980s and the presence of both pharmacies and dispensaries within five kilometers of rural communities had a statistically significant effect on fertility decline.**
- √ **While substantial program impacts were measured, the effects were still small relative to the impact of female education during the 1980s in Peru.**

Introduction

Prior to the 1960s, the governments of Peru were indifferent to or in favor of increased population size. After a process that took twenty years, Peru enacted its National Policy on Population in July 1985. This paper examines the determinants of fertility in rural Peru before and after this important date. Particular attention is paid to assess the effect of family planning (FP) services on fertility. Because change in FP policy will not have an immediate impact on fertility, one of the goals of this paper will be to measure the different effects of program impact over time, if, in fact, there is an impact at all.

Public FP services were virtually non-existent in rural Peru during the 1970s and the expansion in services really started after the passage of the National Policy on Population in 1985. Using data from the 1991 Peru Demographic and Health Survey (PDHS91), the timing and extent of the fertility decline appear to coincide with the growth of the government provision of FP services, as illustrated by Figures 1 and 2.

Figure 1 shows that for all age groups, except the youngest, fertility appears to be declining, and the rate of the decline seems to have accelerated in the 1980s. Figure 2 depicts the expansion of FP services within 5 km of the rural PDHS communities for different type of providers, showing the marked increase after the passage of the National Policy on Population in 1985. This study uses rigorous multivariate statistical tests to determine whether the FP program efforts have indeed contributed to Peru's decreasing fertility rate.

Peru's Family Planning Program

The 1961 census showed that the population of Peru had increased from 6.6 million in 1940 to almost 10 million by 1961, as the governments encouraged population growth prior to the 1960s. In 1968, a Center of Population and Development Studies was established with the goal of promoting smaller family sizes, but its activities were curtailed when a pronatalist military government seized power in the same year. At that time, privately funded FP clinics were closed, only gradually re-opening in the 1970s and early 1980s. The government attitude toward family planning changed during the 1980s. The National Population Law passed in 1985 was based on the premise that couples were free to determine the number and spacing of their children, and the law directed the State to promote this.

By 1991, FP services were evenly split between public and private sources (INEI et al., 1992). Only 20% of Peru's public FP expenditures were covered by in-country funds, with USAID being the principal donor to the effort. The major components of the program included direct support to the Ministry of Health for FP programs, a contraceptive social marketing program, and support through the Private Voluntary Family Planning Project. The efforts of Peru's government and international donors seem to have paid off in increased use of modern contraceptives. In 1977, modern methods were employed by only 35% of all users. This percentage increased to 41% in 1981 and to 50% by 1990 (USAID/Peru Population Sector Strategy, 1990). The total fertility rate declined from a level of 5.0 in 1980 to 4.3 in 1985 and to 3.6 in 1991 (INEI, 1995).

Empirical Model and Estimation Strategy

Figure 2 shows that there has been a rapid expansion in FP services in rural Peru in the later part of the 1980s. These services are far from being universally available, however. In fact the most prevalent source was only available in about 30% of the rural areas in our 1991 sample. When assessing the effects of FP services on fertility outcomes it is important to consider that services might not have been randomly allocated across communities, as a non-random distribution of services could cause simple methods to yield incorrect measures of program impacts (see Box 1).

Targeted, or nonrandom program placement, has been widely recognized as a source of estimation bias in program evaluation literature (Strauss and Thomas, 1995), but few studies control for it (Rosenzweig and Wolpin, 1986; Gertler and Molyneaux, 1994; Angeles, Guilkey, and Mroz, 1998). Most of these studies use a fixed effect estimator because it is relatively simple to implement. The main estimation strategy in the present study was a random effects maximum likelihood estimation that takes into account the fertility of different populations and the placement of FP service provision. The results of a fixed effect estimator are also presented. This strategy was successfully applied in an analysis of fertility in Tanzania (Angeles, Guilkey, and Mroz, 1998), where it was shown that not controlling for the selective distribution of services significantly underestimated the impact of FP health centers on fertility.

Fertility

The fertility model used in the estimation strategy accounts for the influence of observed personal characteristics at each point in time, such as a woman's age and education, the presence of FP services in her community, and other observed community characteristics. Fertility can be influenced by individual characteristics that are not observed, such as the degree of fecundity, which are also accounted for in the model. Additionally, the model accounts for important unobserved community characteristics, such as large family preferences and the degree of support for family planning by community leaders. The model also incorporates the effects of time.

Box 1. Controlling for Biases in the Estimation of Family Program Effects

In assessing the effects of FP services on fertility outcomes, accounting for the selective allocation of services within the country is important. Simple methods may yield incorrect measures of program impacts. For example, consider the case of a country with two groups of people, one with high fertility and one with low fertility, living in two different areas. The group with high fertility has a preference for large families. The government implements a FP program and targets the group with high fertility. Over time, access to FP services increases and fertility starts to decline in the high-fertility areas. A standard cross-section survey of individuals and communities is conducted to evaluate the impact of the program. Standard methods relate variation in the levels of fertility with the variation in program services. Estimates would underestimate the effect of FP services since they were placed in the areas with higher fertility. If post-program fertility levels in these areas are still above the levels of the low-fertility communities (that did not receive the services), estimates could indicate that the presence of the FP program is associated with higher levels of fertility. A cursory interpretation would be that the program increased fertility, which is, of course, incorrect. This example clearly illustrates the necessity to control for the nonrandom, or selective, placement of services to estimate program impact correctly.

FP Service Placement

The FP service placement equation controls for the potential inherent biases of the FP program variable in the fertility equation using a discrete time hazard model. The model includes equations for the placement of three different types of FP service provision: health centers, dispensaries, and community-based distributors (CBD).[1] Unobserved factors influencing fertility and FP service placement are accounted

Figure 1. Age-Specific Fertility Rates for Rural Peru

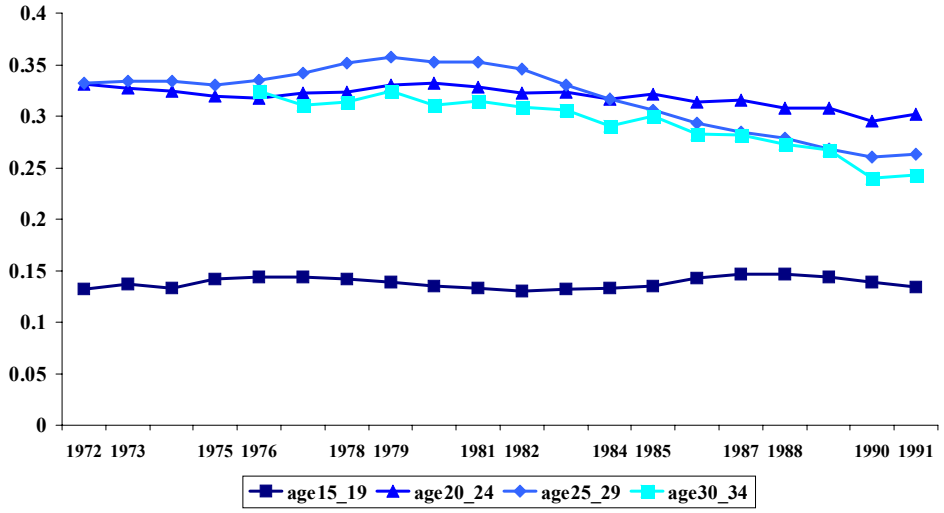
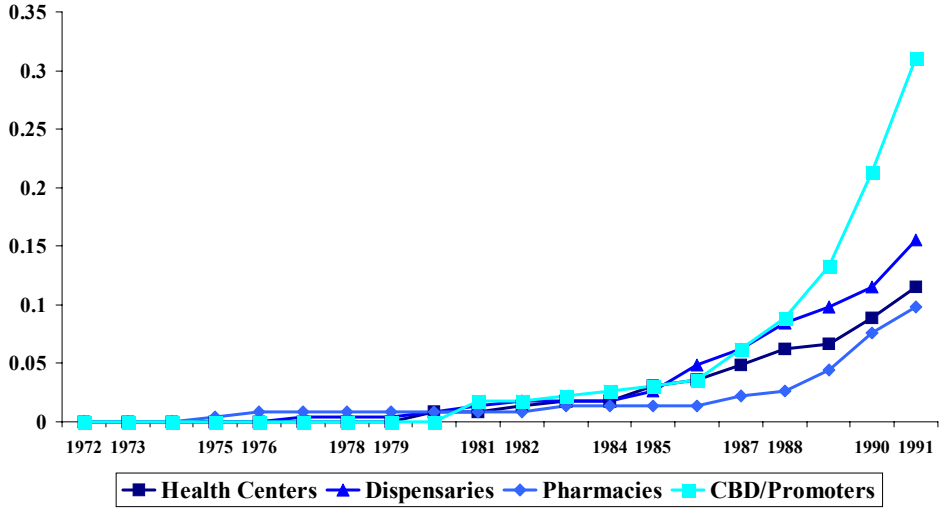


Figure 2. Expansion of Family Planning Services to within 5 Kilometers of Rural Communities

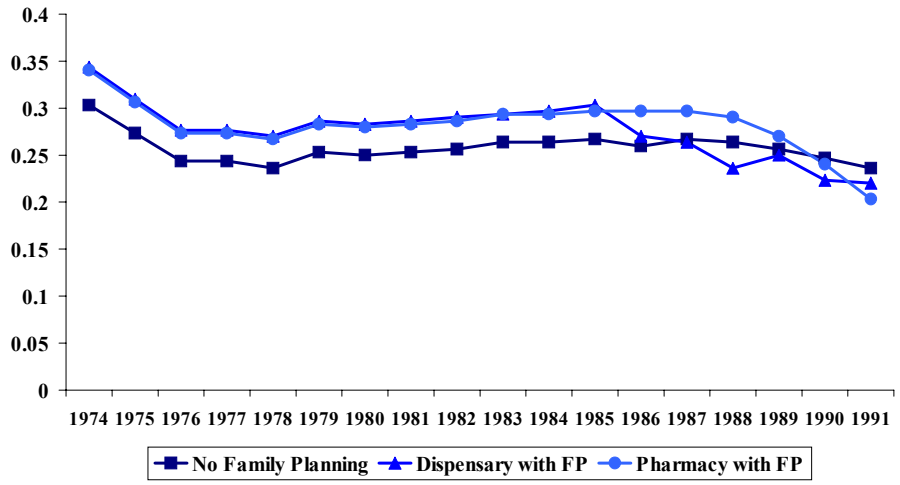


for in this model as well. In particular, the model allows for the possibility of different sets of unobserved factors influencing fertility and service placement, and for any pattern of dependency between them. More details on the method can be found in Angeles, Guilkey, and Mroz (1998).

Data

Population data are used from three sources. First, individual-level data are taken from the PDHS91, a nationally representative survey of 15,882 women aged 15-49. Second, the Peru Situation Analysis 1992 (PSA92) provides information on the availability of FP services in the same areas included in the PDHS91 sample frame and describes the characteristics of the FP service environment in communities. The PSA92 contains a census of service delivery points within 5 km of each community (n=225 communities). Third, the Carolina Population Center, with funding from the EVALUATION Project, conducted a survey of the same facilities included in the PSA92 sample to collect information about the existence of FP services between 1972 and 1991. The data set allows us to estimate the determinants of the annual probability of a birth for every year between 1972 and 1991 and so we completely span this period of marked change.

Figure 3. Simulated Annual Conception Probabilities with and without Dispensaries and Pharmacies
(25-year-old women with 7-9 years of school)



Results

The mid-1980's were a very important period in the development of Peru's modern family planning program. The descriptive evidence presented in Figures 1 and 2 shows a substantial reduction in fertility and a concomitant substantial increase in family planning services in rural Peru during this time. The results of our multivariate analyses provide rigorous statistical tests for the impact of these program variables on fertility and demonstrate that during the 1986 to 1991 period, there appears to be little overall impact of health centers on fertility. Starting in 1986, however, the presence of both pharmacies and dispensaries within 5 km of rural communities are associated with the fertility decline, results consistent with the strengthening of some components of Peru's FP program in reducing fertility in the years after the passage of the National Policy on Population. Contraceptive social marketing activities were an important part of Peru's program during this period and private pharmacies were used as channels to make contraceptives available.

One would not expect an immediate fertility response to a change in government policy and our analyses were designed to measure the change of program impact over time. We created some simulations based on our regression results to aid in the interpretation. The simulations shown in Figure 3 represent the predicted probability that a 25-year-old woman with 7 to 9 years of education who has lived continuously in her current village since age 15 will give birth every year from 1975 to 1991. Three scenarios are graphed in Figure 3: (1) no family planning of any type in a woman's community for all years, (2) continuous availability of dispensaries only and (3) continuous availability of pharmacies only. During the period from 1975 to 1985, the predicted probability of a birth was actually higher when FP services were available, but this portion of the simulation is based on imprecisely measured coefficients. In the latter half of the 1980's and into the 1990's, we begin to see fertility reductions associated with these types of services. By 1991, dispensary or pharmacy availability was estimated to cause a 3-5% reduction in the probability of giving birth in a year.

To put these results into perspective, we also simulated the impact of education by assuming no FP services in the woman's community. The probability that a woman would give birth in a year were 46% for women with no education or 1 to 4 years of education, 41% for women with 5 to 6 years of education, 35% with 7 to 9 years, 24% with 10 years, and 15% with 11 or more years. Thus, while this study showed substantial program impacts, they are still small relative to the impact of female education.

It would be interesting to see how the impact of the program has changed during the 1990's. Unfortunately, later demographic and health surveys in Peru did not provide a link between population-based data and facility data and so the type of analysis performed in this paper is not possible.

Notes

1. Privately owned stores and pharmacies provide non-clinical FP methods in addition to the other general services they offer. They are not considered part of the FP program and are treated as another source of FP services in this study. These two sources were grouped together and called pharmacies.

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Determinants of Contraceptive Method Choice in Rural Tanzania Between 1991 and 1999

Susan Chen and David Guilkey

- √ **In the 1990s, the Tanzanian government implemented several family planning programs in a concerted effort to limit population growth in the country.**
- √ **This study investigated the change in overall contraceptive use and specific method choice in rural Tanzania from 1991 to 1999 using a pooled data set with links between individuals and facilities.**
- √ **From 1980 to 1995, the total fertility rate in Tanzania decreased notably from 6.7 to 5.5. From 1991 to 1996, there was an increase of contraceptive prevalence for modern methods from 6.6% to 15.6%. The trend slowed in the latter part of the decade, rising to 17.9% in 1999.**

Family Planning in Tanzania During the 1990s

In Tanzania, a nation with a 1999 GNP per capita income of $240, which makes it one of the poorest in the world, family planning is one of the few areas in which the health status has improved. Just prior to the 1990s, the total fertility rate was high, at 6.3 children per woman. During the 1990s the government of Tanzania, using funding from a host of donor agencies, implemented a new family planning initiative to upgrade family planning services in existing facilities and carry out an innovative information, education, and communication (IEC) campaign using radio soap operas.

The family planning programs have been modestly successful. The total fertility rate (TFR) declined from 6.7 in 1980 to about 5.8 in 1996, and the use of modern contraceptives increased rapidly from 6.6% in 1991 to 15.6% in 1996. Between 1996 and 1999, however, results were less dramatic. Contraceptive prevalence went up by only 2.3 percentage points to 17.9%. TFR declined slightly from 5.8 in 1996 to 5.6 in 1999.

This study investigates the change in contraceptive use according to specific methods in rural Tanzania during the 1990s as well as the relative impact of specific components of the national family planning program on observed changes.

Components of the Family Planning Program

In 1992, the government of Tanzania developed its first National Population Policy (NPP). With substantial funding from donor agencies, the NPP and subsequent population policies were implemented by the Ministry of Health through its Reproductive and Child Health Unit, which later became the Reproductive and Child Health Section (RCHS). The RCHS oversees a large network of government-run hospitals, health centers, and dispensaries throughout the country.

The Family Planning Program and the Tanzania AIDS Project were the two main programs receiving ongoing support from the U.S. Agency for International Development (USAID) in Tanzania in 1998. The Family Planning Program was designed to train health providers in the provision of family planning, provide logistical support for the provision of family planning supplies, and develop an IEC program to promote contraception use. The government of Tanzania implemented the plan over the 1990s looking to integrate family planning into maternal and child health programs.

With funds from the USAID AIDSCOM project, a condom social marketing program was started in 1988. Initial sales were low, at about 150,000 units over an approximately eighteen-month period. In 1993, Population Services Interna-

Table 1. Source of Supply for Modern Contraceptive Methods for Rural Women (%)

Year	1991/92	1994	1996	1999
Public	74.81	78.72	83.64	76.38
Medical Private	1.13	1.6	2.04	2.36
Private Pharmacy	1.88	2.13	2.42	4.33
Other	22.23	17.55	11.90	16.93

tional took over the condom program, starting an innovative social marketing program. It included package redesign and increasing the number of local distributors. Both the number and the type of retail outlets that sold condoms were increased. These outlets used modern marketing techniques and advertising campaigns. The sale of condoms rose to over $10 million between 1995 and 1997 as a result.

Furthermore, a national mass media campaign was launched. Two radio dramas were broadcast for the first time in 1993 and are still on the air. Introduced in 1993 to promote family planning services through identification with a logo or brand, the Greenstar logo was another component of the IEC effort. Promotional messages, launched using print and electronic media, continue today.

Table 1 shows, among women who used family planning, the source from which contraception was obtained. Throughout the 1990s, the majority of women relied on public sources. About three-quarters of these women sought services in government facilities in 1991, 84% in 1996, and then back to 76% by the end of the decade. Stock-outs at public clinics could have caused the drop since there was a corresponding drop and rise in the use of other sources during the same period.

Finally, the role of the private sector in providing family planning in rural areas increased slightly over the 1990s. The decentralization of the health care system during the 1990s led to the privatization of health services throughout Tanzania. In 1991, 1.1% of women reported private facilities as the source of their current modern method of family planning; this increased to 2.4% in 1999. Pharmacies have also become an important alternative source of modern methods. In 1991, 2% of women in rural areas named pharmacies as a source, and 4.3% of women said the same in 1999.

The Data

The data for these analyses are based on three sources: the Tanzanian Demographic and Health Survey (TDHS), the Tanzania Service Availability Survey (TSAS), and the 1999 Tanzania Reproductive and Child Health Survey (TRCHS) facility supplement. The TDHS conducted four population-based national surveys in 1991, 1994, 1996 and 1999. All four TDHS datasets with facility data from the three TSAS (1991, 1994, 1996) and the 1999 TRCHS surveys for the same time periods were merged to create a final sample of mainland rural women living in clusters matched to the facility data. Thus the final sample of 18,500 women is composed, according to survey year(s) and corresponding subsample, as follows: 1991/2, n=7088; 1994, n=3042; 1996, n=6028; 1999, n=2342.

Methods Employed

In Tanzania over the last ten years, improvements in the family planning sector have taken place on both the supply and demand sides. This study estimates reduced form models that take factors from both into account to test whether they affect contraceptive use (see, for example, Easterlin and Crimmins, 1985; Rosenzweig and Schultz, 1985; Buckner, Tsui, Hermalin, and McKaig 1995; and Schultz, 1986). The simple form of structural models of fertility hypothesizes that exogenous individual background factors, such as age, education, household and family planning program factors, affect a woman's fertility preferences. Along with the direct effects of both these types of variables, fertility preferences themselves influence the propensity of women to use (or not use) contraceptives. In turn, this propensity affects fertility. A multilevel model is used to obtain robust standard errors (see Angeles, Guilkey, and Mroz, 2002).

Reduced form models, however, can only determine the total effect of a certain variable on contraceptive method choice. These models say nothing about causal effects or the pathways through which the variable affects contraceptive preference. For example, an educational campaign may affect fertility preferences, which in turn alters the choice to use contraception. To examine the causal pathways, we would have to estimate a structural model. Reduced form models are easier to estimate than structural models and are without identification problems that tend to make structural estimation controversial and unstable. In addition, the reduced form model provides a straightforward examination of total program effects on contraceptive method use and how these effects change over time.

Table 2. Sample Sizes for the Four Surveys

Year	1991	1994	1996	1999
Total Number of Women	8718	4225	8120	3390
Number of Rural Women	7088	3042	6028	2342

Table 3. Descriptive Statistics (%)

Year	1991	1994	1996	1999	Average
Year Dummy Variable	38	16	33	13	
Women's education 0 years	39	36	32	32	36
Women's education 1 to 6 years	22	22	21	29	22
Women's education 7 years	38	40	42	38	40
Women's education 8 or more years	2	2	4	1	2
Age of Woman (years)	28.1	28.3	28.5	28.0	28.3
Woman listens to the radio	35	44	37	24	36
No religion	17	15	11	13	14
Partner					69
Partner's education 0 years	0	19	17	9	10
Partner's education 1 to 6 years	18	20	15	15	17
Partner's education 7 years	24	30	30	21	27
Partner's education 8 or more years	5	4	6	1	5
Woman heard a family planning message	36	42	43	40	40
Woman heard a radio drama		15	19	7	10
Family Planning Services					
Hospital with family planning within 5 km	5	8	8	9	7
Health Center with family planning within 5 km	9	6	16	22	12
Dispensary with family planning within 5 km	30	35	40	37	35
Pharmacy with family planning within 5 km	18			14	9
Current Contraceptive Choice					
Pill	2	3	4	3	3
Condom	0	2	1	2	1
Other modern (IUD, diaphragm, injection, male & female sterilization)	2	3	4	5	4
Traditional (calendar, withdrawal, mucus, other)	3	6	4	7	5
None	93	86	87	83	87

Descriptive Results

Table 2 includes basic information about the size of each sample. Table 3 shows descriptive information for the surveys. The average age of the sample of women through the four surveys is 28 years. About 69% reported having a marital or cohabiting partner. The proportion of women who reported no religious affiliation dropped slightly from 17% in 1991 to 13% in 1999.

The educational level was fairly low and changed little. In 1991 and 1994, only 2% of women completed eight or more years of school, 4% in 1996, then only 1% in 1999. The same rise and drop in educational attainment was seen among partners: 5% of men completed eight or more years of school in 1991, 6% in 1996, and 1% in 1999.

The proportion of women using modern contraceptives rose from 3% in 1991 to 11% in 1999. Most of this growth has resulted from the increase in use of hormonal methods. Condom use during the 1990s hovered at about 1-2% despite the integration of STD/HIV services into family planning services and the promotion of condoms. The proportion of women listening to radio dramas initially increased from 15% in 1994 to a high of 19% in 1996 but dropped to 7% in 1999.

Access to facilities that offer family planning services has increased somewhat over time. The availability of a dispensary with family planning within 5km increased from 30% in 1991 to 40% in 1996, before dropping off to about 37% in 1999. In 1999, 22% of women lived within 5 km of a health center with family planning services.

There was an initial increase in facilities with contraceptives in stock between 1991 and 1994 during the early years of the FPSS program, a leveling off or decrease between 1994 and 1996, and some further decrease in most cases in 1999. Condoms, however, were an exception. In 1991, 64% of the facilities said that condoms were available. In 1999, 68% of the facilities had condoms in stock.

Results from Logit Multivariate Analyses

Since data on pharmacies were only gathered in 1991 and 1999, a separate model included pharmacy variables. Because pharmacies typically only stock condoms and pills, these two contraceptives were placed in separate categories; injection was grouped in the "other modern method" category. The remaining category was "traditional methods."

Beginning in 1991, the likelihood of using the pill increased every year, the magnitude of the effect growing larger each succeeding year. The pattern for condoms was similar, except the likelihood was larger in 1994 and 1999. The effect of the other modern methods was also increasingly positive through time but statistically significant only in 1999 (results not shown).

Age was a positive, statistically significant predictor of all modern methods except for condoms. Its age predictor was negative and statistically insignificant.

As expected, the respondent's education has a positive and significant effect for all educational levels and modern method types. Generally, the more education a woman has, the more likely she is to use a modern method. Listening to a radio also had a positive and significant impact on modern method use; for condoms the positive effect was only marginally significant. Women who report no religious affiliations are less likely to use any type of modern contraception. Women with an educated partner were more likely to use modern contraception. Preliminary analyses using an index of household assets indicated little difference between people with more or fewer assets.

Results indicate that women who heard a family planning message were more likely to use any sort of modern contraception. Use of other modern methods (not condoms or pills) varied during certain years, however, possibly indicating an emphasis on injection use in the family program during the mid-1990s. The only facility-access variable that demonstrated a significant effect on family planning contraceptive use was the physical presence of a hospital within 5 km of the cluster center. In the early 1990s, the presence of a hospital with family planning within 5 km of the cluster center had a positive effect on the likelihood that women will use pills. Nonetheless, the point estimates across the years appear to indicate that this effect diminishes by 1999. A similar pattern is seen with the impact of access to hospitals on condom use and other modern methods.

Even in rural areas, pharmacies became a more important source of contraception over the course of the 1990s, especially for condoms. The pharmacy surveys conducted in 1991 and 1999 showed that condom availability increased over time at these places. These results for pharmacy access stand in contrast to those for hospitals, health centers, and dispensaries. Also, the findings for condoms are quite interesting since the impact of access to pharmacies on condom use is clearly positive in 1999. The impact of access to pharmacies also increased somewhat for the pill and other modern methods.

Simulations

Simulations are used to examine the magnitude of the effect of factors used in the regression equations. These simulations, while controlling for all of the other variables in the model, show the predicted level of contraceptive use based on the value of one or more factors. Table 4 illustrates the effect of five program factors – access to a hospital, health center, and dispensary within 5 km; and hearing a family planning message or drama on the radio – on the use of any type of modern contraception. The table compares the predicted use of contraception if there was no access to the facility or if the woman did not hear a message or drama with the predicted use if there was access or if the woman did hear a message or drama. The effect of these program factors varied over time. During the first years of the program in 1991, all program factors predicted an increase in the use of modern contraceptives, except in 1999. Only hearing a family planning message and listening to a radio drama still exhibited a more notable increase in the predicted use of methods in 1999. There is a consistent, positive effect on all method types across both years for access to pharmacies within 5 km in 1991 and 1999. The changes between the predicted level of use if the pharmacy was within 5 km or not were similar to what was noted for the facilities and radio variables.

Conclusions

In the early years of the 1990s, the government of Tanzania and several donors made a concerted effort to reduce fertility in Tanzania through a substantial upgrade to the family planning delivery system. The result of this effort was a

Table 4. Simulated Effect of Moving from No Services to Full Service (%)

	1991		1994		1996		1999	
	None	Full	None	Full	None	Full	None	Full
Hospital with FP within 5km								
None	93.4	84.4	86.9	82.7	87.3	82.4	83.2	86.7
Pill	1.6	3.0	2.7	3.2	3.9	5.8	3.5	2.7
Condom	.0	0.17	1.4	3.0	.7	1.5	1.8	.1
Other Modern	1.4	3.6	2.8	5.6	4.2	5.4	4.8	.7
Traditional	3.3	7.3	6.2	5.4	3.9	5.0	6.8	2.3
Health Center with FP within 5km								
None	93.0	91.0	86.7	82.5	87.3	83.9	82.6	86.5
Pill	1.7	1.9	2.8	2.2	3.7	5.9	2.9	5.0
Condom	.4	.9	1.5	2.0	.7	1.0	1.9	1.0
Other Modern	1.5	2.3	2.9	5.3	4.1	5.5	5.2	4.4
Traditional	3.4	3.9	6.0	7.9	4.1	3.6	7.4	3.0
Dispensary with FP within 5km								
None	93.0	92.3	86.6	86.0	86.7	86.8	82.6	84.8
Pill	1.5	2.0	2.5	3.1	4.5	3.4	3.5	3.2
Condom	.4	.6	1.6	1.6	.8	.8	1.9	1.5
Other Modern	1.7	1.4	3.2	3.1	4.2	4.6	5.0	5.0
Traditional	3.4	3.7	6.1	6.1	3.8	4.4	7.1	5.6
Hearing a radio drama								
None	92.8	87.8	87.8	81.4	87.5	84.9	84.3	75.0
Pill	1.7	3.6	2.1	4.3	3.7	4.8	3.1	6.2
Condom	.4	.5	1.3	2.4	.6	1.1	1.7	1.8
Other Modern	1.6	3.2	2.8	4.3	4.4	4.3	4.6	8.5
Traditional	3.5	5.0	5.9	7.6	3.8	4.9	6.3	8.4
Hearing a family planning message								
None	94.7	90.4	88.9	84.4	90.0	82.5	86.0	81.0
Pill	1.0	2.6	1.3	3.7	2.9	5.1	2.9	4.2
Condom	.1	.7	1.5	1.7	.7	.3	1.2	.9
Other Modern	2,6	1,6	2,4	3,8	2,6	9,4	4,2	9,3
Traditional	1.6	4.7	6.0	6.4	3.7	2.6	5.8	4.6

dramatic increase in modern contraceptive use between 1991 and 1994, followed by a leveling off for the remainder of the decade.

Although the availability of modern methods in all types of facilities increased between 1991 and 1994, the availability of some methods leveled off or decreased by the end of the decade. This pattern mirrors the impact of access to facilities on method choice through the decade, providing circumstantial evidence that the leveling off of modern use in the latter half of the decade is related to stock-out problems that became more prevalent during the same period.

The analysis also shows that the effect of having heard a family planning message and having heard a family planning radio drama mirror the descriptive statistics: a strong impact early and a diminished one later in the decade. These results may indicate that these programs may be getting stale and may thus need updating.

Access to pharmacies affected condom use and other methods positively between 1991 and 1999. Although the different wording of questions on condom availability in pharmacies between the two surveys complicates the interpretation of this finding, it appears that pharmacies were more likely to

have condoms in stock in 1999. This increase in condom availability may be the reason for the observed association between increased condom use and access to pharmacies. The results indicate an increased private sector role in delivering family planning methods in rural Tanzania, a potentially crucial finding suggesting that public sector provision must be reinvigorated to play a major role in increasing contraceptive prevalence.

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The Impact of Reproductive Health Project Interventions on Contraceptive Use in Uganda

Charles Katende, Neeru Gupta, and Ruth Bessinger

Introduction

Uganda, located in the Great Lakes region of sub-Saharan Africa, remains a society marked with high fertility and low family planning use. According to the 1995 Demographic and Health Survey, the national fertility rate was 6.9 lifetime children per woman, and only 7.4% of women of reproductive age were using a modern contraceptive method. With the goal of addressing population and health issues, the Government of Uganda has commissioned numerous family planning and reproductive health projects since 1994. Implemented by various organizations, most have adopted the recommendation of the 1994 International Conference on Population and Development to provide integrated reproductive health services. Among these projects was the Delivery of Improved Services for Health (DISH) Project, which focuses on roughly 30% of the country's 21 million inhabitants.

One of the largest reproductive health programs in Uganda, the DISH Project was implemented between 1994 and 2002. Funded by the United States Agency for International Development (USAID), through a bilateral agreement with the Ugandan Ministry of Health, the project operated in 12 of the country's 45 districts. One of the aims of the DISH project was to change reproductive-related behaviors by increasing the availability and improving the quality of integrated reproductive health services. In order to assess its impact, the project included the DISH Evaluation Surveys (DES) as part of its monitoring and evaluation component. This study presents results of the 1999 DES and intends to assess the impact of selected DISH project interventions on contraceptive prevalence in the project target areas.

Data and Methods

The DISH Evaluation Surveys (DES), carried out in 1997 and 1999, collected information on individual-level family planning knowledge, attitude and practices as well as facility-level measures of program inputs. This study uses data from the 1999 DES, which provides quantitative information from both a household and facility module. The household module used a two-stage sampling procedure in which census enumeration clusters were first sampled, and then households were randomly selected within each cluster. In total, 1766 women aged 15-49 were surveyed. All health facilities within each selected cluster, as well as those in two concentric rings of clusters surrounding each cluster, were included in the facility module. The final sample of 292 facilities represented all health facilities geographically accessible to the residents of the clusters included in the household survey.

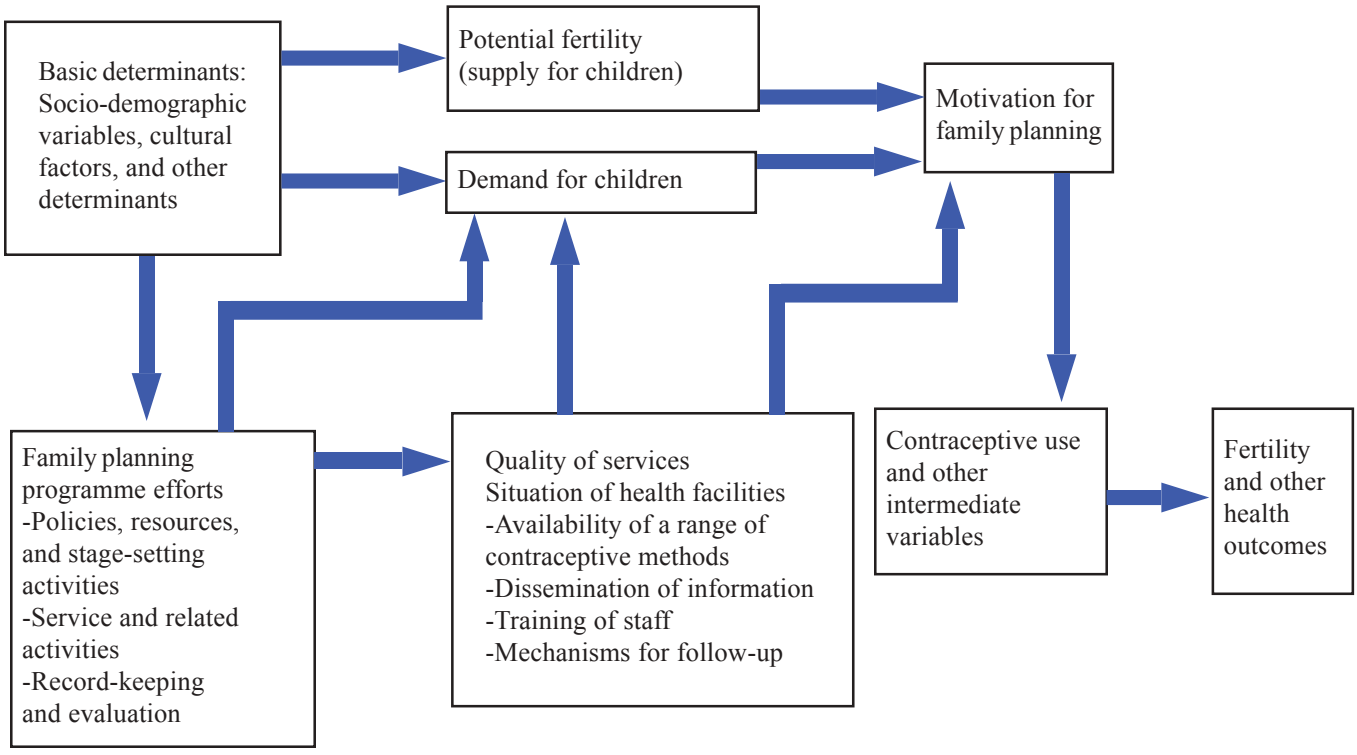
The availability of the DES offered an opportunity to link population-based with facility-based data representing the same geographic area and time frame. By linking independent data on facility-level program inputs with population-level data, we can better elucidate the effects of program efforts on reproductive outcomes. The datasets were pooled and multi-level regression models were used to assess the impact of the quality of the health service environment on contraceptive practices among women in the DISH project area. The analysis considers whether observed differences in women's use of modern contraceptives are likely reflecting real effects of selected DISH interventions or simply differences between certain populations.

Framework for Measuring Impacts of Family Planning Programs

Drawing on established frameworks[1] for evaluating the effort of family planning programs, a model can be created for assessing the impact of DISH efforts on family planning practices in the project districts (Figure 1). This model incorporates elements of the service environment as potential influences on women's use of modern contraceptives. Indicators of the quality of the service environment include access to health facilities offering family planning services, choice of contraceptive methods, dissemination of information, training of staff, and mechanisms for follow-up.

Access to family planning services was measured through the number and types of health facilities offering family planning services geographically accessible to the population. Individuals having access to at least two public, one or more private, or one or more NGO health facilities were considered to be living in areas of better choice of access. The range of contraceptive method choice was assessed according to the availability of short-term and long-term methods to the community. Women with a choice of at least two facilities providing the range of short-term methods (pills, condoms and injectables), and any facility offering a long-term method (IUD, implants, tubal ligation or vasectomy),

Figure 1. Framework for Understanding the Role of Family Planning Programme Effort on Reproductive Health Outcomes



were considered to have a better service environment for contraceptive choice.

Facilities were considered to disseminate information to clients if signpost advertising was visible from any road or if there were family planning charts or posters inside a facility. The impact of staff training was assessed through the total number of staff members who had received training through the DISH project. And finally, record-keeping or mechanism for follow-up was evaluated through the maintenance of family planning registers or client cards at any of the facilities.

Results: Descriptive

Results from the 1997 and 1999 DES show strong increases in use of modern contraceptive methods among women living in the target areas. According to the 1999 DES, 20% of women aged 15-49 were currently using modern contraception. While this marked a sharp jump compared to the 1995 prevalence rates of 13%, most of the increase was observed during the first two-year interval 1995-1997. Injectables were the most used method in 1999, followed by condoms and pills. Adoption of long-term contraceptive methods (IUD, implants, and male or female sterilization) remained low, and usage of other short-term methods (diaphragm, foam, jelly or female condom) was negligible.

At the same time, DES data on the service delivery environment revealed that not all facilities serving the sampled population provided the full range of reproductive health services. While essentially all public health facilities offered family planning services, approximately one-fifth of health facilities operated by non-governmental organizations (NGOs) or private agencies did not. In addition, the availability and quality of family planning services offered at facilities varied.

Table 1 presents the percentage distribution of rural and urban women by the characteristics of health facilities in their resident communities. Almost all women living in rural areas (89%) live in a community that has a public facility offering family planning services, but fewer rural women have access to one or more private facilities (62%) or NGO-operated facilities (21%) that offer family planning services. The facility distribution in urban communities is quite different. Less than one-half of urban women live in communities with a public facility that offers family planning services, while most (85%) have access to one or more private facilities.

Table 1. Percent of Women Living in Urban and Rural Communities by Characteristics of the Family Planning Service Environment, DISH Districts, 1999

Rural (N=1233)		Urban (N=531)	
Public facilities providing FP Services		Public facilities providing FP Services	
none	11	none	55
1	63	1	36
2+	26	2+	9
Private facilities providing FP Services		Private facilities providing FP Services	
none	38	none	15
1	43	1	17
2+	19	2+	68
NGO facilities providing FP Services		NGO facilities providing FP Services	
none	79	none	67
1+	21	1+	33
Facilities offering 3 main supply methods		Facilities offering 3 main supply methods	
none	11	none	2
1	37	1	18
2+	52	2+	80
Facilities offering a long-term method		Facilities offering a long-term method	
none	83	none	49
1+	17	1+	51
Facilities with FP signposts/posters/charts		Facilities with FP signposts/posters/charts	
none	11	none	3
1	51	1	19
2+	39	2+	78
DISH-trained staff providing FP services		DISH-trained staff providing FP services	
none	16	none	11
1-2	51	1-2	48
3+	33	3+	41
Facilities with FP register/client cards		Facilities with FP register/client cards	
none	11	none	3
1-2	49	1-2	24
3+	40	3+	73

Source: 1999 DISH Evaluation Surveys (figures weighted to account for the two-stage cluster sampling design).

Most women live in communities where at least one health facility offers the three dominant supply methods (pill, injectable, condoms). In rural areas, roughly one-half (52%) of women live in communities with two or more facilities that offer these methods, but one-tenth of rural women remain without access to a health facility that offers all three methods. Access to these methods is greater for urban women, where 80% live in communities with two or more facilities that offer the three methods, and only 2% have no health facilities that offer these methods in their community. Fewer women live in communities with a facility that offers a long-term contraceptive method such as implants, IUD, or sterilization. Only one in six rural women have access to a facility that offers long-term methods, while one-half of urban women do so.

Behavior-change communication (BCC) materials, including visible family planning or family health billboards, posters or flip-charts, were found in most communities. The majority of women in urban areas (78%) and 39% of women in rural areas live in communities with two or more health facilities displaying these items. These high coverage rates are primarily due to the presence of posters and flip-charts in health facilities, and less to visible family planning or family health advertising. DISH-trained staff were available to most women with roughly one-half of women in both rural and urban areas living in communities with one or two DISH-trained providers and three or more DISH-trained providers available to 33% of rural women and 41% of urban women. In addition, almost all women live in communities with one or more health facilities maintaining either client registers or cards.

Table 2. Odds Ratios from the Multivariate Logistic Regression Models Measuring Effects on Women's Use of Modern Contraceptives in Urban and Rural Areas, DISH Districts, 1999

Rural Background characteristics		Urban Background characteristics	
Age Group		Age Group	
15-19 (r)	1.00	15-19 (r)	1.00
20-29	1.53	20-29	3.54***
30-39	2.86**	30-39	2.44**
40-49	2.02	40-54	3.21**
Marital Status		Marital Status	
Never married (r)	1.00	Never married (r)	1.00
Currently in union	0.57	Currently in union	1.09
Formerly in union	0.30**	Formerly in union	0.68
Parity		Parity	
No children (r)	1.00	No children (r)	1.00
1-3 children	2.57**	1-3 children	2.18**
4 or more children	3.37**	4 or more children	3.37**
Ethnicity		Ethnicity	
Luganda	0.71	Luganda	1.41**
Runyankole	0.54**	Runyankole	0.98
Other (r)	1.00	Other (r)	1.00
Education		Education	
No education (r)	1.00	No education (r)	1.00
Some primary schooling	4.64***	Some primary schooling	1.37
Some secondary or over	9.91***	Some secondary or over	2.85**
Characteristics of health facilities: service environment		**Characteristics of health facilities: service environment**	
Situation of local facilities		Situation of local facilities	
At least 2 public facilities offering FP services	1.25	At least 2 public facilities offering FP services	0.97
One or more private facilities offering FP serv.	0.84	One or more private facilities offering FP serv.	2.08**
One or more NGO facilities offering FP services	1.18	One or more NGO facilities offering FP services	0.96
Less range of access choice for FP services (r)	1.00	Less range of access choice for FP services (r)	1.00
Contraceptive choice		Contraceptive choice	
2+ facilities offering 3 main supply methods	1.70*	2+ facilities offering 3 main supply methods	1.22
At least 1 facility offering long-term method	0.95	At least 1 facility offering long-term method	0.59**
Less range of choice for range of FP methods (r)	1.00	Less range of choice for FP methods (r)	1.00
Dissemination of information		Dissemination of information	
FP signposts/posters/charts displayed in facility	0.77	FP signposts/posters/charts displayed in facility	0.54*
No dissemination displays at any facility (r)	1.00	No dissemination displays at any facility (r)	1.00
Training of staff		Training of staff	
3+ DISH-trained staff providing FP services	0.78	3+ DISH-trained staff providing FP services	1.68**
Fewer trained staff (r)	1.00	Fewer trained staff (r)	1.00
Mechanisms for follow-up		Mechanisms for follow-up	
FP register/client cards at facility	0.73	FP register/client cards at facility	1.25
No facility maintaining register/client cards (r)	1.00	No facility maintaining register/client cards (r)	1.00

* $p<0.10$
** $p<0.05$
*** $p<0.001$
(r) = reference category
Source: 1999 DISH Evaluation Surveys.

Results: Multi-Level Analysis

Table 2 presents the odds-ratio results of the multi-level regression models measuring the effect of the quality of the health service environment on women's use of modern contraceptives.

After controlling for the effects of socio-demographic variables, the impact of many of the measures of family planning program quality were not significantly associated with differential contraceptive practices. In rural areas, contraceptive method choice emerged as a notable exception. Women living in communities with at least two facilities offering all three of the dominant supply methods (pills, condoms and injectables) were 70% more likely to be currently using a modern method. It is not surprising that the availability of a long-term method was not significantly associated, since few rural women use long-term methods for family planning. In addition, women may be more willing to travel to obtain a long-term method, and access within their community may be less important. Other facility characteristics such as the presence of DISH-trained staff, availability of signs and posters, and maintenance of a client register were not discernibly associated with contraceptive use.

The findings for women living in urban areas were quite different. The presence of private facilities offering family planning services was highly associated with contraceptive use; women living in a community with a private facility were twice as likely to be current users as women not living in the vicinity of a private facility. Contrary to rural areas, the presence of contraceptive choice was not significantly associated with use in urban areas. Further analyses showed that this association was significant in models that did not include a variable for the presence of private facilities in the community (results not shown), indicating that the availability of methods is closely linked to the presence of private facilities.

While not a significant factor in rural areas, there is a 68% increase in the likelihood that a woman would use contraception in urban communities where there are three or more DISH-trained staff providing family planning services. A puzzling finding is that the presence of BCC materials was negatively associated with contraceptive use. One possible explanation is that facilities may be more likely to use BCC materials to promote family planning services in areas where family planning use is low.

Several socio-demographic factors exercise important independent effects on the likelihood of a woman's current use of modern contraceptives. Contraceptive use increased with age and parity among both rural and urban women. The association with parity is not surprising given the high costs of raising children and the motivation for family size limitation.

Better-educated women were significantly more likely to use contraceptives. This effect was particularly striking in rural areas where women with at least some primary schooling were over four times as likely to use contraceptives as their uneducated counterparts, and those with secondary schooling almost 10 times as likely. Explanations for this association include women's appreciation for the health and economic advantages of smaller family sizes, a desire for protection against unplanned pregnancy and infection, or education as an indicator of socio-economic development.

Discussion and Conclusions

Of the characteristics of the health service environment discussed in this paper, the availability of family planning methods is the most important determinant of contraceptive use in rural areas. This finding confirms the importance of a regular supply of a variety of methods and suggests that demand for contraceptives has been created and, consequently, actual use is dependent on availability of supplies. Given this, it is of concern that there were considerable stockouts of contraceptives during the time period in which the survey took place. The 1999 DES reports that almost one in four, one in five, and over one-half of facilities had stockouts for the pill, injectable and condom, respectively. If such stock-outs had led to a decline in contraceptive use, the impact of contraceptive choice on current use would likely have been even greater than revealed by present findings. DISH made considerable efforts to address the issue of stockouts highlighted by the survey findings to ensure regular availability of contraceptives at public facilities.

In urban areas, the presence of one or more private facilities offering family planning was the most important characteristic of the service environment. Urban areas also offer more informal sources of contraceptives such as pharmacies, drug shops and retail shop outlets. While contraceptive use is higher in communities served by private facilities and more informal sources, it is not known whether these facilities are creating demand for family planning or responding to existing demand.

Some evidence suggests that these private and informal sectors are playing a larger role in the provision of family planning services. DES data show that the percent of women receiving family planning from a private source increased from 31% in 1997 to 35% in 1999, while the proportion receiving supplies from a public source declined from 39% to 34% during the same period. Other studies support this trend, suggesting that clients may be switching from the public to

private and informal sectors as a source of family planning services. Given that the focus of this analysis was DISH project interventions aimed at improving services at public facilities, it is not surprising that few program inputs were found to impact on contraceptive use. Future program efforts to increase contraceptive use should consider going beyond the public sector to cover the emerging private and more informal sector.

The link between the presence of DISH-trained staff and contraceptive use in urban areas may be due to the association of DISH-trained staff with higher quality family planning services that result in greater adoption of contraception and lower discontinuation rates. That BCC materials may be more likely to be used in facilities located in areas where fewer women are using contraception in order to increase awareness of, and demand for, family planning services may explain lower contraceptive use rates found in urban communities where facilities had posters/charts. Having a mechanism for client follow-up is found more often in public than in private facilities. Since the predominant contraceptive methods, however, are widely available from sources other than public facilities, it is not surprising that there is no association between the maintenance of client records and contraceptive use.

A companion analysis using data from the household modules of the 1997 and 1999 DES found that men and women exposed to mass media messages about family planning were more likely to use, or to have intentions to use, modern contraception. While project interventions have contributed to creating a demand for family planning services, the subsequent use of services is not as closely tied to facility-based efforts because the methods being most used do not necessarily require a visit to a health facility.

Notes

1. Such frameworks include one by Lapham and Maudlin based on previous models including those from Bongaarts and Easterlin, which considers components to program activities and Jain's model that seeks to refine the definition of "quality" of family planning programs.

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Evaluation of the Rural Service Delivery Partnership (RSDP), Bangladesh

Gustavo Angeles and Paul Hutchinson

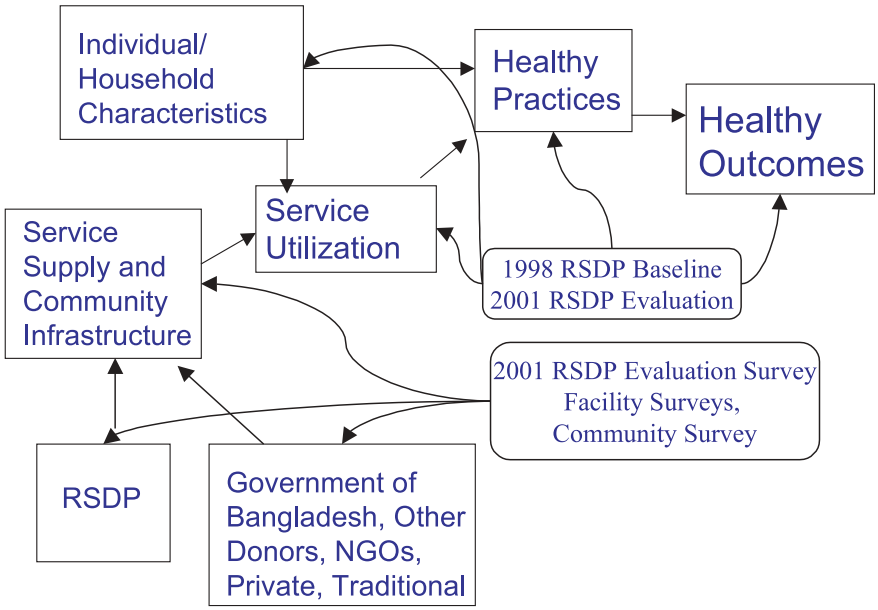
- √ **While there is little evidence that the populations in areas served by the RSDP program are poorer than other rural populations, there is considerable evidence that RSDP services are used in greater proportion by the poor relative to the non-poor.**
- √ **Comparisons with the 1998 Baseline Survey indicate significant increases in the use of certain essential health services such as antenatal care and vitamin A.**
- √ **Little change has been observed since 1998 in the use of curative care at RSDP clinics, and very few such children are treated in RSDP clinics, preferring local pharmacies or traditional doctors instead.**

Overview

Since 2000, MEASURE *Evaluation* has been engaged in an evaluation of the Rural Service Delivery Partnership (RSDP), the rural component of Bangladesh's National Integrated Population and Health Program (NIPHP). The NIPHP is a seven-year, USAID-supported health and population project, that began in 1997. As part of the evaluation, a population-based survey of communities, health facilities and households was conducted by Associates for Community and Population Research (ACPR), a Dhaka-based research firm, with technical assistance from the MEASURE *Evaluation* Project. The 2001 Rural Service Delivery Partnership Evaluation Survey collected information from 9,625 women in RSDP project areas and 3,122 women in non-RSDP areas about the use of Essential Service Package (ESP) components at RSDP clinics and elsewhere. It also collected information on women's knowledge of health promotion behaviors, awareness of RSDP services, and quality of treatment at RSDP clinics. The survey had two main objectives: (1) to collect information on and to monitor changes in the NIPHP Performance Indicators at the project population level since the RSDP Baseline Survey in 1998, and (2) to conduct an evaluation of the impact of the RSDP program on the health and health care seeking behavior of the project's catchment area population by linking data on individual behaviors and health outcomes with data on the health service supply environment.

The evaluation of the RSDP program has focused on several key issues: (1) determining the characteristics of the population – particularly socioeconomic status – living in RSDP areas and served by the program relative to other rural populations, (2) measuring changes since 1998 in health care seeking behaviors and health outcomes, and (3) assessing whether changes since 1998 are attributable to the RSDP program. This report summarizes the overall evaluation design, the main results from the 2001 RSDP Evaluation Survey, some of the unique features of the subsequent analysis, and the results from an impact evaluation of the project.

Figure 1. Linking Inputs to Outcomes for Evaluating NIPHP Impact



Main Findings

- While there is little evidence that the populations in areas served by the RSDP program are poorer than other rural populations, there is considerable evidence that RSDP services are used in greater proportion by the poor relative to the non-poor. Further, there is greater equity in utilization of essential services in RSDP areas than in non-RSDP areas.
- Comparisons with the 1998 Baseline Survey indicate significant increases in the use of certain essential health services such as antenatal care and vitamin A. Impact evaluation results indicate that the RSDP program is responsible for an 8.6 percentage point increase from 1998 to 2001 in the use of antenatal care, an 8.6 percentage point increase in the number of pregnant women with two or more tetanus toxoid injections, and a 3.3 percentage point increase in the use of modern contraception.
- On the other hand, RSDP reaches few children with pneumonia and diarrhea who need treatment. Little change has been observed since 1998 in the use of curative care at RSDP clinics, and very few such children are treated in RSDP clinics, preferring local pharmacies or traditional doctors instead. This may be partially due to the scattered location of RSDP catchment areas relative to RSDP static clinics.
- RSDP's market share for several essential services has increased. This does not necessarily result in more people being served, but does result in more people being served by RSDP. This indicates good customer satisfaction and bodes well for the potential expansion of NGO services, resources permitting.
- Except for antenatal care and ORT use during diarrhea, service utilization is not higher in RSDP areas compared to the non-project areas.

Evaluation Design

The 2001 RSDP Evaluation Survey was intended to provide a midpoint assessment of the impact of the RSDP program. The 2001 survey was a follow-up to the 1998 RSDP Baseline Survey, which collected information on knowledge and use of ESP services for nearly 47,000 women. Additional follow-up surveys are planned for 2003 and 2005 (end-of-project).

The evaluation is designed so as to be able to attribute changes in service utilization, healthy practices, and ultimately healthy outcomes either to the influence of the RSDP program or to the many other factors that might affect these outcomes (Figure 1). More specifically, it is hypothesized that outcomes are influenced by factors at many different levels – the community level, the health facility level, the household level and the individual level. Data collection that focuses on only one of these levels is likely to present a very incomplete picture of the pathways affecting decisions and outcomes. Household level data alone, for example, might be able to trace the influences of education, socioeconomic status, age, household composition or other household characteristics on household health care decisions but will be unlikely to provide information on how the quality of available services, proximity to services, prices and other supply side characteristics affect such decisions. Similarly,

Table 1. Differences Between Poor and Non-Poor in Use of Essential Services, RSDP and Non-RSDP Areas

	RSDP			Non-RSDP		
Indicator	Poor	Non-Poor	Gap	Poor	Non-Poor	Gap
Modern Contraception	38.0	39.4	+1.4	39.0	41.1	+2.1
Antenatal Care	34.6	70.5	+34.9	20.7	65.8	+45.1
DPT3	47.3	67.7	+20.4	47.2	77.2	+30.0
Vitamin A	61.8	72.6	+10.8	72.5	73.7	+1.2

data collection that focuses only on the service supply environment might show that facility quality, size, and accessibility influence service utilization but will be unable to determine which population sub-groups – poor v. non-poor, more educated vs. less educated, boys vs. girls – are more likely to use services.

In order to measure the contribution of the RSDP program to changes in service utilization and health outcomes, it is important also to have information on as many of the health care alternatives to the RSDP program as possible in order that we can assess how changes in the RSDP program compare to changes in other types of providers. In order to do this, information is needed on the other potential influences on the service supply environment – programs of the Government of Bangladesh (GOB), other NGOs, the private sector and traditional practitioners. Such information is useful, for example, in determining whether increased service utilization of RSDP facilities is attributable to expansion of the program or quality improvements or whether it is attributable to withdrawals and diminution of quality or services at GOB providers.

Data Collection

The 2001 RSDP Evaluation Survey therefore involved data collection from communities or clusters, health facilities, health care workers, households and women. By examining changes in health knowledge and behaviors from 1998 to 2001 and linking those changes to the presence and intensity of RSDP efforts, the impact of the project in improving the health status of the population can be more rigorously evaluated.

A women's questionnaire was used to collect relevant information from ever-married women aged 10 to 49 years. The village questionnaire had two principal objectives: (1) to collect information on the communities in which households served by the RSDP program lived and (2) to identify the RSDP and non-RSDP providers of health services in the communities. The facility and health worker questionnaires aimed to collect information on the service supply environment faced by women in RSDP and non-RSDP areas.

A detailed protocol was employed for collecting the community, facility and satellite clinic information, based on reports by community leaders on the availability of services in the Community Survey. Overall, 746 facility interviews were conducted. Of these, 629 were in RSDP areas and 117 were in non-RSDP areas. The largest number of facilities were surveyed in Dhaka division (218). Family Welfare Centres were the most commonly surveyed facilities (181) in RSDP areas, followed by RSDP Static Clinics (130) and Thana Health Centers (126). In addition, 387 interviews with satellite clinic workers were also conducted. Of these, 316 (82%) were RSDP satellite clinics, 70 (18%) were government-owned, and 1 was another NGO satellite clinic. Interviews were also conducted with 363 depotholders.

The 2001 RSDP Evaluation Survey employed a nationally representative two-stage cluster sample stratified by NGOs. Clusters were selected from the 1998 Baseline Survey sample. Overall, information was collected for seven sample domains: the five divisions in which the project operates, the RSDP project as a whole, and a sample of non-project comparison areas. The 1998 Baseline Survey, in contrast, was intended to collect information and obtain estimates of indicators for each of the 19 NGOs. As a result, the sample size for the 2001 RSDP Evaluation Survey – only 12,747 women in total – was considerably smaller than the 47,000 women sampled in the Baseline Survey.

Results

Socioeconomic Status

Women and households in the 2001 RSDP Evaluation Survey were categorized into different socioeconomic levels using an index of household assets. The index was constructed using the method of principal components, which assigns each asset a factor score. The total factor score for a household is the sum of the factor scores for each asset owned by the household. Households were then categorized into quintiles based on their total asset score. This method is used to overcome the absence of other measures of household income and wealth and the problems of aggregating different forms of income, particularly the value of

Table 2. Percent of Children aged 12-23 Months Vaccinated Any Time before the Survey

	RSDP			Non-RSDP		
Indicator	1998	2001	Change	1998	2001	Change
Modern Contraception	36.5%	40.4%	3.9	37.6%	41.6%	4.0
Antenatal Care	39.3%	46.8%	7.5	42.6%	39.1%	-3.5
Tetanus Toxoid	74.7%	80.0%	5.3	79.6%	80.7%	1.1
Child Health						
Vitamin A	62.5%	66.4%	3.9	76.5%	71.4%	-5.1
BCG	89.3%	89.0%	-0.3	89.7%	90.7%	1.0
DPT 3	67.6%	55.2%	-12.4	68.1%	59.5%	-8.6
Polio 3	72.1%	78.6%	6.5	71.7%	85.5%	13.8
Measles	68.9%	62.9%	-6.0	70.7%	71.7%	1.0
All antigens	58.9%	45.8%	-13.1	59.4%	51.8%	-7.6
ORT	62.9%	75.4%	12.5	50.9%	67.5	16.6
ARI Treatment	32.4%	23.7%	-8.7	44.4%	25.3%	-19.1

household agricultural production. The methodology has been applied to the 1996 BDHS by Gwatkin et al. (2000).

MEASURE *Evaluation* applied the same methodology to the BDHS 1999-2000. From these calculations, asset factor scores were calculated separately for urban and rural areas of the country for each factor in the index. These factor scores were then applied to the household assets in both the 2001 Urban Family Health Partnership (UFHP) Evaluation Survey and the 2001 RSDP Evaluation Survey.

Overall, there were no significant differences in socioeconomic status among the population in RSDP areas and other rural areas of Bangladesh, indicating that RSDP areas were not 'worse-off' than the rest of Bangladesh (measured by socio-economic indicator only). Approximately 22% of the rural project population was in the lowest asset quintile as compared with exactly 20% in the BDHS 1999-2000. Approximately 45% of the RSDP population was in the lowest two quintiles, as compared with 40% of the Bangladesh rural population.

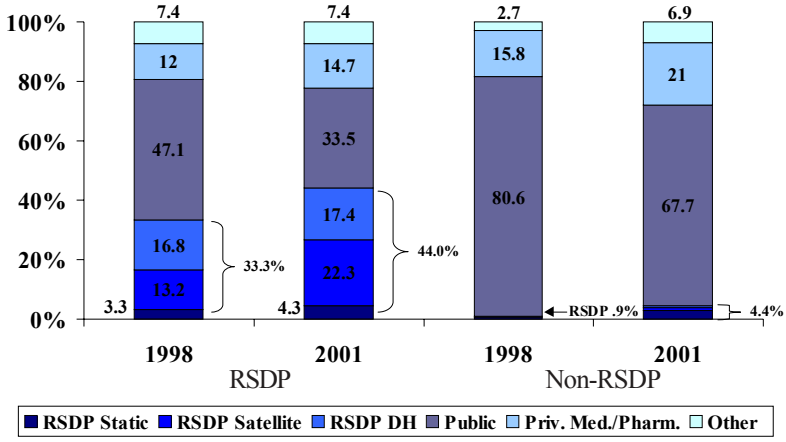
In terms of proximity to poor and non-poor populations, RSDP satellite clinics and depotholders were as accessible to the poor as they were to the non-poor. On average, the poor were approximately 1 km from an RSDP satellite clinic and 0.5 km from a depotholder. The non-poor were 0.8 km and 0.7 km from RSDP satellite clinics and depotholders respectively. On the other hand, the poor were slightly farther (6.4 km on average) from RSDP static clinics than the non-poor (5.2 km on average).

In general, the non-poor were more likely to use health services than the poor (Table 1). In RSDP areas, for example, 70.5% of non-poor women used antenatal care for births in the last year as compared with only 34.6% of poor women. Similarly, nearly two-thirds of RSDP children in the highest asset quintile received their DPT3 vaccination, as compared with less than half of children in the lowest asset quintile. For contraceptive use, on the other hand, utilization rates were more similar for the poor and non-poor. Approximately 38% of married women in the lowest asset quintile used modern contraception as compared with 39.4% of married women in the highest asset quintile.

Even with these differences, equity of service use by rich and poor was generally higher in RSDP project areas than in non-RSDP comparison areas. For example, the gap between the poor and non-poor in utilization rates for antenatal care was 35 percentage points in RSDP areas but was 45%age points in non-RSDP areas. Similarly, the gap between rich and poor in DPT3 vaccination rates was 20.4 percentage points in RSDP areas but 30.0 percentage points in non-RSDP areas.

For many services, RSDP providers were the principal source of services for the poor. For example, approximately 46% of contraceptive users in the lowest asset quintile received their method from RSDP providers, as compared with only 32% of contraceptive users in the highest asset quintile. For antenatal care, the gap was even larger; 75% of antenatal care users in the lowest asset quintile went to RSDP providers, as compared with only 30% of antenatal care users in the highest asset quintile. For DPT3 vaccinations, roughly equal

Figure 2. Source of Modern Contraception, RSDP and non-RSDP areas, 1998 and 2001



proportions of the poor (57.5%) and non-poor (60.2%) used RSDP providers.

Trends

Comparisons with the 1998 Baseline Survey indicated significant increases in the use of essential health services in general and RSDP providers specifically. For several services, RSDP providers appeared to be the main reasons for the increases.

For both ANC and Vitamin A, increases from 1998 to 2001 were observed only in RSDP areas, not comparison areas (Table 2). For women with a live birth in the one-year preceding the survey, 46.8% made at least one antenatal care visit. This was an increase from the 39.3% recorded by the 1998 Baseline Survey. In non-RSDP areas, the proportion of women receiving any antenatal care actually decreased from 42.7% of women giving birth in the year prior to the survey to 39.4% of women. Among children 6 to 59 months, 66.4% received a vitamin A capsule in the past 6 months in the 2001 Survey, as compared with 62.5% of children in the Baseline Survey. In RSDP comparison areas, however, a decline was observed in vitamin A consumption in the previous 6 months, from 76.5% to 71.4% of children 6 to 59 months of age.

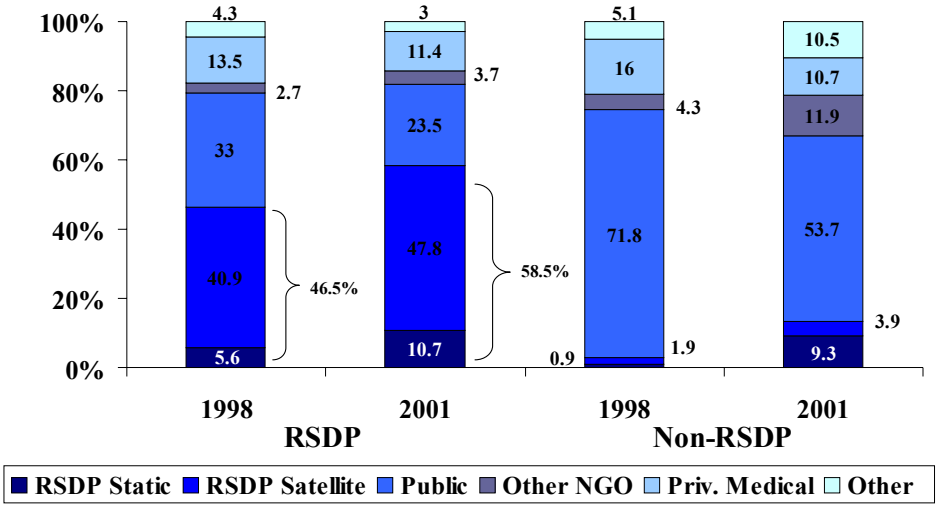
For utilization of child health services, improvements were less noticeable. Almost 90% of children aged 12-23 months received their BCG vaccination, nearly identical to the Baseline Survey rate in 1998. During the same period, polio3 vaccination rates increased slightly from 72.1% to 78.6% of children 12-23 months. However both DPT3 and measles vaccination rates declined. The percent of children 12-23 months receiving DPT3 vaccinations declined from 67.6 to 55.2%. Measles vaccinations declined from 68.9% to 62.9% of children aged 12-23 months. In non-RSDP areas, a decline was also observed in DPT3 coverage, although not in measles coverage.

Of the 6.2% of children with diarrhea in the 2 weeks preceding the survey, most were treated with either Packet ORS or labon gur solutions. The proportion receiving packet ORS increased from the Baseline Survey, as did the proportion receiving homemade water-salt-sugar/labon gur solutions. The overall proportion of children with diarrhea receiving ORT (ORS and/or labon gur solution) increased from 62.9% in 1998 to 75.4% in 2001. A larger increase occurred in non-RSDP areas, from 50.9% to 67.5% of children with diarrhea.

Just over 15% of children had symptoms of an acute respiratory infection in the 2 weeks preceding the survey, twice the observed rate in the Baseline Survey. In RSDP areas, 24% of children with ARI symptoms were taken to a health provider (excluding traditional doctors/pharmacies), considerably lower than the 32.4% who sought care at medical facilities in the Baseline Survey. In non-RSDP areas, the proportion seeking care was similar, 25%. The proportion seeking care from any source was however as high as 75% in both RSDP and non-RSDP areas.

The market share of RSDP providers increased for several services from 1998 to 2001. The share of RSDP services in total contraceptive supply increased by 11 percentage points, from 33.3% to 44.0% of users (Figure 2). The largest increase came from an increase in the share attributable to use of RSDP satellite clinics from 13.2 to 22.3% of current users. Much of this increase came from new users of contraception, but at least some also came from users who switched from government suppliers of modern contraception. In RSDP areas, the government share of modern contraceptive supply fell from 47.1% of users to 33.5% of users, making RSDP sources the leading suppliers of modern contraception in

Figure 3. Source of Antenatal Care, RSDP and Non-RSDP Areas, 1998 and 2001



project areas. The government share fell also in non-RSDP areas, from 80.6 to 67.7% of users, with increasing shares experienced by private medical/pharmacy sources, other sources, and even RSDP sources.

The share of RSDP providers for ANC care increased by 12 percentage points, from 46.5% of women giving birth in the year prior to the survey and seeking ANC care to 58.5% of such women (Figure 3). Most of this represented an increase in ANC usage – only a small proportion resulted from a decline in use of public sources of ANC care.

With respect to delivery of health services for children, the impact of the RSDP program was mixed. RSDP providers constituted an increasing share of immunization services, increasing from just over one-third of all vaccinations in 1998 to nearly 60% of all vaccinations in 2001. The share of RSDP providers in treatment of diarrhea, however, was small in both years – 3.4% in 1998 and 4.5% in 2001. Among those who sought care from any source, less than 0.5% of children with symptoms of ARI were taken to an RSDP provider.

Impact Evaluation

Multilevel analyses were used to evaluate the magnitude of the effects of the RSDP program on the use of essential health services. Two types of impact evaluation estimates were undertaken: (a) difference-in-difference pooled analysis of 1998 Baseline Survey and the 2001 RSDP Evaluation Survey and (b) multilevel regression analysis using data from the 2001 Women's Survey linked with the 2001 Facility Survey.

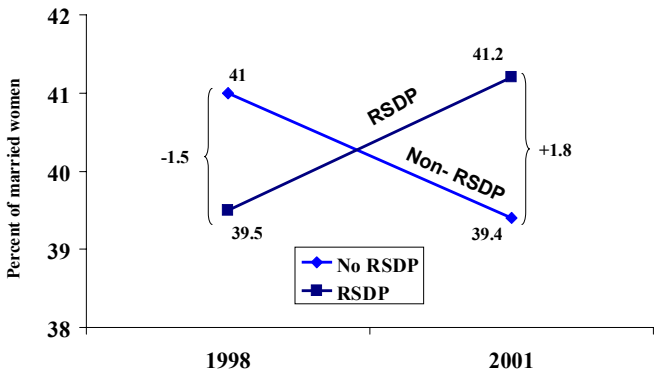
The first type of estimations, performed on three health behavior variables and two awareness variables, tested whether the presence of the RSDP project was associated with changes over time in key health behaviors that would not have been experienced in the absence of the project. Probit estimations were conducted using combined data from the 1998 Baseline Survey and the 2001 RSDP Evaluation Survey in order to isolate the magnitude of the effect of the RSDP program on service utilization from 1998 to 2001. No facility-level variables were included because such data were not collected in 1998. Overall, the RSDP program appeared to be responsible for percentage point increases of 8.6 for antenatal care and tetanus toxoid, 3.3 for contraceptive use, and 20.4 and 35.0 in awareness of RSDP depotholders and satellite clinics (Figure 4).

The second type of multilevel analyses linked women and children to their service supply environment in order to determine the relative importance of individual and supply characteristics on the use of essential services. Only data from the 2001 Survey were used. Two main sets of services were examined: women's reproductive health services including use of modern contraception (and of specific types of RSDP contraception providers) and use of antenatal care (and of specific types of RSDP antenatal care providers) and children's health services and health outcomes including immunizations and illness prevalence. The effects of the project were measured by two main sets of variables – categorical variables for proximity to RSDP static and satellite clinics and a dummy variable for being in a project area or not.

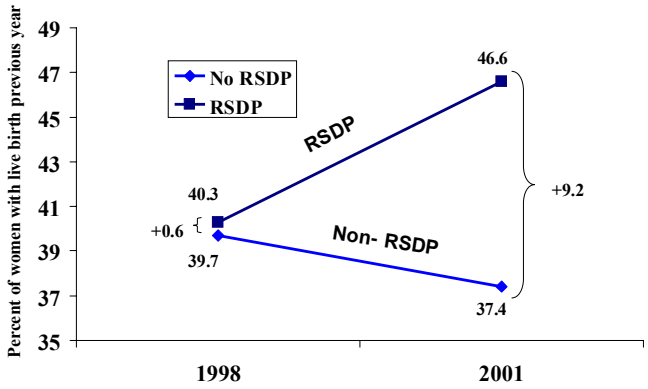
The estimated coefficients from these models were then used to simulate the effects of different policy changes. These simulations provided considerable support for the hypothesis that individuals preferred higher quality, more accessible RSDP facilities that provided value for money. For ex-

Figure 4. Simulated Impacts of RSDP Program, 1998–2001

(a) Modern Contraception
Net Impact= 3.3%



(b) Antenatal Care
Net Impact= 8.6%



ample, the likelihood that a women chose to get her contraceptive method from an RSDP depotholder increased by approximately 4 percentage points, from 15.3% of users to 19.4% of users, if the depotholder had a secondary education relative to having only a primary level education. Greater availability of services at RSDP static clinics had a moderate effect on overall use of antenatal care; if an RSDP static clinic were to offer an additional 3 services – from a mean of 18 services – the use of antenatal care at RSDP static clinics would increase by 2.5 percentage points. Distance too was a significant determinant of overall use of antenatal care and of RSDP providers for antenatal care and modern contraception. Being within 1 kilometer of an RSDP static clinic, for example, was associated with an increased likelihood of use of antenatal care of 9.1 percentage points. Other factors, such as price, generally had little impact on use of RSDP facilities, indicating some scope for additional cost recovery measures. Other factors that affected the use of RSDP services were satellite clinic worker experience and the availability of key services.

Conclusion

The evaluation of the RSDP program contained several elements that were notable. First, considerable effort was placed on determining the socioeconomic status of populations living in RSDP areas. These calculations demonstrated that, although the project does not seem to be located in areas that are substantially poorer than other rural areas, the project clearly caters to the needs of the poor more so than to those of the non-poor. Second, the use of multiple waves of data allowed for pooled difference-in-difference models that approximated quasi-experimental designs and demonstrated clear impacts of the project on the use of such services as antenatal care, tetanus toxoid, and modern contraception. Finally, the complex survey design which collected detailed data from multiple levels – community, health care facility, and household – permitted analysis of the relative contributions of the different factors associated with service utilization and health outcomes, including the impact of high quality, accessible RSDP health services. Additional evaluations of the impact of the RSDP program based on surveys to be conducted in 2003 should be available by late 2003/early 2004.

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