Health Systems and Infectious Diseases Surveillance System Report, 2002-2003

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The opinion expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Agency for International Development.

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Summary

This report presents a description and analysis of some of the data collected by the Health Systems and Infectious Diseases Surveillance System (HSIDSS) during 2002 and 2003. Compared to the 2000-2001 report, more data on which the figures are based have been included in the annexes. Other detailed data can be obtained, on certain conditions, from the Surveillance and Data Resources Unit. The HSIDSS collects a wide variety of data from the surveyed population. In addition to providing the most important indicators, this report should give researchers an overview of the surveillance data available. It is not intended to be an exhaustive source of data. Like the previous edition, this report will be published simultaneously in printed and electronic form.

The average household size fell from 5.1 in 2002 to 4.8 persons in 2003. The figure for the latter year, however, includes urban Kamalapur, where the size was 4.6 and which was not included in 2002. If the same area of 2002 is compared with 2003, the figure for 2003 comes to 5.0, a slight decline. This decline was caused by the Mirsarai surveillance site, which has the highest average household size, where the average household fell from 5.5 in 2002, which was also the average in 2001, to 5.4 in 2003. In Abhoynagar/Keshobpur the average remained the same in 2002 and 2003 at 4.6 persons per household, slightly down from the 4.7 in 2001.

Compared to 2000-2001, the mortality did not show a clear trend in the rural areas. Life expectancy at birth for males in Mirsarai and females in Abhoynagar/ Keshobpur increased between 2000-2001 and 2002-2003, while that of females in Mirsarai and males in Abhoynagar/Keshobpur decreased in the same period.

The total fertility rates for the different surveillances areas were not very different from 2001. It rose in Abhoynagar/Keshobpur from 2.5 to 2.6 in 2002, to fall back to 2.4 in 2003. In Mirsarai it fell from 2.9 in 2001 to 2.8 in 2002 and 2.7 in 2003.

The mean age at first marriage for men in the rural areas was lower than the 26.1 years of 2001: 25.1 in 2002 and 25.3 in 2003. For women it remained almost the same, 19.1 in 2001, 19.2 in 2002 and 19.1 years in 2003. The mean age at first marriage in the new urban surveillance site of Kamalapur in 2003 was 25.8 years for men and 19.3 years for women, higher than in the former urban surveillance sites in 2000, where it was 23.6 and 18.6, respectively.

Contraceptive prevalence was highest in Abhoynagar and lowest in Mirsarai, not much different from 2001.

Vaccination coverage was high or very high in all areas, except for tetanus toxoid vaccinations for women of reproductive age in all areas. The latter has improved, however, compared to 2001.

Health spending was much higher in Mirsarai than in the other surveillance areas.

For the first time there is a chapter on education. During the last 10 years the education of girls has improved compared to that of boys. However, Mirsarai is performing less well compared with the other rural sites and even showed a decline in the proportions of boys completing primary and secondary education.

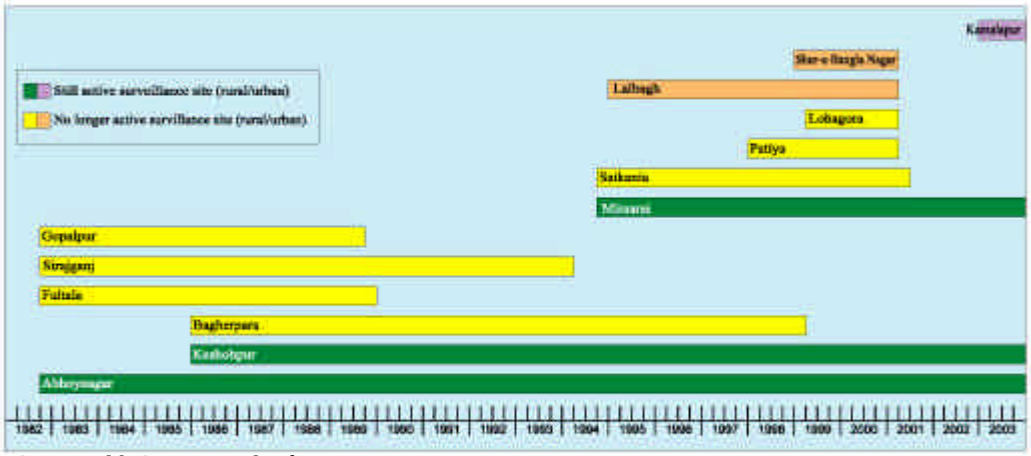
This edition's special feature chapter looks at the influence of the gender composition of the living children on the fertility of the mother. It includes not only data of the HSID surveillance sites, but also of Matlab.

Introduction

The surveillance systems of the former rural and urban extension projects of ICDDR,B: Centre for Health and Population Research were merged in 1997 to form a single longitudinal demographic and programmatic surveillance system, known then as the Operations Research Project (ORP) Surveillance System. The Family Health Research Project (FHRP) replaced the Operations Research Project in 2001. The surveillance was considerably scaled down, as shown in Figure 1. Since then, the support of FHRP has been reduced. The surveillance is now mostly funded by ICDDR,B core funds and by the different protocols taking place in the areas. For this reason, the name was changed to Health Systems and Infectious Diseases (HSID) Surveillance Sites. This report covers the calendar years 2002 and 2003.

The ORP demographic and programmatic surveillance was set up in 1982 under the title of Sample Registration System (SRS). Since then additional field sites have been incorporated into the system and others discontinued to meet the requirements of the interventions carried out at ORP field sites as shown by Figure 1, a graphical presentation of the addition and phase out of field sites under demographic and programmatic surveillance during the 1982-2003 period.

Fig. 1. Surveillance areas of SRS, ORP, FHRP and HSID between 1982 and 2003



HSID=Health Systems and Infectious Diseases Division
FHRP=Family Health Research Project
ORP=Operations Research Project
SRS=Sample Registration System

In 2003 demographic surveillance was started in Kamalapur, a mostly slum area in Dhaka. This replaces the urban surveillance in Lalbagh and Sher-e-Bangla Nagar, which was stopped in 2001. Among samples of the population of this area intensive surveillance for vaccine studies and specific diseases was already taking place, now an annual demographic surveillance of the whole population has been added.

The collection of data is the same in all other areas: four times a year, once in each quarter, Field Research Assistants visit all households, which are included in the sample, and collect the demographic, health and programmatic data. Each quarterly cycle of data collection is called a round. In the predominantly rural areas a stratified two-stage sampling design is used. From each stratum, unions were randomly selected, and households served as the second stage-sampling units. The sampling fraction was designed in such a way that each household had an equal probability of selection. A systematic random-sampling technique was applied to select the sample households. The sampling fractions include every sixth household in the Abhoynagar and Keshobpur field sites of Jessore district and every fourth household in the Mirsarai field site of Chittagong district.

No sampling takes place in urban Kamalapur, as all the household of this area are included in the surveillance.

Although the intervention and comparison sites have shifted over the years, the primary objectives of the surveillance system remain the same over the period. The overall objectives are:

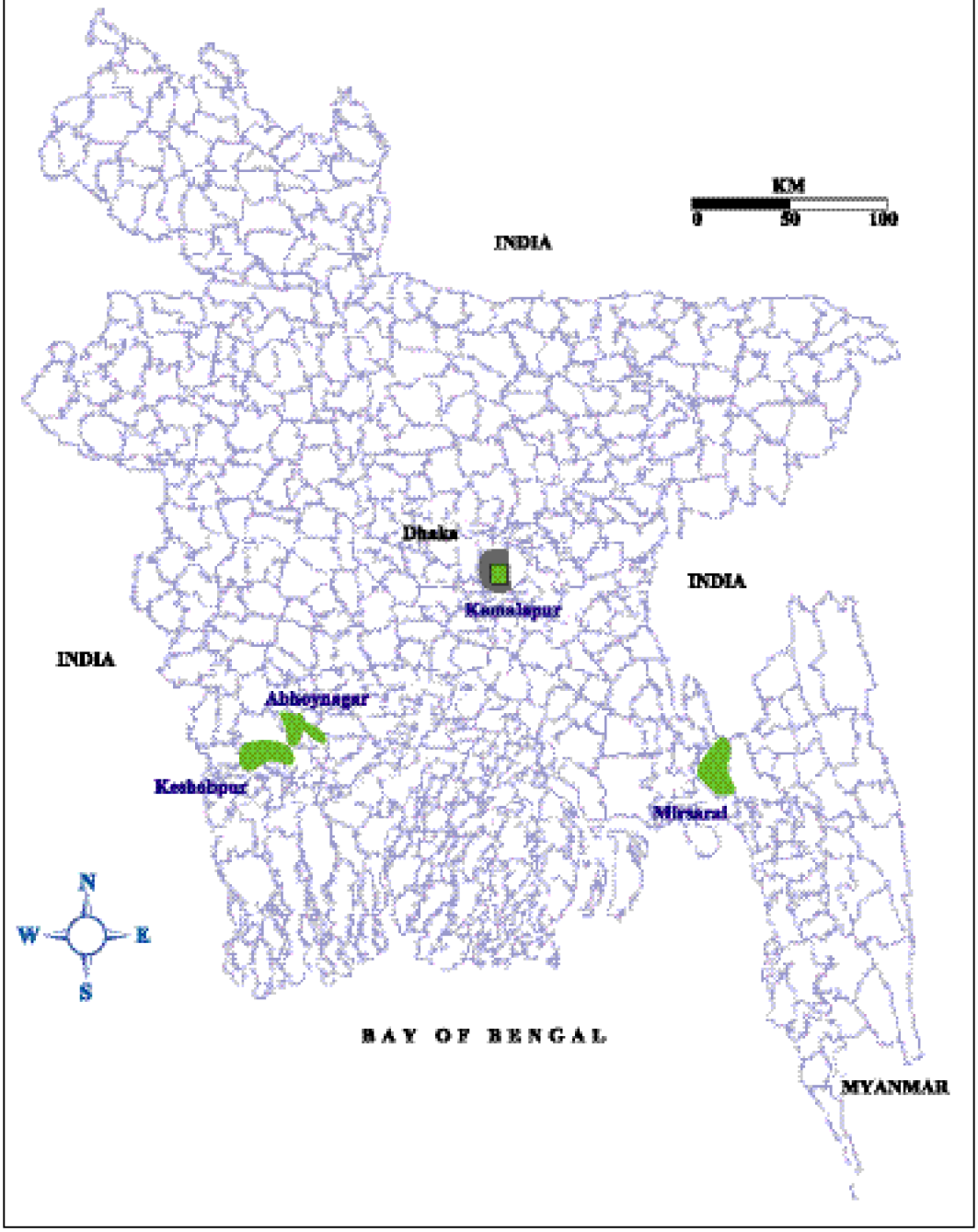
1. to monitor the services provided through the field workers of the Ministry of Health and Family Welfare, Government of Bangladesh, and particularly non-governmental organisations (NGOs) in urban areas;
2. to provide feedback to the project management;
3. to review findings and recommend changes affecting the health and population policy; and
4. to assist in evaluating the demographic and programmatic impacts of those services and policies.

Field activities no longer distinguish between intervention and comparison areas, now interventions may take place in part of the comparison areas, while part of intervention areas may be used for comparison. The term comparison area will, therefore, no longer be used.

Active areas

Figure 2 shows a map with the surveillance areas that were active in 2002 and 2003. Table 1 shows selected key figures for the surveillance sites for the fourth quarters of 2002 and

Fig. 2. Surveillance sites of HSID, which were active in 2002 and 2003



2003. The former urban field sites in Dhaka, Sher-e-Bangla Nagar and Lalbagh, where surveillance has been stopped, were replaced by surveillance activities in Kamalapur. In addition to demographic information collected as part of the disease surveillance, there will be full demographic surveillance of all people living in the field site, around 200,000. This will make it easier to follow households that frequently move between different locations in the area, which is common. To cover such a large population, the frequency of surveillance will be reduced to once a year, with more frequent surveillance of sub-samples continuing. Various problems during the initial surveillance round in 2003 caused a serious undercount of the population in Kamalapur. These problems included difficulties to enumerate households, where all members were working during the day. As the surveillance staff was female, it was difficult for them to enumerate after dark. These problems will be addressed in future surveillance rounds. The undercount can be attributed almost completely to the blocks in Kamalapur, which are not part of the sub-sample where disease surveillance is taking place.

Table 1. Sample households, male and female population, currently married women of reproductive age, children aged less than five years, and average household size at the last surveillance round* by field site, rural and urban, and year

	Field sites	Households		Population				Currently married women of re-productive age		Children aged less than 5 years		Average household size	
				Male		Femlae							
		2002	2003	2002	2003	2002	2003	2002	2003	2002	2003	2002	2003
Rural	Abhoynagar	4,742	4,864	11,363	11,500	10,957	11,121	4,652	4,780	2,388	2,409	4.7	4.7
	Keshobpur	2,186	2,232	5,057	5,137	4,815	4,917	2,105	2,165	1006	1030	4.5	4.5
	Abhoynagar and Keshobpur	6,928	7,096	16,420	16,637	15,772	16,038	6,757	6,945	3,394	3,439	4.6	4.6
	Mirsarai	7,044	7,262	18,522	18,752	19,896	20,205	6,528	6,825	4,208	4,345	5.5	5.4
	All Rural	13,972	14,358	34,942	35,389	35,668	36,243	13,285	13,770	7,602	7,784	5.1	5.0
Urban	Kamalapur		23,688		55,498		53,749		23,605		14,128		4.6
Total		13,972	38,046	34,942	90,887	35,668	89,992	13,285	37,375	7,602	21,912	5.1	4.8

* This is the October to December round for rural areas; the round in Kamalapur took place from March to June 2003

In 1997, the semi-urban part of Abhoynagar became a municipality. This affects three Unions: Noapara, after which the municipality is named, Prembagh and Rajghat. Respectively, two-thirds, one quarter, and half of the households of these unions are under

the municipality. Of the municipal unions, surveillance only takes place in Rajghat. Almost half of its surveyed population is under the municipality. As this is less than a tenth of the surveyed population in Abhoynagar and the number too small to be treated separately, we have considered in this report that the population of Abhoynagar is rural.

The average household size for the rural surveillance areas decreased slightly or remained the same between 2002 and 2003, the average rural household size fell from 5.1 to 5.0 persons per household. This is similar to the trend in 2000 and 2001; all rural sites had in 2003 a smaller average household size than in 2000.

Demographic Results

Age distribution

Figures 3 and 4 show the average age and gender distribution for the rural surveillance sites in 2002-2003. Figure 5 shows the distribution of the enumerated population of the initial surveillance round in Kamalapur. The underlying data of these figures are shown in Annexes 1, 2 and 3.

Both the rural pyramids show that the fertility was much higher more than 15 to 20 years ago and that has been falling since, resulting in the age group 15 to 19 being the most numerous. Both also have fewer males in this age group than females, probably a result from labour migration. Here the similarities stop; the pyramid of Abhoynagar and Keshobpur is quite regular above that age. The one from Mirsarai, however, shows a clear deficit between that age group and around 40, more pronounced for men than for women, indicating an important out-migration. The wider shape of the pyramid of Mirsarai shows that fertility was much higher in this area, while the contracting base indicates a continuing reduction in fertility. Abhoynagar and Keshobpur had a fertility reduction for around 15 years, since then the fertility has remained the same.

Kamalapur has more women between ages 10 and 29 years than men. This suggests either a strong out-migration of men in these age groups, an in-migration of young women or a combination of both. Possible causes of immigration of young women could be the garment industry, which attracts many young rural women. Departure of many young men may be caused by large numbers seeking employment abroad, while also men being posted in the rural areas may leave their family behind in Dhaka. The wide base of the pyramid below 40 years suggests that immigration of persons under that age has been stronger than emigration. Although the urban surveillance has shifted to Kamalapur from Sher-e-Bangla Nagar and Lalbagh since the previous surveillance report, the urban population pyramids of both reports show remarkable similarities.

Fig. 3. Population pyramid by average population of the Abhoynagar and Keshobpur surveillance sites in 2002-2003

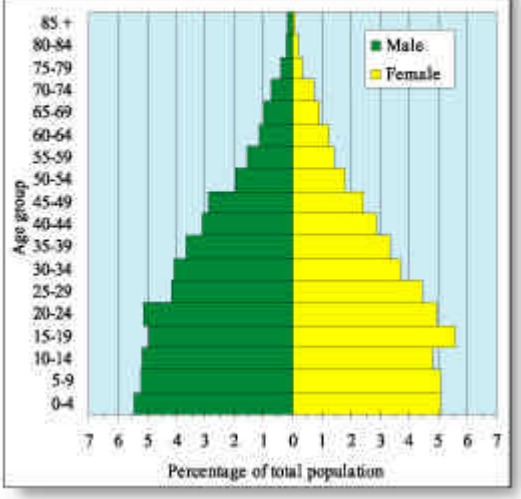
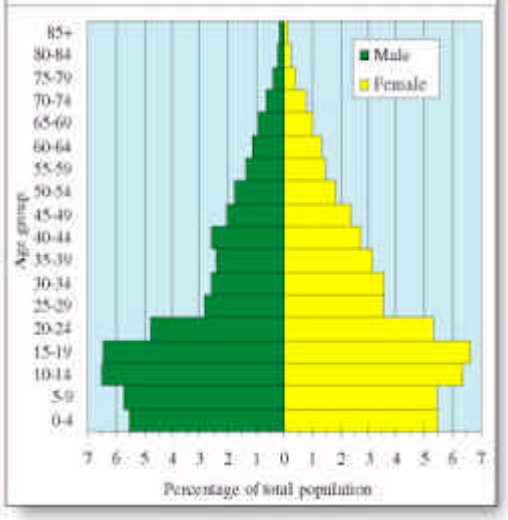


Fig.4. Population pyramid by average population of the Mirsarai surveillance site in 2002-2003

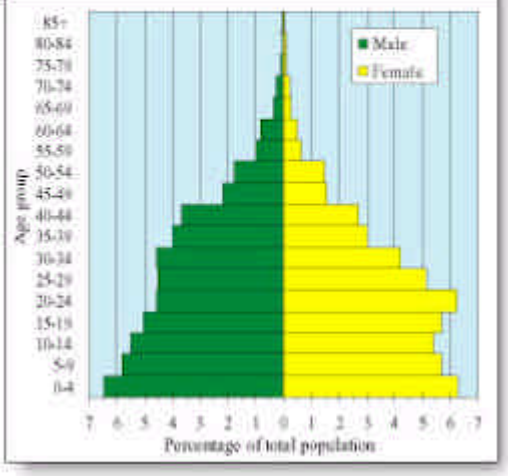


The presence of many women of reproductive age in the urban field site is the reason for a larger proportion of young children compared with the rural areas, despite a generally lower fertility in urban areas. Another striking feature of the pyramid for the urban population is that the elderly are far less numerous. There are two probable explanations:

1. Most inhabitants of the urban surveillance sites are people who migrated as young adults to Dhaka. As most people migrated in the last forty years, there are relatively few elderly yet.

2. Many people still have their roots in their villages and return there when they are old.

Fig. 5. Population pyramid of Kamalapur by population during initial surveillance round in 2003



Further research is needed to determine the factors affecting the size of the elderly population.

Mortality

Table 2 shows the crude death rates (deaths per 1,000 person-years lived) of the rural sites by gender and year[1]. No mortality data are available yet for Kamalapur.

Table 2. Crude death rates per thousand person-years by gender and rural surveillance area

Surveillance area	Crude death rates					
	Male		Female		Total	
	2002	2003	2002	2003	2002	2003
Abhoynagar	6.7	6.9	5.4	5.8	6.1	6.4
Keshobpur	5.4	3.9	5.8	5.2	5.6	4.5
Abhoynagar and Keshobpur	6.3	6.0	5.5	5.6	5.9	5.8
Mirsarai	7.5	9.5	5.9	6.9	6.7	8.2
All rural	6.9	7.9	5.7	6.3	6.3	7.1

Crude death rates are sensitive to the age composition of the population. Another mortality measure, life expectancy at birth[2], overcomes this disadvantage. However, as this measure is based on the mortality at different ages, it is impractical to use for small populations. Therefore, life expectancies for Abhoynagar and Keshobpur have not been shown separately and pairs of years have been combined. Still, the fluctuations seem quite large. One has to take into account, however, that deaths are far more rare than births. Also, life expectancies may be slightly higher than actual as there is a tendency to overstate the age of death of the elderly. Table 3 gives the life expectancies for the present rural surveillance areas for this reporting period (2002-2003) and the previous one (2000-2001). The life expectancies for both sexes in Abhoynagar and Keshobpur, and for females in Mirsarai are around 70 years, while that for men in Mirsarai is about five years

Table 3. Life expectancy at birth in years by gender and rural surveillance area

Surveillance area	Life expectancy at birth			
	2000-2001		2002-2003	
	Male	Female	Male	Female
Abhoynagar and Keshobpur	72.3	68.9	68.8	70.7
Mirsarai	63.6	70.1	64.7	69.2

[1] Note that the sites vary in size and the smaller ones are more sensitive to random fluctuations than the larger ones.

[2] Life expectancy is used here as a measure of annual mortality and, therefore, based on the mortality experienced during the year; yearly fluctuations in mortality, caused by, for example, bad harvests or epidemics, may result in important changes of the life expectancy measured in this way.

less. Further research should consider the reasons for the comparatively low life expectancy among males in Mirsarai.

Figure 6 shows the theoretical survivors from 100,000 births up to 85 years old, if they experienced during their life the same mortality pattern as observed in 2002-2003. Separate graphs by gender are shown for the combined rural field sites Abhoynagar and Keshobpur and for Mirsarai.

The graph shows Mirsarai males have a smaller chance to survive to all ages, than the other three groups, whose curves are close together. Also here, the high proportions surviving until an advanced age seem to suggest an overstatement of higher ages. The abridged live tables on which this figure is based are shown in Annexes 3 and 4.

Fig. 6. Life table survivors from 100,000 births by rural surveillance area and gender according to the combined 2002 and 2003 mortality

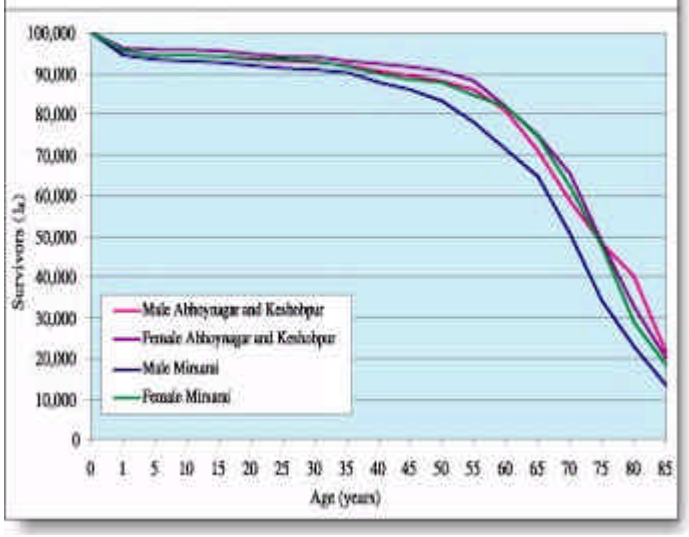


Table 4 shows infant death rates (deaths of children less than one year old per thousand live births during the year) and child death rates (deaths of children aged one to four years per thousand persons-years lived by the population aged one to four during the year) by gender and rural surveillance area. The infant death rates

Table 4. Infant (before first birthday) death rates per 1,000 live births and child (from first to before fifth birthday) death rates per 1,000 person-years by gender and rural surveillance area

Surveillance area	Infant death rates						Child death rates					
	Male		Female		Total		Male		Female		Total	
	2002	2003	2002	2003	2002	2003	2002	2003	2002	2003	2002	2003
Abhoynagar	42.2	60.4	27.6	50.4	35.6	55.7	4.2	3.1	1.1	0.0	2.7	1.6
Keshobpur	27.0	32.8	28.3	43.1	27.7	37.8	2.5	0.0	5.1	0.0	3.8	0.0
Abhoynagar and Keshobpur	38.2	51.7	27.8	48.0	33.4	49.9	3.7	2.2	2.4	0.0	3.1	1.1
Mirsarai	48.3	61.6	37.5	53.3	43.1	57.4	3.0	4.1	1.8	3.0	2.4	3.6
All rural	43.6	57.1	33.2	51.3	38.6	54.1	3.3	3.2	2.1	1.7	2.7	2.5

of Abhoynagar and Keshobpur are lower than those of Mirsarai. The number of child deaths is so small that no clear patterns are obvious in the child death rates. The only conclusion that may be drawn is that the child mortality is very low in comparison with the infant mortality, despite children spending up to four years in the age group. The actual risk of dying during these ages is about four times the annual death rate for this group.

Table 5 illustrates the breakdown of infant death rates into neonatal (deaths of children aged 0 to 28 days per thousand live births) and post-neonatal death rates (deaths of children aged 29 days to their first birthday per thousand live births). It is clear that most infant deaths take place during the first four weeks. As numbers of post-neonatal deaths are smaller, the rates show more fluctuations. No male post-neonatal death has taken place in Keshobpur, although this area had in both years the highest female post-neonatal death rate.

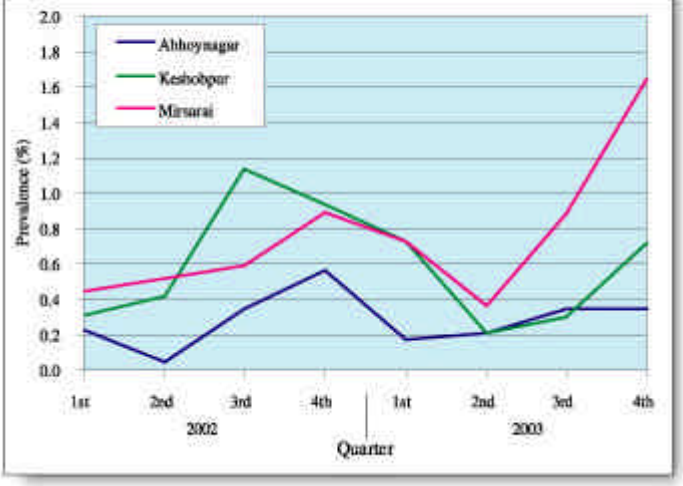
Table 5. Neonatal (infants aged 0 to 28 days) and post-neonatal (infants aged 29 days to before first birthday) death rates per 1,000 live births by gender and rural surveillance area

Surveillance area	Neonatal death rates						Post-neonatal death rates					
	Male		Female		Total		Male		Female		Total	
	2002	2003	2002	2003	2002	2003	2002	2003	2002	2003	2002	2003
Abhoynagar	29.2	49.1	19.7	33.6	24.9	41.8	13.0	11.3	7.9	16.8	10.7	13.9
Keshobpur	27.0	32.8	0.0	25.9	13.8	29.4	0.0	0.0	28.3	17.2	13.8	8.4
Abhoynagar and Keshobpur	28.6	43.9	13.9	31.1	21.8	37.8	9.6	7.8	13.9	17.0	11.6	12.2
Mirsarai	37.8	34.0	15.5	41.0	26.9	37.5	10.5	27.6	22.1	12.3	16.2	19.8
All rural	33.5	38.5	14.8	36.8	24.6	37.7	10.1	18.7	18.5	14.3	14.1	16.5

Morbidity

Morbidity information for children aged less than five years has been collected for acute respiratory infections, dysentery and diarrhoea since April 2000. Figures 7, 8 and 9 show the prevalence of these diseases (the proportion of children affected during the last seven days before the visit of the field worker). Annexes 5, 6 and 7 show the underlying

Fig. 7. Prevalence of acute respiratory infections among children less than five years old by surveillance area and round



data. If a child is reported as experiencing diarrhoea without blood initially, followed by stool with blood, it is classified as dysentery and not as diarrhoea. These data are not yet available for Kamalapur.

Prevalence (previous 7 days) of acute respiratory infections was generally low (<2%) in all three rural surveillance areas. Prevalence was generally higher in the 3rd and 4th quarters of 2002 and 2003. Prevalence of dysentery was low (<1%) in all three areas, and there was no consistent seasonal pattern in these two years.

The prevalence of diarrhoea was generally much higher than that of the other two diseases. The data from Mirsarai show a consistent seasonality: low during the third quarters, rising gradually to the second quarter of the nex year. The other two areas, Abhoynagar and Keshobpur had low prevalence throughout these two years.

Fig. 8. Prevalence of dysentery (stool with blood) among children less than five years old by surveillance area and round

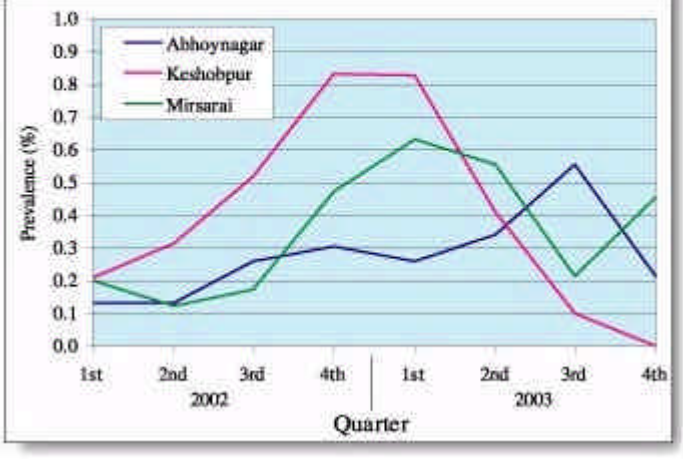
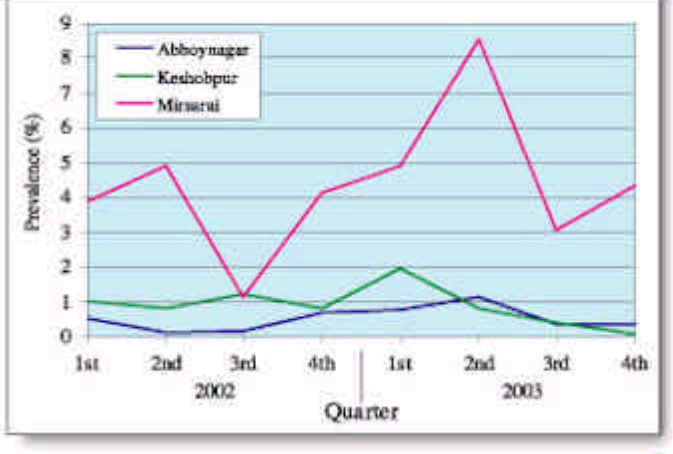


Fig. 9. Prevalence of diarrhoea (without blood) among children less than five years old by surveillance area and round



Fertility

Table 6 shows the most common indicators of fertility for the different rural surveillance areas by year. These are the crude birth rate (the number of births per thousand person-years lived during the year by the total population), the general fertility rate (similar, but per thousand person-years lived by women aged 15 to 49) and the total fertility rate (the average number of children born per woman if she lived through the reproductive period of her life experiencing the age-specific fertility observed during the year). The crude birth rate and, to a lesser degree, the general fertility rate are influenced by the age composition of the population.

Table 6. Crude birth rates per thousand person-years of total population, general fertility rates per 1,000 person-years of female population between 15 and 49 years of age and total fertility rates per women by year and surveillance area

Surveillance	Crude birth rates		General fertility rates		Total fertility rates	
	2002	2003	2002	2003	2002	2003
Abhoynagar	25.4	22.4	92.2	81.1	2.7	2.4
Keshobpur	22.1	24.0	83.0	89.8	2.4	2.5
Abhoynagar and Keshobpur	24.4	22.9	89.5	83.7	2.6	2.4
Mirsarai	24.4	24.8	90.0	90.3	2.8	2.7
All rural	24.4	23.9	89.7	87.3	2.7	2.6

The overall total fertility rate has declined slightly from 2.7 in 2002 to 2.6 in 2003 for all rural HSID surveillance sites. This rate is well below the national total fertility rate of 3.0[3]. The total fertility rates in Abhoynagar and Keshobpur remain around 2.5, as they did previously in 2000 and 2001. This area has traditionally a low fertility. Although the fertility rate in Mirsarai is higher, it fell from 2.9 in 2000 and 2001 to 2.8 in 2002 and 2.7 in 2003. This is well below the national level, which is remarkable, as this is a conservative area. These have generally a fertility level above the national average. The fact that many of the husbands in this area work abroad for extended periods may be a factor in reducing the fertility. See Annexes 8 and 9 for details on the births in 2002 and 2003 by surveillance area and for the age-specific fertility rates.

Nuptiality

Table 7 shows the median and mean ages at marriage for brides and grooms of the rural surveillance sites by previous marital status and year. The median ages are given in completed years and an age with a ½ indicates that the median fell between two discrete

[3] NIPORT, Mitra & Associates, ORC Macro. Bangladesh Demographic and Health Survey 2004. Dhaka/Calverton, 2004.

ages. The mean ages are based on ungrouped age data, assuming that marriages at a certain age were evenly distributed between the birthdays. The standard deviation is in years and relates to the mean age at marriage. The median age at first marriage for men decreased over from 25½ in 2000 to 24 in 2002 and remained the same in 2003. During this whole period the median age at first marriage for women remained the same at 18 years. The difference in median age at first marriage between rural men and women is 6 years, down from 7 years in 2001 for the same areas. This difference is greater for divorced men and women: 7 years in 2002 and 7½ years in 2003. As this was 6 years in 2001, there seems to be an upward trend. The median age difference between remarrying widowers and widows is much greater: 13 and 12½ years for 2002 and 2003 respectively, reflecting that a much smaller proportion of widows remarry and that the younger ones have a relatively better chance.

Table 7. Measures of age at marriage by their previous marital status for both grooms and brides, 2002-2003

Gender	2002			2003		
Previous marital status	Age		Standard deviation	Age		Standard deviation
	Median	Mean		Median	Mean	
Grooms						
Single	24	25.1	5.2	24	25.3	5.3
Married	32	33.5	11.5	32½	34.7	9.7
Divorced	30	29.9	6.8	28½	30.4	9.9
Widowed	40	41.6	12.5	41½	43.7	14.0
Total	25	26.4	7.0	25	26.8	7.5
Brides						
Single	18	19.2	3.3	18	19.1	3.5
Divorced	23	24.4	6.5	21	22.8	6.9
Widowed	27	27.5	3.6	29	31.5	11.4
Total	19	19.7	4.0	18	19.5	4.2

Although no events have been registered in urban Kamalapur yet, the distribution by marital status and gender allows the calculation of the singulate mean age at marriage, which is an indirect method to estimate the mean age at first marriage[4]. Annex 10 shows the underlying data. Using this method the mean age at first marriage for women is 19.3 years and for men 25.8. Both ages are slightly above the means found in the rural surveillance sites.

[4] United Nations Department of International Economic and Social Affairs: Manual X, Indirect Techniques for Demographic Estimation. Annex 1, page 225. New York, 1983.

Table 8 shows the proportions of brides and grooms by previous marital status for the years 2002 and 2003. More brides than grooms were marrying for the first time. Grooms who were married already, meaning that these were polygamous marriages, account for most of the difference. Annexes 11 and 12 provide the absolute numbers of the brides and grooms by age group and previous marital status, for the rural surveillance sites of HSID in 2002 and 2003.

Table 8. Proportions of grooms and brides by previous marital status, 2002-2003

Gender	Years	Previous marital status (%)				
		Single	Married	Divorced	Widowed	Total
Grooms	2002	84.7	5.4	7.0	2.9	100.0
	2003	82.0	5.8	9.5	2.7	100.0
Brides	2002	87.1	-	11.5	1.4	100.0
	2003	89.4	-	9.8	0.8	100.0

Figure 10 and Annex 13 show the marriage rates by gender, age group and year per 1,000 person-years irrespective of the previous marital status. The marriage rates were generally higher in 2002 than 2003. Most women marry young, while the age at marriage for men peaks much later and less pronounced.

Fig. 10. Rural marriage rates by age group, year and gender

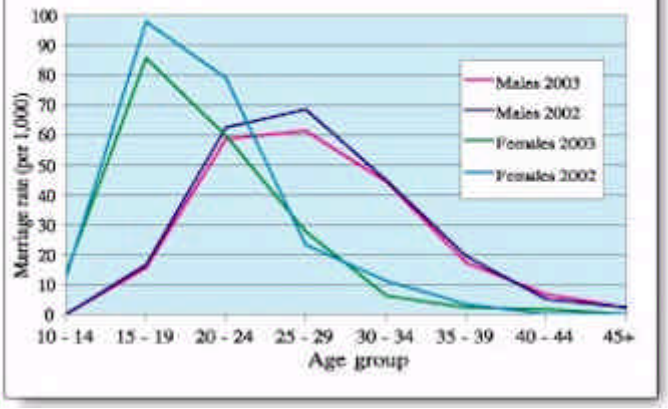


Figure 11 shows how weddings are spread over the year. November is the month with the fewest weddings. Ramadan fell mostly in this month during 2002 and 2003. Muslims, who constitute more than 80% of our surveillance populations, refrain from marrying just before or during this month of fasting. The second half of the wet season, August and September, also have relatively few weddings. The popular months are March, May, July and October.

Figure 12 is similar to Figure 11, but depicts the monthly distribution of divorces in 2002 and 2003. As the number of divorces is much smaller than the number of marriages, random factors play a greater role. The greatest number of monthly divorces is found in both years during October, the month preceding Ramadan in 2002 and 2003. Annex 14 shows the data used for figures 11 and 12.

Fig. 11. Proportions of yearly marriages by month, 2002-2003

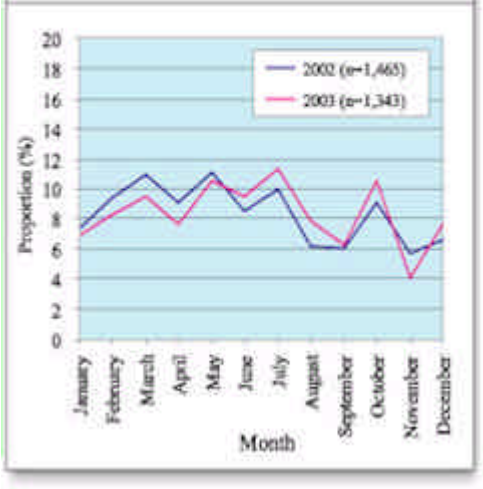
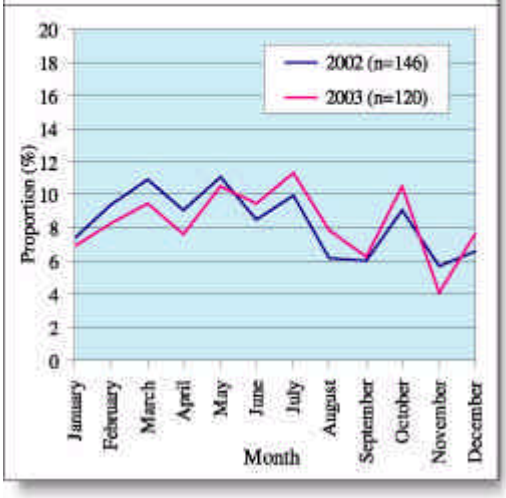


Fig. 12. Proportions of yearly divorces by month, 2002-2003



Figures 13 and 14 show the proportions of the rural surveillance population by marital status and age group in 2003 for men and women respectively. They show clearly that women marry much younger than men. From age 60 more than half of the women are widowed, while less than one third of the men over 85 years are widowers. The absolute numbers are shown in Annexes 15 and 16.

Fig. 13. Proportions of rural men by marital status and age group in 2003

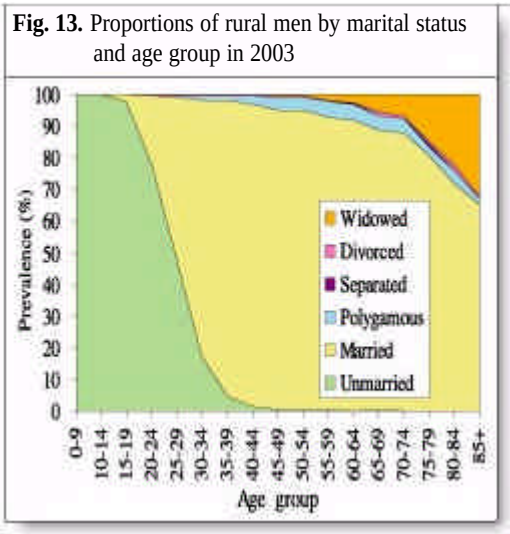
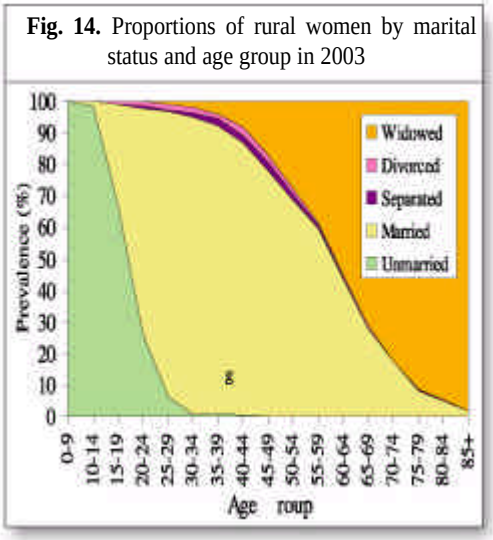


Fig. 14. Proportions of rural women by marital status and age group in 2003



Contraception

Figure 15 and Annex 17 show the contraceptive prevalence rate of currently-married women of reproductive age of the rural surveillance sites by method mix and year. The overall contraceptive prevalence rate was highest in Abhoynagar, where it rose from 58.3% in 2002 to 59.0% in 2003. For modern methods these values were 55.9% and 56.8%, respectively. The prevalence was almost as high in the adjacent area of Keshobpur. However, here the prevalence fell slightly from 56.0% to 54.6% or from 52.1% to 50.1% if only modern methods are taken into account. The lowest prevalence was found in Mirsarai, where it rose from 45.3% to 46.2% or from 42.9% to 43.6% excluding the traditional methods. The method mix shows that the oral pill was by far the most popular contraceptive method in all areas, followed by injectable contraceptives and tubectomy. Use of permanent and long lasting methods, such as tubectomy, vasectomy, Norplant and intra-uterine devices (IUD) was in decline between 2002 and 2003 in all areas, except in Mirsarai where use of IUD remained at 1.6% and vasectomy at 0%.

Fig. 15. Contraceptive prevalence rate and method mix by currently married women of reproductive age in surveillance area, 2002-2003

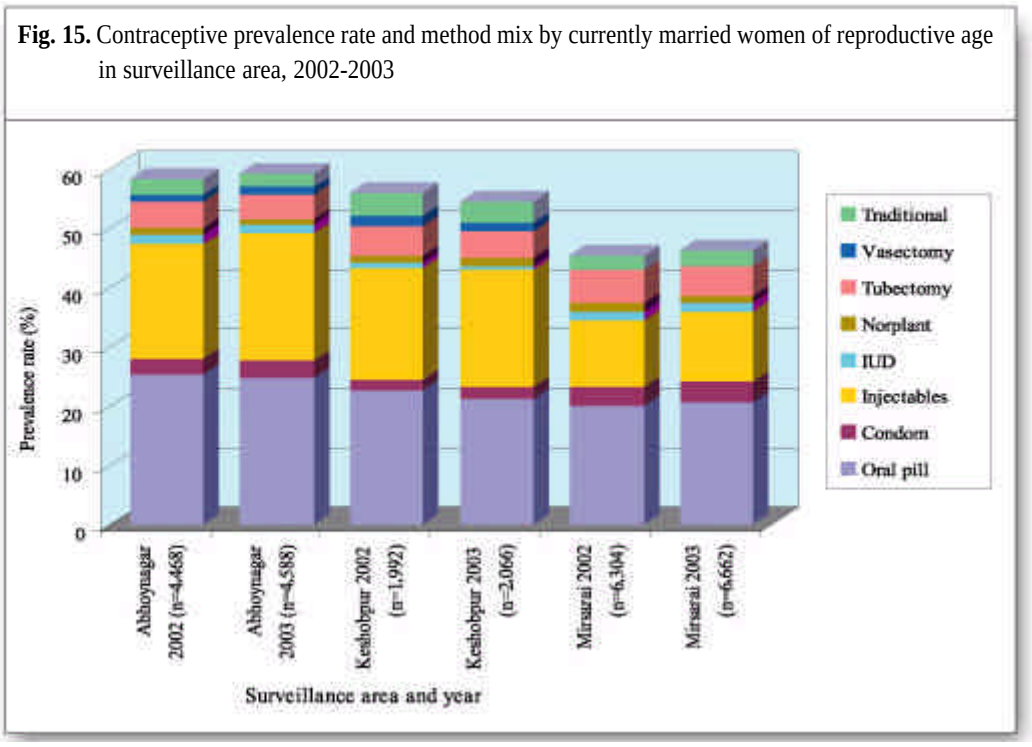
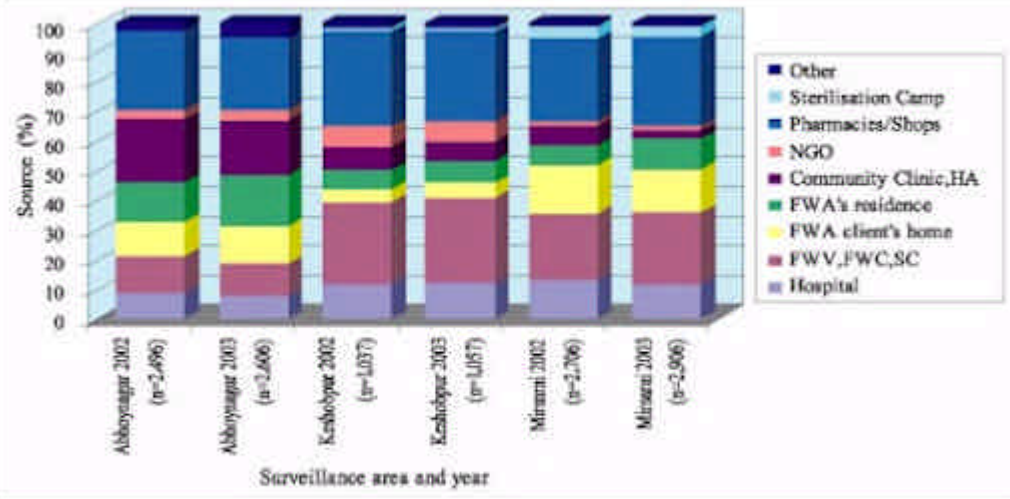


Figure 16 and Annex 18 show the reported sources of modern methods. Pharmacies and other shops were the most important source, providing between a third and a quarter. After their share continued to rise since 2000, it started falling slightly in the two western sites.

It continued rising in Mirsarai. In Abhoynagar the Community Clinic and Health Assistant were the second source, while in the other two areas the Family Welfare Visitor, Family Welfare Clinic and Satellite Clinic took this place. Other important sources were the Family Welfare Assistants, both from her own residence as at the client's home, and hospitals.

Fig. 16. Proportional distribution of sources of modern contraceptives by surveillance area and year



FWV=Family Welfare Visitor, FWC=Family Welfare Clinic, SC=Satellite Clinic, FWA=Family Welfare Assistant, HA=Health Assistant, and NGO=Non-governmental Organisation

Vaccination

Figure 17 and Annex 19 show the proportions of children aged 12-23 months who were vaccinated against diphtheria, pertussis and tetanus (DPT). The vaccination coverage is very high: in 2003 more than 98% of the children of this age group in all rural surveillance areas had received at least one DPT vaccination. More than 87% were fully immunisised against DPT. The proportions vaccinated were slightly higher in 2003 than in 2002, except for Keshobpur, where at least one vaccination fell from 99.6 to 98.2 and full immunisation from 94.6 to 93.1, still well above the two other rural surveillance areas.

Fig. 17. Percentages of children aged 12-23 months having received diphtheria, pertussis and tetanus vaccinations, by number of doses, surveillance area and year

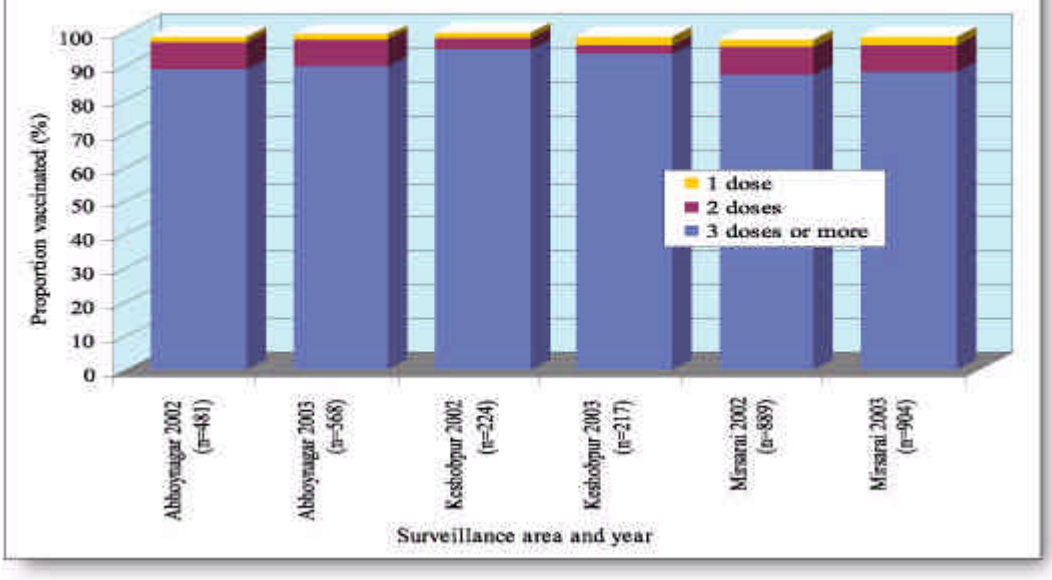


Figure 18 and Annex 20 show oral polio vaccination coverage, it is so complete that only the percent between 99 and 100 is shown to make it possible to see the differences. As oral polio vaccine is normally given at the same time as the DPT vaccinations, one would expect the coverage to be the same. However, even higher rates were observed, in Abhoynagar and Mirsarai nearly all children are fully vaccinated, having received three or more doses. For 2002 and 2003 the proportions were 99.6% and 99.7% respectively. As with DPT the rate in Keshobpur fell slightly from 100% in 2002 to 99.1% in 2003.

Figure 19 and Annex 21 show the percentage of children aged 12 to 23 months that received BCG (tuberculosis) and measles vaccine. It also shows the proportion of children less than five years of age, who have received vitamin A supplementation during the previous six months. In all sites a greater proportion of children had received BCG vaccination than measles vaccination, although both percentages are slightly lower in Mirsarai than in the western areas. The vitamin A coverage is lower than that of both vaccinations.

Fig. 18. Percentages of children aged 12-23 months having received oral polio vaccinations, by number of doses, surveillance area and year

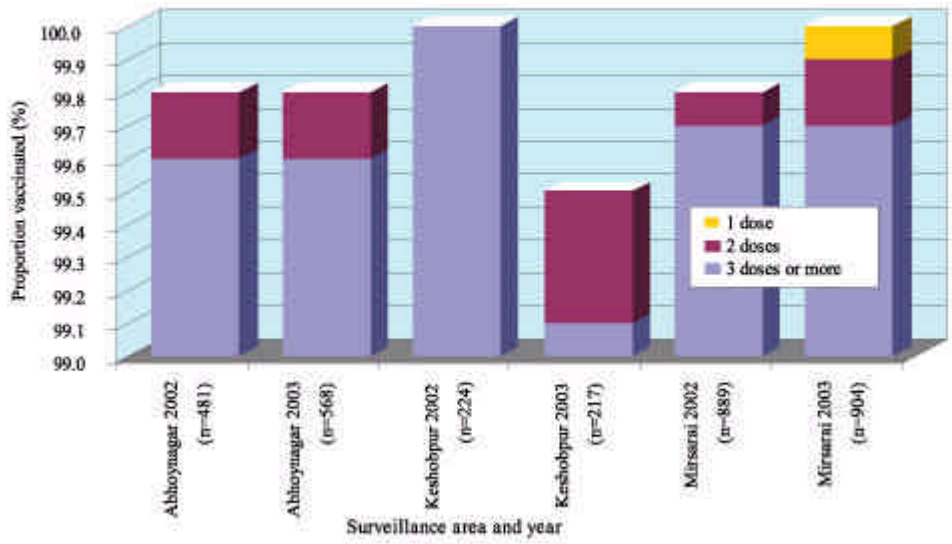
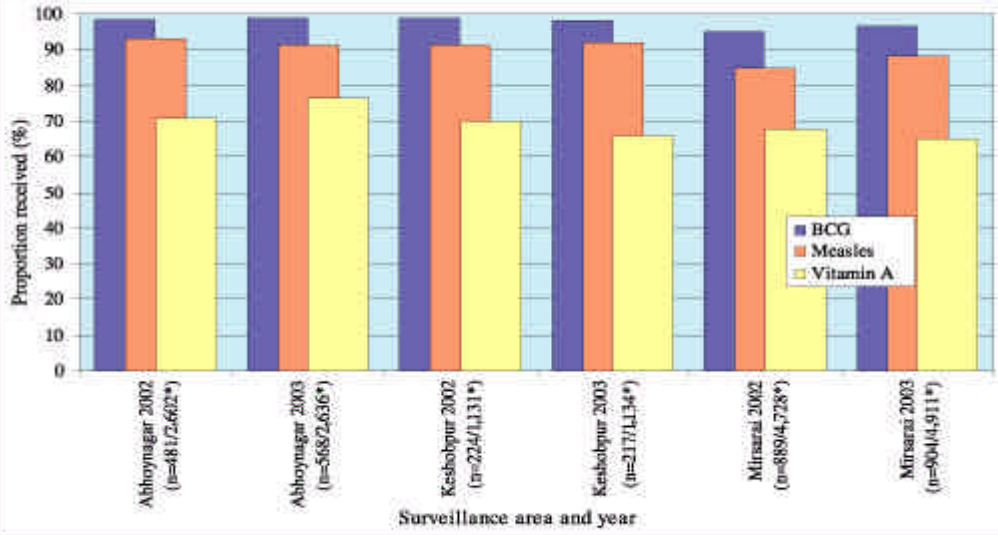


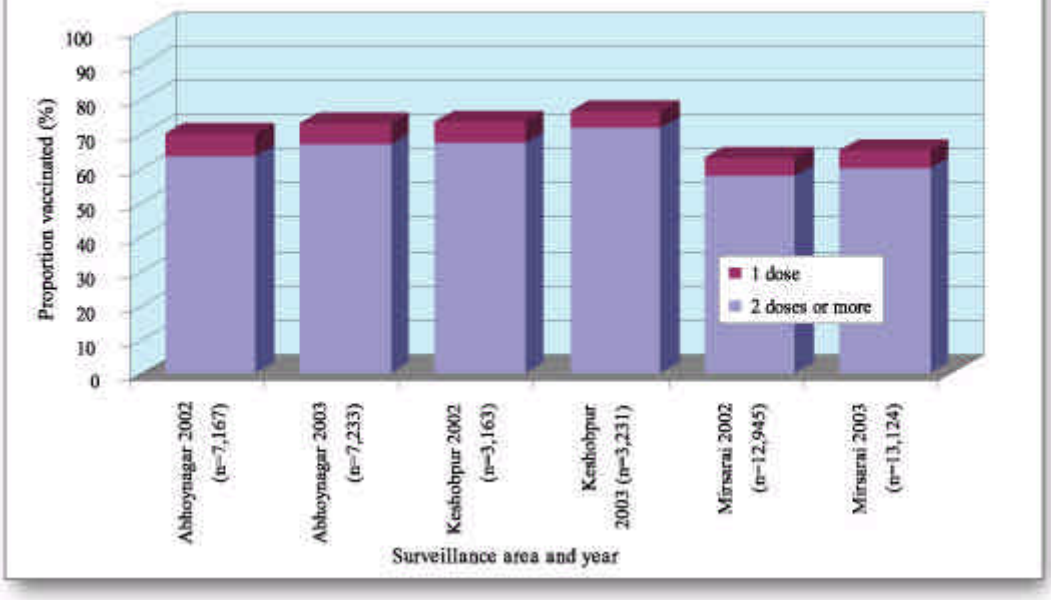
Fig. 19. Percentages of children aged 12-23 months having received BCG and measles vaccinations and children less than five years having received vitamin A during the last 6 months, by surveillance area and year



*Children less than five years old

Figure 20 and Annex 22 show the proportions of women between 10 and 49 years of age, who received tetanus vaccinations. In 2002, the highest coverage was found in Keshobpur, where 73% of the women received at least one dose of tetanus vaccine, followed by Abhoynagar (70%) and Mirsarai (63%). All areas show an improvement in 2003, Abhoynagar and Keshobpur by 3%, while the coverage in Mirsarai rose by 2%. The pattern for at least two doses is similar to one or more vaccinations, only a few percent lower.

Fig. 20. Percentages of women aged 10 to 49 years having received tetanus toxoid vaccinations, by number of doses, surveillance area and year



Health Expenditure

Figure 21 shows the median[5] health expenditure (Taka) per household during the preceding three months by quarterly surveillance round, and area. As most medians were rounded figures, some lines in the graph were invisible because they overlap. In these cases the values have been adjusted slightly upward or downward to make all lines visible.

[5] Medians are used as the means were influenced by a small number of very high amounts spent; the actual means were in all cases about double the median values.

During the surveillance rounds in 2002 and 2003, the median health expenditure by Mirsarai households was more than twice as high as the median in the two western rural surveillance areas. The same was found in 2000 and 2001. The median rate of spending in Abhoynagar is higher than that in Keshobpur during most quarters, except three, when it is the same. Health spending may be higher in Mirsarai because households have more money, which can result from the relatively high proportion of men from this area who earn a living abroad, mostly in the Gulf region. Figure 22 shows the proportion of husbands of women under contraceptive surveillance (ever married women under fifty years of age) reported to be living with their family, without their family elsewhere in Bangladesh and abroad in the last surveillance round in 2002. In Mirsarai more than 17% of their husbands live abroad whereas it is less than half a percent in the two other areas. Almost 7% of Mirsarai men live away from their wife elsewhere in Bangladesh, while this is only between 2% and 3% for Abhoynagar and Keshobpur. The average spending, both mean and median, on health by family and the proportions of husbands away are shown in Annexes 23 and 24.

Fig. 21. Median expenditure on health in Taka by family during the preceding three months by surveillance area and round

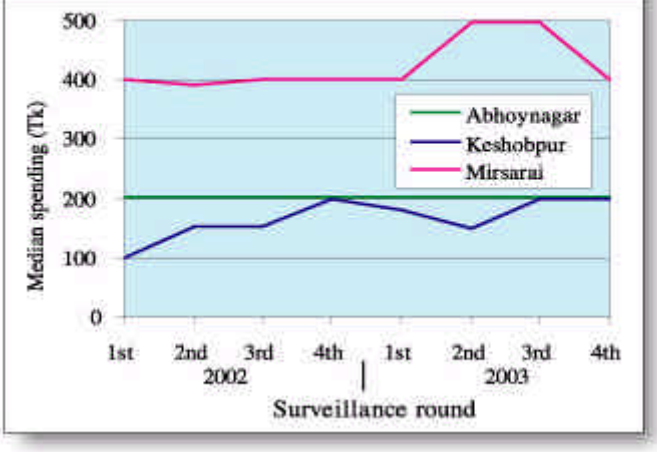
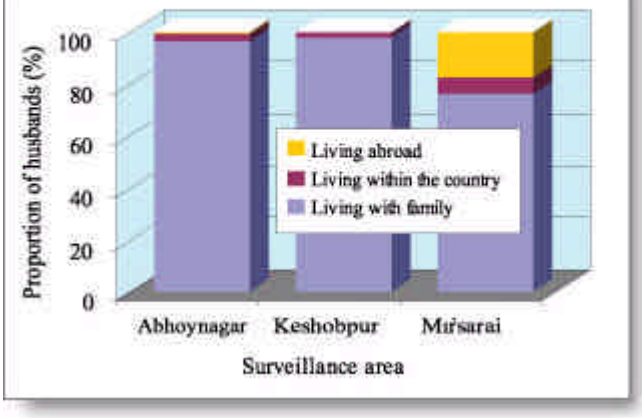


Fig. 22. Proportions of husbands living with family, elsewhere in the country, or abroad during the fourth surveillance round of 2002 by surveillance area



It is interesting that, despite higher expenditure on health in Mirsarai, life expectancy of men is lower and under five mortality of both boys and girls is higher than

in the other rural sites. It is a research question if this is linked to the greater proportion of husbands living away.

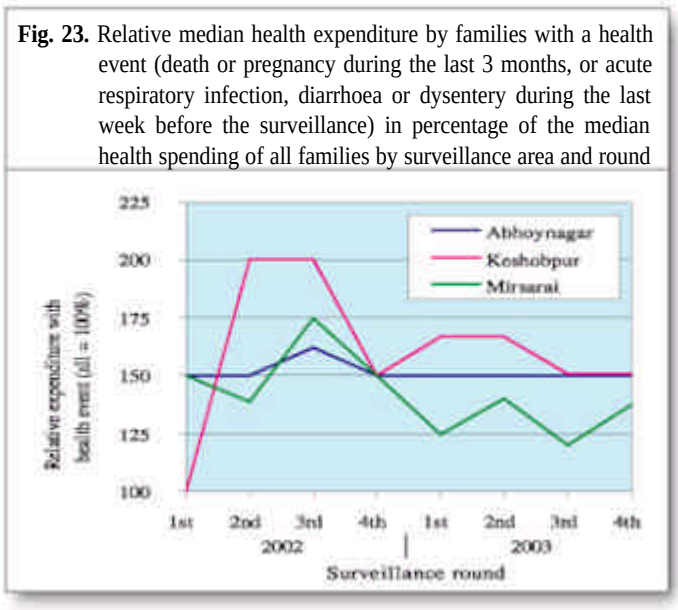


Fig. 23. Relative median health expenditure by families with a health event (death or pregnancy during the last 3 months, or acute respiratory infection, diarrhoea or dysentery during the last week before the surveillance) in percentage of the median health spending of all families by surveillance area and round

Health expenditure is linked to (prevention of) pregnancies, preventing and curing diseases, and deaths. The surveillance system covers all pregnancies and deaths in the surveyed population. However, no complete information on disease episodes is collected. Only dysentery, diarrhoea and acute respiratory infections during the week before the surveillance visit are reported. As a quarter is about 13 weeks, data on most (12/13) episodes are not available, while no data on other diseases are collected, unless the person died of the disease. However, households with one or more of the reported health events mentioned, should, on average, have a higher spending on health than other households. Figure 23 shows that this is indeed the case. Although the figures fluctuate, this graph shows that the median health spending of households with a reported health event is about 50% higher than the median for the whole population surveyed. The mean and median amounts spent by families with a known health event are shown in Annex 25.

Education

For the first time, this report contains information on education. For this reason, available information since 1994 is shown. Figure 24 and Annex 26 show the proportions of 15 year olds, who have completed primary education (5 years) by gender, year and surveillance area. This information is available for the whole period only for the Abhoynagar and Keshobpur site. For Mirsarai this information is available since 1995 and in Kamalapur only for 2003.

In all sites in 2003 between 60-61% of the 15-year-old boys had completed primary education. In Mirsarai the proportion was 5% less than in 1995, while it rose by more than 20% in the Abhoynagar/Keshobpur area in the 10 years between 1994 and 2003. The

proportions of girls with primary education were below those of the boys in the rural sites at the beginning of our observations. They are in 2003 well above the proportions for boys in each area: 8% above in Kamalapur, 12½ % in Mirsarai and 16½% in Abhoynagar/ Keshobpur. In the latter area the proportion for girls more than doubled from 36% to 77%.

Fig. 24. Population aged 15 years by proportion who completed primary education (5 years) by gender, year and surveillance area

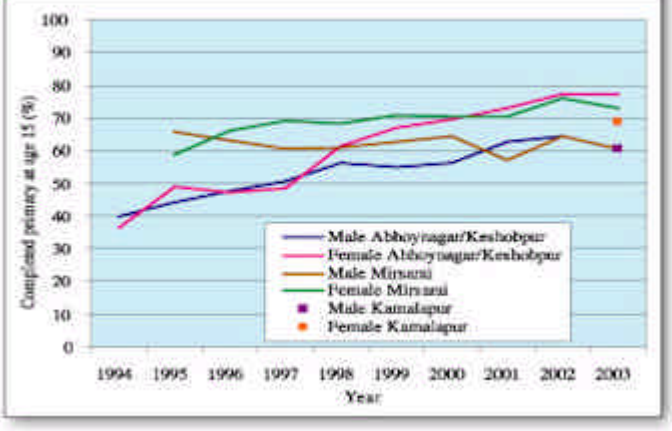
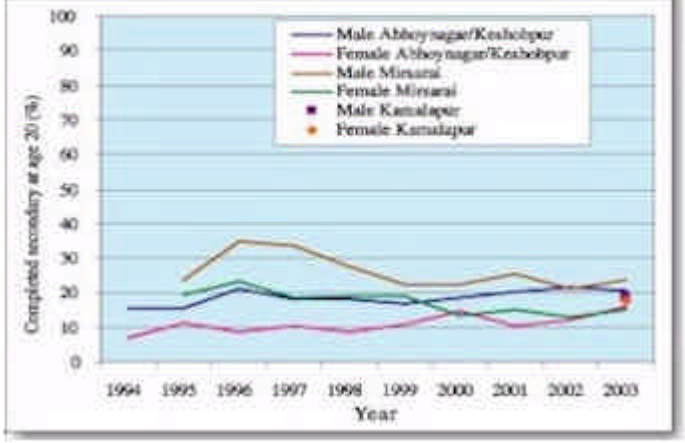


Figure 25 and Annex 27 show the proportions of the population aged 20 years, who had completed primary education (10 years) by gender, year and surveillance area for the period 1994-2003. Completion of secondary education of women still lags behind that of men. Only 14.9% of women aged 20 in Mirsarai had completed secondary education in 2003, 15.7% in Abhoynagar/ Keshobpur and 17.5% in Kamalapur. Earlier Mirsarai had relatively double the proportion of women with completed secondary education compared with Abhoynagar/Keshobpur, but the proportion declined since 1996, while it increased in Abhoynagar/Keshobpur.

Fig. 25. Population aged 20 years by proportion who completed secondary education (10 years) by gender, year and surveillance area



There is a similar pattern for the men in Mirsarai: after a record 34.6% with completed secondary education in 1996, the proportion gradually fell to 23.4% in 2003. It is still higher than that in Abhoynagar/ Keshobpur (20.4%) and Kamalapur (18.8%) but the difference between the rural sites is now much smaller than in the last 10 years.

Feature: Gender preference and fertility in ICDDR,B field sites

Introduction

This edition's feature discusses in detail the influence of the preference for sons and daughters on the consecutive fertility of women in the surveillance areas of ICDDR,B.

In Bangladesh there is a strong preference for male offspring for both social and economic reasons. The social reasons are similar to those in other countries, which have a male dominated society. The economic causes are the care of the sons for the parents when they become too old to work, which is also common in many other countries, and the dowry, common in South Asia. The latter is a substantial amount, compared to the annual income, which has to be paid by the bride's family to the groom's. This puts a heavy financial burden on a family having only or mostly daughters. Another factor is the inheritance laws, which cause a substantial part of the family possessions to go to the father's relatives if he dies without male offspring. Sons, therefore, can be valued more than daughters and have often received better health care and food, resulting in lower infant and child mortality for boys than for girls. This is completely opposite to the natural situation of girls having lower mortality than boys if all other factors are equal. In recent years this situation has improved: presently mortality of female children is below that of male children in most surveillance areas.

Modern family planning methods are now widely used in Bangladesh. These have caused the total fertility to fall by more than half during the last 25 years. During the last 10 years, however, the fall in fertility has stalled, although there are indications that it has recently started to decline slightly again. One of the reasons could be that couples who have only, or mostly, daughters want to have one or more sons and, therefore, decide to have one or more additional children. This chapter presents data from the HSID Surveillance Sites and the Matlab Health and Demographic Surveillance System (HDSS) to see if this hypothesis is connect. A previous study by Bairagi and Chowdhury[6] showed a slightly higher fertility among women having no, or few, sons in the Matlab MCH/FP area in the early 1980s. Earlier studies showed no differences. As family planning is now much more widely practised, this pattern should be much clearer.

[6] Bairagi R, Chowdhury MK. Effects of parental gender preference on fertility and mortality in Matlab. Matlab: Women, Children and Health edited by Vincent Faveau. Dhaka: ICDDR,B. 1994, Pages 311-313.

Methodology

The study considers women less than 45 years of age living in the Matlab surveillance area who had two or three living children at the beginning of 1983, and women in Matlab and the rural HSID sites in 1995, who were still living in the area four years later. No distinction is made between the women living in the area where the ICDDR,B provides services and those living outside this area. These women are divided into seven groups, depending on the number of sons and daughters: two daughters, one son and one daughter, and two sons for the women having two children; and three daughters, one son and two daughters, two sons and one daughter, and three sons for the women having three children. For each group the proportion is calculated who had at least one additional live birth during the next four years. If the hypothesis is true, the proportions having an additional live birth should be greater for mothers having only, or mostly, daughters compared with other mothers. As more women used modern family planning methods in the late 1990s than in the mid-1980s, the differences should be larger for the women followed up from 1995-1999, than for those followed-up from 1983-1987. The period 1995-1999 was chosen to assess recent trends, as this allows maximum geographical coverage (several HSID sites have been closed since then).

Proportion of women having additional children, by gender composition of family

Figure 26 shows that of the women aged 15-44 years in Matlab who at the beginning of 1983 had either two sons or a son and a daughter, a similar proportion (65%) went on to have an additional child in the next four years. On the other hand, of the women who at the beginning of 1983 had two children who were both daughters, a higher proportion (72%) had an additional child in the next four years. The proportions were also similar for women who at the beginning of 1995 had two children and at least one son, (48%) while the proportion (62%) was higher for women with two daughters in 1995. Clearly, there was a reduction in four-year fertility between 1983-1987 and 1995-1999 whatever the gender composition of the family, but the reduction was greater for those who had at least one son at the beginning of the four-year periods.

For women with three children at the beginning of 1983, those with no son were more likely to have an additional child in the next four years. Those with no daughter were also more likely to have an additional child compared with those with one daughter and two sons. There was a similar pattern for women with three children at the beginning of 1995, although for each type of family the proportion of women having an additional child was lower than for women in 1983. Again the reduction in four-year fertility between 1983-1987 and 1995-1999 was greater for women who already had at least one son than for those with no son.

Fig. 26. Proportions of women under 45 years in Matlab with 2 or 3 living children on 1/1/1983 and on 1/1/1995 having additional live birth(s) before 1/1/1987 and 1/1/1999 respectively, by gender of children

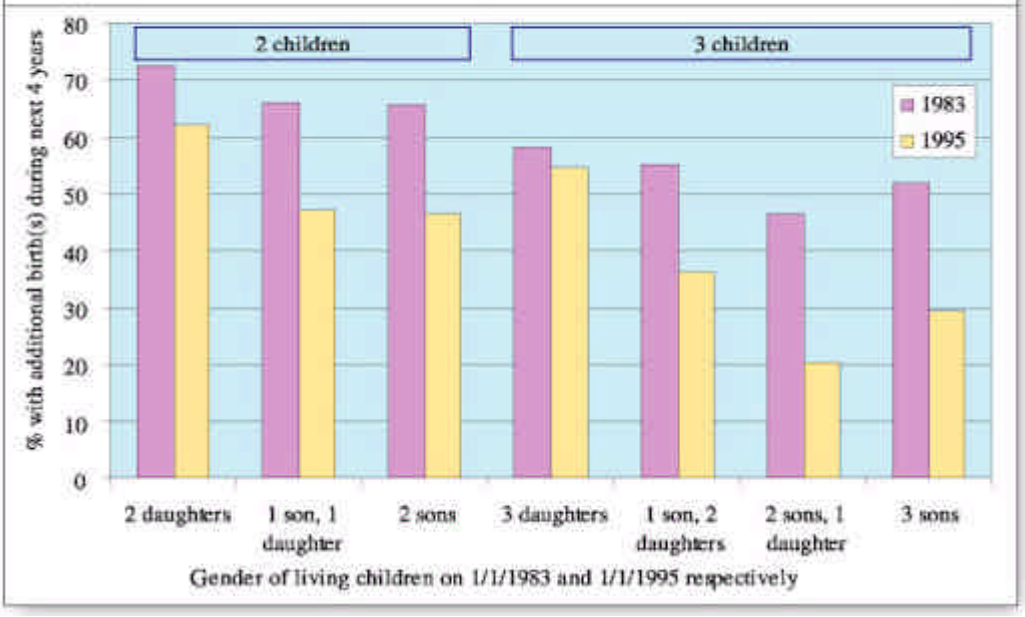
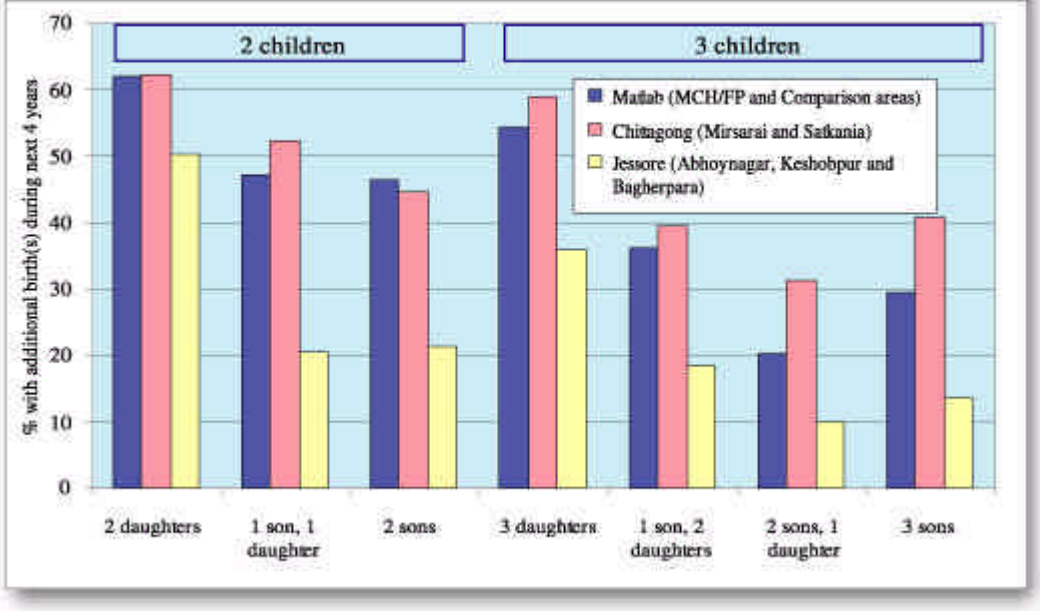


Figure 27 shows data for 1995-1999 for three areas in Matlab, Chittagong district and Jessore district. For women with two children at the beginning of 1995, the proportion that had an additional child in the next four years was lower for those with at least one son already in each of the three areas. There was little difference between those with one son and those with two sons. For women with three children at the beginning of 1995 in each of the areas, the proportion that had an additional child in the four-year period was lower for those with one son than those with no sons, and even lower for those with two sons. Those with no daughter in 1995 were slightly more likely to have an additional child than those with two sons and one daughter, indicating some preference for at least one daughter.

There were large differences between the areas in terms of the proportion of women going on to have an additional child, which reflect the differences in total fertility between the areas. For example, Mirsarai has the highest total fertility of the three areas, and the highest proportion of women with three children having an additional child, regardless of gender composition. However, the main finding is that gender composition of the family had an important effect on fertility in all three areas, and that gender preference led to less fertility decline. Annex 28 shows the numbers on which figures 26 and 27 are based.

Fig. 27. Proportions of women under 45 years with 2 or 3 living children on 1/1/1995 having additional live birth(s) before 1/1/1999, by gender of children and area



Annex 1. Rural surveillance population by person-years lived in the area, age group, year, area and gender

Age (years)	Abhoynagar and Keshobpur				Mirsarai			
	2002		2003		2002		2003	
	Male	Female	Male	Female	Male	Female	Male	Female
0-4	1,732.1	1,615.9	1,766.7	1,643.4	2,116.3	2,066.0	2,148.8	2,137.9
5-9	1,685.9	1,635.6	1,664.4	1,628.4	2,229.0	2,105.0	2,172.3	2,084.4
10-14	1,675.3	1,548.7	1,654.4	1,551.3	2,516.2	2,478.7	2,453.2	2,404.5
15-19	1,589.6	1,792.5	1,600.8	1,805.6	2,453.6	2,512.3	2,509.5	2,567.8
20-24	1,649.5	1,579.5	1,634.1	1,585.6	1,793.1	1,969.4	1,876.2	2,114.5
25-29	1,306.4	1,405.9	1,362.9	1,455.2	1,048.3	1,331.4	1,129.7	1,373.7
30-34	1,329.4	1,184.3	1,303.0	1,195.0	981.4	1,362.2	1,020.9	1,365.1
35-39	1,151.0	1,063.8	1,194.2	1,086.9	935.1	1,221.9	922.8	1,199.3
40-44	1,009.8	908.0	996.7	935.5	972.9	1,019.8	1,025.4	1,077.5
45-49	889.5	773.7	953.6	788.8	791.8	907.6	800.3	921.0
50-54	622.0	558.1	645.0	598.8	660.9	681.5	712.8	734.2
55-59	490.6	464.1	523.1	461.9	514.6	563.2	524.6	549.9
60-64	369.0	391.3	354.2	389.4	418.1	501.9	443.5	519.8
65-69	305.5	288.5	333.9	312.2	347.3	381.9	338.9	377.4
70-74	236.5	233.1	232.9	238.6	249.5	294.6	250.5	316.0
75-79	134.8	109.7	141.0	110.6	150.9	160.9	162.3	161.9
80-84	70.6	62.1	77.6	69.2	95.2	85.4	93.5	92.1
85+	58.5	30.3	60.5	39.1	66.8	57.4	70.4	62.2
All ages	16,305.9	15,645.0	16,499.0	15,895.4	18,340.8	19,701.2	18,655.5	20,059.1

Annex 2. Urban surveillance population on 15 May 2003 by age group, year, area and gender

Age (years)	Kamalapur	
	2003	
	Male	Female
0-4	7,047	6,854
5-9	6,351	6,203
10-14	5,995	5,890
15-19	5,481	6,173
20-24	5,016	6,820
25-29	4,955	5,608
30-34	4,997	4,578
35-39	4,327	3,315
40-44	4,010	2,946
45-49	2,424	1,714
50-54	1,966	1,608
55-59	1,089	685
60-64	916	552
65-69	413	320
70-74	309	265
75-79	109	95
80-84	58	76
85 and over	35	47
All ages	55,498	53,749

Annex 3. Abridged life table for Abhoynagar and Keshobpur by gender, based on the observed mortality in 2002 and 2003

Age (years)	Male				Female			
	${}_nq_x$	l_x	${}_nL_x$	e_x	${}_nq_x$	l_x	${}_nL_x$	e_x
0	0.04491	100,000	96,279	68.78	0.03784	100,000	96,835	70.68
1	0.01164	95,509	379,276	71.00	0.00467	96,216	383,724	72.45
5	0.00150	94,397	471,633	67.82	0.00155	95,767	478,463	68.78
10	0.00300	94,256	470,573	62.92	0.00324	95,618	477,316	63.88
15	0.00623	93,973	468,404	58.10	0.00693	95,308	474,941	59.08
20	0.00305	93,388	466,222	53.45	0.00474	94,648	472,054	54.48
25	0.00559	93,104	464,315	48.60	0.00349	94,200	470,213	49.73
30	0.00757	92,584	461,305	43.86	0.00837	93,870	467,498	44.89
35	0.01479	91,882	456,145	39.18	0.00693	93,085	463,846	40.25
40	0.01237	90,523	449,787	34.73	0.01079	92,440	459,770	35.51
45	0.01346	89,403	444,199	30.13	0.00956	91,443	455,183	30.87
50	0.02727	88,199	435,695	25.51	0.02567	90,569	448,005	26.14
55	0.05770	85,794	418,083	21.14	0.07309	88,243	426,556	21.76
60	0.12382	80,844	381,053	17.26	0.08592	81,794	391,967	18.26
65	0.17162	70,834	323,922	14.32	0.12549	74,766	352,193	14.73
70	0.18318	58,677	265,530	11.77	0.25972	65,384	286,128	11.46
75	0.16708	47,928	220,850	8.87	0.32239	48,402	202,152	9.56
80	0.46483	39,920	152,764	5.12	0.39359	32,798	130,431	7.95
85	1.00000	21,364	51,588	2.42	1.00000	19,889	130,275	6.55

Annex 4. Abridged life table for Mirsarai by gender, based on the observed mortality in 2002 and 2003

Age (years)	Male				Female			
	${}_nq_x$	l_x	${}_nL_x$	e_x	${}_nq_x$	l_x	${}_nL_x$	e_x
0	0.05460	100,000	95,629	64.74	0.04547	100,000	96,300	69.24
1	0.01419	94,540	374,789	67.47	0.00966	95,453	379,459	71.53
5	0.00225	93,198	465,466	64.42	0.00240	94,531	472,087	68.21
10	0.00399	92,988	464,014	59.56	0.00409	94,304	470,555	63.37
15	0.00703	92,617	461,529	54.79	0.00295	93,918	468,892	58.62
20	0.00678	91,966	458,269	50.16	0.00364	93,642	467,370	53.78
25	0.00688	91,343	455,157	45.48	0.00369	93,300	465,748	48.97
30	0.00747	90,715	452,055	40.78	0.01638	92,956	461,435	44.14
35	0.02394	90,037	445,269	36.07	0.01636	91,433	453,417	39.83
40	0.02226	87,882	434,646	31.89	0.01655	89,937	445,734	35.45
45	0.03401	85,926	422,932	27.55	0.00817	88,448	440,543	31.01
50	0.06356	83,004	402,695	23.43	0.03476	87,725	431,898	26.24
55	0.08307	77,728	372,816	19.84	0.03536	84,676	416,455	22.09
60	0.09432	71,271	340,704	16.40	0.08933	81,682	392,314	17.80
65	0.21637	64,549	290,428	12.83	0.16408	74,385	343,220	14.27
70	0.32515	50,582	210,858	10.64	0.23919	62,180	275,220	11.55
75	0.33046	34,135	141,322	9.58	0.39411	47,307	188,060	9.36
80	0.41360	22,855	89,160	8.13	0.36550	28,663	116,273	8.89
85	1.00000	13,402	96,625	7.21	1.00000	18,187	138,625	7.62

Annex 5. Cases of acute respiratory infections, diarrhoea (without blood) and dysentery (stool with blood) during the 7 days before the visit of the field worker in Abhoynagar among children less than five years old by quarter

Diesease	Year and quarter							
	2002-1	2002-2	2002-3	2002-4	2003-1	2003-2	2003-3	2003-4
Acute respiratory infections	5	1	8	13	4	5	8	8
Diarrhoea (without blood)	12	3	4	16	18	27	9	9
Dysentery (stool with blood)	3	3	6	7	6	8	13	5
Children under 5	2,244	2,291	2,299	2,306	2,318	2,351	2,346	2,337

Annex 6. Cases of acute respiratory infections, diarrhoea (without blood) and dysentery (stool with blood) during the 7 days before the visit of the field worker in Keshobpur among children less than five years old by quarter

Diesease	Year and quarter							
	2002-1	2002-2	2002-3	2002-4	2003-1	2003-2	2003-3	2003-4
Acute respiratory infections	3	4	11	9	7	2	3	7
Diarrhoea (without blood)	10	8	12	8	19	8	4	1
Dysentery (stool with blood)	2	3	5	8	8	4	1	0
Children under 5	965	959	969	961	968	977	990	980

Annex 7. Cases of acute respiratory infections, diarrhoea (without blood) and dysentery (stool with blood) during the 7 days before the visit of the field worker in Mirsarai among children less than five years old by quarter

Diesease	Year and quarter							
	2002-1	2002-2	2002-3	2002-4	2003-1	2003-2	2003-3	2003-4
Acute respiratory infections	18	21	24	36	30	15	37	69
Diarrhoea (without blood)	156	200	46	166	202	355	128	183
Dysentery (stool with blood)	8	5	7	19	26	23	9	19
Children under 5	4,025	4,076	4,079	4,032	4,107	4,160	4,182	4,201

Annex 8. Number of live births by gender, person-years lived by women, and age-specific fertility rates per thousand person-years lived for five-year age groups of women between 15 and 49 years of age, and surveillance area in 2002

Field sites			Age group (years)						
			15-19	20-24	25-29	30-34	35-39	40-44	45-49
Abhoynagar	Live births	Male	77.0	108.0	71.0	36.0	13.0	3.0	0.0
		Female	76.0	87.0	51.0	28.0	9.0	3.0	0.0
		Total	153.0	195.0	122.0	64.0	22.0	6.0	0.0
	Person-years of mothers		1,212.5	1,125.2	978.7	819.8	721.9	673.4	562.4
	Age-specific fertility rate		126.2	173.3	124.7	78.1	30.5	8.9	0.0
Keshobpur	Live births	Male	36.0	40.0	22.0	10.0	3.0	0.0	0.0
		Female	33.0	35.0	22.0	11.0	4.0	1.0	0.0
		Total	69.0	75.0	44.0	21.0	7.0	1.0	0.0
	Person-years of mothers		580.0	454.3	427.2	364.5	341.9	234.7	211.3
	Age-specific fertility rate		119.0	165.1	103.0	57.6	20.5	4.3	0.0
Abhaynagar and Keshobpur	Live births	Male	113.0	148.0	93.0	46.0	16.0	3.0	0.0
		Female	109.0	122.0	73.0	39.0	13.0	4.0	0.0
		Total	222.0	270.0	166.0	85.0	29.0	7.0	0.0
	Person-years of mothers		1,792.5	1,579.5	1,405.9	1,184.3	1,063.8	908.0	773.7
	Age-specific fertility rate		123.9	170.9	118.1	71.8	27.3	7.7	0.0
Mirsarai	Live births	Male	93.0	167.0	122.0	65.0	25.0	4.0	0.0
		Female	85.0	174.0	93.0	72.0	23.0	5.0	1.0
		Total	178.0	341.0	215.0	137.0	48.0	9.0	1.0
	Person-years of mothers		2,512.3	1,969.4	1,331.4	1,362.2	1,221.9	1,019.8	907.6
	Age-specific fertility rate		70.9	173.2	161.5	100.6	39.3	8.8	1.1

Annex 9. Number of live births by gender, person-years lived by women, and age-specific fertility rates per thousand person-years lived for five-year age groups of women between 15 and 49 years of age, and surveillance area in 2003

Field Sites			Age group (years)						
			15-19	20-24	25-29	30-34	35-39	40-44	45-49
Abhoynagar	Live births	Male	74.0	84.0	61.0	34.0	10.0	2.0	0.0
		Female	74.0	84.0	61.0	34.0	10.0	2.0	0.0
		Total	144.0	160.0	111.0	66.0	18.0	4.0	0.0
	Person-years of mothers		1,228.5	1,135.0	1,008.4	835.7	731.4	689.6	573.1
	Age-specific fertility rate		117.2	141.0	110.1	79.0	24.6	5.8	0.0
Keshobpur	Live births	Male	45.0	37.0	27.0	9.0	4.0	0.0	0.0
		Female	42.0	32.0	25.0	13.0	3.0	1.0	0.0
		Total	87.0	69.0	52.0	22.0	7.0	1.0	0.0
	Person-years of mothers		577.1	450.6	446.8	359.3	355.5	245.9	215.8
	Age-specific fertility rate		150.8	153.1	116.4	61.2	19.7	4.1	0.0
Abhaynagar and Keshobpur	Live births	Male	119.0	121.0	88.0	43.0	14.0	2.0	0.0
		Female	112.0	108.0	75.0	45.0	11.0	3.0	0.0
		Total	231.0	229.0	163.0	88.0	25.0	5.0	0.0
	Person-years of mothers		1,805.6	1,885.6	1,455.2	1,195.0	1,086.9	935.5	788.8
	Age-specific fertility rate		127.9	144.5	112.0	73.6	23.0	5.4	0.0
Mirsarai	Live births	Male	80.0	185.0	103.0	71.0	26.0	4.0	2.0
		Female	99.0	194.0	103.0	62.0	22.0	8.0	0.0
		Total	179.0	379.0	206.0	133.0	48.0	12.0	2.0
	Person-years of mothers		2,567.8	2,114.5	1,373.7	1,365.1	1,199.3	1,077.5	9,21.0
	Age-specific fertility rate		70.1	179.3	149.9	97.4	40.0	11.2	2.2

Annex 10. Population of Kamalapur in 2003 aged 10 to 54 years by age group, gender and if ever married

Age	Male		Female	
(years)	Never married	Ever married	Never married	Ever married
10-14	5,987	8	5,762	128
15-19	5,317	164	3,743	2,430
20-24	3,682	1,334	1,312	5,508
25-29	1,645	3,310	341	5,267
30-34	553	4,444	73	4,505
35-39	104	4,223	12	3,303
40-44	32	3,978	6	2,940
45-49	8	2,416	1	1,713
50-54	4	1,962	0	1,608

Annex 11. Bride and groom's age at marriage by previous marital status for rural surveillance areas 2002

Age (years)	Previous marital status									
	Single		Married		Divorced		Widowed		Total	
	Grooms	Brides	Grooms	Brides	Grooms	Brides	Grooms	Brides	Grooms	Brides
10-14	0	51	0	-	0	1	0	0	0	52
15-19	65	400	1	-	1	20	0	1	67	421
20-24	196	238	7	-	12	38	1	5	216	281
25-29	145	44	6	-	8	20	2	0	161	64
30-34	83	11	7	-	12	12	2	5	104	28
35-39	24	0	4	-	8	6	4	1	40	7
40-44	3	0	4	-	0	0	3	0	10	0
45-49	1	0	1	-	2	1	2	0	6	1
50-54	0	0	2	-	0	0	1	0	3	0
55-59	0	0	0	-	0	0	2	0	2	0
60-64	0	0	0	-	0	0	0	0	0	0
65+	0	0	1	-	0	0	1	0	2	0
All ages	517	744	33	-	43	98	18	12	611	854

Annex 12. Bride and groom's age at marriage by previous marital status for rural surveillance areas 2003

Age (years)	Previous marital status									
	Single		Married		Divorced		Widowed		Total	
	Grooms	Brides	Grooms	Brides	Grooms	Brides	Grooms	Brides	Grooms	Brides
10-14	1	53	0	-	0	1	0	0	1	54
15-19	62	350	0	-	2	25	0	0	64	375
20-24	187	201	5	-	13	19	1	1	206	221
25-29	125	62	7	-	18	14	2	2	152	78
30-34	83	4	8	-	10	11	1	1	102	16
35-39	24	0	3	-	6	3	3	2	36	5
40-44	3	2	5	-	3	1	3	0	14	3
45-49	0	0	3	-	2	0	1	0	6	0
50-54	0	0	2	-	0	0	1	0	3	0
55-59	0	0	0	-	1	0	2	0	3	0
60-64	0	0	1	-	0	0	0	0	1	0
65+	0	0	0	-	1	0	2	0	3	0
All ages	485	672	34	-	56	74	16	6	591	752

Annex 13. Rural marriage rates per 1000, irrespective of the previous marital status, by age group, year and gender

Age (years)	Males		Females	
	2002	2003	2002	2003
All Ages	22.7	21.6	30.6	26.5
10-14	0.0	0.2	12.9	13.7
15-19	16.6	15.6	97.8	85.9
20-24	62.7	58.8	79.2	59.9
25-29	68.4	61.2	23.4	27.6
30-34	45.0	44.0	11.0	6.3
35-39	19.2	17.0	3.1	2.2
40-44	5.0	6.9	0.0	1.5
45 and over	2.0	2.4	0.2	0.0

Annex 14. Marriages and divorces in the rural surveillance sites by year and month

Month	2002				2003			
	Marriage		Divorce		Marriage		Divorce	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
All Months	1,465	100	146	100	1,343	100	120	100
January	109	7.4	15	10.3	92	6.9	5	4.2
February	136	9.4	17	11.6	112	8.3	10	8.3
March	160	10.9	11	7.5	127	9.5	13	10.8
April	134	9.1	5	3.4	102	7.6	7	5.8
May	163	11.1	6	4.1	142	10.5	16	13.3
June	125	8.5	9	6.3	127	9.5	8	6.7
July	146	10.0	11	7.5	152	11.3	12	10.0
August	91	6.2	16	11.0	106	7.9	8	6.7
September	88	6.0	13	8.9	84	6.3	5	4.2
October	133	9.1	19	13.0	142	10.5	24	20.0
November	84	5.7	13	8.9	55	4.1	3	2.5
December	96	6.6	11	7.5	102	7.6	9	7.5

Annex 15. Rural male surveillance population by age group and marital status in 2003

Age (years)	Marital status						
	Unmarried	Married	Polygamous	Separated	Divorced	Widowed	Total
0-9	7,754	0	0	0	0	0	7,754
10-14	4,019	0	0	0	0	0	4,019
15-19	4,098	97	1	0	1	0	4,197
20-24	2,707	764	5	0	10	0	3,486
25-29	1,219	1,351	15	0	12	1	2,598
30-34	391	1,871	27	1	10	1	2,301
35-39	101	1,985	32	0	8	0	2,126
40-44	25	1,942	53	1	8	4	2,033
45-49	11	1,698	69	1	11	6	1,796
50-54	5	1,338	58	0	7	8	1,416
55-59	4	982	55	1	6	17	1,065
60-64	1	748	43	1	2	21	816
65-69	4	597	32	0	7	38	678
70-74	0	433	21	0	4	34	492
75-79	0	242	9	3	2	45	301
80-84	0	130	8	0	3	40	181
85 and over	0	85	2	0	1	42	130
All ages	20,337	14,265	430	8	92	257	35,389

Annex 16. Rural female surveillance population by age group and marital status in 2003

Age (years)	Marital status					
	Unmarried	Married	Separated	Divorced	Widowed	Total
0-9	7,522	0	0	0	0	7,522
10-14	3,853	44	0	2	0	3,899
15-19	2,994	1,381	2	37	0	4,414
20-24	995	2,709	21	52	6	3,783
25-29	181	2,571	23	49	22	2,846
30-34	24	2,412	32	44	49	2,561
35-39	20	2,090	51	36	90	2,287
40-44	10	1,795	47	56	167	2,075
45-49	3	1,334	45	42	293	1,717
50-54	1	951	25	27	383	1,387
55-59	1	588	11	8	379	987
60-64	0	403	6	7	516	932
65-69	0	195	2	4	497	698
70-74	0	100	1	0	465	566
75-79	0	24	2	0	269	295
80-84	0	8	0	1	152	161
85 and over	0	2	0	0	111	113
Total	15,604	16,607	268	365	3,399	36,243

Annex 17. Contraceptive prevalence rates (percent) and method mix by currently married women of reproductive age in surveillance area

Method	Abhoynagar 2002 (n=4,468)	Abhoynagar 2003 (n=4,588)	Keshobpur 2002 (n=1,992)	Keshobpur 2003 (n=2,066)	Mirsarai 2002 (n=6,304)	Mirsarai 2003 (n=6,662)
Oral pill	25.4	24.6	22.7	21.2	19.9	20.6
Condom	2.6	3.1	1.8	1.9	3.3	3.4
Injectables	19.2	21.3	18.7	19.8	11.2	11.8
IUD	1.7	1.6	0.8	0.7	1.6	1.6
Norplant	1	0.8	1.4	1.3	1.4	1
Tubectomy	4.5	4.3	4.8	4.5	5.4	5.1
Vasectomy	1.3	1.2	1.9	1.6	0	0
Modern	55.9	56.8	52.1	51.1	42.9	43.6
Traditional	2.4	2.2	3.9	3.5	2.4	2.6
All	58.3	59.0	56.0	54.6	45.3	46.2

Annex 18. Proportional distribution (percent) of sources of modern contraceptives by surveillance area and year

Source	Abhoynagar 2002 (n=2,496)	Abhoynagar 2003 (n=2,606)	Keshobpur 2002 (n=1,037)	Keshobpur 2003 (n=1,057)	Mirsarai 2002 (n=2,706)	Mirsarai 2003 (n=2,906)
Hospital	8.8	7.6	11.7	11.9	13.0	11.7
FWV,FWC,SC	12.6	11.0	27.7	28.9	22.7	24.2
FWA client's home	11.5	12.7	4.3	5.1	16.1	14.7
FWA's residence	13.3	17.4	6.5	7.5	6.9	10.2
Community Clinic, HA	21.2	18.4	7.8	6.8	6.6	2.8
NGO	3.2	3.3	7.0	6.7	1.4	1.4
Pharmacies/Shops	26.6	24.4	32.1	30.2	28.0	30.4
Sterilisation Camp	0.3	0.2	1.3	1.0	4.0	3.5
Other	2.5	5.0	1.6	1.9	1.3	1.1
Total	100	100	100	100	100	100

FWV = Family Welfare Visitor; FWC =Family Welfare Clinic; SC =Satellite Clinic, FWA = Family Welfare Assistant; HA = Health Assistant; and NGO = Non-governmental Organisation

Annex 19. Percentages of children aged 12-23 months having received diphtheria, pertussis and tetanus vaccinations, by number of doses, surveillance area and year

Doses	Abhoynagar 2002 (n=481)	Abhoynagar 2003 (n=568)	Keshobpur 2002 (n=224)	Keshobpur 2003 (n=217)	Mirsarai 2002 (n=889)	Mirsarai 2003 (n=904)
3 or more	88.6	89.6	94.6	93.1	87.1	87.8
2	7.9	7.8	3.2	2.8	8.1	8.1
1	1.8	1.5	1.8	2.3	2.3	2.4
At least one	98.3	98.9	99.6	98.2	97.5	98.3

Annex 20. Percentages of children aged 12-23 months having received oral polio vaccinations, by number of doses, surveillance area and year

Doses	Abhoynagar 2002 (n=481)	Abhoynagar 2003 (n=568)	Keshobpur 2002 (n=224)	Keshobpur 2003 (n=217)	Mirsarai 2002 (n=889)	Mirsarai 2003 (n=904)
3 or more	99.6	99.6	100.0	99.1	99.7	99.7
2	0.2	0.2	0.0	0.4	0.1	0.2
1	0.0	0.0	0.0	0.0	0.0	0.1
At least one	99.8	99.8	100.0	99.5	99.8	100.0

Annex 21. Percentages of children aged 12-23 months having received BCG and measles vaccinations and children less than five years having received vitamin A during the last 6 months, by surveillance area and year

Vaccination/ supplement	Abhoynagar 2002 (n=481/ 2,602*)	Abhoynagar 2003 (n=568/ 2,636*)	Keshobpur 2002 (n=224/ 1,131*)	Keshobpur 2003 (n=217/ 1,134*)	Mirsarai 2002 (n=889/ 4,728*)	Mirsarai 2003 (n=904/ 4,911*)
BCG	98.5	98.8	98.7	98.2	95.2	96.7
Measles	93.1	91.4	91.1	92.2	84.7	88.1
Vitamin A	70.9	76.4	69.9	65.8	67.8	65.0

* Children less than five years old

Annex 22. Percentages of women aged 10 to 49 years having received tetanus toxoid vaccinations, by number of doses, surveillance area and year

Doses	Abhoynagar 2002 (n=7,167)	Abhoynagar 2003 (n=7,233)	Keshobpur 2002 (n=3,163)	Keshobpur 2003 (n=3,231)	Mirsarai 2002 (n=12,945)	Mirsarai 2003 (n=13,124)
2 or more	63.2	66.7	67.1	71.4	57.6	60.0
1	6.8	6.2	6.2	4.9	5.2	5.0
0	30.0	27.1	26.7	23.7	37.2	35.0

Annex 23. Mean and median expenditure on health in Taka by family during the preceding three months by surveillance area and round

Year - quarter	Abhoynagar		Keshobpur		Mirsarai	
	Mean	Median	Mean	Median	Mean	Median
2002 - 1	420.93	200	294.01	100	844.22	400
2002 - 2	398.91	200	337.67	150	862.66	390
2002 - 3	410.05	200	370.56	150	943.61	400
2002 - 4	393.32	200	395.92	200	883.36	400
2003 - 1	342.39	200	352.33	180	773.88	400
2003 - 2	341.31	200	354.66	150	937.12	500
2003 - 3	424.92	200	365.52	200	856.09	500
2003 - 4	436.90	200	479.73	200	925.95	400

Annex 24. Percentages of husbands living with family, elsewhere in the country, or abroad during the fourth surveillance round of 2002 by surveillance area

Site	Husband living status		
	With family	Away in country	Abroad
Abhoynagar	96.9	2.7	0.4
Keshobpur	97.7	2.2	0.1
Mirsarai	76.0	6.6	17.4

Annex 25. Mean and median expenditure on health in Taka by families with a health event (death or pregnancy during the last 3 months, or acute respiratory infection, diarrhoea or dysentery during the last week before the surveillance) in percentage of the median health spending of all families by surveillance area and round

Year - quarter	Abhoynagar		Keshobpur		Mirsarai	
	Mean	Median	Mean	Median	Mean	Median
2002 - 1	616.11	300	473.16	100	1,427.89	600
2002 - 2	812.11	300	651.51	300	1,280.34	540
2002 - 3	701.70	325	1,136.18	300	2,032.35	700
2002 - 4	688.30	300	577.10	300	1,361.42	600
2003 - 1	503.83	300	500.49	300	1,394.84	500
2003 - 2	812.60	300	1,039.33	250	1,681.90	700
2003 - 3	1,226.22	300	603.75	300	1,521.08	600
2003 - 4	603.96	300	863.26	300	1,541.19	550

Annex 26. Population aged 15 by percentage who completed primary education (5 years) by gender, year and surveillance area

Year	Abhoynagar/Keshobpur		Mirsarai		Kamalapur	
	Male	Female	Male	Female	Male	Female
1994	39.8	36.4	-	-	-	-
1995	44.2	49.1	65.5	59.0	-	-
1996	47.8	47.3	63.1	66.0	-	-
1997	50.7	48.4	60.5	69.0	-	-
1998	56.3	61.4	61.1	68.3	-	-
1999	55.1	66.8	62.7	70.8	-	-
2000	56.2	69.4	64.4	70.4	-	-
2001	62.5	72.8	56.9	70.3	-	-
2002	64.4	77.2	64.4	75.9	-	-
2003	60.6	77.2	60.4	72.9	60.7	68.7

Annex 27. Population aged 20 by percentage who completed secondary education (10 years) by gender, year and surveillance area

Year	Abhoynagar/Keshobpur		Mirsarai		Kamalapur	
	Male	Female	Male	Female	Male	Female
1994	15.4	6.7	-	-	-	-
1995	15.6	11.2	23.8	19.1	-	-
1996	20.8	8.5	34.6	23.2	-	-
1997	17.9	10.5	33.6	18.4	-	-
1998	18.0	8.7	27.5	18.9	-	-
1999	16.6	10.7	22.3	18.9	-	-
2000	18.5	14.6	22.2	13.2	-	-
2001	20.0	10.3	25.3	14.9	-	-
2002	21.4	12.2	21.0	12.7	-	-
2003	20.4	15.7	23.4	14.9	18.8	17.5

Annex 28. Percentages of women under 45 in Matlab with 2 or 3 living children on 1/1/1983 and in Matlab, Jessore and Chittagong* on 1/1/1995 having additional live birth(s) before 1/1/1987 and 1/1/1999 respectively, by gender of children

Gender composition	1983	1995		
	Matlab	Matlab	Jessore	Chittagong
2 daughters	72.5	61.9	50.2	62.4
1 son, 1 daughter	65.9	47.1	20.4	52.2
2 sons	65.8	46.3	21.4	44.7
3 daughters	58.2	54.5	35.9	59.1
1 son, 2 daughters	55.1	36.2	18.6	39.6
2 sons, 1 daughter	46.3	20.3	9.9	31.3
3 sons	51.8	29.4	13.5	40.7

* Chittagong includes Mirsarai and Satkania, Jessore includes Abhoynagar, Keshobpur and Bagherpara