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

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This chapter 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 youth reproductive health needs are especially acute there and little is being done to meet them.

Context and Research Questions

The findings are based on microlevel analysis from primary quantitative and qualitative data collected to evaluate an intervention study conducted from 2001 to 2003. In this study we test whether 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 and accountability to poor and disadvantaged populations. By amplifying client voice and widening choice, do such programs act as critical mechanisms for improving service accessibility and health outcomes for the disadvantaged?

The 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 when most

men and women experience the key transitions 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 is 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 apply to older age groups, most often because of social and moral assumptions and judgments concerning youth sexuality and service needs (Mathur, Malhotra, and Mehta 2001). This tends to hold 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 now has the largest-ever youth generation—more than a billion young people between the ages of 10 and 19—and 84 percent of them 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 own life outcomes but also the future of their societies.

Our 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 means of empowering communities, creating ownership of 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, increased client power can strengthen accountability in the relationship between poor people and providers, between poor people and policy makers, and between policy makers and providers (World Bank 2004).

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 vital type of service coproduction because information and social support are important means of 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, and to the use of 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 (Mensch, Bruce, and Greene 1998; Norman 2001).

Participatory programs may strengthen clients' 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 more likely than those who do not to be motivated and able to monitor services and exert leverage on providers for better services. Community-based participatory programs may empower disadvantaged citizens by providing access to information and to decision-making bodies and by increasing their ability to build coalitions, influence the political process and the allocation of resources, and establish monitoring and accountability mechanisms (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, microlevel, community-based participatory programs have enormous potential for influencing the relationship between disadvantaged youths and service providers, as well as the relationship between disadvantaged youths and policy makers. To date, however, 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 youths. Our study offers such an evaluation, focusing on 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 child-bearing by the age of 20. Only 55 percent of the women under age 20 who had given birth reported receiving antenatal care, 14 percent of the births were attended by trained personnel, and only 9 percent of deliveries took place 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, marry and initiate childbearing two to three years earlier, on average, than urban women and are eight times less likely to use antenatal services and to deliver in a health facility (Nepal, Ministry of Health, and others 2002).

Study Design

In the Nepal Adolescent Project (NAP) we employed a quasi-experimental case-control study design to implement and test the effectiveness of a community-based, client-centered participatory approach aimed at improving the sexual and reproductive health of adolescents in rural and urban Nepal. The five-year project was conducted from 1998 to 2003 as a collaboration between an international service delivery organization (EngenderHealth), an international research organization (International Center for Research on Women), and two local Nepali nongovernmental organizations (NGOs), New ERA Ltd., and BP Memorial Health Foundation. The project was conducted in 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 permit 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. Because of 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.

The study and control sites were differentiated by implementation methods and by the elements included. In comparison with 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 youths and

adult community members, especially the disadvantaged. At the intervention design stage, an action planning process was conducted in which 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 more inclusive in the study sites, with community-level committees that allowed both adults and youths to increase their authority and decision-making 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, and ethnic minorities—in these structures and processes (for example, by setting up rotating representation). The control sites had no such participatory processes or structures.

Intervention components were very different for study and control sites. Study site interventions attempted to address structural, normative, and systemic barriers to youth reproductive health, while the control sites addressed only the most immediate risk factors such as sexually transmitted diseases (STDs) and unwanted pregnancies. Thus, interventions in the study site linked youth reproductive health programs with other programs deemed to influence the environment where youths live; such programs included adult education programs, activities to address social norms, and economic livelihoods interventions. Eight such linked interventions, developed and prioritized by community members, were implemented in the study sites. For comparison, the project staff designed and implemented in the control sites three standard reproductive health interventions 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. The difference in focus is especially relevant to this analysis.

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

Data and Methodology

In our analysis, we use cross-sectional quantitative household and adolescent survey data collected at baseline and endline for the Nepal Adolescent Project, as well as relevant qualitative and participatory data (see annex 11.1). 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 that age group, for the endline we tracked this cohort which was by then 18 to 25 years old. The study design allowed us to track the cohort, but not specific individuals, within each community. Since the intervention design was at the community level, interventions to increase knowledge and information covered a broader population. To ensure capture of the impact of such interventions on younger adolescents, we included the age 14–17 group in the endline sample (see table 11.1).² Although the full sample covering married and unmarried males and females age 14–21 at baseline and age 14–25 at endline is fairly large, the subsamples for each site are relatively small. These small subsample sizes pose limitations for multivariate analysis, especially where the analysis requires a focus on further subcategories such as married females who have had a pregnancy.

Dependent Variables

The survey data offer 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

Table 11.1. *Adolescent Survey Samples and Subsamples, Nepal*

<i>Sample and subsample base</i>	<i>Adolescent survey sample sizes (married and unmarried, males and females)</i>	
	<i>Baseline (age 14–21)</i>	<i>Endline (age 14–25)</i>
Urban study	184	260
Urban control	164	260
Rural study	175	205
Rural control	198	254
Total	721 ^a	979

Source: Nepal Adolescent Project, 1999 baseline adolescent and household surveys and 2003 endline adolescent and household surveys.

a. At the baseline, 724 adolescents were interviewed, but 3 respondents had to be excluded from the analysis because of missing household data.

frequently identified in the literature as critically important for reproductive health, especially for young people: prenatal care, institutional delivery, and knowledge about HIV/AIDS. The variables for prenatal care and institutional delivery refer to the first pregnancy of young married women because no pregnancies were reported among young unmarried women.³ 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/AIDS at baseline was already very high (over 90 percent), we use for this study 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, needle sharing, mother-to-child transmission, and blood transfusion.

Independent Variables

DEFINING DISADVANTAGE. The term *disadvantaged* refers here to adolescent girls and boys and their families who are worse off than others in the same population on several dimensions.⁴ 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 showing that 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 Nepal Adolescent Project did not collect data on household income or consumption. Consequently, we measure household wealth in terms of household assets (for details, see annex 11.2). Other studies have shown that household assets are a reasonable proxy for household income or consumption (Montgomery and others 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 and about land ownership, home ownership, source of drinking water, toilet facilities, and other characteristics related to household wealth status.

From these data, following the approach used by Gwatkin and others (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.

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, such analysis would be done on a pooled sample of individuals at baseline and endline, with dichotomous variables for study-control and for baseline-endline. Because, however, the interventions were at the community level, the NAP data provide, 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.⁵

The three dependent variables also apply to different subsamples of adolescents. The two pregnancy-related variables (prenatal care and institutional delivery) are applicable only to young married women. Because the interventions targeted the age 14–21 group for these service delivery-related outcomes, we track this cohort and compare the outcomes for the age 18–25 group at endline. 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 age 14–21 group at baseline and endline. The age 14–17 group at endline is included in the comparison because information-related interventions were aimed at the entire community, including younger adolescents. The age 22–25 group is excluded only because knowledge levels among youths in the older age groups are so high that there is no variation to explain. 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 care and institutional delivery outcomes, we pooled the urban and rural samples and used a continuous wealth variable with the household asset scores for the combined urban and rural areas. 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 asset score and divided into poor and nonpoor (for institutional delivery) or into 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.

Means and Distributions for Variables in the Analysis

Table 11.2 presents the descriptive frequencies with means and the range of values, where relevant, 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 higher 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 because of the greater representation of rural women in this subsample, the wealth score shows only minimal change from baseline to endline in both sites. 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. They also indicate that the overall impact of the participatory interventions was not universally positive. Our evaluation of a wide range of results (Mathur, Mehta, and Malhotra 2004) 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. The participatory approach was significantly more successful in showing positive change in more fundamental and indirect determinants of reproductive health such as youths' and young women's empowerment, age at marriage, and social norms (Mathur, Mehta, and Malhotra 2004).

Table 11.2. Sample Means and Distributions for Variables in the Analysis, Nepal

Variable	Study baseline	Study endline	Control baseline	Control endline
Subsample for prenatal care and institutional delivery: married young women with pregnancy experience				
<i>Independent variables</i>				
Mean age in years (range in parentheses)	19.5 (14–21)	22.1 (18–25)	19.1 (14–21)	21.6 (18–25)
Percentage living in rural areas	41.1	57.5	60.7	69.5
Mean wealth score (range in parentheses)	-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 years of schooling	4.1	4.8	2.9	3.3
<i>Dependent variables</i>				
Percentage receiving prenatal care	71.4	58.8	53.6	56.8
Percentage using institutional delivery	48.2	51.7	32.1	47.4
N	56	80	56	95
Subsample for knowledge of modes of HIV/AIDS transmission: rural male and female youths				
<i>Independent variables</i>				
Mean age in years (range in parentheses)	17.2 (14–21)	17.1 (14–21)	17.0 (14–21)	17.2 (14–21)
Mean wealth score (range in parentheses)	0.56 (-2.3, 4.2)	0.65 (-2.5, 10.1)	0.07 (-2.3, 3.8)	-0.15 (-2.5, 13.2)
Percentage 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>				
Percentage who know at least two modes of HIV transmission	45.1	82.4	45.6	80.5
N	175	157	198	202

Source: Nepal Adolescent Project, 1999 baseline adolescent and household surveys and 2003 endline adolescent and household surveys.

The second part of table 11.2 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 end-

line 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 was closer to 80 percent.

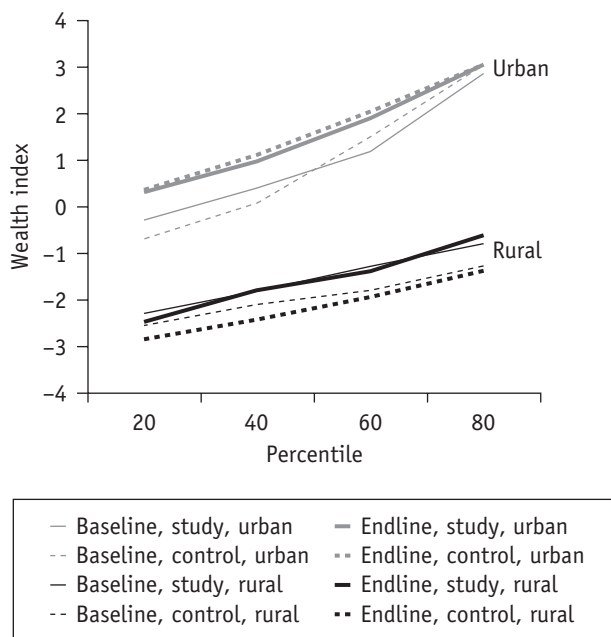
Findings

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 and 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 11.1, which shows the cutoff 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 much higher than in the rural areas; the cutoff for the poorest 20th percentile in the urban areas is also at a higher asset index score than the cutoff for the least poor 20th percentile in the rural area. This gap in the distribution of wealth across the two areas is apparent at both baseline and endline.

Two other measures of disadvantage—education and ethnicity—also overlap substantially with both wealth and rural-urban residence. Because of the high collinearity across these measures of disadvantage and the small sizes of the subsamples for some of our dependent variables, the effects of individual disadvantage-defining variables cannot always be disentangled in a multivariate setting. We therefore limit our multivariate analyses to basic models with minimal controls.⁶ Where needed, we present bivariate graphs showing the relation of household wealth to the outcome in question.

Figure 11.1. Wealth Quintile Cutoff Points, Nepal

Source: Nepal Adolescent Project, 1999 baseline adolescent and household surveys and 2003 endline adolescent and household surveys.

Prenatal Care

Table 11.3 shows the effect of disadvantage, measured separately by rural-urban residence as well as by 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 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.

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 is reduced 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 the ratio drops to 1.2.

Table 11.3. Prenatal Care: Regression Results, Study and Control Sites, Nepal

	Study		Control	
	Baseline (age 14–21)	Endline (age 18–25)	Baseline (age 14–21)	Endline (age 18–25)
<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
<i>p</i> -value	0.001	0.644	0.028	0.021
N	56	80	56	95
One-tailed <i>t</i> -test (<i>p</i>)	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
<i>p</i> -value	0.005	0.189	0.017	0.010
N	56	80	56	95
One-tailed <i>t</i> -test (<i>p</i>)	2.3 (0.01)		1.1 (0.13)	

Source: Nepal Adolescent Project, 1999 baseline adolescent and household surveys and 2003 endline adolescent and household surveys.

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

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. The 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 study and control site 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.

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 the coefficient for wealth is much smaller by the endline than at baseline and is no longer significant. By contrast, at the control site at endline, wealth remains an important differentiating factor in young women's access to pre-

natal care. Again, significance tests confirm that the baseline-endline change is significant in the study sites but not in the control sites.⁷

Institutional Delivery

Table 11.4 shows the regression results for the relationship between disadvantage and young women's delivery of their first pregnancies in a medical facility. Model 2a shows the extent to which rural-urban differentials shifted from baseline to endline. 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 with urban areas: in the study site urban young women are over 15 times more likely to have an institutional delivery than rural women, 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

Table 11.4. *Institutional Delivery: Regression Results, Study and Control Sites, Nepal*

	<i>Study</i>		<i>Control</i>	
	<i>Baseline</i> (age 14–21)	<i>Endline</i> (age 18–25)	<i>Baseline</i> (age 14–21)	<i>Endline</i> (age 18–25)
<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
<i>p</i> -value	0.000	0.002	0.000	0.000
N	56	79	56	95
One-tailed <i>t</i> -test (<i>p</i>)	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
<i>p</i> -value	0.019	0.001	0.000	0.000
N	56	79	56	95
One-tailed <i>t</i> -test (<i>p</i>)	-0.2 (0.57)		1.5 (0.07)	

Source: Nepal Adolescent Project, 1999 baseline adolescent and household surveys and 2003 endline adolescent and household surveys.

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

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. By 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 institutional deliveries than their rural counterparts.

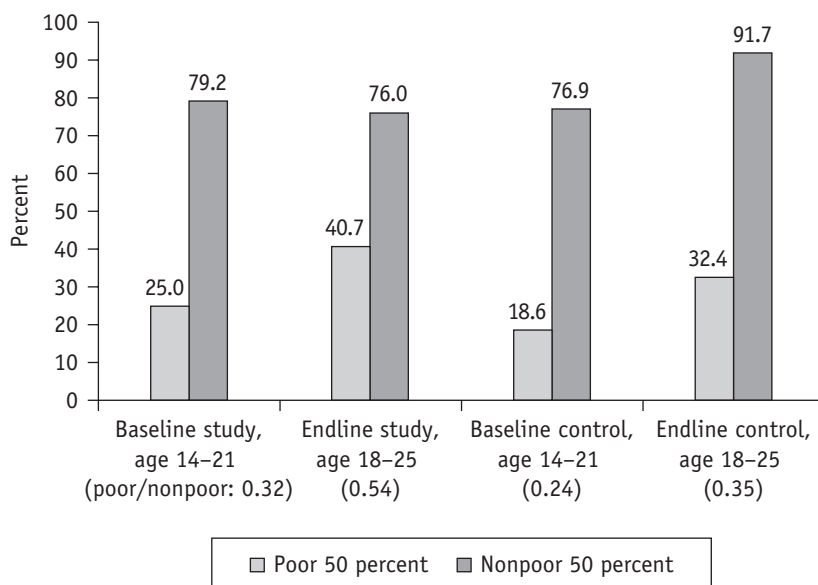
At a bivariate level, wealth differentials (poor-nonpoor ratios) show a similar, although less dramatic, pattern. At baseline both study and control sites show substantial differentials between the better off and the poor: the poor-nonpoor ratio in institutional deliveries is 0.32 in the study sites and 0.24 in the control sites (figure 11.2).⁸ 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 affects only the poorer 50 percent of the population in the study site, whereas in the control sites both the better off and the poor gain from the interventions. As a result, at the endline the poor-nonpoor ratio in institutional deliveries improves to 0.54 in the study sites but only to 0.35 in the control sites.

The multivariate analysis for the relationship between wealth and institutional delivery, however, is not consistent with this interpretation. As model 2b in table 11.4 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 there is 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. When wealth is defined as a continuous variable and in a linear relationship, the control sites show a stronger improvement, but when it is defined as a dichotomous variable, or with a squared term, and in a curvilinear relationship, the study sites show a stronger improvement. This is because in the control sites much of the increase in institutional deliveries is at the extreme ends of the wealth continuum, while in the study sites much of the improvement is among those in the middle.

Knowledge of HIV Transmission

The factors generating disadvantage in knowledge of HIV transmission modes are somewhat different from 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 youths and adults have noted,

Figure 11.2. *Delivery in a Medical Facility: First Pregnancy, Poor and Nonpoor Young Married Women, Nepal*

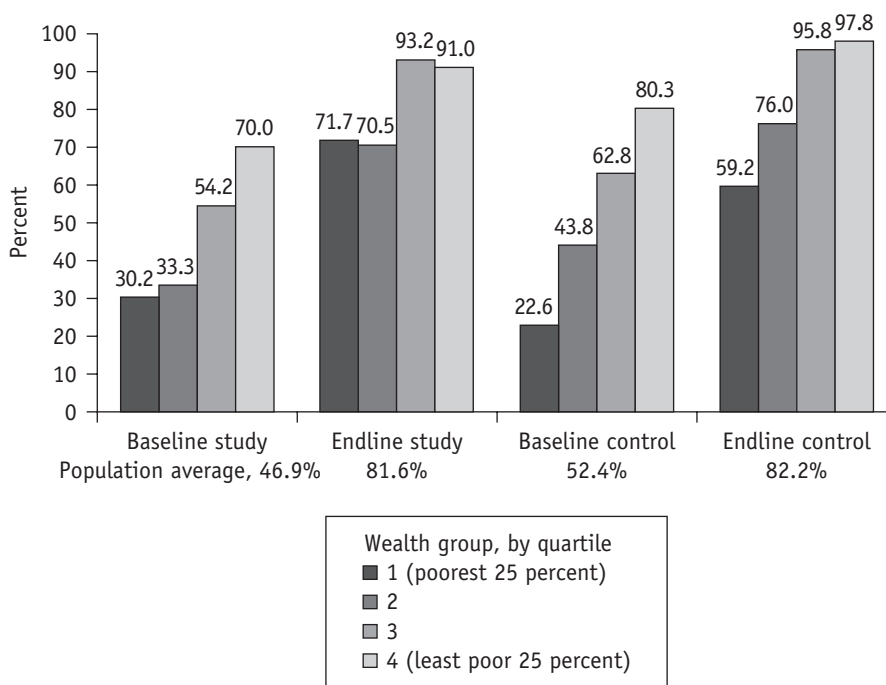


Source: Nepal Adolescent Project, 1999 baseline adolescent and household surveys and 2003 endline adolescent and household surveys.

women are at a relative disadvantage in comparison with men in access to information and knowledge on sexual and reproductive issues in general and HIV/AIDS in particular (Weiss, Whelan, and Gupta 1996; World Bank 2004). Thus, gender, along with poverty and rural-urban residence, is an important basis for disadvantage.

Figure 11.3 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-nonpoor ratios, thus capturing a more nuanced picture of the relationship between disadvantage and HIV knowledge. As the figure shows, the overall proportion of those who can correctly identify at least two modes of HIV transmission is fairly similar for both the study and control sites, with a substantial improvement from baseline to endline for both. The degree of improvement, however, varies by wealth score: by the endline, the differentials by wealth in knowledge of HIV transmission are less

Figure 11.3. Knowledge of At Least Two Modes of HIV Transmission, by Wealth Quartile, Young Men and Women Age 14–21, Nepal



Source: Nepal Adolescent Project, 1999 baseline adolescent and household surveys and 2003 endline adolescent and household surveys.

marked in the study site than in the control site. 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.

To further explore these differentials, we present three multivariate models in table 11.5. 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 in the urban areas knowledge levels for everyone were high at endline.

Model 3a shows that in the rural study site at baseline, differentials in knowledge of HIV transmission by gender, although 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, this

Table 11.5. Knowledge of HIV/AIDS Transmission: Rural Study and Control Sites, Nepal

	Study		Control	
	Baseline	Endline	Baseline	Endline
Model 3a: gender (controlling for age)				
<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
<i>p</i> -value	0.211	0.430	0.531	0.000
One-tailed <i>t</i> -test (<i>p</i>)	1.4 (0.07)		-3.1 (0.99)	
Model 3b: gender and education (controlling for age)				
<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
<i>p</i> -value	0.612	0.086	0.003	0.034
One-tailed <i>t</i> -test (<i>p</i>)	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
<i>p</i> -value	0.001	0.000	0.000	0.000
One-tailed <i>t</i> -test (<i>p</i>)	-2.2 (0.98)		0.5 (0.32)	
Model 3c: gender, education, and wealth (controlling for age)				
<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
<i>p</i> -value	0.634	0.079	0.003	0.034
One-tailed <i>t</i> -test (<i>p</i>)	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
<i>p</i> -value	0.002	0.000	0.000	0.000
One-tailed <i>t</i> -test (<i>p</i>)	-2.1 (0.98)		0.1 (0.48)	
<i>Coefficient wealth</i>				
	-0.05	-0.09	-0.08	-0.05
<i>p</i> -value	0.619	0.510	0.586	0.625
One-tailed <i>t</i> -test (<i>p</i>)	0.2 (0.41)		-0.2 (0.55)	
N	175	157	198	202

Source: Nepal Adolescent Project, 1999 baseline adolescent and household surveys and 2003 endline adolescent and household surveys.

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

small male advantage disappears, and the odds of males' knowing more are less than 1 (but not statistically significant). The disappearance of the male advantage from baseline to endline in the study site is statistically significant, however. By contrast, no significant gender differences are apparent at the baseline in the control site, but by the endline, 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 two modes of transmission (odds ratio, 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 has a very minor coefficient and is insignificant, suggesting that for knowledge of HIV transmission, education and gender, not wealth, are defining aspects of disadvantage.

Summary of Findings

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 the participatory approach, although generally more positive in its outcomes, is by no means a panacea. The overall evaluation of the study concluded that the participatory approach required significant investment of time and resources by both implementers and community. 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, Mehta, and Malhotra 2004). The broader conclusions are also reflected in our analysis, where we find that the participatory approach is usually, 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 the Nepal Adolescent Project make 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 by young people and in health outcomes among them. According to our analysis of these data, at least three important aspects of the greater effectiveness of the participatory approach were at work: (1) facilitating coproduction of services, (2) empowering youths and adults and increasing the accountability of service providers and policy makers to the community, and (3) increasing community demand for information and services.

1. **COPRODUCTION.** 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

showed more substantial improvement in the study sites. As one of the young men who participated in the study site interventions said in the end-line survey, in response to a question about where youths seek advice on love and marriage (a taboo subject in the community):

We don't go to the subhealth 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*)

2. EMPOWERMENT AND ACCOUNTABILITY. As a result of the active effort to impart information and build decision-making structures and coalitions, the participatory intervention was substantially more successful in empowering youths and adult community members and increasing the accountability of providers and policy makers to the communities. One factor was that the participatory structures (committees, task forces, and youth clubs) set up in the study sites 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 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 youths, study site*)

3. COMMUNITY DEMAND. Finally, in the study sites the greater focus not just on altering reproductive health outcomes but also on 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 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 marked by 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 of the demand for youth reproductive health services in the long run.

Limitations and Implications for Future Studies

Our study has limitations that need to be considered in designing future studies and analyses of this kind. One such limitation—or choice to be considered—is associated with conducting a micro household and community-based study versus a large, macro survey. Although 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. 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. But the community-based nature of the data did allow more in-depth, 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 the observed patterns of disadvantage and change.

As highlighted in this chapter, wealth, residence, education, caste, and gender are all important measures of disadvantage in the Nepali context. No single variable, however, 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 that was used succeeded in fully capturing the extent to

which groups with 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 not only includes wealth or asset ownership but also accounts for the other relevant factors contributing to disadvantage. Whether a combined index or separate measures of disadvantage should be used will depend on the question to be answered.

Another important point 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, the study employed a longitudinal study design in that we studied a cohort of young people over time, but we could not duplicate a true panel design by following the same individuals. Unfortunately, most recent studies of youth reproductive health issues in the developing world have found it difficult and practically impossible to overcome the challenges involved in setting up a true panel design (Magnani and others 2001).

Conclusions

The study results suggest that empowerment and accountability issues, which are considered essential for improving health for the poor, can be operationalized at multiple levels. Our work shows that in addition to macrolevel initiatives, smaller scale community-level efforts can be targeted to achieve these outcomes. In fact, macro policy efforts have much to learn from the participatory processes implemented at the 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 expand access to services by disadvantaged clients. As such, it adds significantly to the literature on the role of participation in diminishing the disadvantages faced by those who are worst off: poor, rural, uneducated, female clients.

Our results show that the participatory approach can provide clients, especially those who are disadvantaged, with choices and mechanisms for engaging 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 accountability of providers 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 power-

ful measure of disadvantage. Nonetheless, in many rural communities in the developing world the most disadvantaged owe their condition to complex and interwoven interactions between various contextual factors. To arrive at a full measure of disadvantage in any one community, these context-specific factors need to be fully considered. Beyond this, 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 need to be accompanied by analyses of rural-urban residence, gender, and educational access as important markers of social, cultural, and economic differentials.

Annex 11.1. Data and Methodology

See annex table 11.1.

Annex 11.2. 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 that ranked households by their asset score. We calculated asset indexes separately for baseline and endline. In addition to one overall baseline and one endline index, we created separate urban and rural indexes 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 that it does not indicate a particularly wealthy household. 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.⁹

Specifically, the overall and urban asset indexes take into account whether a household has a flush toilet, a pit toilet, a water source in the residence or yard, electricity, radio, black-and-white television, color television, telephone, bicycle, motorcycle, refrigerator, or car; whether a household owns its house; and whether a household owns any land, owns land in rural

Annex Table 11.1. *Data Sources, Samples, and Research Tools, Nepal Adolescent Project*

<i>Methodology</i>	<i>Baseline and formative research (January 1999–March 2000)</i>	<i>Endline (April to November 2003)</i>	<i>Monitoring and process documentation (November 2000–March 2003)</i>
Quantitative (study and control sites)	<ul style="list-style-type: none"> • Household survey, N = (965) • Adolescent survey, age 14–21, N = (724) • Adult survey, age 30+, N = (752) • Service provider survey, N = (59) 	<ul style="list-style-type: none"> • Household survey, N = (1,003) • Adolescent survey, age 14–25, N = (979) • Adult survey, age 30+, N = (654) • Service provider survey, N = (62) 	<ul style="list-style-type: none"> • Facilitator reports on participation in intervention activities (231) • Mystery client survey at midpoint and endpoint (48)
Qualitative (study and control sites)	<ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • Community mapping • Mobility mapping • Free listing and ranking • Lifelines • Body mapping • Reproductive health problem trees • Reproductive health service matrix 	5 participatory activities with 20 groups each: <ul style="list-style-type: none"> • Mobility mapping • Lifelines • Reproductive health problem trees • Reproductive health service matrix • Trend analysis 	67 community group assessments at midpoint and endpoint

areas (and if so, how much), or 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 component 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:

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

Notes

We would like to thank our U.S. and Nepal-based partners, the Andrew W. Mellon Foundation, EngenderHealth, New Era, and the BP Memorial Foundation, whose efforts and contributions made this work possible.

1. The two rural sites, located in the Terai, in Nawalparasi and Kwasoti Districts near the border with India, are about 80 kilometers apart and have about 200 households each. They were selected because they each have a secondary school, a range of health service providers, access to a main road, access to electricity, and at least one working NGO. They thus 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 selected, located about 20 kilometers apart and with about 300 households each, were drawn from middle-class suburbs on the outskirts of Kathmandu. They 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.

2. Because of 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, however, for the lagged cohort samples (ages 14–21 and 18–25), there is substantial overlap in the individuals in the sample from baseline to endline.

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

4. There is considerable debate on defining inequality in health (Alleyne, Casas, and Castillo-Salgado 2000; Gakidou, Murray, and Frenk 2000; Gwatkin 2000).

Although 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.

5. Although we were tracking a cohort of adolescents, the samples are likely to contain repeat observations of the same individual. These repeat observations, however, cannot be identified, and so we would not be able to correct for them as would be necessary for a pooled time-series analysis.

6. 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.

7. 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, largely because of the small sample sizes. The issue of sample selection was also problematic 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 toward the poorest.

8. As noted, because of the small sample size for institutional delivery, we use poor-nonpoor ratios rather than tertiles, quartiles, or quintiles.

9. In some cases, because of 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 cutoffs for urban and rural samples are available from the authors on request.

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