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Reaching The Poor Program Paper No. 8

Nepal: The Distributional Impact of Participatory Approaches on Reproductive Health for Disadvantaged Youth

Anju Malhotra, Sanyukta Mathur, Rohini Pande and Eva Roca

May 2005



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APPROACHES ON REPRODUCTIVE HEALTH FOR
DISADVANTAGED YOUTH**

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Health, Nutrition and Population (HNP) Discussion Paper

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Paper prepared for the Program on Reaching the Poor with Effective Health, Nutrition, and Population Services, organized by the World Bank in cooperation with the William and Melinda Gates Foundation and the Governments of the Netherlands and Sweden.

Abstract: In this paper, we present findings from a community-based study testing the effectiveness of participatory approaches in improving services and outcomes for youth reproductive health in Nepal. The findings are based on micro-level analysis from primary quantitative and qualitative data collected to evaluate an intervention study conducted from 2001-2003. The main purpose of the study is to test whether many of the key principles advocated in the 2004 World Development Report on “making services work for poor people,” can be effectively operationalized through small-scale, community-based programmatic interventions. Our results from various vantage points indicate that as compared to the non-participatory intervention design, the participatory approach was more successful in reducing advantage-based differentials in youth reproductive health outcomes. Our analyses also show that what defines disadvantage varies by outcome. For access to prenatal care services and institutional delivery, the key aspect of disadvantage is urban-rural residence, with household wealth being significant for prenatal care only. For knowledge of HIV transmission, it is gender and educational differences that are key.

Keywords: Nepal, youth reproductive health, Nepal Adolescent Project (NAP), disadvantaged youth, participatory approaches

Disclaimer: The findings, interpretations and conclusions expressed in the paper are entirely those of the authors, and do not represent the views of the World Bank, its Executive Directors, or the countries they represent.

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FOREWORD

This discussion paper is one in a series presenting the initial results of work undertaken through the Reaching the Poor Program, organized by the World Bank in cooperation with the Gates Foundation and the Governments of Sweden and the Netherlands.

The Program is an effort to begin finding ways to overcome social and economic disparities in the use of health, nutrition, and population (HNP) services. These disparities have become increasingly well documented in recent years. Thus far, however, there has been only limited effort to move beyond documentation to the action needed to alleviate the problem.

The Program seeks to start rectifying this, by taking stock of recent efforts to reach the poor with HNP services. The objective is to determine what has and has not worked in order to guide the design of future efforts. The approach taken has been quantitative, drawing upon and adapting techniques developed over the past thirty years to measure which economic groups benefit most from developing country government expenditures.

This discussion paper is one of eighteen case studies commissioned by the Program. The studies were selected by a professional peer review committee from among the approximately 150 applications received in response to an internationally-distributed request for proposals. An earlier version of the paper was presented in a February 2004 global conference organized by the Program; the present version will appear in a volume of Program papers scheduled for publication in 2005, *Reaching the Poor with Effective Health, Nutrition, and Population Services: What Works, What Doesn't, and Why*.

Further information about the Reaching the Poor Program is available through the “Reaching the Poor Program” section of the World Bank’s poverty and health website:

<http://www.worldbank.org/povertyandhealth>

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INTRODUCTION

This paper presents findings from a community-based study testing the effectiveness of participatory approaches in improving services and outcomes for youth reproductive health in Nepal. The study was motivated by the desire to test the impact of participatory approaches in improving youth reproductive health. Nepal was chosen because it is a country where youth reproductive health needs are especially acute and little is being done to meet them.

CONTEXT AND RESEARCH QUESTIONS

The findings are based on micro-level analysis from primary quantitative and qualitative data collected to evaluate an intervention study conducted from 2001 to 2003. In this study, we test whether many of the key principles advocated by development practitioners for making services work for poor people can be effectively operationalized through small, community-based programmatic interventions. In particular, our study seeks to establish whether participatory intervention programs can increase empowerment of poor and disadvantaged populations and accountability to them. By amplifying client voice and widening choice, do such programs serve as critical mechanisms for improving service accessibility and health outcomes for the disadvantaged?

This study targeted youth reproductive health as the outcome of interest for a number of important reasons. For reproductive health policy and programming, a focus on youth is critical, because adolescence is the time most young men and women experience key transitions in terms of initiating sexuality, entering marriage, and starting childbearing. Yet, most young people embark on this life stage with insufficient information about sexual and reproductive health, inadequate support and guidance from adults, and limited access to health care resources. Youth itself serves as a disadvantage in accessing reproductive health information and services. In most countries, young people are denied reproductive health services in critical ways that do not hold true for older age groups, most often due to social and moral assumptions and judgments around youth sexuality and service needs (Mathur, Malhotra, and Mehta al 2001). This tends to be true even in countries where many adolescents are married or in unions and therefore at high risk of unwanted pregnancies or disease (Senderowitz 1999).

Lack of access to reproductive health services among young people is an issue of some urgency. Demographically, the world is facing the largest-ever youth generation—more than a billion young people between the ages of 10 and 19—and most of them (84 percent) live in developing countries (UNFPA 2004). More than at any other time in history, the health, capabilities, and actions of adolescents will define not only their life outcomes but also the future of their societies.

The study was motivated by the desire to test the impact of participatory approaches in improving youth reproductive health. In the field of development programming, community-based and participatory programs have been advocated as more effective than traditional approaches. They involve the beneficiaries in program design, implementation, and evaluation,

thus serving as the means of empowering communities and creating “ownership” over the interventions, and fostering accountability to poor clients (World Bank 2004). Empowerment and accountability can improve service delivery by amplifying clients’ voice and broadening their choices. At a macro level, increasing client power can strengthen accountability in the relationship between poor people and providers, between poor people and policymakers, and between policymakers and providers (ibid.).

This process should also work at a micro, community level. For example, well-informed, mobilized, and organized community members can exert power by contributing financial resources and coproducing health services. With regard to youth reproductive health, self-care is a particularly important type of service coproduction because information and social support are important means for promoting practices such as safe sex, contraceptive use, and prenatal care. Participatory processes increase awareness and information sharing. Better information, in turn, can lead to change in self-care behaviors to expanded consumer power to use complaint and redress mechanisms. For youth reproductive health in particular, information sharing is critical for raising community awareness of key demand-side barriers including attitudinal, normative, and institutional constraints such as early marriage, son-preference, and sexual double standards (Norman 2001; Mensch, Bruce, and Greene 1998).

Participatory programs may strengthen client power in their dealings with clinical service providers. Availability of, access to, and quality of services may improve because, clients who actively participate in decision-making are likely to be motivated than clients who do not, and better able to monitor services and exert leverage on providers for better services. With regard to client power vis-à-vis policymakers, community-based participatory programs may empower disadvantaged citizens by increasing their ability to build coalitions, influence the political process and the allocation of resources, and establish monitoring and accountability mechanisms, due to better and more readily available information and access to decision-making bodies gained through a participatory approach (Cornwall and Gaventa 2001). In addition to the coproduction issues raised above, adolescents approached in a consultative, inclusive manner are more likely to increase their knowledge base, critical thinking, and decision-making abilities on intimate issues related to sexual and reproductive health (McCauley and Salter 1995; Senderowitz 1998).

For all these reasons, micro-level, community-based participatory programs have enormous potential for influencing the relationship between disadvantaged youth and service providers, as well as the relationship between disadvantaged youth and policymakers. However, to date, no comprehensive evaluations have been conducted on the effectiveness of a participatory process at the community level in implementing programs for adolescent reproductive health in developing countries, and, in particular, in reaching poor and otherwise disadvantaged youth. Our study offers one such evaluation of a program in Nepal.

We chose Nepal for our study because youth reproductive health needs there are especially acute. Despite a large youth population and chronically poor outcomes on a number of reproductive health indicators among young people, this issue has received limited programmatic and policy attention.

Early marriage, a strong predictor of reproductive risk, is nearly universal in Nepal: girls marry at an average age of 16, and 52 percent begin childbearing by the age of 20. Among women giving birth, 55 percent under age 20 reported receiving any antenatal care, 14 percent of the births were attended by trained personnel, and only 9 percent of deliveries were in a health facility. Less than 7 percent of married women in the 15-19 age group reported using any method of contraception, and only 4 percent reported a modern method. Rural women in Nepal, who are typically poorer than their urban counterparts, are further disadvantaged: they marry and initiate childbearing two to three years earlier on average, and are eight times less likely to use antenatal services and a health facility for delivery (Ministry of Health, Nepal, 2002).

STUDY DESIGN

In the Nepal Adolescent Project (NAP), we used a quasi-experimental case-control study design to implement and test the effectiveness of a community-based, client-centered participatory approach to improve the sexual and reproductive health of adolescents in rural and urban Nepal. This five-year project was conducted from 1998 to 2003 as a collaboration by an international service delivery organization (EngenderHealth), an international research organization (International Center for Research on Women), and New ERA Ltd. and BP Memorial Health Foundation, both local Nepali nongovernmental organizations (NGOs). There were two study sites (one urban and one rural) and two control sites (one urban and one rural). Participatory methodologies and techniques were utilized during the research, needs assessment, intervention design, implementation, and monitoring and evaluation phases in the two study sites. More traditional reproductive health research, design, and intervention elements were implemented in the two control sites. The overall intervention period ranged from 12 to 24 months; the first set of interventions began in November 2000, and the last set ended in March 2003.

The rural and urban areas were chosen to enable us to make a clear differentiation in infrastructure, service options, levels of economic development, and standard of living.¹ In other words, the rural-urban difference in site selection itself was intended to capture structural disadvantages as well as wealth differentials. Due to the requirements of intervention design, we also needed to select communities that were readily accessible by road, and already had institutions such as a secondary school and a health post. Thus, the communities included in this study are more developed than the typical Nepali rural or urban setting. The communities selected were randomly assigned to study or control.

¹ The two rural sites are located in the “Terai,” in Nawalparasi and Kawsoti districts near the Nepali-Indian border. With about 200 households each, the two communities, about 80 kilometers apart, were selected because they have a secondary school, a range of health service providers, access to a main road, access to electricity, and at least one working NGO. As such, they represent the more developed Nepali village. Communities in the urban area were defined as extended neighborhoods in a specific geographic area with shared facilities for schooling, commercial, and social services and a governance structure as one ward within the larger municipality. The two urban communities, consisting of about 300 households each, were drawn from middle-class suburbs on the outskirts of Kathmandu. About 20 kilometers apart from each other, the two suburbs selected met the basic criteria described above and also had a more developed infrastructure and wider range of options for transportation, schooling, employment, health services, and leisure activities.

The study and control sites were differentiated by implementation methods and by the elements included. Compared to the control sites, the overall design and implementation efforts in the study sites were more comprehensive, inclusive, and interactive, with a great deal of attention to building community ownership and involvement at every step. This was achieved by setting up mechanisms and structures such as advisory and coordination teams and consultative committees that engaged youth and adult community members, especially those who were disadvantaged. At the intervention design stage, an action planning process was conducted, where the needs assessment results were shared and analyzed with the community, and community task forces were created to set priorities and design feasible interventions. Program implementation structures were also more inclusive in the study sites, with community-level committees that allowed both adults and youth to increase their authority and decisionmaking power in the project. With its mandate for a participatory approach, the project staff used strategies to ensure the active involvement of disempowered groups—the poor, women, ethnic minorities—in these structures and processes (for example, by setting up rotating representation). There were no such participatory processes or structures in the control site.

Intervention components were very different between study and control sites. Study site interventions attempted to address structural, normative, and systemic barriers to youth reproductive health, while the control site addressed only the most immediate risk factors such as sexually transmitted diseases (STDs) or unwanted pregnancies. Thus, interventions in the study site link youth reproductive health programs with other programs deemed to influence the environment youth lived in such as adult education programs, activities to address social norms, and economic livelihoods interventions. Eight such linked interventions, developed and prioritized by the community members, were implemented in the study sites. In comparison, the project staff designed and implemented three standard reproductive health interventions in the control sites that focused on basic risk factors. Socioeconomic disadvantages—based on gender, rural-urban residence, wealth, ethnicity, schooling status, and marital status—were a specific focus of the intervention design and approach in the study sites, but not in the control sites. This difference in focus is especially relevant to this analysis.

In the context of this intervention research design, we examine whether the participatory or the nonparticipatory intervention approach is more successful in reducing the gaps in youth reproductive health service access and outcomes between the disadvantaged and the advantaged.

DATA AND METHODOLOGY

SAMPLE

In our analysis, we use cross-sectional quantitative household and adolescent survey data collected at baseline and endline for NAP as well as relevant qualitative and participatory data.²

² Appendix A catalogues the full range of data sources, samples, and methodologies used in the program.

For the quantitative surveys, a 100 percent census of households was taken in the rural areas at the baseline and endline. Because the population base in the urban area is larger, a 50 percent random sampling was considered sufficient. This resulted in a sample size of 965 households at baseline and 1,003 households at endline.

The age group sampled for the adolescent survey at baseline was 14 to 21 years old. Since most of the service-related interventions were targeted at this age group, for the endline, we tracked this cohort which was then 18 to 25 years old. The study design did not allow us to track specific individuals but rather the cohort within each community. Moreover, since the intervention design was at community level, interventions to increase knowledge and information covered a broader population. Therefore, to ensure capture of the impact of such interventions on the younger cohort of adolescents, we also included the 14 to 17 year olds in the endline sample.³ The sample sizes for the adolescent survey are shown in Table 1. Although the full sample covering married and unmarried males and females (ages 14 to 21 at baseline and ages 14 to 25 at endline) is fairly large, the subsamples for each site are relatively small. These small subsample sizes present limitations for multivariate analysis, especially where the analysis requires a focus on further subcategories (e.g., married females who have had a pregnancy).

Table 1: Adolescent survey samples and subsamples

<i>Sample and subsample base</i>	<i>Adolescent survey sample sizes (married and unmarried, male and female)</i>	
	<i>Baseline (ages 14 to 21)</i>	<i>Endline (ages 14 to 25)</i>
Total	721^a	979
Urban Study	184	260
Urban Control	164	260
Rural Study	175	205
Rural Control	198	254

a. At the baseline, 724 adolescents were interviewed. However, for this analysis, 3 respondents had to be excluded due to missing household data.

Sources: Nepal Adolescent Project. 1999 Baseline Adolescent and Household Surveys and 2003 Endline Adolescent and Household Surveys.

DEPENDENT VARIABLES

The survey data provide a number of interesting outcome variables, including knowledge, behavior, attitudes, and service use for several factors relevant to youth reproductive health. Here, we focus on three dependent variables frequently identified in the literature as critically important for reproductive health, especially for young people. These are: prenatal care, institutional delivery, and knowledge of HIV and AIDS. The variables for prenatal care and institutional delivery refer to the first pregnancy of married young women,⁴ because no

³ Due to the community-based nature of this project, the baseline and endline are two independent samples, rather than a longitudinal sample of the same cohort. In reality, for the lagged cohort samples (ages 14 to 21 and 18 to 25 years), there is substantial overlap in the individuals in the sample from baseline to endline.

⁴ Because the respondents are young women with a recent first pregnancy, recall bias is expected to be negligible.

pregnancies were reported among unmarried young women. The prenatal care variable is a dichotomous measure of whether or not the pregnant woman visited a trained provider (doctor, nurse, or trained clinician) for prenatal care at least once. The institutional delivery variable is a dichotomous measure of whether or not the delivery (or miscarriage or abortion) for the first pregnancy was at a medical facility (hospital, clinic, or nursing home). Since general awareness of HIV and AIDS at baseline was already very high (over 90 percent), we use a more sophisticated dichotomous measure—whether or not the respondent could correctly list at least two modes of HIV transmission. Response options considered correct were: unsafe sexual contact, sharing needles, mother-to-child transmission, and blood transfusion.

INDEPENDENT VARIABLES

Defining disadvantage

The “disadvantaged” refers here to adolescent girls and boys, and their families, who are worse-off than others in the same population on several dimensions.⁵ We examine disadvantage by the respondent’s household economic status, and the respondent’s own education, rural-urban residence, and gender. The inclusion of these criteria is based on qualitative data that show they are at least as important as wealth in defining disadvantage in our project areas. Gender and rural-urban residence are defined as dichotomous variables. Education is defined by years of schooling completed. Economic status is defined and measured in terms of household wealth, as elaborated below.

Measuring household wealth

The NAP did not collect data on household income or consumption. Consequently, we measure household wealth in terms of household assets (for details, see appendix B). Other studies have shown that household assets are a reasonable proxy for household income or consumption (Montgomery et al. 2000; Filmer and Pritchett 2001). We obtained the asset information from the NAP household questionnaire, which includes questions about each household’s ownership of consumer items ranging from a radio to a television and car; land ownership; home ownership; drinking water source; toilet facilities; and other characteristics related to household wealth status. From these data, following the approach used by Gwatkin et al. (2000), we created an “asset index” that provides a single measure of household wealth. Each individual is then assigned the value or score of the asset index for his or her household.

⁵ There is considerable debate on defining “inequality” in health (Gwatkin 2000; Gakidou, Murray and Frenk 2000; Alleyne, Casas and Catillo-Salgado 2000). While pure inequality—that is, health inequality between any two individuals—is important in its own right, in this chapter we focus on inequalities in access to health information or services systematically associated with economic status, gender, rural-urban residence, or educational attainment at the time of the study. Other research has examined the extent of unjustness or inequity related to various inequalities (Le Grand 1987), and the potential ethical dilemmas posed by focusing on reducing inequalities in health relative to improving health for all (Wagstaff 2001). We acknowledge the importance of these debates; but they are outside the scope of this study.

DATA ANALYSIS

We compare the relationship between various measures of disadvantage and the three dependent variables at baseline and endline for the study and control sites using multivariate analysis. If our intervention design had targeted specific individuals, the analysis would have been done on a pooled sample of individuals at baseline and endline, with dichotomous variables for study-control and baseline-endline. However, because the interventions were at the community level, the NAP data provide us with essentially two cross-sectional samples at baseline and endline. Thus, we present analyses separately by the samples for study-baseline, study-endline, control-baseline, and control-endline, and use significance tests to test the differences in coefficients between baseline and endline, in study versus control sites.⁶

The three dependent variables also apply to different subsamples of adolescents. The two pregnancy-related variables (prenatal care and institutional delivery) are applicable to only young married women. Because the interventions targeted the 14 to 21 year-old age group for these service delivery-related outcomes, we track this cohort and compare these outcomes for 18 to 25 year olds at endline. On the other hand, the dependent variable on knowledge regarding modes of HIV transmission applies to the full sample of adolescents, males and females, married and unmarried. Here, we compare the 14 to 21 year olds at baseline and endline. The 14 to 17 year olds at endline are included in the comparison because information-related interventions were aimed at the entire community, including younger adolescents. However, the 22 to 25 year olds are excluded only because knowledge levels among youth in the older age groups are so high that there is no variation to explain. The lack of variation is also an issue for the entire urban sample, and so we limit the analysis of this third variable to the rural sites.

For the multivariate analyses a continuous wealth variable is used in every case, although the particular continuous variable used depends on the outcome being considered. For the prenatal use and institutional delivery outcomes, we pooled the urban and rural samples and used a continuous wealth variable with the household asset scores for urban and rural areas combined. For the HIV/AIDS knowledge outcome, the rural continuous wealth variable is used, because the analysis is limited to the rural sample.

To visually highlight our findings, we also occasionally use bivariate graphs to show the association between an outcome and household wealth. For the bivariate analysis, households were ranked by their asset score and divided into poor-rich (for institutional delivery) or quartiles (for HIV knowledge), with a different grouping used depending on the sample size for the health outcome analyzed. All sample individuals were assigned the wealth group of the household in which they resided.

⁶ We were tracking a cohort of adolescents, and the samples are likely to have repeat observations from the same individual. However, these repeat observations cannot be identified and thus we would not be able to correct for this as needed in a pooled, time-series analysis.

MEANS AND DISTRIBUTIONS FOR VARIABLES IN THE ANALYSIS

Table 2 presents the descriptive frequencies with means and, where relevant, the range of values, for outcome variables and key independent variables. The first set of frequencies is for the subsample of young women who have ever been pregnant. The sample size here is fairly small, posing limitations for the multivariate analysis. because the cohort aged during the intervention period, the mean age at endline is older than at baseline for both study and control sites. Also, in both sites, the proportional representation of rural women increases from baseline to endline, indicating that urban women were less likely to have had a pregnancy by endline. In part due to the greater representation of rural women for this subsample, the wealth score shows only minimal change from baseline to endline in both sites. However, this group of women is somewhat better educated by the endline in both sites.

Interestingly, the overall change in the two maternal health outcome variables does not indicate an improved scenario in the study sites as opposed to the control sites. For prenatal care, the mean declined in the study site, while increasing minimally in the control site. For institutional delivery, the change was positive for both sites, but substantially more so in the control site than in the study site. To some degree, these numbers reflect small sample sizes and also the worsening of a selection bias in the type of women who are likely to experience first pregnancy at a young age. However, they also indicate that the overall impact of the participatory interventions was not universally positive. Our evaluation of a wide range of results (presented elsewhere) indicates that for direct measures of reproductive health outcomes, the impact of the participatory approach was mixed, with some negative, some neutral, and some positive results. The balance, however, favored more positive results than did the standard approach. On the other hand, the participatory approach was significantly more successful in showing positive change in more fundamental and indirect determinants of reproductive health (such as youth and young women's empowerment, age at marriage, social norms) (Mathur, Mehta, and Malhotra 2004).

The second part of Table 2 presents descriptive statistics for the rural sample of married and unmarried young men and women and the variable on knowledge regarding modes of HIV transmission. For the overall sample of rural young people, the improvements in education from baseline to endline are more substantial than for the selective sample of young women who have had pregnancies. The change in the outcome variable of interest is also more substantial from baseline to endline in both control and study sites. At baseline, less than 50 percent of respondents could accurately name at least two modes of transmission, but by the endline the proportion is closer to 80 percent.

Table 2: Sample means and distributions for variables in the analysis*Subsample for prenatal care and institutional delivery: married young women with pregnancy experience*

<i>Variable</i>	<i>Study baseline</i>	<i>Study endline</i>	<i>Control baseline</i>	<i>Control endline</i>
<i>Independent variables</i>				
Mean age in years (range)	19.5 (14 to 21)	22.1 (18 to 25)	19.1 (14 to 21)	21.6 (18 to 25)
Percent living in rural areas	41.1	57.5	60.7	69.5
Mean wealth score (range)	-0.47 (-2.9, 3.7)	-0.51 (-3.4, 3.8)	-1.33 (-2.9, 2.2)	-1.13 (-3.4, 3.3)
Mean highest education received in years of schooling	4.1	4.8	2.9	3.3
<i>Dependent variables</i>				
Percent receiving prenatal care	71.4	58.8	53.6	56.8
(N)	56	80	56	95

Subsample for knowledge of modes for HIV/AIDS transmission: rural male and female youth

<i>Variable</i>	<i>Study baseline</i>	<i>Study endline</i>	<i>Control baseline</i>	<i>Control endline</i>
<i>Independent variables</i>				
Mean age in years (range)	17.2 (14 to 21)	17.1 (14 to 21)	17.0 (14 to 21)	17.2 (14 to 21)
Mean wealth score (range)	0.56 (-2.3, 4.2)	0.65 (-2.5, 10.1)	0.07 (-2.3, 3.8)	-0.15 (-2.5, 13.2)
Percent female	53.7	49.7	57.6	50.5
Mean years of schooling	4.6	5.6	4.2	5.2
<i>Dependent variable</i>				
Percent who know 2+ modes of HIV Transmission	45.1	82.4	45.6	80.5
(N)	175	157	198	202

Sources: Nepal Adolescent Project. 1999 Baseline Adolescent and Household Surveys and 2003 Endline Adolescent and Household Surveys.

FINDINGS

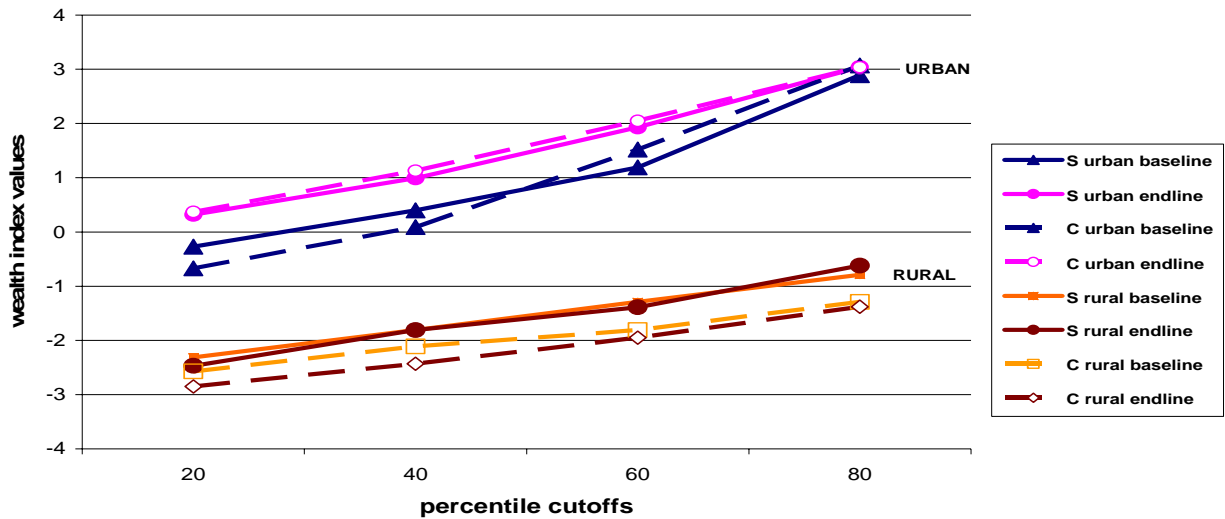
Our results from various vantage points indicate that the participatory approach was more successful than the nonparticipatory intervention in reducing advantage-based differentials in youth reproductive health outcomes. This is generally true for the three indicators presented here—prenatal care, institutional delivery, and knowledge of HIV/AIDS transmission.

OVERLAP IN DISADVANTAGES

As a first analysis step, we examine disadvantage in the study and control communities. We find a notable overlap in the incidence of the different types of disadvantage we measure in this population. The overlap between household wealth status and urban-rural status is especially striking. Our data show that the difference in wealth across the two settings is so large as to be almost synonymous with rural-urban residence itself. Figure 1, which shows the cut-off points for wealth quintiles for all four sites at baseline and endline, clearly illustrates the wide gap in

rural-urban wealth. In the urban areas, not only is the curve for distribution of wealth at a much higher level than in the rural areas, the cut-off for the poorest twentieth percentile in the urban areas is also at a higher asset index score than the cut-off for the richest twentieth percentile in the rural area. This gap in the distribution of wealth across the two areas is apparent at both baseline and endline.

Figure 1: Wealth quintile cut-off points



Sources: Nepal Adolescent Project. 1999 Baseline Adolescent and Household Surveys and 2003 Endline Adolescent and Household Surveys.

Two other measures of disadvantage—education and ethnicity—also overlap substantially with both wealth and rural-urban residence. Due both to the high collinearity across these measures of disadvantage and to the small sizes of the subsamples for some of our dependent variables, the effect of each disadvantage-defining variable cannot always be disentangled in a multivariate setting. Therefore, we limit our multivariate analyses to basic models with minimal controls.⁷ Where needed, we also present some bivariate graphs showing the relation of household wealth to the outcome in question.

PRENATAL CARE

Table 3 shows the effect of disadvantage, as measured separately by rural-urban residence as well as wealth, on the use of prenatal care by young married women for their first pregnancy. In all cases, the regression coefficients shown are from two models: Model 1a controls for age and

⁷ For all outcomes, models were run with combinations of the following variables: age, education, gender, rural-urban residence, and household wealth. Due to sample size limitations, interaction models were not possible. Only final regression models are shown here.

shows the impact of residing in an urban as opposed to a rural area, and Model 1b controls for age and shows the impact of wealth as a continuous variable.

A comparison of the coefficients for baseline with those at endline (Model 1a) shows that the rural-urban differential is practically eliminated in the study sites but is essentially unchanged in the control sites. The coefficient for urban residence in the study site is 2.8 at baseline and is significant at the 0.001 level, whereas at the endline, it reduces to 0.22, and is no longer significant. The odds ratios indicate a dramatic turnaround: at baseline, an urban young woman in the study site was 16 times more likely to get prenatal care than a rural young woman, but by the endline, she is only 1.2 times as likely to get prenatal care. In the control site, the initial contrast was less extreme: urban women were only 3.7 times more likely to get prenatal care than rural women. However, this differential shrinks to only 3.2 times more likely for the urban women and remains significant at the endline. Tests of significance between baseline and endline coefficients in each of the study and control sites confirm a statistically significant decline in residence-based advantage in the study sites between the baseline and the endline; no significant change occurs in the control sites.

Table 3: Prenatal care: regression results, study and control sites

	<i>Study</i>		<i>Control</i>	
	<i>Baseline (14 to 21 years)</i>	<i>Endline (18 to 25 years)</i>	<i>Baseline (14 to 21 years)</i>	<i>Endline (18 to 25 years)</i>
<i>Model 1a: Urban vs. Rural residence (controlling for age)</i>				
Coefficient	2.80	0.22	1.32	1.16
Odds ratio	16.4	1.2	3.7	3.2
P value	0.001	0.644	0.028	0.021
(N)	56	80	56	95
One-tailed t-test (p)	2.9 (0.00)		0.2 (0.42)	
<i>Model 1b: Wealth (controlling for age)</i>				
Coefficient	1.01	0.20	0.66	0.36
P value	0.005	0.189	0.017	0.010
(N)	56	80	56	95
One-tailed t-test (p)	2.3 (0.01)		1.1 (0.13)	

Note: The t-tests are one-tailed to test the hypothesis that differentials by disadvantage *are reduced* from baseline to endline.

Sources: Nepal Adolescent Project. 1999 Baseline Adolescent and Household Surveys and 2003 Endline Adolescent and Household Surveys.

Model 1b shows similar results, using wealth as the key independent variable, and again, controlling for age. The beneficial impact of belonging to a wealthier family is substantial and significant in both study and control sites at baseline (more so in the study than in the control site). In the study site, by the endline the coefficient for wealth is much smaller than at baseline, and no longer significant. In contrast, at the control site, at endline wealth remains an important differentiating factor in young women's access to prenatal care. Again, significance tests confirm that the baseline-endline change in the study sites is significant, but not in the control sites.⁸

⁸ To see how wealth interacted with rural-urban residence, we also ran regressions separately by urban and rural areas, but these did not yield meaningful results. This is due largely to the small sample sizes. Moreover sample

INSTITUTIONAL DELIVERY

Table 4 shows the regression results for the relationship between disadvantage and young women’s delivery of their first pregnancy in a medical facility. Model 2a shows the extent to which rural-urban differentials shifted from baseline to endline, and again, the results are much more encouraging in the study sites than in the control sites. At baseline, and in both study and control sites, institutional delivery is a rare occurrence in rural compared to urban areas: in the study site, urban young women are over 15 times more likely than rural women to have an institutional delivery, and in the control site, they are over 13 times more likely to do so. Although differences remain in the study site by the endline, they are substantially reduced: the odds ratio is down to 4.6, and the urban-rural coefficient decreases from 2.75 to 1.52, a statistically significant difference between baseline and endline. In contrast, the differentials actually increase in the control sites, where at endline young women in the urban area are 21 times more likely to have an institutional delivery compared to their rural counterparts.

Table 4: Institutional delivery: regression results, study and control sites

	<i>Study</i>		<i>Control</i>	
	<i>Baseline (14 to 21 years)</i>	<i>Endline (18 to 25 years)</i>	<i>Baseline (14 to 21 years)</i>	<i>Endline (18 to 25 years)</i>
<i>Model 2a: Urban vs. Rural residence (controlling for age)</i>				
Coefficient	2.75	1.52	2.61	3.05
Odds ratio	15.6	4.6	13.5	21.3
P value	0.000	0.002	0.000	0.000
(N)	56	79	56	95
One-tailed t-test (p)	1.4 (0.08)		-0.4 (0.66)	
<i>Model 2b: Wealth (controlling for age)</i>				
Coefficient	0.62	0.68	1.42	0.85
P value	0.019	0.001	0.000	0.000
(N)	56	79	56	95
One-tailed t-test (p)	-0.2 (0.57)		1.5 (0.07)	

Note: the t-tests are one-tailed to test the hypothesis that differentials by disadvantage *are reduced* from baseline to endline.

Sources: Nepal Adolescent Project. 1999 Baseline Adolescent and Household Surveys and 2003 Endline Adolescent and Household Surveys.

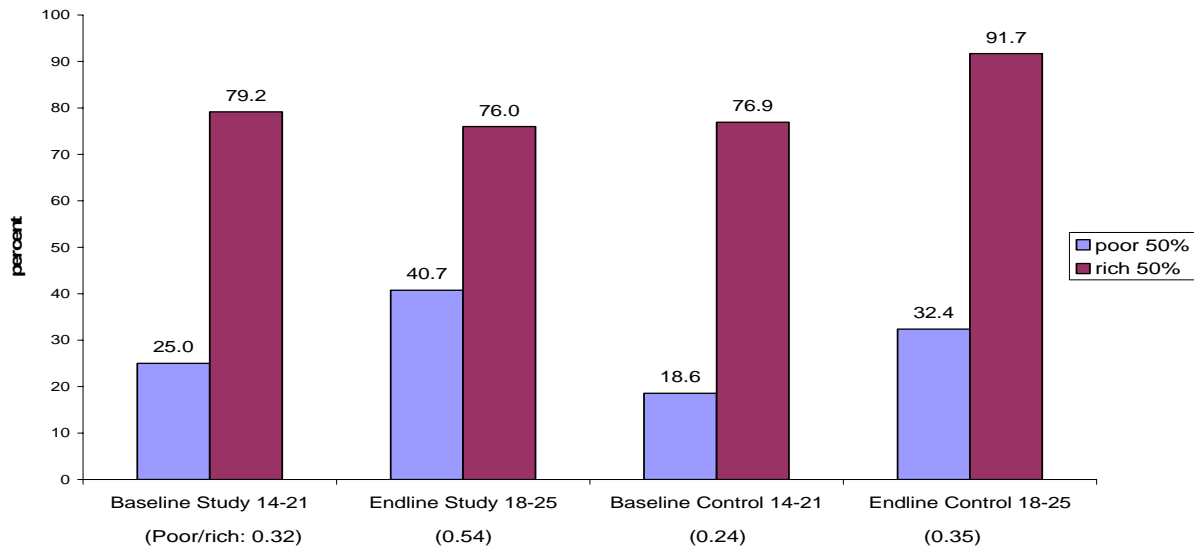
At a bivariate level, wealth differentials (poor-rich ratios) show a similar, though less dramatic pattern. Figure 2 shows that at baseline, both study and control sites show substantial differentials between the rich and the poor: the poor-to-rich ratio in institutional deliveries is 0.32 in the study sites and 0.24 in the control sites.⁹ However, as a result of the intervention, differentials are reduced more in the study sites than in the control sites, largely because of improved access by the poor in the study sites. By the endline, the improvement in access to institutional delivery is entirely among the poorer 50 percent of the population in the study site,

selection was also a problematic issue in the urban areas. Between baseline and endline, urban areas showed a large decline in pregnancies, and the pregnancies that did occur were heavily skewed among the poorest.

⁹ As noted, due to a small sample size for institutional delivery, we use poor-rich ratios rather than tertiles, quartiles, or quintiles.

whereas in the control sites, both the rich and the poor gain from the interventions. As a result, at the endline, the poor-to-rich ratio in institutional deliveries improves to 0.54 in the study sites, but only to 0.35 in the control sites.

Figure 2: Delivery in a medical facility: first pregnancy, poor and rich young married women



Sources: Nepal Adolescent Project. 1999 Baseline Adolescent and Household Surveys and 2003 Endline Adolescent and Household Surveys.

The multivariate analysis for the relationship between wealth and institutional delivery, however, is not consistent with this interpretation. As model 2b in Table 4 shows, when the measure for wealth is used as a continuous variable, and the age of the respondent is controlled for, there is little change between baseline and endline in the study sites, but a more dramatic reduction in the control sites. Our diagnostics show that the relationship between wealth and institutional delivery for the study and control sites is highly sensitive to how the wealth variable is defined. Defined as a continuous variable and in a linear relationship, the control site shows a stronger improvement. However, defined as a dichotomous variable, or with a squared term, and in a curvilinear relationship, the study site shows a stronger improvement. This is because in the control site much of the increase in institutional deliveries was at the extreme ends of the wealth continuum while in the study site, much of the improvement was among those in the middle.

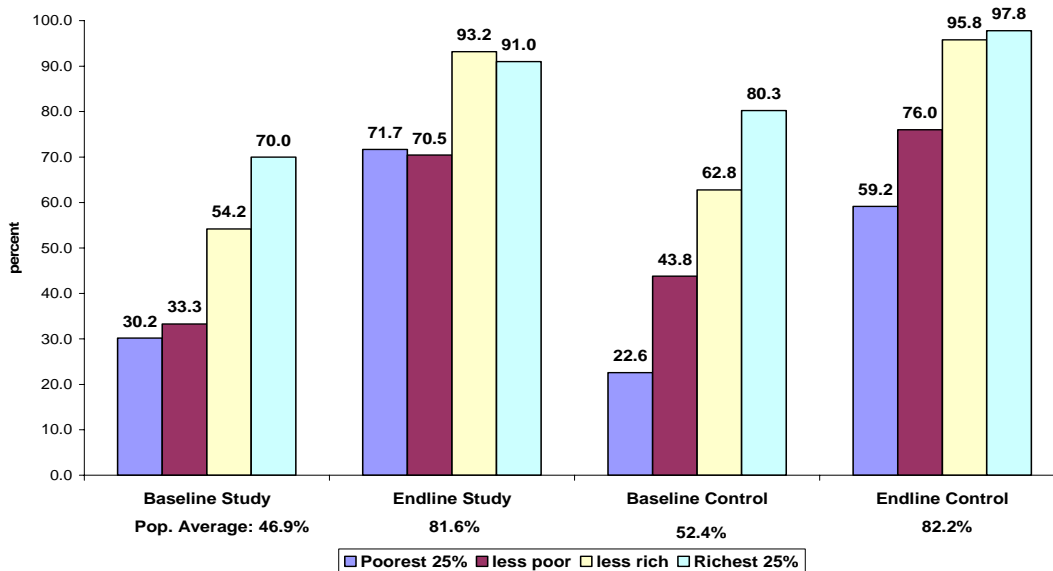
KNOWLEDGE OF HIV TRANSMISSION

The factors generating disadvantage in knowledge of HIV transmission modes are somewhat different and broader than those applying to prenatal care and institutional delivery. A major reason for this is the broader sample base to which this indicator applies: married and unmarried young men and women. As many studies on youth and adults have noted, women are at a relative disadvantage compared to men in access to information and knowledge on sexual and

reproductive issues in general and HIV and AIDS in particular (World Bank 2004; Weiss, Wehlan, and Gupta 1996). Thus, gender serves as an important basis for disadvantage, in addition to poverty or rural-urban residence.

Figure 3 presents a bivariate graph of wealth-based inequalities in knowledge of at least two modes of HIV transmission for the study and control sites at baseline and endline. A larger sample size than was available for maternal care allows us to use wealth quartiles in the bivariate analysis rather than just poor-rich ratios, thus capturing a more nuanced picture of the relationship between disadvantage and HIV knowledge. As Figure 3 shows, the overall proportion who can correctly identify at least 2 modes of HIV transmission is fairly similar for both the study and control sites, with a substantial improvement from baseline to endline for both sites. However, the degree of improvement varies by the level of wealth score: by the endline, the differentials by wealth in knowledge of HIV transmission are less marked in the study sites than they are in the control sites. In particular, at endline, young people from the poorest quartile are closer in knowledge to the remainder of the population in the study sites than in the control sites.

Figure 3: Knowledge of at least two modes of HIV transmission: by wealth quartiles, young men and women (aged 14 to 21 years)



Sources: Nepal Adolescent Project. 1999 Baseline Adolescent and Household Surveys and 2003 Endline Adolescent and Household Surveys.

To further explore these differentials, we present three multivariate models in Table 5. Model 3a shows the effect of being male rather than female, controlling only for age; model 3b shows the effect of gender and schooling; and model 3c further includes a continuous variable for household wealth. The multivariate models present data only for the rural areas, since there was lack of variation in the urban areas, where knowledge levels for everyone were high at endline.

Table 5: Knowledge of HIV/AIDS transmission: rural study and control sites

	<i>Study</i>		<i>Control</i>	
	<i>Baseline</i>	<i>Endline</i>	<i>Baseline</i>	<i>Endline</i>
<i>Model 3a: Gender(controlling for age)</i>				
<i>Coefficient male vs female (0 = female)</i>	0.41	-0.28	-0.21	1.23
Odds ratio	1.5	0.8	0.8	3.4
P value	0.211	0.430	0.531	0.000
One-tailed t-test (p)	1.4 (0.07)		-3.1 (0.99)	
<i>Model 3b: Gender and education (controlling for age)</i>				
<i>Coefficient male vs. female (0 = female)</i>	0.18	-0.71	-1.23	0.74
Odds ratio	1.2	0.5	0.3	2.1
P value	0.612	0.086	0.003	0.034
One-tailed t-test (p)	1.6 (0.05)		-3.7 (0.99)	
<i>Coefficient education</i>	0.21	0.46	0.39	0.35
Odds ratio	1.2	1.6	1.5	1.4
P value	0.001	0.000	0.000	0.000
One-tailed t-test (p)	-2.2 (0.98)		0.5 (0.32)	
<i>Model 3c: Gender, education, and wealth (controlling for age)</i>				
<i>Coefficient male vs. female (0 = female)</i>	0.17	-0.73	-1.22	0.74
Odds ratio	1.2	0.5	0.3	2.1
P value	0.634	0.079	0.003	0.034
One-tailed t-test (p)	1.7 (0.05)		-3.6 (0.99)	
<i>Coefficient education</i>	0.22	0.46	0.40	0.35
Odds ratio	1.2	1.6	1.5	1.4
P value	0.002	0.000	0.000	0.000
One-tailed t-test (p)	-2.1 (0.98)		0.1 (0.48)	
<i>Coefficient wealth</i>	-0.05	-0.09	-0.08	-0.05
P value	0.619	0.510	0.586	0.625
One-tailed t-test (p)	0.2 (0.41)		-0.2 (0.55)	
(N)	175	157	198	202

Note: the t-tests are one-tailed to test the hypothesis that differentials by disadvantage *are reduced* from baseline to endline.

Sources: Nepal Adolescent Project. 1999 Baseline Adolescent and Household Surveys and 2003 Endline Adolescent and Household Surveys.

Model 3a shows that, in the rural study site at baseline, differentials in knowledge of HIV transmission by gender, though not statistically significant, favored males: young men were 1.5 times more likely than young women to identify at least two modes of transmission. By the endline, however, this small male advantage disappears, and the odds of males knowing more are less than 1 (but not statistically significant). However, the disappearance of the male advantage from baseline to endline in the study site is statistically significant. In contrast, no significant gender differences are apparent at the baseline in the control site. By the endline, however, young men in the control site are more than three times more likely than young women to know how HIV is transmitted.

Model 3b sheds further light on this pattern. In both sites at both baseline and endline, education is positively and significantly associated with knowledge of HIV transmission. In fact, there is little change between baseline and endline in the effect of education. In the study site, by the endline, a baseline advantage for men seems to have disappeared and women are significantly more likely to have correct knowledge of HIV transmission than men: men are only half as likely as women to correctly list 2 modes of transmission (odds ratio of 0.5). Significance tests between baseline and endline coefficients show that this shift is significant. This suggests that, because men are more likely than women to be educated and the educated are much more likely to know about HIV transmission, only by controlling for the confounding effects of education can we see the true effect of the intervention in reducing gender disparities in HIV knowledge. In the control site, on the contrary, even after controlling for education, and thus for men's advantage on the schooling front, young men are still more likely than young women to be aware of HIV transmission modes. In fact, there is no significant change in the gender differentials between baseline and endline in the control site.

Adding in a variable for household wealth (Model 3c) makes no difference to the gender or education coefficients. The wealth variable itself, in addition, has a very minor coefficient and is insignificant, suggesting that education and gender, not wealth, are defining aspects of disadvantage for knowledge of HIV transmission.

SUMMARY

Our analysis shows that, for the population in this study, change in the relationship between disadvantage and health knowledge or behavior depends on both the measure used to define disadvantage and the specific health outcome in question. For access to prenatal care services and institutional delivery, the key aspect of disadvantage is urban-rural residence. Household wealth is significant for prenatal care only. For knowledge of HIV transmission, gender and educational differences are key. On balance, our analysis shows that, for most of the measures used to define disadvantage, the participatory approaches in the study sites were more successful in increasing access or knowledge for the disadvantaged than the more standard approaches used in the control sites.

WHY DID THE PARTICIPATORY APPROACH WORK? THE PROCESSES BEHIND THE RESULTS

Our broader results indicate that, though generally more positive in its outcomes, the participatory approach is by no means a panacea. The overall evaluation of the study concluded that the participatory approach required significant investments of time and resources, by both implementers and communities. Moreover, a number of immediate outcomes of interest were not significantly more positive in the study sites than in the control sites, although they were in the end (Mathur et al. 2004). The broader conclusions are also reflected in our analysis, where we generally find the participatory approach generally, but not universally, more effective in reducing differentials due to disadvantage by rural-urban residence, wealth, and gender.

The qualitative and participatory data collected for NAP makes it possible to elaborate on some of the reasons for the greater success of the participatory approach in reducing disadvantage-based differentials in the use of reproductive health services and health outcomes among youth. According to our analysis of these data, at least three important factors were at play: the greater effectiveness of the participatory approach (1) in facilitating coproduction of services, (2) in empowering youth and adults and increasing the accountability of service providers and policymakers to the community, and (3) in increasing community demand for information and services.

The nature of adolescent reproductive health makes it especially amenable to coproduction and self-service by clients, and the participatory intervention design substantially facilitated such coproduction. Qualitative data from the study sites underscore the emergence of well-informed and trained peers and more reliable social networks as critical sources of service provision for young people. Based on findings from the needs assessment, the study site interventions tapped and strengthened social networks for information exchange and counseling, while the control site interventions did not. Moreover, young people's understanding of what services actually mean, and how to best use the options available to them, improved substantially more in the study sites. As one of the young men who participated in the study site interventions said at the endline, in response to a question about where youth seek advice on love marriage (a taboo subject in the community):

We don't go to the sub-health post, hospitals, FCHVs [family and child health volunteers] because they cannot solve our problem. We can talk with friends and peer educators, they can help in case of severe problem....

—MALE URBAN YOUTH, STUDY SITE, ENDLINE

Second, because of the active effort at imparting information and building decision-making structures and coalitions, the participatory intervention was substantially more successful in empowering youth and adult community members and increasing the accountability of providers and policymakers to the communities. In part, this resulted from the participatory structures (committees, task forces, youth clubs) set up in the study sites which fostered community skills in consensus building, decision-making, planning, organizing, consulting, and demanding resources and accountability from various actors. For example, adults and youth learned to negotiate with the Village Development Committee (VDC) and felt that, jointly, they could demand government funds to continue project activities. Empowerment and demand for accountability are also apparent from the data documenting the change in the client-provider relationship in the study sites. Not only were the providers trained by the program to be more youth friendly, courteous, and responsive, young people in the community were also made aware that they can enforce these expectations. Both male and female respondents noted this.

Earlier, the service provider used to give a very bad response if anyone went for counseling hence feared and felt embarrassed to go...but now with the help of the program, the service providers show cordial behavior and maintain confidentiality. Due to this the adolescents as well as the adults have started to go for health and counseling services.

—RURAL MALE AND FEMALE YOUTH, STUDY SITE

Finally, in the study sites, the greater focus on altering not just reproductive health outcomes—but changing fundamental social norms and institutions—was a major factor in increasing demand for information and services among the disadvantaged. The evaluation data for the full study (not shown here) demonstrate that the participatory approach had a significant impact on a number of the broader contextual factors that have long-term consequences for reproductive health outcomes, including entry into marriage and childbearing, secondary schooling, mobility, and social spaces for young women (Mathur, Mehta, and Malhotra 2004). The results also indicate that the enabling environment for good reproductive health has improved in the study sites because the participatory approach has generated a new mindset in the communities, one with a deeper, more sophisticated understanding of youth reproductive health and its implications. Community members are better able to understand and articulate the basic connections between youth reproductive health and a range of critical life outcomes. They are also clearer about how family, gender, and social structures and norms constrain healthier sexual and reproductive behaviors. This richer, enhanced understanding is a sign of sustainability in the demand for youth reproductive health services in the long run.

LIMITATIONS AND IMPLICATIONS FOR FUTURE STUDIES

Our study has some limitations that need to be considered in designing such studies and analyses in the future. One such limitation—or choice to be considered—is associated with a micro, household and community-based study versus a large, macro survey. While the micro-household study design provides a unique perspective that is more in-depth than macro studies can be, it has analytical limitations that arise mainly from small sample size. Our study is no exception to this. One of our main constraints has been the small sample sizes for some outcomes of interest that prevented us from considering certain key reproductive health outcomes such as contraceptive use. For the outcomes we were able to analyze, small sample sizes restricted our ability to use sophisticated regression models. On the other hand, the community-based nature of the data allowed for greater in-depth and qualitative analyses. These were a huge asset in defining disadvantage and poverty in a manner that was contextually-appropriate to our study and control communities in rural and urban Nepal and in analyzing causes of our observed patterns of disadvantage and change.

As highlighted in this report, wealth, residence, education, caste, and gender are all important measures of disadvantage in the Nepali context. However, no single variable captures disadvantage completely. Using an index based solely on household wealth or a measure of urban-rural residence captures most, but not all levels of disadvantage in this population. Other measures such as gender or education, capture different dimensions of disadvantage than do wealth or urban-rural residence. Thus, no measure of disadvantage used succeeded in fully capturing the extent to which groups that have multiple disadvantages suffer. An alternative for future consideration in this and other work is to develop a broader measure of disadvantage by creating an index that includes not only wealth or asset ownership but which also accounts for the other relevant factors in determining disadvantage. Whether a combined index or separate measures of disadvantage should be used will depend on the question to be answered.

Another important point to note is that, because the availability of health services in or near the rural and urban communities was a factor in site selection, it could not be used as a factor in the analysis. Finally, as noted earlier, this study employed a longitudinal study design to the extent that we studied a cohort of young people over time. We could not duplicate a true panel design, in that the same individuals were not followed over time. Unfortunately, most recent studies of youth reproductive health issues in the developing world have found it difficult or practically impossible to overcome the challenges involved in setting up a true panel design (Magnani et al. 2001).

CONCLUSIONS

These study results suggest that empowerment and accountability issues, considered essential to improve health for the poor, can be operationalized at multiple levels. Our work shows that, in addition to macro level efforts, smaller scale community-level efforts can also be targeted to achieve these outcomes. In fact macro policy efforts have much to learn from the participatory processes implemented at grassroots. Such community-based participatory projects are usually not well documented or evaluated. This study presents a rare, rigorous evaluation of the benefits and pitfalls of using participatory approaches to improve reproductive health outcomes and access to services for disadvantaged clients. As such, this evaluation adds significantly to the literature on the role of participation in diminishing the disadvantages faced by the worst-off: poor, rural, uneducated, female clients.

Our results show that the participatory approach can provide clients, especially disadvantaged clients, with choices and mechanisms to engage with health and social systems. These approaches and mechanisms have strengthened the power of young people in our study communities in negotiating for appropriate, accessible, and accurate information and services from providers and policymakers. This, in turn, has increased the extent to which such providers are accountable to these clients.

Perhaps most critically, our study reinforces the literature on the need for broader definitions of disadvantage. Poverty is irrefutably a key and powerful measure of disadvantage. Nonetheless, in many rural communities in the developing world, the most disadvantaged owe this disadvantage to complex and interwoven interactions between various contextual factors. To get a full measure of disadvantage in any one community, these context-specific factors need to be fully considered. Beyond this, however, even at a broader, generalizable level, our study and others that examine inequalities in health, show that analyses of poverty as a measure of disadvantage needs to be accompanied by analyses of rural-urban residence, gender, and educational access as other important markers of social, cultural, and economic differentials.

APPENDIX A: DATA SOURCES, SAMPLES, AND METHODOLOGIES IN THE NEPAL ADOLESCENT PROJECT

<i>Methodology</i>	<i>Purpose and research tools</i>		
	Baseline and formative research (January 1999–March 2000)	Endline (April to November 2003)	Monitoring and process documentation (November 2000–March 2003)
Quantitative (study and control sites)	Household Survey N = (965) Adolescent Survey ages 14-21, N = (724) Adult Survey ages 30+, N = (752) Service Provider Survey, N = (59)	Household Survey N = (1003) Adolescent Survey ages 14-25, N = (979) Adult Survey ages 30+, N = (654) Service Provider Survey, N = (62)	Facilitator reports on participation in intervention activities (231) Mystery client survey at mid-point and end-point (48)
Qualitative (study and control sites)	Key informant interviews (3) In-depth Interviews (14) Focus group discussions (10)	Focus group discussions (16)	Facilitator reports on intervention activities (same as above)
Participatory (study sites only)	9 participatory activities with 4 to 5 groups each: Community mapping Mobility mapping Free listing and ranking Lifelines Body mapping Reproductive health problem Trees RH Service Matrix	5 participatory activities with 20 groups each: Mobility mapping Lifelines Reproductive health Problem Trees RH Service Matrix Trend analysis	67 community group assessments at mid-point and end point

APPENDIX B: MEASUREMENT OF HOUSEHOLD WEALTH

Household wealth in our analysis is measured in terms of household assets. From the data in our study on household asset ownership, and following the approach used by Gwatkin and others (2000), we created an “asset index” where households were ranked by their asset score. We calculated asset indices separately for baseline and endline. In addition to one overall baseline and one endline index, we also created separate urban and rural indices at baseline and endline, following the approach taken by Pande and Yazbeck (2003). Our creation of separate rural and urban indexes is based on the likelihood that the same asset has different possible valuations in different contexts. For instance, owning a bicycle might score high (and thus indicate a wealthy household) in a rural area whereas the same asset may be common enough in an urban area and not indicate a particularly wealthy household in that context. More specifically, based on our understanding of the study and control sites, it was clear to us that the rural sample is much poorer than the urban sample, and thus we expected the entire rural wealth distribution to be very different from that for urban areas. To retain comparability across urban and rural areas, and across baseline and endline samples, assets are defined identically for the most part.¹⁰

Specifically, assets included in the overall and urban asset indexes are: whether or not a household has a flush toilet, a pit toilet, a water source in the residence/yard, electricity, radio, black-and-white television, color television, telephone, bicycle, motorcycle, refrigerator, car; whether a household owns its house; whether a household owns any land, owns land in rural areas and how much, owns land in urban areas. The only asset excluded from the rural index was ownership of urban land since only two rural respondents at baseline, and only three at endline, owned any urban land.

Each asset was assigned a weight or factor score generated through principal components analysis, using programs generated by STATA (StataCorp 1997). The resulting “raw” asset scores were standardized in relation to a standard normal distribution with a mean of zero and a standard deviation of one. For each household, the scores reflecting the distribution of assets for that household were summed to generate a household asset score as follows:

$$\text{Household asset score} = \left(\frac{\text{value of asset variable} - \text{unweighted mean of asset variable}}{\text{unweighted standard deviation of asset variable}} \right) \times \text{"raw" asset factor score}$$

¹⁰ In some cases, due to small sample sizes for certain categories of assets for either rural or urban areas, definitions may differ between rural and urban areas. Asset definitions, scores and household quintile cut-offs for urban and rural samples are available upon request.

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