SOCIOECONOMIC AND REGIONAL DISPARITY IN THE UTILIZATION OF REPRODUCTIVE HEALTH SERVICES IN BANGLADESH

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Abstract

Although the health care system has significantly expanded in Bangladesh during the last two decades, the health status of the population has remained very poor because of the uneven distribution of services. Inequality in health exists in many forms and multiple dimensions such as age, sex, education, income, ethnicity, etc. Using data from a nationally representative sample, this study attempts to improve our understanding about the socioeconomic and regional disparity in the utilization of reproductive health services in Bangladesh.

Data for this study came from the demographic and health surveillance system of BRAC which provided the updated information of the ownership of household asset and the use of reproductive health services. Socioeconomic disparity was measured by constructing a wealth index using compound assets and possessions of a set of household wealth. The surveillance areas were categorized into four regions as urban slum, rural under-served, other rural and the hill tracts. The utilization of reproductive health services was measured by the use of ante and postnatal care, maternal immunization coverage, and the use of safe delivery. A total of 1,182 randomly selected women, who gave birth in 2001, were interviewed.

Findings revealed significant socioeconomic and regional differentials in the use of reproductive health services. The use of services was much lower among the extreme poor than the non-poor and among the ethnic minorities in the hill and rural under-served than the other regions. The region specific inequalities, which were greater than the socioeconomic inequalities, may be reduced by expanding outreach health programs to bring services closer to the disadvantaged. The study concludes that much of these inequalities are social constructs that can be reduced by prioritizing the needs of the disadvantaged and adopting appropriate policy change options.

Introduction

Equal opportunities for health are desirable goal in all societies. It is expected that everyone should have a fair chance to attain their full health potential and that none should be excluded from achieving this. Although the health status in most countries of the world has significantly improved over the past few decades, substantial inequalities in health outcomes among nations, socioeconomic groups and individuals have remained (Leon and Walt 2001). Improving the health of the poor and reducing health inequalities have become the central goals of many development programs (Wagstaff 2002). Four dimensions in health such as equal access to available care for equal need, equal utilization for equal need, equal quality of care for equal need, and equity in outcome are emphasized to promote health equity (Krasnik 1996).

Studies revealed that poverty and ill-health are intertwined (Wagstaff 2002) and that poverty and marginalization are the underlying causes of inequities in health (Evans et al. 2001). The health status of the poor requires to be understood by their social conditions including access to the basic needs and amenities like food, drinking water, housing, education, employment, transport and communication (Prasad 2000). The socioeconomic well-being of the poorer section of the community has deteriorated in many developing countries in relative terms because the rural poor were generally denied access to resources needed to them by which they could improve their own incomes and living conditions (World Bank 1993). The general process of economic growth which involves the increase in national income per capita may not necessarily promote health unless choices to be made on the priorities to be chosen (Sen 1999).

The poor and women are expected to suffer a greater burden of ill health than do the rest of the population particularly during pregnancy and childbirth. The need of the expansion of reproductive health services in developing countries has now been recognized than ever. More than 500,000 maternal deaths that occur every year of which a quarter to a third of all deaths is the result of complications of pregnancy (WHO 2000). The regional variation in reproductive health outcome is also very wide. More than 99% of maternal deaths occur in developing countries. A woman living in Africa has 200 times greater risk of dying from complications related to pregnancy than a woman living in an industrialized country (WHO 2000).

Although the poor faces the worse reproductive health outcome than others, poverty is not an insurmountable barrier to health if appropriate investment in health is made. There are many discriminatory policies in place in most developing countries. One major problem in reaching the poor women has been that most cost-effective interventions are not targeted to the poor but targeted at the very diseases from which the poor suffer disproportionately (Feachem 2000). Moreover, the rich receive more of subsidies than the poor and, as a result, the cost of health care deters poor from seeking care to a

greater extent than the rich (Wagstaff 2002). The distribution of public health services is unequal in many developing countries (Makinen et al. 2000). The use of health services with an illness or injury varies significantly by consumption quintiles and urban-rural differences (Baker and van der Gaag 1993).

Bangladesh is a poor country with nearly half (48%) of the population lived on the wrong side of the poverty line. The poor are vulnerable to illnesses by a combination of low levels of education and poor access to health services. Thus, regardless of the increase of access to primary health care in recent years, the poor continue to suffer from lack of access to services. The community-based non-formal education has been promoted in some countries to raise health information and reduce morbidity with marked improvement in health knowledge in many countries (Power 1996). Although the health care network has expanded in the rural areas of Bangladesh and the country has experienced significant health development over the past two decades, the overall livelihood situation of the poor women has changed very little.

The problems of health care system are deeply rooted in the society and their transformation requires major structural changes. Several attempts have been made to understand the equity issues in Bangladesh although, the questions to many issues have remained unanswered (Bhuiya et al. 2001; Chowdhury and Bhuiya 1999). Using longitudinal cohort data, they have shown the existence of gender and socioeconomic inequality in child survival, intra-household food distribution, child nutrition, family planning, literacy and family violence, and demonstrated how intervention programs have promoted equity in health. Both studies were conducted in a small geographic area with a very homogeneous population in Matlab and, thus, the other dimensions of inequalities such as urban-rural and regional differentials in health have not been addressed. The variation in reproductive health status has consistently been reported very wide and has never been uniform across the country (Mitra et al. 1997). This study attempts to improve our understanding about the socioeconomic and regional disparity in the utilization of reproductive health services in Bangladesh. Four domains of reproductive health services viz. antenatal and postnatal care, maternal immunization and safe delivery were considered in this study.

Materials and methods

Data source

Data for this study came from *Watch Project*,[1] the demographic and health surveillance system of BRAC covering more than 90,000 people living in 85 villages in ten rural areas, four urban clusters in a large metropolitan city and five ethnic clusters in the hill regions of Bangladesh where several NGOs had poverty reduction programs since 1990s. The surveillance areas of Watch Project were selected to become representative of the country. In each surveillance area, BRAC operates a field research station

to cover approximately 1,000 households in the neighbouring 6 to 8 villages. Two female and one male field investigators routinely visit all households each month and record relevant health and demographic information on the registers. The surveillance system provided updated sampling frame of all married women (aged <50 years) who had given birth in 2001. A systematic random sampling technique was followed to select sample women from the database. Data were collected by a team of women investigators who had professional training and experience in the survey research techniques. A structured questionnaire was used to collect detailed information of the socio-demographic characteristics of sample women, household wealth and use of reproductive health services. A total of 1,182 women were interviewed. Data were collected in April 2002.

Measuring household wealth index

Watch Project had updated information about the household ownership of wealth such as table, cot, quilt, watch. radio, television and cycle. In addition, information about housing characteristics, use of electricity, source of drinking water, etc. were also available in the database. The approach in developing the household wealth index for this study has been developed by Filmer and Pritchett (2000) who have shown that the wealth index performs as well as a more traditional measure such as household-size-adjusted consumption expenditures. Following this approach, a set of household level variables was identified to include in the construction of wealth index.[2] These were table, cot, quilt, watch, radio, television, cycle and electricity. Each of the variables was recoded into categorical dichotomous (yes-no) variable. A total of 8 dichotomous variables was created and standardized. The principal component analysis was run with all constructed variables with certain criteria. The component score coefficient matrix was multiplied by the standardized variables to produce factor scores which were termed as household wealth score. The wealth scores were classified into quintile for this research.

Definitions of the variables

The study focuses on the *utilization of reproductive health care*[3] as the outcome variable. Four aspects of reproductive health viz. the use of ante and postnatal care, maternal immunization coverage, and safe delivery were examined in this study. All married women who had given birth in 2001 were asked to report about the relevant health services they received. If a woman had routine health check-up in the third trimester and took (iron and vitamin) supplementation, she was considered to have antenatal care during pregnancy. On the other hand, a woman was considered received post-natal care if she was monitored at least once by a health professional within 4 weeks after delivery. Similarly, a woman was considered immunized if she had both doses of tetanus toxoid vaccines. If she delivered in the health clinic or hospital under the supervision of a physician or midwife, the delivery was considered safe.

The socioeconomic and regional disparity in the utilization of reproductive health services was assessed in this study where the main independent variables were wealth index and region of residence. The other variables were age and education of women and ownership of land. Based on the preliminary analysis, *age* of women was dichotomized as <30 and 30± years, *education* of women was coded as some or no education and *land ownership* was considered as continuous variable as decimals. *Region of residence*[4] was created from the widely dispersed and varied DSS sites. A total of four distinct regions such as hill, urban, traditionally under-served rural and other rural were identified based on certain criteria. The residents of the *hill region* in the south-east were primarily ethnic minorities who were very different than the mainstream population in terms of language, culture, religion, food habit and economic activities. The *urban* clusters consisted of urban poor and lower middle class in the city of Dhaka. *Traditionally under-served areas* included remote and inaccessible, and traditionally conservative villages where the public services were always found poor. The *other rural* sites were largely representative rural communities in Bangladesh.

Findings

Profile of sample women

The differences in socio-demographic characteristics of sample women by the region of residence are shown in Table 1. More than a third (35.7%) of the women was relatively younger with the mean age of nearly 28 years. The proportion of younger women were much larger in the hill and traditionally underserved regions compared to the urban and other rural regions. Illiteracy among women was widespread in the study areas as only 44.8% sample women could read and write. Literacy rate was significantly lower among the ethnic minorities in the hill compared to the other regions. Only 36% of the households had some kind of agricultural land. The mean ownership of land was only 1.6 hectares. As expected, the urban households had no farm land while the land ownership was highest in the hill regions. In summary, the socio-economic characteristics of sample women differ significantly by the region of residence.

Table 1 here

Socio-demographic factors and the health services use

The utilization of all four components of reproductive health services was shown in Figure 1. About 36.5% pregnant women had received antenatal care while only half (18.2%) of them had accessed postnatal care. The maternal immunization coverage appeared to be very high (76.3%) compared to only

63.7% at the national average in 2000 (Mitra et al. 2001). The use of health facility such as hospital or clinic for the delivery, on the other hand, was only 4.1% compared to nearly 7.9% at the national level (Mitra et al. 2001).

Figure 1 here

Table 2 shows the role of socioeconomic factors on the use of reproductive health services. Unlike other studies (Swenson et al. 1993), age of women appeared to have negative association with reproductive health service use although the relationships were not significant (at $p<.05$) for the hospital delivery and postnatal care. Negative association of maternal immunization and hospital delivery with age was also apparent in other studies as well (Magadi, Madise and Rodrigues 2000; Mitra et al. 2001). Education was more likely to positively influence the use of health care (Swenson et al. 1993; Kutzin 2001; Mitra et al. 2001). Education of women, not only greatly strengthened their ability to understand the options available to them and modified their individual attitudes to seek care when in need but also increased their ability to make good use of health services (World Bank 1993; Cook and Fathalla 1996). Like education, land ownership was positively associated with the utilization of reproductive health services although the relationship was not statistically significant except for maternal immunization.

Table 2 here

Economic and regional disparity in the use of services
The socioeconomic and regional disparity in the use of reproductive health was very wide (Table 3). The use of services in all four components significantly ($p<.01$) increased with the increase of household wealth. The differences in the utilization of reproductive health care by wealth index indicate that the extreme poor were significantly less likely to use antenatal health services than the moderate and other less poor. The picture was nearly similar for the case of postnatal care. The delivery in the hospital was nearly 8 times higher among the least than the extreme poor. This finding was consistent with other studies where the safe delivery rate was about 16.5 times higher among the rich than the poor (Gwatkin et al. 2000). About 82% of the least poor women were immunized during pregnancy compared with only 59% of the extreme poor women. The least poor – extreme poor inequality was less pronounced in TT coverage compared to the use of other reproductive health services.

Table 3 here

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The disparity in the utilization of reproductive health care by the region of residence was also very wide which might be related to regional differences in access to services (Swenson et al. 1993). Overall, the coverage of services was lowest among the ethnic communities in the hill than other three regions except for the use of postnatal care. The women in the rural underserved region had limited access because of the unavailability of the services and, thus, the utilization was poorer than other rural and urban regions. The women living in 'other rural' regions had better access than others in receiving antenatal care. As found elsewhere (Mitra et al. 2001), the use of tetanus toxoid during pregnancy and delivery in the hospital was much higher in the urban (8.3%) than other regions probably because of the better hospital facilities in the urban region.

Figure 2 here

Figure 2 shows that nearly 80% received at least one kind of reproductive health services. As expected, the coverage systematically reduced with the number of services. Only 2% women received all four types of reproductive health services in the study areas.

Table 4 here

Table 4 shows the variation in the use of the number of health services received by wealth index and the region of residence. Although nearly 80% received at least one service (Figure 2), the proportion of women received at least one service was only 62.2% among the extreme poor. The use of services increased with the reduction of poverty level although the service utilization was reduced slightly among the least poor who received at least one service. Relatively lower coverage of maternal immunization among the least poor (Table 3) appeared to be responsible for such unusual pattern of services. Among those who received at least two services, the coverage was positively associated with wealth index. When the coverage among extreme and least poor women were compared, the ratio was found to systematically increase with the number of services. Overall pattern of the use of services among the wealth quintiles indicates that wealthier groups have used health services more often when they need it compared to the poorer groups (Makinen et al. 2000).

As found earlier, women living in 'other rural' region had highest coverage among those who received at least one service while women living in the hill region were more deprived. This ratio varied significantly with the increase of the number of services. Among those who received three or more services, the coverage was highest in the urban region probably because of wider use of hospital delivery

and post-natal care in the urban center. Overall, the reduction of coverage with the increase of the number of services was least among urban followed by the women of 'other rural' regions.

Discussion

This study provides two important findings: the use of reproductive health services was largely inadequate at the aggregate level and significant health sector inequality exists in Bangladesh. Although it is not certain whether the increased access to and the availability of services would lead to increased utilization of services among the poor and disadvantaged (Magadi, Madise and Rodrigues 2000), there were evidences which suggested that unavailability of health services not only reduced the coverage of services but also forced many women to seek alternative health care providers not acceptable by any standard (Whitehead et al. 2001). As found elsewhere, this study also shows that education of women not only raised their ability to understand the need of seeking care during pregnancy but also increased their ability to make good use of services (World Bank 1993). The socioeconomic and regional disparity in the use of reproductive health services was very wide and the poor women living in the under-served region suffered a greater burden than others during pregnancy and post-natal period (Magadi, Madise and Rodrigues 2000; Dowan and Brewster 1998).

Although reproductive health services were expanded in the last two decades, it did not promote health equity because the services were available largely to urban centers. As a result, the use of reproductive health services has remained very low among the poor particularly among the ethnic minorities in the hills and under-served rural regions. Even in the urban and better-served rural areas, the poor-nonpoor disparity has continued to exist because the health services were not designed for the poor (Hadi, Nath and Chowdhury 2001).

Among the services, the coverage of maternal immunization was quite high compared to other components of reproductive health care although socioeconomic and regional differences in maternal immunization were also large. The high maternal immunization coverage indicates that reaching a larger group of pregnant women for other services was quite possible within the existing provision of MCH services. The use of post-natal services was about a half of that of the antenatal health services. While relatively poor showing during post-natal period was consistent with other studies (Mitra et al. 2001), this was not the case in the hill region. Although both the ante and post-natal health services were quite low in this group of ethnic minorities, a relatively better system of follow-up of pregnant women after delivery made it possible there to reduce the gap of coverage between the ante and post-natal services. The study clearly identifies the need of institutional delivery services particularly for the complicated

pregnancies. The highest coverage of hospital delivery among the urban poor reflects the notion that the access to institutional delivery would raise the use of such services among the poor in other areas as well.

Disparity in enjoying public goods such as health care has never been new in Bangladesh. What is new is the recognition that closing the health gap would help reaching the desired social goals. Gender and socioeconomic inequality in health care have received considerable attention in recent literature (Chowdhury and Bhuiya 1999; Bhuiya et al. 2001) although very few studies have focused on the disparities at the regional perspectives. This study has attempted to look this issue at the wider perspective and demonstrated that the regional differences in the use of health services, in some cases, were greater than the socioeconomic disparities.

Bangladesh continues to face a formidable challenge in the improvement of health of the poor. In a society where incomes of the poor are too low to buy a minimum essential package, the provision should be developed to provide essential health services according to a sliding scale of fees for easily identified subgroups of the population. The health need of the poor should be recognized and health interventions should be tailored to match the specific livelihood strategies of poor households. The distribution of health resources should focus not only on the size of the population but also on the burden of diseases (Whitehead et al. 2001). As a short-term policy measure, targeted health interventions may produce desired outcomes. There are evidences which suggest that targeted approach has the potential to significantly raise access to health services in Bangladesh (Chowdhury and Bhuiya 1999; Hadi, Nath and Chowdhury 2001).

Since the focus of the health program should be equitable health development, the current health system should include pro poor health components in it. An essential element of this strategy should be the sensitization of the community about the benefits of this approach, inclusion of the poor in decision making and raising access of the poor to basic health resources and services. As have seen, the health outcomes vary according to socioeconomic categories, the proposed system needs to move beyond the one-size-fits-all model of health care. In other words, the health care for the poor should not only be subsidized but the mode of services must be appropriate to reach them. The policy options to improve maternal health should also include testing new initiatives and systemic interventions that would help designing the most effective intervention models for the poor and disadvantaged. Health development can only be ensured by enhancing the lives of women and by providing them freedom (Sen 1999). The poor women in Bangladesh should be given that freedom to avoid ill-health during pregnancy and escapable maternal mortality.

The long-term policy options must incorporate several other issues including expansion of health program to the under-served regions, behavioral change issues through adult education among relatively older women and ensuring the availability of trained birth attendants for safe delivery. The region

specific inequality may be reduced by the expansion of outreach health programs to bring services closer to the disadvantaged. Among other alternatives, re-allocation of health resources to reduce regional gaps and the promotion of health services for the ethnic minorities and the outreach may be a viable option. The study argues for the development of new approaches which will prioritize the needs of the poorest and most disadvantaged. The reduction of the health inequality can be achieved by adopting targeted health delivery strategy to ensure that the very poor get access to reproductive health services. The study concludes that expanded pro-poor health development program can significantly improve the access to and the utilization of health services among the disadvantaged in developing countries.

Endnotes

1. *Watch Project* is the demographic and health surveillance system of BRAC covering more than 90,000 people living in 85 villages in ten rural areas, four urban clusters in a large metropolitan city and five ethnic clusters in the hill regions of Bangladesh. The surveillance system is considered representative of Bangladesh.

2. Steps to produce the wealth index: The socioeconomic information for each household of Watch Project areas were updated. A set of household level variables was identified to include in the construction of wealth index. These were table, cot, quilt, watch. radio, television, cycle and electricity. Each of the variables was recoded into categorical dichotomous (yes-no) variable. Thus, we created eight dichotomous variables. All variables were then standardized. The principal component analysis (factor analysis) was run with all constructed variables with the criteria as follows: only one factor to be produced, no rotation, principal components extraction, factor score to be calculated with regression method and print only component score coefficient matrix. The component score coefficient matrix was multiplied by the standardized (sampling weight) variables to produce factor scores which were termed as household wealth scores. The *household wealth* scores were classified into quintiles for this research.

3. Utilization of reproductive health services was measured by four indicators such as a) the use of antenatal and b) post-natal care, c) immunization coverage during pregnancy and d) delivery in the hospital. *Antenatal care* included participation of pregnant women in health education sessions, routine health check-up by a medically trained professional, monitoring weight gain, identification of danger signs, intake of iron tablets, vitamin and nutrition supplementation if needed and the use of emergency services for the complicated cases. If a woman had routine health check-up in the third trimester and took (iron and vitamin) supplementation, she was considered to have received antenatal care during pregnancy. *Post-natal care* covered follow-up visits by a medically trained professional, education on breastfeeding, food supplementation, counseling and post-partum period, growth monitoring and immunization for the newborn. If a woman was monitored at least once by a health professional within 4 weeks after delivery, she was considered to have received postnatal care in this study. The women were expected to receive two doses of tetanus toxoid (TT) during pregnancy. A woman was considered *immunized* if she had both doses of tetanus toxoid vaccines. When the newborn was delivered in a health clinic or *hospital,* the delivery was considered safe.

4. Region of residence: Watch Project coverage was expanded in 2002 to include ethnic minorities in the southeastern hill district of Bandarban, and urban poor and lower middle classes in the city of Dhaka. The ethnic minorities in the hill region were very different than the mainstream population in terms of language, culture, religion, food habit and economic activities. The urban clusters consisted of the lower classes and, therefore, not representative of urban population in general. Among the 10 rural sites covered by the *Watch Project*, two sites were located in the remote haor (riverine low land) and, as a result, were very inaccessible to the public facilities. Another two sites were located in traditionally conservative districts where the health services for women were consistently low and always found neglected (Mitra et al. 1997). These four sites constituted the traditionally under-served regions in this study. The remaining six rural sites were considered average and largely represented the rural communities of Bangladesh. Watch Project sites were, therefore, categorized into four regions such as hill, urban, rural under-served and other rural areas.

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Table 1. Profile of sample women by region of residence

Study Variable	Region				All
	Hill [a]	Urban [b]	Rural-1 [c]	Rural-2 [d]	
Age ≤30 years	41.7	27.4	43.6	27.4	35.7
Mean age (years)	30	28	30	27	28
Literacy rate	21.7	48.8	45.7	48.7	44.8
Land ownership	53.9	---	33.5	40.4	35.9
Mean amount of land (hec)	4.9	---	1.2	1.4	1.6
N	115	84	505	478	1182

[a] The residents of the hill region in the south east are primarily ethnic minorities.
[b] Urban samples include only the lower middle class and slum dwellers.
[c] Rural-1 represents the traditionally underserved and remote rural areas.
[d] Rural-2 represents other rural areas.

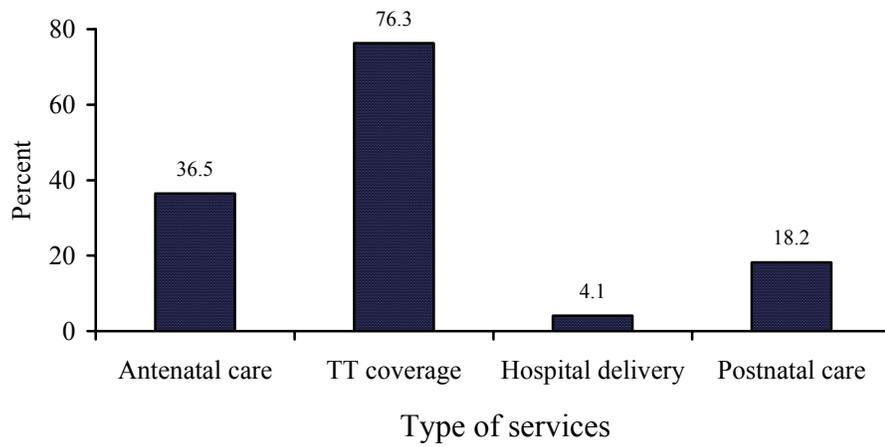Figure 1. Utilization of reproductive health services by type

Table 2. Utilization of reproductive health services by socioeconomic factors

Socio-demographic factors	Reproductive health services				
	Received ANC	TT coverage	Delivery in hospital	Received PNC	N
Age of women (years)					
≤ 30	40.8	79.1	4.5	19.1	422
30 +	28.9	71.3	3.3	16.6	760
P	.001	.003	.203	.287	
Education of women					
No education	26.5	71.0	2.3	13.2	652
Educated	48.9	82.8	6.2	24.3	530
P	.001	.001	.001	.001	
Land ownership (hectare)					
Landless	35.1	73.9	3.6	17.0	758
Land owner	39.2	80.7	5.0	20.3	424
P	.165	.009	.947	.163	

P-values are tests of heterogeneity.

Table 3. Utilization of reproductive health services by wealth index and region of residence

Wealth index and region	Reproductive health services				
	Received ANC	TT coverage	Delivery in hospital	Received PNC	N
Wealth index					
Extreme poor	15.7	59.0	1.2	7.2	249
2	33.2	76.4	3.1	15.3	229
3	29.5	78.4	2.1	15.8	190
4	49.4	86.1	4.2	25.5	259
Least poor	52.2	81.6	9.0	25.9	255
P[a]	.001	.001	.001	.001	
Region					
Hill tracts	22.6	51.3	2.6	22.6	115
Urban	39.3	61.9	8.3	14.3	84
Rural underserved	27.3	68.7	2.6	17.0	505
Other rural	49.2	92.9	5.2	19.0	478
P[b]	.001	.001	.042	.386	

[a] P-values are tests of trend.
[b] P-values are tests of heterogeneity.

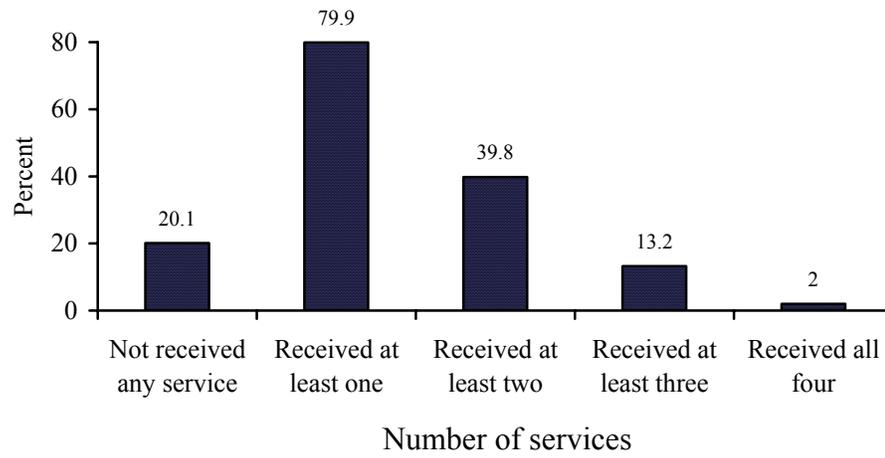Figure 2. Use of reproductive health by the number of services

Table 4. Use of the number of reproductive health services by wealth index and region of residence

Wealth index and region	Not received	Received at least			
		1	2	3	4
Wealth index					
Extreme poor	37.8	62.2	16.8	3.9	0.4
2	19.7	80.4	35.3	10.4	0.9
3	19.5	80.5	34.7	9.4	1.1
4	9.7	90.3	54.4	17.3	2.7
Least poor	14.1	85.9	55.3	23.5	4.7
P		.001	.001	.001	
Region					
Hill tracts	40.0	60.0	24.3	13.9	1.7
Urban	35.7	64.3	40.5	16.7	3.6
Rural underserved	27.3	72.7	32.1	9.7	1.6
Other rural	4.8	95.2	51.7	16.3	2.3
P		.001	.001	.001	

[a] P-values are tests of trend.
[b] P-values are tests of heterogeneity.