Health Systems and Infectious Diseases Surveillance System Report, 2000-2001

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Preface

This report documents the results of analysis of data collected during 2000-2001 by the Health Systems and Infectious Diseases Surveillance System (HSIDSS) of ICDDR,B: Centre for Health and Population Research. The present format is different from the 1999 report. Readability has been improved by including only summary tables and figures in the main text. Some important source data have been included in annexures. Other detailed data can be obtained, on certain conditions, from the Surveillance and Data Resources Unit of HSID.

For the first time, this report is published simultaneously in printed and electronic form.

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Summary

This report presents the results of analysis of some of data collected during 2000-2001 by the Health Systems and Infectious Diseases Surveillance System (HSIDSS) of ICDDR,B: Centre for Health and Population Research. HSIDSS collects a wide variety of data from the surveyed population. In addition to providing the most important indicators, this report gives researchers an overview of the available surveillance data. It is not intended to be an exhaustive source of data.

Results of the surveillance showed that the average household size fell from 5.4 persons in 1999 to 5.3 in 2000. As the surveillance was discontinued in several sites at the end of 2000, aggregate figures for 2001 cannot be compared with those for the previous year. However, in 2 of the 3 still active areas, the average household size also fell by 0.1, while it remained the same in the third site.

Compared to 1999, mortality rate continued to decline in the rural areas. Life expectancy at birth for males increased from 62.5 years in 1999 to 66.4 years in 2000, and 68.4 years in 2001. For females, the increase was from 63.9 years to 67.4 years in 2000, and 71.1 years in 2001. The same trend was found in the urban areas: for men from 58.7 years in 1999 to 62.4 years in 2000 and for women from 61.1 years in 1999 to 66.0 years in 2000. There are no urban data for 2001 as the sites were changed in that year (see Introduction).

The total fertility rates for the different surveillance areas were not very different from 1999, except in Lohagara, where the rate increased from 3.4 to 4.6 in 2000. This was the smallest site and was, therefore, more prone to annual fluctuations.

The mean age at first marriage for men in the rural areas was 26.2 years in 2000 and 26.1 years in 2001, and for women it was 19.2 and 19.1 years respectively. The mean age at first marriage in the urban surveillance sites in 2000 was 23.6 years for men and 18.6 years for women.

Contraceptive prevalence was the highest in the sites in Jessore district and the lowest in the sites in Chittagong district, while the urban sites had values between these.

Vaccination coverage was high or very high in all the areas, except for vaccinations against measles in the urban sites and tetanus toxoid vaccinations for women of reproductive age in all the areas.

Spending on health was much higher in the southeastern sites than in the other surveillance areas.

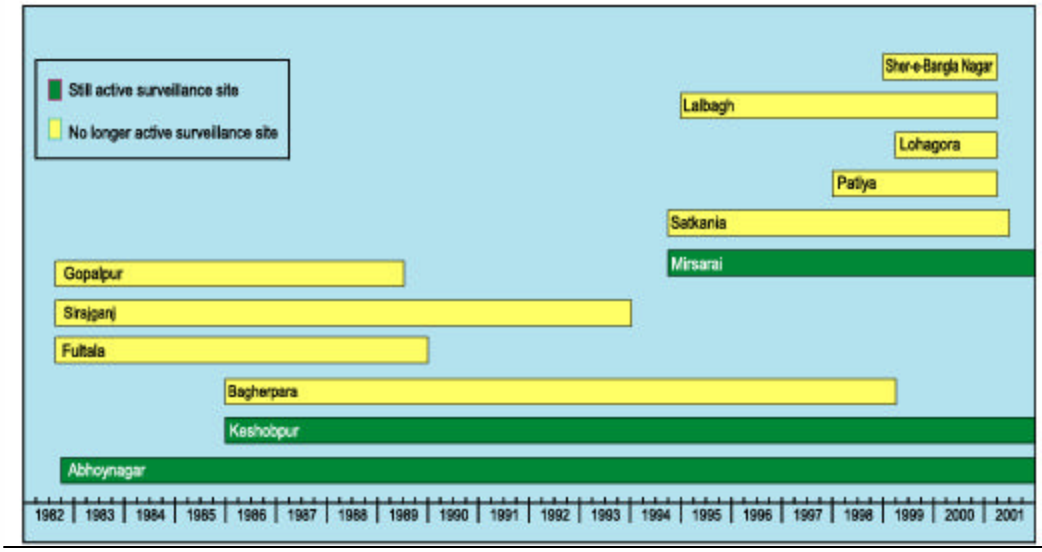
For the first time, there is a special feature chapter in this report, which describes the causes of death in Abhoynagar and Keshobpur. As these are the two oldest, and still active sites, in the surveillance system, it allows a comparison to be made with causes of death in the 1980s.

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. Covering the calendar years, 2000 and 2001, this report describes the findings of this surveillance during a period when a major reorganization of this project and its surveillance was taking place.

The demographic and programmatic surveillance of ORP was set up in 1982 and was known as Sample Registration System (SRS). Since then, additional field sites have been incorporated into the system, and some sites have been discontinued to meet the requirements of the interventions carried out at the ORP field sites. Figure 1 shows the addition and phase-out of the field sites under the demographic and programmatic surveillance during the 1982-2001 period.

Fig. 1. Surveillance areas of SRS, ORP, and FHRP between 1982 and 2001



FHRP=Family Health Research Project
ORP=Operations Research Project
SRS=Sample Registration System

Collection of data was same in all the areas. The Field Research Assistants visited all the households included in the sample 4 times a year and once each quarter and collected demographic, health and programmatic data. Each quarterly cycle of data collection is called a round.

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

1. to monitor the services provided through the field workers of 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.

Different sampling designs were adopted for the predominantly rural and urban areas. For the predominantly rural areas, the design was a stratified two-stage sampling. From each stratum, unions were randomly selected, and households served as 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 included every sixth household in Abhoynagar and Keshobpur field sites of Jessore district and every fourth household in Mirsarai, Satkania, Patiya, and Lohagara field sites of Chittagong district.

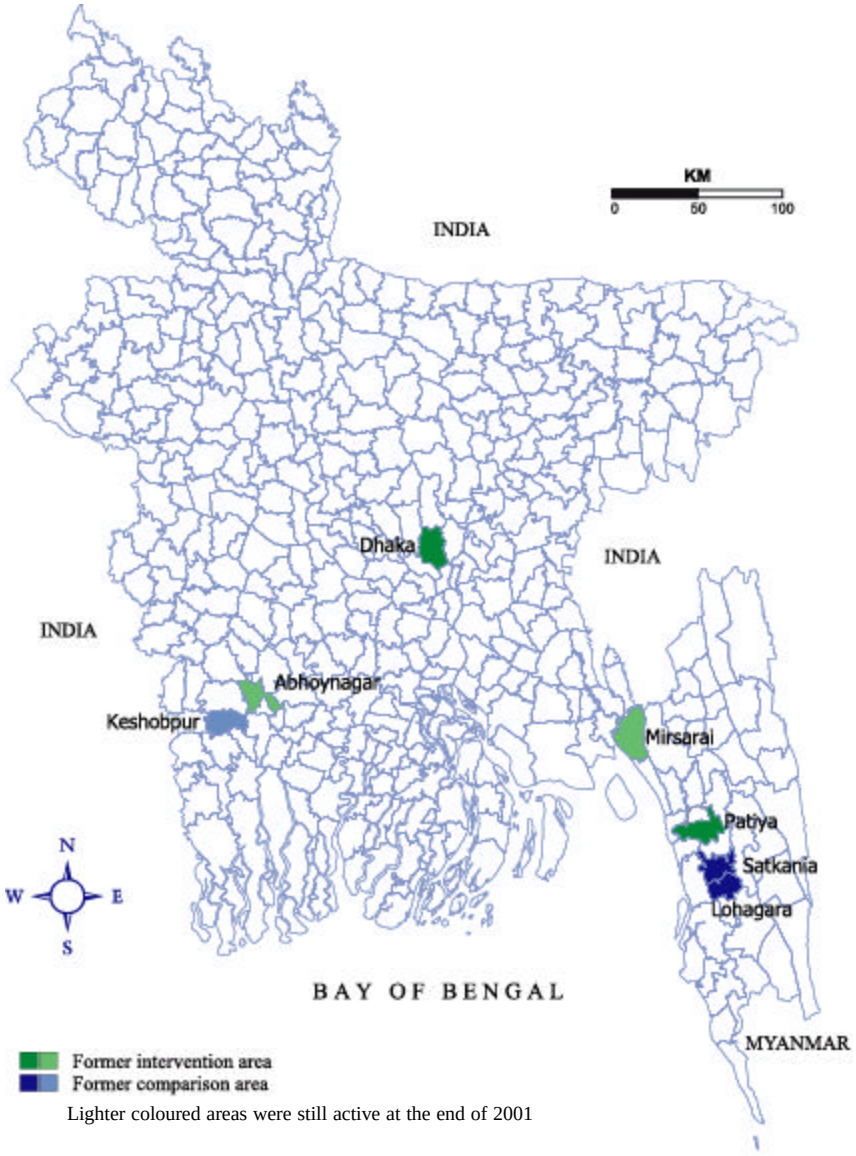
In the urban areas, a cluster-sampling design was followed. All households of a selected cluster, consisting of 40-50 households, were included in the ORP surveillance system. Its design was reviewed in 1999. Following the recommendations of this evaluation, 3,000 additional households were included in the surveillance. This brought the sampling fractions to around one-fourth of the households in Sher-e-Bangla Nagar and one-fifth in Lalbagh.

The Family Health Research Project (FHRP) replaced the Operations Research Project in 2001. The surveillance was considerably scaled down (Fig. 1). Funding by the United States Agnecy for International Development (USAID) of the surveillance in Mirsarai was terminated at the end of September and was obtained from other sources. Field activities no longer distinguish between the intervention and the comparison areas; and interventions may take place in part of the comparison areas, while part of the intervention areas may be used for comparison. The term intervention area and comparison area will, therefore, no longer be used.

Active areas

Figure 2 shows a map indicating the surveillance areas that were active in 2000 and 2001. All coloured areas were active at the beginning of 2000, while the lighter ones were still

Fig. 2. Surveillance sites of ORP and FHRP which were active in 2000 and 2001



FHRP=Family Health Research Project

ORP=Operations Research Project

active at the end of 2001. Table 1 shows selected key figures for the surveillance sites for the fourth quarters of 2000 and 2001. This table clearly shows the effect of termination of many sites during this period. During the last round of 2001, about 50% of households were surveyed compared to the last round of 2000. The discontinued rural field site activities were all in Chittagong district, and only one site is left there, with roughly the same number of households as in the other two rural sites in Jessore district. The urban field sites in Dhaka, 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 Kamalapur 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.

Table 1. Sample households, population, currently-married women of reproductive age, children, and average household size at the October to December surveillance round by field site, rural and urban, and year

		Households		Population				Currently-married women of reproductive age		Children aged less than 5 years		Average household size	
				Male		Female							
Field site	Year	2000	2001	2000	2001	2000	2001	2000	2001	2000	2001	2000	2001
Rural	Abhoynagar	4,528	4,644	11,106	11,205	10,660	10,787	4,513	4,590	2,181	2,173	4.8	4.7
	Keshobpur*	2,081	2,122	4,955	4,991	4,749	4,722	2,045	2,024	938	959	4.7	4.6
	Abhoynagar and Keshobpur	6,609	6,766	16,061	16,196	15,409	15,509	6,558	6,614	3,119	3,132	4.8	4.7
	Mirsarai	6,905	6,902	18,132	18,251	19,523	19,628	6,348	6,387	4,005	4,000	5.5	5.5
	Satkania*	2,232		6,678		6,803		2,197		1,744		6.0	
	Patiya	4,300		13,532		13,080		4,366		2,983		6.2	
	Lohagara*	1,376		4,173		4,274		1,331		1,127		6.1	
Urban	Sher-e-Bangla Nagar	3,630		7,909		8,053		3,397		1,999		4.4	
	Lalbagh*	2,250		5,273		5,176		2,102		1,286		4.6	
Total		27,302	13,668	71,758	34,437	72,318	35,137	26,299	13,001	16,263	7,132	5.3	4.9

* Former comparison area

In 1997, the semi-urban part of Abhoynagar became a municipality. This affected three unions: Noapara, after which the municipality is named, Prembagh, and Rajghat. Two-thirds, one quarter, and half of the households of these unions are respectively under the municipality. Of the municipal unions, surveillance takes place only 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 as the number is too small to be treated separately, the population of Abhoynagar has been considered in this report as rural.

The average household size in all the surveillance areas decreased from 5.3 persons to 4.9 persons per household. Several factors contributed to this decrease. The rural areas where surveillance was discontinued had a household size well above average and, although that of the urban sites was below average, the total number of urban households was smaller, giving it less influence on the average. Further, 2 of the 3 remaining sites experienced a fall in their average household size. The male and female population and the number of currently-married women of reproductive age under surveillance all fell by slightly more than 50%. The number of children aged less than 5 years, however, was more than 56% lower, indicating that the discontinued sites had relatively more children compared to the remaining ones.

Demographic Results

Age distribution

Figures 3, 4, and 5 show the age and gender distribution in person-years[1] for both rural and urban surveillance sites in 2000 and 2001. In normal circumstances, the number of person-years is very close to the mid-year population. Person-years are used for the calculation of most rates, for example birth and death rates. Details are provided in Annexure 1.

The pyramids depicting the rural surveillance population clearly show a fall in fertility in the recent past, resulting in a smaller proportion of children aged 0-9 years. This is more pronounced in 2000, indicating that past fertility was higher and the recent fertility reduction was greater in the discontinued surveillance areas, which are no longer included in Figure 5.

The pyramid illustrating the urban surveillance population demonstrates a very interesting situation. In most large cities, there is a surplus of young economically active males, causing a 'bulge' on the male side of the pyramid between ages 15 and 29 or 34. Here the opposite is true: there are far more women aged 15-29 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

[1] Person-years are the actual total number of years lived by a population in the area and correspond to the average population during the calendar year; for instance, a child born on 1 March and dying exactly 3 months later contributes a quarter of a person-year.

many young men may be caused by large numbers seeking employment abroad, while also men being posted in rural areas may leave their family behind in Dhaka.

Fig. 3. Population pyramid by person-years of rural surveillance in 2000

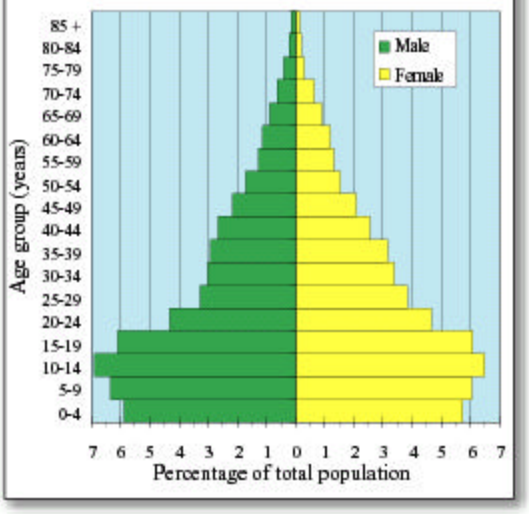
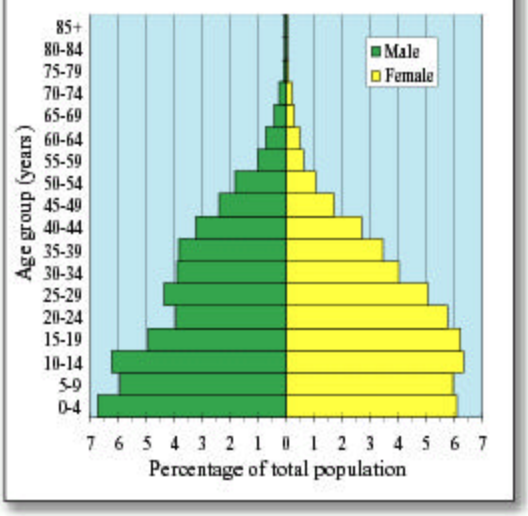


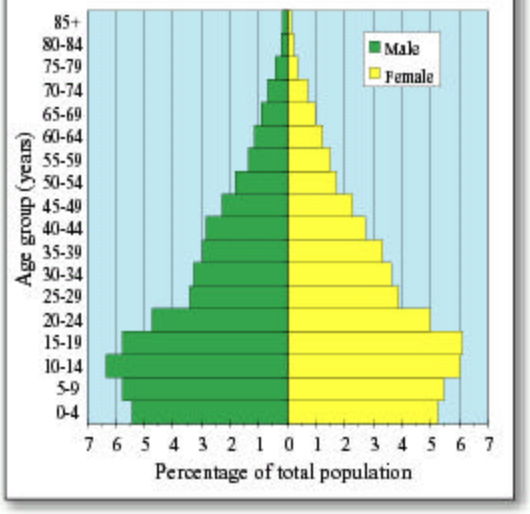
Fig. 4. Population pyramid by person-years of urban surveillance in 2000



The presence of many women of reproductive age in the urban field sites is the cause of a larger proportion of young children compared to the rural areas, despite generally lower fertility in the 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 40 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 by person-years of rural surveillance in 2001



Further research is needed to determine the factors playing a role.

Mortality

Table 2 shows the crude death rates (deaths per 1,000 person-years lived) in the different sites by gender and year.[2] In all the areas for which data for both the years are available, mortality was lower in 2001 than that in 2000 for each sex. There was a remarkable difference, however, between the sites in Jessore district—Abhoynagar and Keshobpur—and the other sites: the former had higher mortality in females than in males, while the latter showed the reverse: male mortality was higher than female mortality, which is more common almost everywhere. Traditionally, female mortality in South Asian countries was higher than male mortality, as women and girls received less food and medical care than men and boys, and women had additional risks from childbearing. In recent years, this trend has reversed.

Table 2. Crude death rates per 1,000 person-years by gender and surveillance area

Surveillance area		Crude death rates					
		Male		Female		Total	
		2000	2001	2000	2001	2000	2001
Rural	Abhoynagar	6.1	4.3	5.8	5.1	5.9	4.7
	Keshobpur	5.5	4.8	7.6	6.6	6.5	5.7
	Abhoynagar and Keshobpur	5.9	4.5	6.4	5.6	6.1	5.0
	Mirsarai	8.6	8.5	6.6	5.1	7.6	6.7
	Satkania	5.6		7.1		6.4	
	Patiya	5.9		6.1		6.0	
	Lohagara	10.1		6.4		8.2	
	All South-eastern sites*	7.4		6.5		6.9	
	All rural	7.0	6.6	6.5	5.3	6.7	5.9
Urban	Sher-e-Bangla Nagar	7.1		4.5		5.8	
	Lalbagh	6.3		5.3		5.8	
	All urban	6.8		4.8		5.8	
Total		6.8	6.6	6.3	5.3	6.5	5.9

* Mirsarai, Satkania, Patiya, and Lohagara

[2] The sites vary in size, and the smaller ones are more sensitive to random fluctuations than the larger ones.

Crude death rates are sensitive to age composition of the population. Life expectancy at birth[3], another mortality measure, overcomes this disadvantage. However, as this measure is based on mortality at different ages, it is impractical to use it for small populations. In view of this, the surveillance sites in the same region have been combined to give populations of more than 13,000 inhabitants of each sex. The pattern of life expectancy for these areas shown in Table 3 is similar to that in Table 2: the Jessore sites had higher female mortality than male mortality, while the other sites had the opposite differential. In the combined sites of Abhoynagar and Keshobpur, male life expectancy in 2000 was around four years higher than the average for all the sites, while female life expectancy was close to the average.

In the urban sites, the effect of age composition becomes clear. Although the crude death rates were close to the average, life expectancy was well below that of the other sites, especially for males.[4] The crude death rates were not higher, because the urban sites had very few elderly, who are more at risk of dying, as Figure 3 has shown.

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

Surveillance area		Life expectancy at birth			
		Male		Female	
		2000	2001	2000	2001
Rural	Abhoynagar and Keshobpur	70.7	74.2	67.4	70.5
	Mirsarai	63.8	63.9	67.9	72.3
	Other rural*	66.7		67.1	
	All rural	66.4	68.4	67.4	71.1
Urban		62.3		66.0	
Total		66.0	68.4	67.1	71.1

* Less populous areas in the same region have been grouped together

Analysis of life expectancy in the sites for which data are available for both the years shows that life expectancy was higher in 2001, although not for Mirsarai males.

Figure 6 shows the expected number of survivors from 100,000 births up to age 85 years, if they experience the same mortality pattern as observed in the year specified. Separate graphs are shown for urban and rural population based on the observed mortality

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

[4] This is probably caused by the fact that the urban sites include a large proportion of slum dwellings.

in 2000 and 2001 (rural mortality only), by gender. The urban mortality patterns are less regular as a result of the much smaller urban surveillance population and fluctuations in the number of deaths. The graphs show that rural women, according to the mortality data of 2001, have a higher chance of surviving from birth to all ages, except 35 and 40 years, compared to any other groups. Fewer urban men survive to ages up to 70 years compared to women or rural men. Above this age there are so few men in the urban sample that the mortality pattern is not clear. The survival curves of all other categories are close together, indicating that there are no major differences in the chance of surviving to different ages between these categories. The abridged life-tables on which this figure is based are shown in Annexures 2, 3, and 4.

Fig. 6. Life-table of survivors from 100,000 births until specified ages by grouped surveillance areas, year, and gender

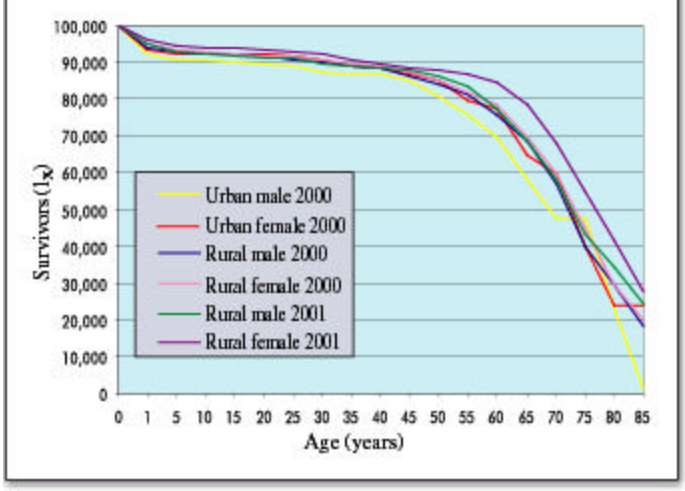
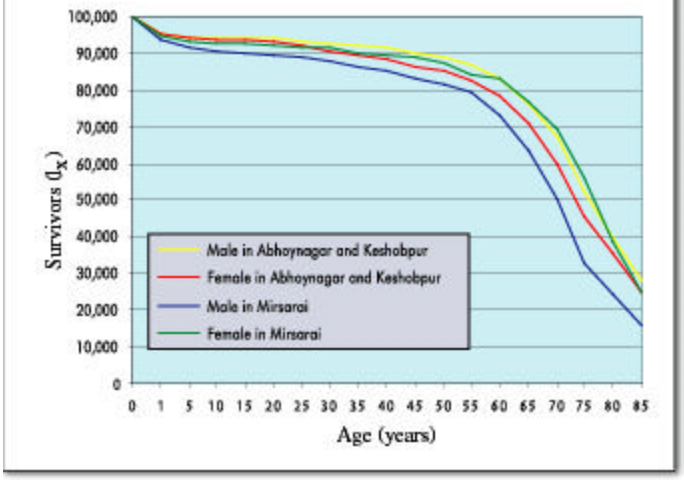


Figure 7 is similar to Figure 6, but depicts the survival chances for the population of Mirsarai and those living in the combined areas of Abhoynagar and Keshobpur by gender, based on mortality experienced in both 2000 and 2001. Widening the time period, thereby increasing the sample, reduces fluctuations due to the small number of deaths. The Mirsarai males clearly have higher mortality than other groups. The males and females of Abhoynagar and Keshobpur experience a similar, lower mortality up to age 15 years, compared to Mirsarai. Female mortality above the age of 15 years was higher than male mortality in Abhoynagar and Keshobpur. At age 30 years

Fig. 7. Life-table of survivors from 100,000 births by surveillance area and gender according to combined 2000 and 2001 mortality



and above, it was even higher than that of women in Mirsarai, while male mortality in Abhoynagar and Keshobpur remained low even at higher ages compared to other groups. As shown earlier, male mortality in Mirsarai was higher than female mortality, which is typical in most populations, while this was reversed in Abhoynagar and Keshobpur. The abridged life-tables (life-tables based on survival to the first birthday and then to each fifth birthday) on which this figure is based are shown in Annexures 5 and 6.

Table 4 shows death rates of infants aged less than one year per 1,000 livebirths during the year, and death rates of children aged 1-4 years per 1,000 person-years lived during the year, by gender and surveillance area. The surveillance areas in this table and Table 5 are grouped as done in Table 3, for the same reasons. For infant mortality, the pattern is similar to that of life expectancies shown in Table 3, i.e. the urban infant death rates were higher than average, while the male infant death rates for the combined sites of Abhoynagar and Keshobpur were lower. The number of child deaths was so small that no clear patterns were obvious in the child death rates. The only conclusion that may be drawn is that child mortality was very low compared to infant mortality, despite children spending up to four years in the age group. The actual risk of dying during these ages was around four times higher than the annual death rate for this group.

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

Surveillance area		Infant death rates						Child death rates					
		Male		Female		Total		Male		Female		Total	
		2000	2001	2000	2001	2000	2001	2000	2001	2000	2001	2000	2001
Rural	Abhoynagar and Keshobpur	53.6	42.2	53.7	40.2	53.7	41.3	0.8	2.3	1.6	4.0	1.2	3.1
	Mirsarai	63.3	60.1	62.5	36.6	62.9	48.7	6.1	7.3	5.0	4.3	5.6	5.8
	Other rural*	61.5		40.1		50.7		2.9		5.4		4.1	
	All rural	60.0	52.1	50.3	38.2	55.2	45.4	3.4	5.1	4.4	4.2	3.9	4.6
Urban		76.5		63.8		70.2		4.0		1.8		2.9	
Total		63.3	52.1	53.0	38.2	58.2	45.4	3.5	5.1	3.9	4.2	3.7	4.6

* Less populous areas in the same region have been grouped together

Table 5 illustrates the breakdown of infant death rates into neonatal (deaths of children aged 0-27 days per 1,000 livebirths) and postneonatal death rates (deaths of children aged 28 days to their first birthday per 1,000 livebirths). It is clear that most infant deaths took place during the first four weeks, except in the urban sites, where the postneonatal death rates were about the same as the neonatal rates. Otherwise, the patterns were similar to the previous table.

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

Surveillance area		Neonatal death rates						Post-neonatal death rates					
		Male		Female		Total		Male		Female		Total	
		2000	2001	2000	2001	2000	2001	2000	2001	2000	2001	2000	2001
Rural	Abhoynagar and Keshobpur	42.9	36.9	36.9	31.6	40.2	34.4	10.7	5.3	16.8	8.6	13.4	6.9
	Mirsarai	56.6	49.4	34.5	18.3	45.3	34.3	6.8	10.7	28.0	18.3	17.7	14.4
	Other rural*	39.4		26.2		32.7		22.1		13.9		17.9	
	All rural	45.5	43.8	31.2	24.2	38.5	34.4	14.5	8.3	19.1	14.0	16.8	11.0
Urban		39.7		31.9		35.8		36.8		31.9		34.4	
Total		44.4	43.8	31.3	24.2	37.9	34.4	18.9	8.3	21.6	14.0	20.2	11.0

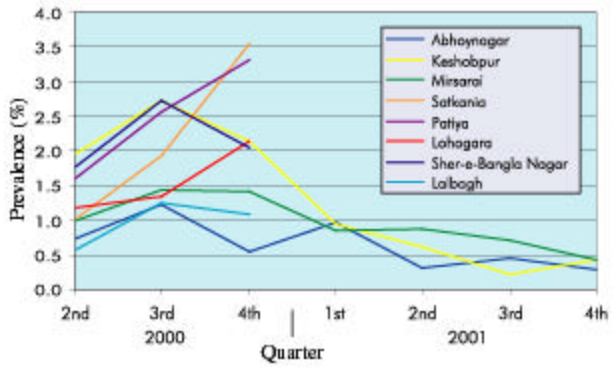
* Less populous areas in the same region have been grouped together

Morbidity

Morbidity information for children aged less than 5 years has been collected for acute respiratory infections, dysentery, and diarrhoea since April 2000. Figures 8, 9, and 10 show the prevalence (proportion of children affected during the last 7 days before the visit of the field worker) of these diseases. If a child was reported as experiencing diarrhoea without blood initially, followed by stool with blood, it was classified as dysentery and not as diarrhoea. Information for 2001 was not available for the sites because surveillance activities were discontinued at the end of 2000.

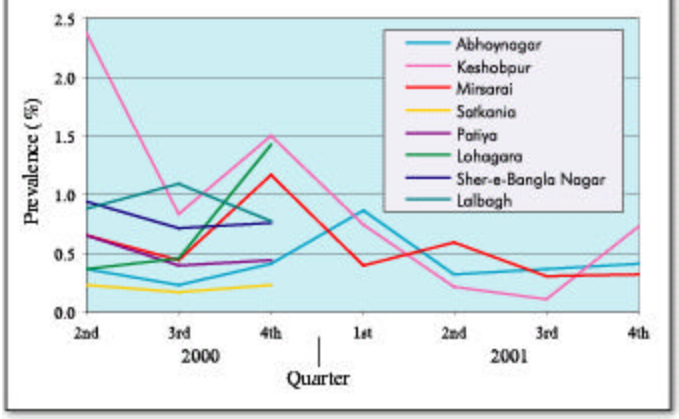
Reported new cases of acute respiratory infections rose in all surveillance areas in the third quarter of 2000 compared to the previous quarter. The rise continued in the southeastern sites during the fourth quarter, except in Mirsarai, where the prevalence remained constant. Simulta-neously, the prevalence of acute respiratory infections fell in all other areas. The prevalence was much lower in 2001 in the sites where the surveillance continued.

Fig. 8. Prevalence of acute respiratory infections among children aged less than 5 years by surveillance area and round



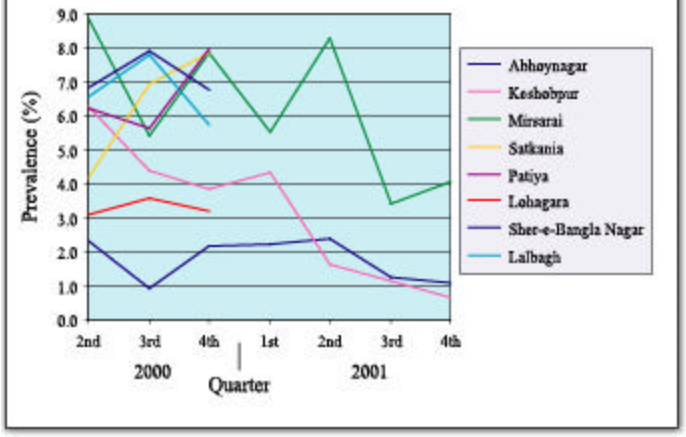
In most sites, the prevalence of dysentery fell in the third quarter of 2000, except in Lohagara and Lalbagh, where it rose slightly. The latter was the only area where there was a fall in new cases of dysentery in the fourth quarter, and in all other sites the prevalence increased. This increase continued during the first quarter of 2001 in Abhoynagar, while the other two remaining sites showed a decrease. All three remaining sites showed an increase during the last quarter of 2001.

Fig. 9. Prevalence of dysentery (stool with blood) among children aged less than 5 years by surveillance area and round



The prevalence of diarrhoea was generally much higher compared to the other two diseases. However, no clear patterns can be observed during this period. Generally, the prevalence was higher in the urban and southeastern sites, except Lohagara, while it was also relatively high in Keshobpur during the second quarter of 2000.

Fig. 10. Prevalence of diarrhoea (stool without blood) among children aged less than 5 years by surveillance area and round



Fertility

Table 6 shows the most common indicators of fertility for the different surveillance areas by year. These are the crude birth rate (numbers of births per 1,000 person-years lived during the year by the whole population), the general fertility rate (similar, but per 1,000 person-years lived by women aged 15-49 years), and the total fertility rate (average number of children born per woman if she lived through the reproductive period of her life experiencing age-specific fertility observed during the year). The crude birth rate and,

to a lesser degree, the general fertility rate were influenced by the age composition of the population.

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

Surveillance area		Crude birth rate		General fertility rate		Total fertility rate	
		2000	2001	2000	2001	2000	2001
Rural	Abhoynagar	23.2	22.7	85.1	82.5	2.5	2.4
	Keshobpur	21.0	23.9	80.7	91.0	2.3	2.6
	Abhoynagar and Keshobpur	22.5	23.0	83.7	85.0	2.4	2.5
	Mirsarai	24.4	24.1	92.2	89.9	2.9	2.9
	Satkania	29.5		119.8		3.9	
	Patiya	23.2		94.8		3.0	
	Lohagara	34.1		143.3		4.6	
	All southeastern sites*	25.8		101.9		3.3	
	All rural	25.0	23.6	97.0	87.6	3.0	2.7
Urban	Sher-e-Bangla Nagar	29.8		99.9		2.8	
	Lalbagh	27.9		100.1		2.9	
	All urban	29.0		100.0		2.8	
Total		25.6	23.6	97.5	87.6	3.0	2.7

* Mirsarai, Satkania, Patiya, and Lohagara

The Jessore sites had a relatively low fertility, only just above replacement level. The southeastern sites had fertility equal to the national average, a total fertility rate of about 3.3, although the total fertility rates varied widely from 2.9 in Mirsarai to 4.6 in Lohagara. The large number of husbands who work abroad may be the major cause for relatively low total fertility rate in Mirsarai. Without Mirsarai, the fertility in the southeastern sites was above the national average, indicating that women from these sites gave birth to more children than in most other areas of Bangladesh. The urban sites had a fertility slightly below the national average. (Annexures 7 and 8 for details on births in 2000 and 2001 by surveillance area and age-specific fertility rates).

Nuptiality

Table 7 shows the median and mean ages at marriage for brides and grooms by previous marital status and year. The data for 2000 have been shown separately for urban and rural areas, while the surveillance in 2001 covered only the rural areas. The median ages are

given in completed years, and an age with a ½ means that the median fell between two discrete ages. The mean ages were based on ungrouped data on age, 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 mean age at first marriage was lower for both brides (about half a year) and grooms (two and a half years) in the urban surveillance areas compared to the rural areas. A possible explanation is that over 80% of the population in the urban field sites in Dhaka are slum dwellers and belong to the lowest socioeconomic groups, which have lower age at marriage.

Previously-widowed urban grooms were older than those in the rural surveillance areas. The differences between urban and rural data for all other categories were small, although previously-divorced grooms in the urban areas were slightly older. It should be taken into account, however, that the number of marriages other than first marriage was relatively small, so, small absolute differences can have a large effect on the mean and median ages at marriage. The differences in age at marriage between 2000 and 2001 were small, and omission of data from the former sites of Satkania, Patiya, and Lohagara appears to have had a little influence.

Table 7. Median and mean ages at marriage, including standard deviation of the latter, by gender, year, and urban or rural

Gender	Urban 2000			Rural 2000			Rural 2001		
Previous marital status	Age		Standard deviation	Age		Standard deviation	Age		Standard deviation
	Median	Mean		Median	Mean		Median	Mean	
Groom									
Single	22	23.6	5.4	25½	26.2	5.2	25	26.1	5.3
Married	33	34.6	7.8	33	35.0	10.9	33	34.8	10.0
Divorced	29	30.0	6.3	26	26.5	6.0	27	28.4	7.8
Widowed	56	52.8	11.0	41	42.9	11.0	41½	41.4	11.8
Total	24	25.9	7.8	26	27.2	6.9	26	27.4	7.2
Bride									
Single	17	18.6	4.2	18	19.2	3.3	18	19.1	3.5
Divorced	20	23.7	7.1	23	24.4	6.5	21	22.8	6.9
Widowed	30	30.5	14.1	27	27.5	3.6	29	31.5	11.4
Total	18	19.4	5.3	19	19.7	4.0	18	19.5	4.2

Table 8 shows the proportions of brides and grooms by previous marital status, year, and urban or rural areas. The proportion of urban polygamous grooms was more than twice that in the rural surveillance areas. Furthermore, the proportion of urban brides who remarried was much greater than that in the rural areas. Annexures 9, 10, and 11 provide the absolute numbers of brides and grooms by age group, previous marital status, and year for urban and rural surveillance sites.

Table 8. Proportions of grooms and brides by previous marital status, year, and urban or rural

Gender	Area and year	Previous marital status				
		Single (%)	Married (%)	Divorced (%)	Widowed (%)	Total (%)
Grooms	Urban 2000	79.2	12.1	6.9	1.7	100.0
	Rural 2000	84.4	5.7	7.0	3.0	100.0
	Rural 2001	81.5	5.9	8.8	3.8	100.0
Brides	Urban 2000	84.3	-	14.8	0.9	100.0
	Rural 2000	91.2	-	7.9	0.9	100.0
	Rural 2001	89.6	-	9.4	0.9	100.0

Figure 11 shows the marriage rates by gender, age group, year, and urban or rural per 1,000 person-years irrespective of the previous marital status. As for Table 7, this graph illustrates that there was a little difference between the rural migration rates in 2000 and 2001. However, for the urban surveillance areas, the peak rates and the maximum rate for grooms were lower in urban than in rural areas.

Fig. 11. Marriage rates by gender, urban or rural, and year

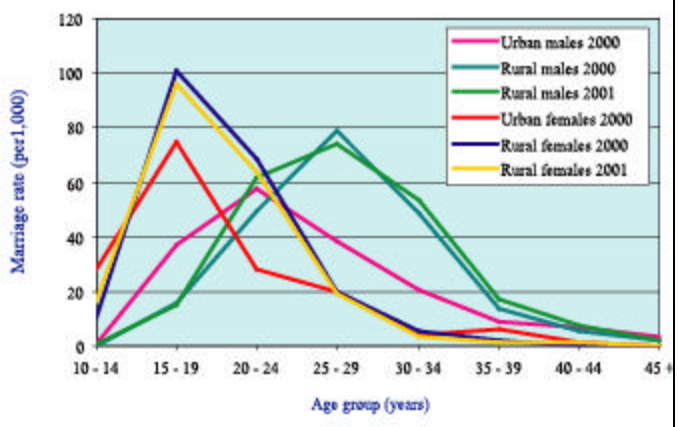


Figure 12 shows how weddings are spread over the year. The patterns for the rural and urban sites were very similar. The numbers of rural marriages peaked in both February-March and May-June and, to a lesser extent, in November. The numbers of urban marriages did not peak in February-March, but in May. The numbers of urban marriages during the second half of the year peaked in October rather than in November. All three categories showed a sharp drop in December. In both 2000 and 2001, the beginning of Ramadan fell in December, and most Muslims, who constituted more than 80% of our surveillance populations, refrain from marrying just before or during the month of fasting.

Figure 13 is similar to Figure 12, but depicts the distribution of divorces over the months. There was no clear pattern, which might have been partly caused by the much smaller numbers. The number of divorces was 13% of the number of marriages in the urban sites in 2000; in the rural sites, it was 8% and 11% for 2000 and 2001 respectively.

Fig. 12. Proportions of marriages by month, year, and urban or rural

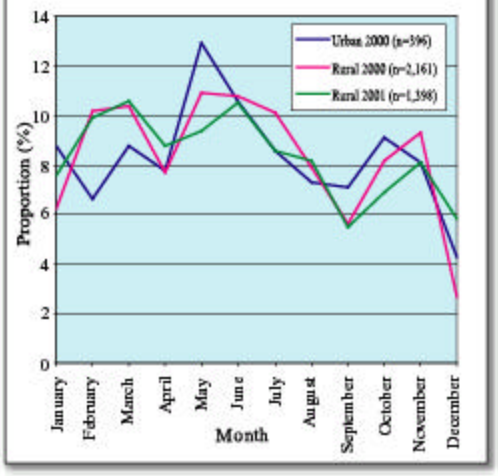
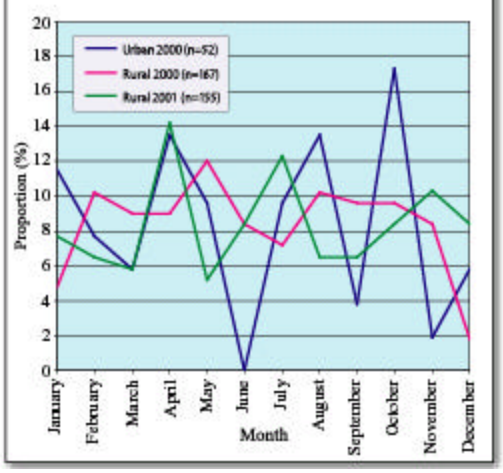


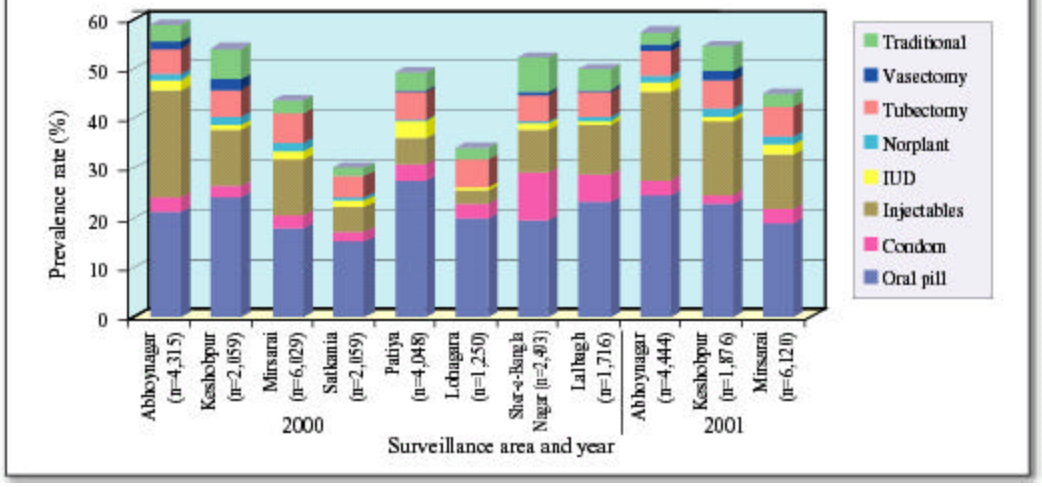
Fig. 13. Proportions of divorces by month, year, and urban or rural



Contraception

Figure 14 shows the contraceptive prevalence rates of currently-married women of reproductive age and method-mix for the surveillance areas in 2000 and 2001. The prevalence was the highest in the two sites in Jessore district. The lowest prevalence was found in the Chittagong district area, although the two former intervention sites had much higher contraceptive use than the two former comparison areas. The prevalence rates in

Fig. 14. Contraceptive prevalence rate and method-mix per 100 currently-married women of reproductive age by surveillance area and year

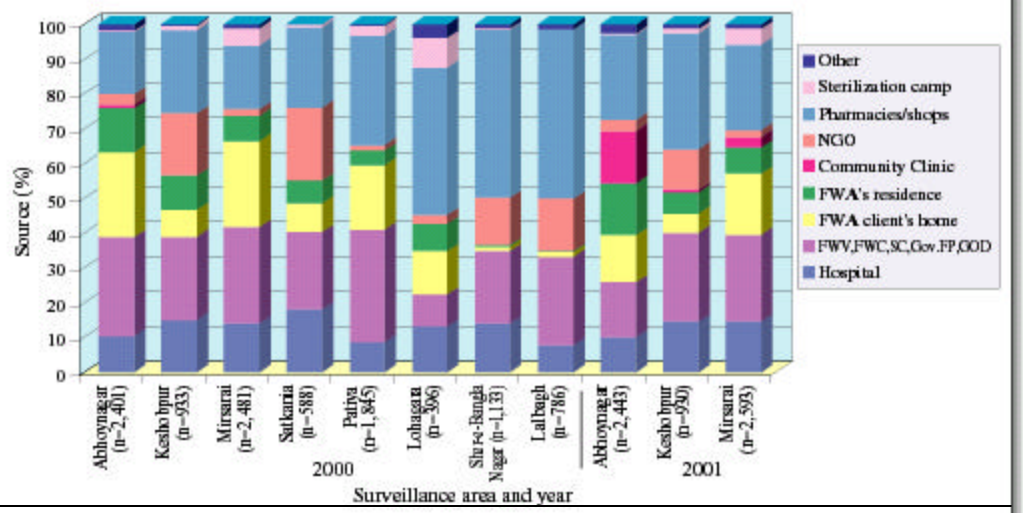


the two urban areas were between those of the Jessore district and those from the areas around Chittagong. In 2001, the prevalence was slightly lower than the previous year in Abhoynagar and slightly higher in Keshobpur and Mirsarai.

The method-mix showed that oral pill was by far the most popular contraceptive. Only in Abhoynagar, in 2000, slightly more users of injectable contraception than pill were recorded, while the reverse was reported in 2001. The number of injectable contraception users was less than three quarters of that of pill users in Abhoynagar during that year. In most other areas, injectable contraception was the second most commonly-used method, except in Patiya and Lohagara, where tubectomy was the second most popular method, and Sher-e-Bangla Nagar, where condom use was the second most popular method after the pill. The other urban area, Lalbagh, had relatively more condom users than any of the rural surveillance areas, although use of injectable contraception was more common.

Figure 15 shows the reported sources of modern methods. In the urban areas, half of users obtained contraceptives through pharmacies or other shops. In the rural areas, this is between one-third and one-fifth. In the areas where surveillance continued in 2001, the pharmacies and other shops increased their share of clients for contraceptive services by more than a third compared to 2000. The Family Welfare Centre, with Family Welfare Visitors, and Satellite Clinics in the rural areas, and the Government Family Planning Clinics and the Government Outdoor Dispensaries in the urban areas supplied between one-fifth and one-third of family-planning methods, except in Lohagara and Abhoynagar,

Fig. 15. Proportional distribution of sources of modern contraceptives by surveillance area and year



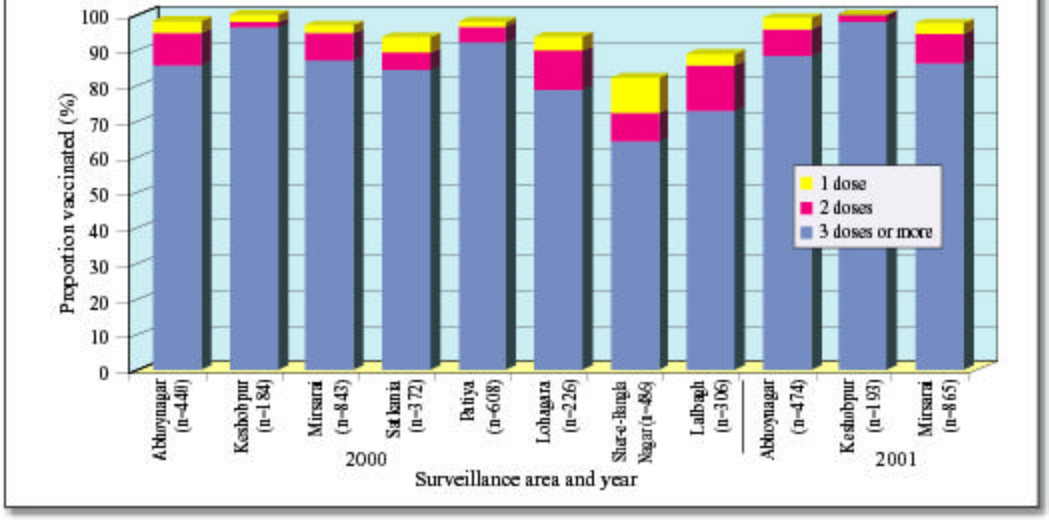
FWV=Family Welfare Visitor, FWC=(rural) Family Welfare Centre, SC=(rural) Satellite Clinic, Gov.FP=(urban) Government Family Planning Clinic, GOD=(urban) Government Outdoor Dispensary, FWA=Family Welfare Assistant, HA=Health Assistant, and NGO=Non-governmental organization

in 2001. In the latter site, the share of this category fell almost by half compared to 2000. In the rural areas, the Family Welfare Assistants, both from their own residence and while visiting their clients, were also an important source of contraceptives. This share diminished in 2001, coinciding with the introduction of Community Clinics as the lowest level of health and family-planning service-delivery. In Abhoynagar, where the first Community Clinics were constructed, the proportion of clients for family-planning services rose from 1% in 2000 to 15% in 2001. The opening of a Community Clinic was coupled with a move from door-to-door services to static service and selective household visits in the catchment area of the clinic. The Family Welfare Assistant and Health Assistant of the area were to provide services based at the clinic. Comparison of the 2000 and 2001 stacked bars of Abhoynagar showed that launching of Community Clinics and phasing out of domiciliary visits coincided with a shift to the new static clinics as a source and also to pharmacies and other shops. At the same time, Satellite Clinic services were transferred to Community Clinics, which received more clients.

Vaccination

Figure 16 shows the proportion of children, aged 12-23 months, who were vaccinated against diphtheria, pertussis, and tetanus (DPT). More than 90% of rural children in all surveillance areas had received at least one dose. More than 90% of children received at least two doses in most rural sites. In Satkania and Lohagara, the population was about 89%. In Keshobpur, 100% of children of this age had received at least two DPT

Fig. 16. Percentages of children, aged 12-23 months, who received diphtheria, pertussis, and tetanus vaccinations, by number of doses, surveillance area, and year



vaccinations. Only in Keshobpur, in 2000 and 2001, and in Patiya, more than 90% of children received three doses as recommended. All other rural sites received between 80% and 90%, except Lohagara, with 79%. The vaccination coverage in the urban surveillance areas was lower than that in the rural sites. This was particularly noticeable in Sher-e-Bangla Nagar, a predominantly slum area where performance was relatively low. In fact, only 82% of children aged 12-23 months were vaccinated at least once, while less than two-thirds received three vaccinations. Although still worse than any rural site, the situation in Lalbagh was better. At least one dose was given to 89% of children, and 73% were fully vaccinated.

Figure 17 shows the coverage of oral polio vaccination. As oral polio vaccine is normally given at the same time as DPT vaccinations, one would expect that the coverage is to be the same. However, in the rural surveillance areas, nearly all children were completely vaccinated, while the proportion was 93% and 98% in Sher-e-Bangla Nagar and Lalbagh respectively. Although these figures are impressive, the coverage was lower in the urban areas compared to the rural areas.

Fig. 17. Percentages of children, aged 12-23 months, who received oral polio vaccinations, by number of doses, surveillance area, and year

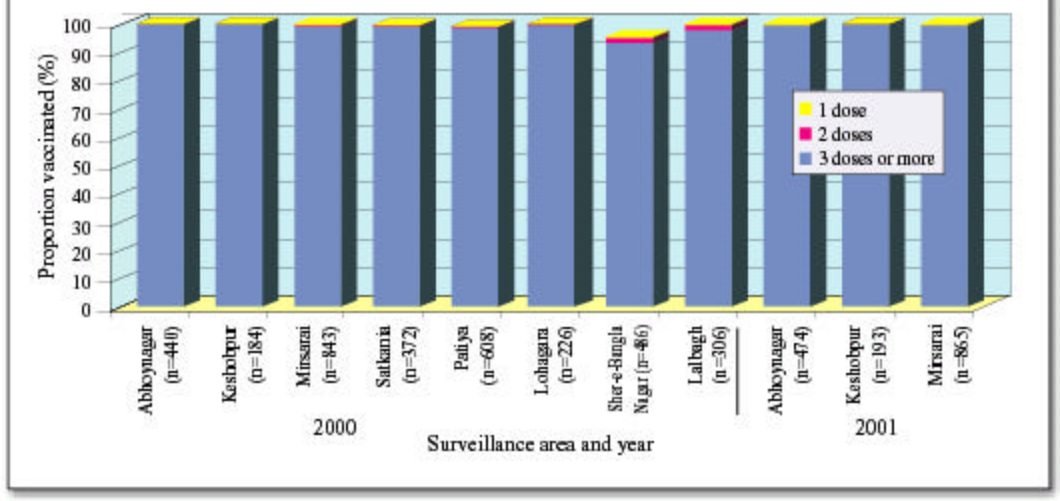
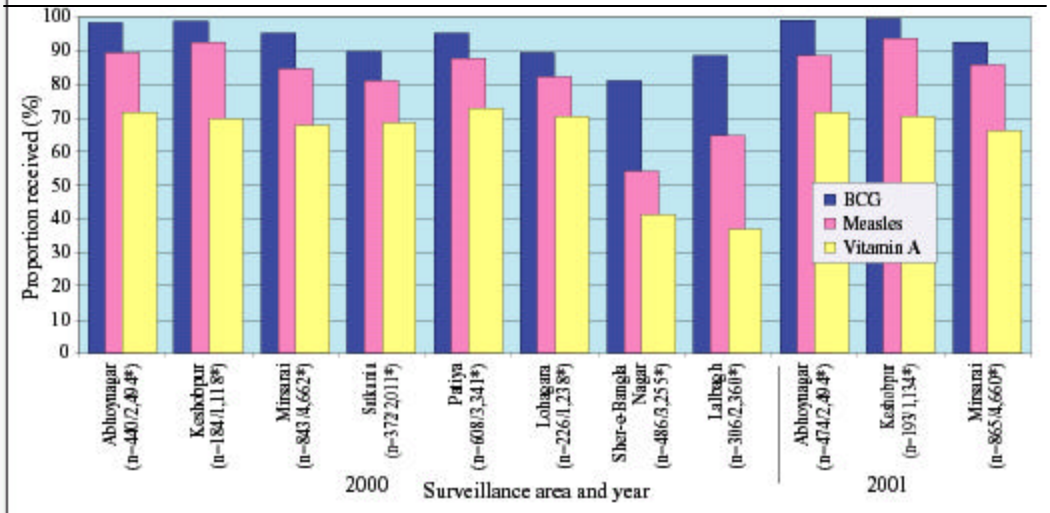


Figure 18 shows the percentage of children, aged 12-23 months, who received BCG and measles vaccines. It also shows the proportion of children, aged less than 5 years, who received vitamin A supplementation during the last 6 months. The patterns are similar to the previous two figures: highest in the rural areas, especially in the Jessore sites, and lowest in the urban surveillance areas, with the lowest proportion in the Sher-e-Bangla Nagar slum area. In all the sites, a greater proportion of children received BCG vaccination than measles vaccination, and an even smaller proportion received vitamin A capsules.

It is clear from all vaccination data for the surveillance sites that rural children have a greater chance of being vaccinated than urban children, although the coverage may be higher in the relatively-rich areas of Dhaka. It is clear that the extra effort for global eradication of polio has resulted in a higher coverage of polio vaccination than against diphtheria, pertussis, and tetanus.

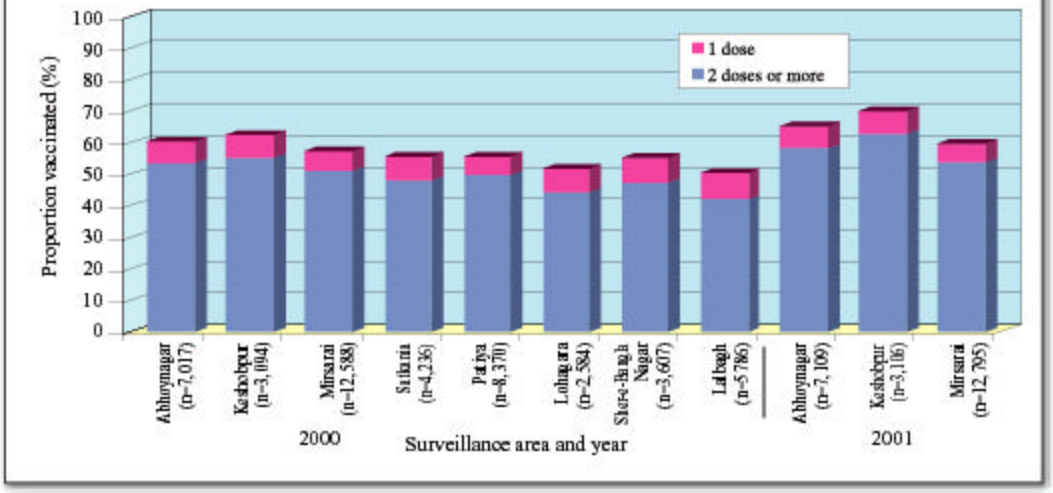
Fig. 18. Percentages of children, aged 12-23 months, who received BCG and measles vaccinations and children, aged less than 5 years, who received vitamin A during last 6 months, by surveillance area and year



*Children aged less than 5 years

Figure 19 shows the proportion of women, aged 10-49 years, who received tetanus vaccinations. The differences between the rural and the urban sites are less-pronounced. The Lalbagh surveillance area still has the lowest coverage, but only marginally. The other urban site, Sher-e-Bangla Nagar, has a coverage similar to a middle-ranking rural area. The sites where surveillance was still conducted in 2001 showed an improvement in coverage compared to 2000. However, even in 2001, only Keshobpur reached a coverage of more than two-thirds for at least one vaccination and over 60% for at least two.

Fig. 19. Percentages of women, aged 10-49 years, who received tetanus toxoid vaccinations, by number of doses, surveillance area, and year

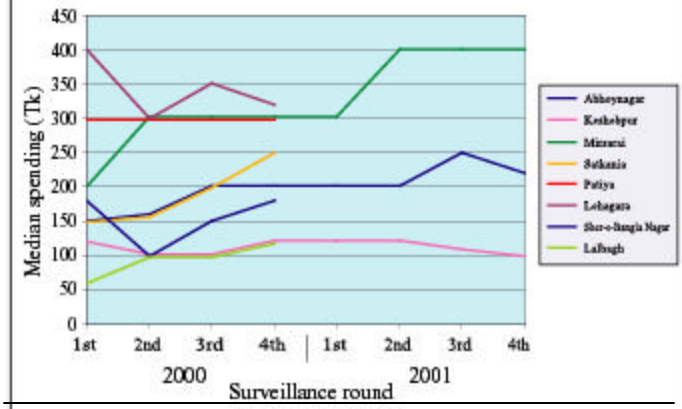


Health Expenditures

Figure 20 shows the median[5] health expenditure (Taka) per household during the preceding 3 months, by quarterly surveillance round, and area. As most medians were rounded figures, some lines in the graph were invisible due to the overlap. Theses values have been adjusted slightly either upward or downward to make the lines visible.

During the surveillance rounds in 2000, 3 of the 4 south-eastern areas had median quarterly health expenditure well above the other sites. In the fourth, Satkania, expenditure was equal to or above the other areas in the last 3 quarters. In 2001, only 3 of these areas

Fig. 20. Median expenditures on health in takas by family during preceding 3 months by surveillance area and round

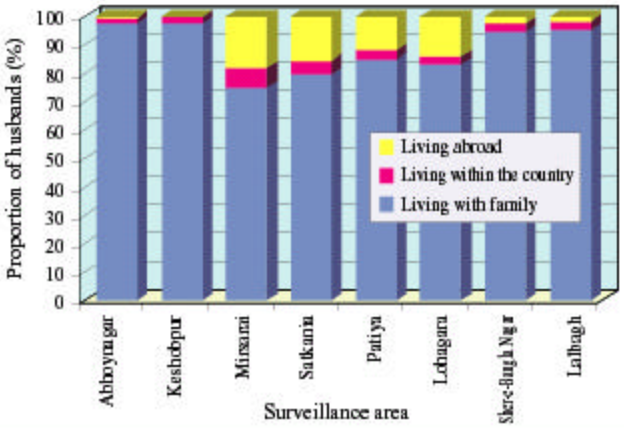


Some values have been changed slightly to make otherwise overlapping lines visible

[5] Medians are used as the means were influenced by a small number of very high amounts spent.

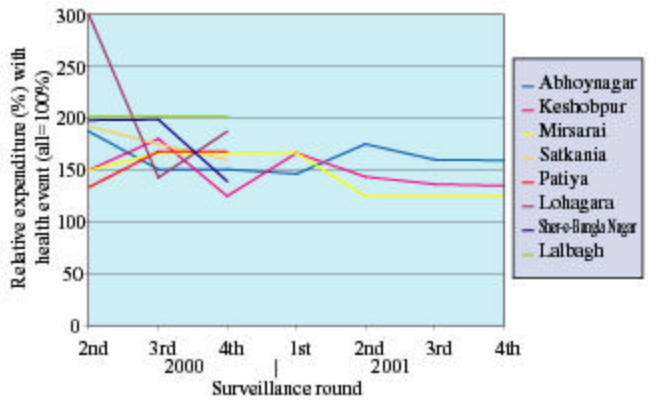
were still active: spending on health in Mirsarai continued to increase and was well above that in Abhoynagar and Keshobpur. Spending on health may be higher in the south-eastern areas because households in the region have more money. This may be related to the relatively high proportion of men from this area who earn a livelihood abroad, mostly in the Gulf region. Figure 21 shows the proportion of husbands of women under contraceptive surveillance (ever-married women aged less than 50 years) reported to be living with their family, without their family elsewhere in Bangladesh and abroad in the last surveillance round in 2000. In all south-eastern sites, more than 10% of husbands lived abroad compared to more than 18% in Mirsarai. In the other rural areas, this proportion was negligible, while in the urban areas less than 1 in 40 husbands was living abroad.

Fig. 21. Proportions of husbands living with family, elsewhere in the country, or abroad during the fourth surveillance round of 2000 by surveillance area



Health expenditure is linked to (prevention of) pregnancies, prevention and curing diseases, and deaths. The surveillance system covers all pregnancies and deaths in the surveyed population. However, no complete information on disease episodes was collected. Only dysentery, diarrhoea, and acute respiratory infections during the week before the surveillance visit were reported; the latter only from the second round of 2000 onwards. As a quarter is about

Fig. 22. Relative median health expenditures by family with a health event (death or pregnancy during last 3 months, or acute respiratory infection, diarrhoea, or dysentery during last week before the surveillance) in percentage of median spending of all families on health by surveillance area and round



Some values have been changed slightly to make otherwise overlapping lines visible

13 weeks, data on most (12/13) episodes were not collected. No data on other diseases were collected unless the person died of the disease. However, households with one or more of the reported health events mentioned, should, on average, have higher spending on health than on other households. Figure 22 shows that this is indeed the case. Although the figures fluctuate, this graph shows that median spending of households on health with a reported health event was about 50% higher than the median for the whole population surveyed. No data are given for the first round of 2000, as this did not include questions on acute respiratory diseases.

Feature: Causes of Death in Abhoynagar and Keshobpur

This section reports on causes of death in the Abhoynagar-Keshobpur surveillance area. As the number of deaths during one year was too small to study the causes of mortality, data from 5 consecutive years (1997 to 2001) have been combined. A comparison was made with the causes of mortality from 1983 to 1987. Since the geographical areas were not identical, the absolute numbers of deaths should not be compared. The Demographic Surveillance System started in Abhoynagar in the last quarter of 1982, and in Keshobpur at the beginning of 1986, and has continued since with 4 surveillance rounds per year. The surveillance is presently carried out in 73 villages in 5 of 8 unions of Abhoynagar and 41 villages of 2 unions of Keshobpur. Surveillance in one additional union of Abhoynagar began in 1999. In the preceding years, the surveillance covered only 4 unions of this upazila.

Table 9 shows that the distribution of deaths by different age groups is mostly consistent for the 1997-2001 period, except for an unexpectedly high number of female deaths in the age group of 15-44 years. The sex ratio[6] for neonatal deaths is close to the sex ratio of living children in this age group. This is to be expected as most deaths at this age were of endogenous causes. The sex ratio of postneonatal deaths was less than that of living children in this age group, indicating a surplus mortality of girls. However, it should be taken into account that only two more male deaths or two less female deaths would correct this.

Table 10 shows the same data for the 1983-1987 period. During this period, almost half of the deaths occurred among children aged less than 5 years compared to just over a quarter during the most recent 5-year period. Although a greater proportion of the population was in this age group during the 1980s, most of this change could be attributed to a fall in infant and child mortality. The sex ratios of deaths for postneonatal children and for children aged 1-4 years and 5-14 years were much lower than that of living children in these age groups. This is the result of differences in healthcare-seeking

[6] Average number of males per female.

behaviour by parents in the case of illness of sons and daughters. In recent years, fortunately, most of these differences have disappeared.

Table 9. Distribution of deaths in Abhoynagar-Keshobpur during 1997-2001 by age and sex

Age group	Male		Female		Total		M:F ratio
	No.	%	No.	%	No.	%	
0-27 days	77	17.9	73	16.7	150	17.3	1.05
28 days-11 months	27	6.3	28	6.4	55	6.3	0.96
12-59 months	14	3.3	14	3.2	28	3.2	1.00
5-14 years	12	2.8	9	2.1	21	2.4	1.33
15-44 years	44	10.2	94	21.5	138	15.9	0.47
45-59 years	48	11.2	40	9.1	88	10.1	1.20
≥60 years	208	48.4	180	41.1	388	44.7	1.16
Total	430	100	438	100	868	100	0.98

M:F = Male:female

Table 10. Distribution of deaths in Abhoynagar-Keshobpur during 1983-1987 by age and sex

Age group	Male		Female		Total		M:F ratio
	No.	%	No.	%	No.	%	
0-27 days	95	23.3	89	20.8	184	22.0	1.07
28 days-11 months	60	14.7	82	19.2	142	17.0	0.73
12-59 months	37	9.1	46	10.7	83	9.9	0.80
5-14 years	13	3.2	19	4.4	32	3.8	0.68
15-44 years	34	8.4	59	13.8	93	11.1	0.58
45-59 years	42	10.3	37	8.6	79	9.5	1.14
≥60 years	126	31.0	96	22.4	222	26.6	1.31
Total	407	100	428	100	835	100	0.95

M:F = Male:female

Table 11 shows the most prevalent causes of death for each age group. Whereas most deaths during the first month originated from birth defects and neonatal causes, preventable infectious diseases caused most infant deaths after the first month. In view of this, a further reduction of mortality is clearly possible. Child deaths in the 12-59-months age group were the result of injuries in over 40% of cases and infectious diseases in 30%.

Table 11. Major causes of deaths in Abhoynagar-Keshobpur during 1997-2001 by age, proportion, and rank

Rank based on proportion	Age Group							Overall rank
	0-27 days	28 days - 11 months	12-59 months	5-14 years	15-44 years	45-59 years	≥60 years	
1 (%)	Prematurity/LBW (38.7)	ARI (50.9)	Unintentional injuries (42.9)	Intentional injuries (28.6)	Intentional injuries (29.0)	Neoplasms (20.5)	Other non-communicable (32.0)	Other non-communicable (16.6)
2 (%)	Birth asphyxia (17.3)	Diarrhoeal (14.5)	ARI (10.7)	Unintentional injuries (23.8)	Cardiovascular (13.0)	Cardiovascular (17.0)	Cardiovascular (25.8)	Cardiovascular (15.4)
3 (%)	Neonatal ARI (12.0)	Malnutrition (7.3)	Diarrhoea (10.7)	Other communicable (14.3)	Unintentional injuries (11.6)	Other non-communicable (10.2)	Pulmonary (9.5)	Prematurity/LBW (6.7)
4 (%)	Neonatal tetanus (6.7)	Other communicable (5.5)	Other communicable (10.7)	Diarrhoea (9.5)	Neoplasms (10.9)	Intentional injuries (5.7)	Neoplasms (4.4)	Intentional injuries (6.2)
5 (%)	Other neonatal (5.3)	Other non-communicable (5.5)	Malnutrition (7.1)	Neoplasms (9.5)	Other non-communicable (3.6)	Unintentional injuries (5.7)	Diabetes (3.6)	Neoplasms (6.1)
6 (%)	Sudden infant death (2.0)	Hepatitis (1.8)	Other non-communicable (7.1)	Other non-communicable (4.8)	Maternal bleeding (3.6)	Acute abdominal (5.7)	Diarrhoea (3.6)	ARI including neonatal (6.0)
7 (%)	Malnutrition (0.7)	Renal (1.8)	Cardiovascular (3.6)	Liver (4.8)	Other communicable (2.9)	Liver (4.5)	Tuberculosis (3.1)	Unintentional injuries (5.6)
8 (%)		Unintentional injuries (1.8)	Neoplasms (3.6)		Acute abdominal (2.9)	Pulmonary 4.5)	Unintentional injuries (2.6)	Pulmonary (5.0)
9 (%)			Central nervous system (3.6)		Diarrhoea (2.2)	Diabetes (4.5)	Other communicable (2.6)	Diarrhoea (3.7)
10 (%)					Central nervous system (2.2)	Tuberculosis (3.4)	Central nervous system (2.3)	Other communicable (3.3)
Other (specified) (%)					(13.0)	(6.8)	(5.2)	(19.2)
Other (unspecified) (%)	(17.3)	(10.9)	(0.0)	(4.8)	(5.1)	(11.4)	(5.4)	(6.1)
Total (%)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)

ARI=Acute respiratory infection, LBW=Low birth-weigth

So far, the pattern of mortality in Abhoynagar-Keshobpur is not much different from other areas in the same stage of development, both inside and outside Bangladesh. However, in the next two age groups—5-14 and 15-44 years—the most common cause of death was intentional injuries accounting for between a quarter and a third of the cases. Most deaths caused by intentional injuries occurred among women, and these were reported as suicide. This is the main reason that the sex ratio of the deceased in the age group of 15-44 years is so low. Although suicide rates are traditionally higher in this area than elsewhere in Bangladesh, it should be noted that, in all over South Asia, cases of female homicide for dowry reasons are often masked as suicide. Important causes in these age groups were also unintentional injuries, respectively, second and third cause in the two age groups; neoplasms (shared) fourth; and, in the age group of 15-44 years only, cardiovascular, which was the second cause. As can be expected, cardiovascular diseases and neoplasms gain in importance as causes of death among those aged over 45 years. Over the age of 60 years, other non-communicable diseases[7] are the main causes of death. This category contains in the highest age group mostly deaths attributed to 'senility'.

Table 12 shows categories of causes of death by sex during the most recent 5-year period, while Table 13 shows the same data for the 1983-1987 period. The burden of communicable diseases as causes of death has more than halved between the middle of the eighties and the end of the nineties, while that of non-communicable disease mortality has almost doubled. This suggests that Bangladesh has made great progress in fighting preventable infectious diseases. This is even more remarkable when taking into account the fall in the crude death rate in this period, from 9.8 to 6.3 per 1,000, which makes the

Table 12. Proportion of deaths in Abhoynagar-Keshobpur during 1997-2001 by sex and specific disease categories

Category	Male		Female		Overall	
	No.	%	No.	%	No.	%
Communicable	59	13.7	52	11.9	111	12.8
Non-communicable	218	50.7	221	50.5	439	50.6
Accidents and injuries	53	12.3	50	11.4	103	11.9
Maternal	-	-	10	2.3	10	1.2
Neonatal	73	17.0	68	15.5	141	16.2
Other	3	0.7	8	1.8	11	1.3
Undetermined	24	5.6	29	6.6	53	6.1
Total	430	100	438	100	868	100

[7] See table 14 for all defined causes.

absolute reduction in deaths per 1,000 inhabitants due to communicable disease even greater. The proportion of deaths relating to accidents and injuries rose slightly due to the greater number of suicides. Neonatal mortality fell both in absolute and relative terms. There was a slight rise of maternal mortality. However, in view of the small numbers involved, this is not significant.

Table 13. Proportion of deaths in Abhoynagar-Keshobpur during 1983-1987 by sex and specific disease categories

Category	Male		Female		Overall	
	No.	%	No.	%	No.	%
Communicable	120	29.5	145	33.9	265	31.7
Non-communicable	143	35.1	142	33.2	285	34.1
Accidents and injuries	34	8.4	39	9.1	73	8.7
Maternal	-	-	6	1.4	6	0.7
Neonatal	87	21.4	74	17.3	161	19.3
Other	7	1.7	13	3.0	20	2.4
Undetermined	16	3.9	9	2.1	25	3.0
Total	407	100	428	100	835	100

Table 14 shows the absolute figures of deaths by cause during the most recent 5-year period. It also gives the number of person-years lived during this period for the total population and the population in the age groups of 12-59 months->60 years. For age groups under one year it gives the total number of livebirths during this period.

Results of verbal autopsy from this surveillance site seem to be consistent with those from the Matlab surveillance site in south-central Bangladesh. Only the first age group, neonatal deaths, showed significant differences. In Matlab, which has monthly surveillance, it is easier to determine if a child is premature than in the Health Systems and Infectious Diseases Division (HSID) sites with data collection conducted quarterly. Efforts should be made to find out the real causes of deaths of many ‘senility’ cases in the highest age group.

Table 14. Absolute number of deaths in Abhoynagar -Keshobpur during 1997-2001 by disease categories

Cause of death	Age group							
	0-27 days	28 days-11 months	12-59 months	5-14 years	15-44 years	45-59 years	≥ 60 years	Total
Communicable diseases	0	40	9	5	11	7	39	111
Malaria	0	0	0	0	0	0	0	0
Measles	0	0	0	0	0	0	0	0
ARI	0	28	3	0	0	0	3	34
Hepatitis	0	1	0	0	1	0	0	2
Tuberculosis	0	0	0	0	3	3	12	18
Diarrhoeal diseases	0	8	3	2	3	2	14	32
Tetanus	0	0	0	0	0	0	0	0
Other	0	3	3	3	4	2	10	25
Non-communicable diseases	0	4	5	4	51	61	314	439
Cardiovascular	0	0	1	0	18	15	100	134
Pulmonary	0	0	0	0	2	4	37	43
Liver	0	0	0	1	2	4	4	11
Acute abdominal	0	0	0	0	4	5	8	17
Diabetes	0	0	0	0	1	4	14	19
Neoplasms	0	0	1	2	15	18	17	53
Renal	0	1	0	0	1	1	1	4
Central nervous system	0	0	1	0	3	1	9	14
Other	0	3	2	1	5	9	124	144
Injuries	0	1	12	11	56	10	13	103
Unintentional	0	1	12	5	16	5	10	49
Intentional	0	0	0	6	40	5	3	54
Maternal	0	0	0	0	10	0	0	10
Bleeding	0	0	0	0	5	0	0	5
PIH/eclampsia	0	0	0	0	3	0	0	3
Infection	0	0	0	0	1	0	0	1
Other	0	0	0	0	1	0	0	1
Neonatal	141	0	0	0	0	0	0	141
Asphyxia/birth injury	26	0	0	0	0	0	0	26
Prematurity/LBW	58	0	0	0	0	0	0	58
Congenital	0	0	0	0	0	0	0	0
Infection	28	0	0	0	0	0	0	28
Other	29	0	0	0	0	0	0	29
Miscellaneous	1	4	2	0	3	0	1	11
Anaemia	0	0	0	0	2	0	1	3
Malnutrition	1	4	2	0	1	0	0	8
Undetermined cause	8	6	0	1	7	10	21	53
Total no. of deaths	150	55	28	21	138	88	388	868
Total population (*Livebirths/person-years)	3,143*	3,143*	11,839	29,726	69,321	14,803	9,311	137,939

ARI=Acute respiratory infection, LBW=Low birth-weight

Annexure 1. Surveillance population by person-years lived, age group, year, urban or rural, and gender

Age (years)	2000				2001	
	Urban		Rural		Rural	
	Male	Female	Male	Female	Male	Female
0-4	1,577.7	1,431.2	6,691.8	6,570.8	3,740.0	3,625.4
5-9	1,392.9	1,398.4	7,253.9	6,915.4	3,963.0	3,771.9
10-14	1,463.6	1,484.1	7,866.7	7,432.4	4,360.9	4,170.7
15-19	1,157.7	1,462.3	6,949.4	6,955.0	3,965.5	4,207.7
20-24	924.0	1,356.4	4,944.3	5,340.5	3,259.8	3,448.0
25-29	1,024.0	1,187.9	3,741.6	4,372.2	2,369.2	2,688.7
30-34	914.9	946.2	3,445.2	3,865.2	2,251.4	2,506.5
35-39	894.8	811.5	3,340.6	3,635.1	2,031.1	2,291.3
40-44	754.8	629.5	3,040.5	2,928.5	1,963.3	1,882.3
45-49	563.5	405.4	2,445.8	2,393.7	1,580.8	1,576.0
50-54	426.5	244.3	1,960.1	1,755.2	1,261.1	1,170.8
55-59	236.7	143.3	1,454.6	1,510.1	941.7	1,024.8
60-64	166.5	111.6	1,279.7	1,375.8	786.2	860.5
65-69	98.4	66.6	1,009.0	1,034.3	633.9	671.0
70-74	56.3	50.0	726.4	759.1	469.0	492.9
75-79	21.4	19.9	436.5	350.6	288.8	254.8
80-84	13.7	11.8	227.4	222.7	160.0	145.0
85+	13.7	14.1	157.4	159.4	115.5	91.6
All ages	11,700.9	11,774.2	56,971.0	57,576.1	34,141.1	34,879.7

Annexure 2. Abridged life-table for combined urban areas by gender, based on observed mortality in 2000

Age (years)	Male				Female			
	${}_nq_x$	l_x	${}_nL_x$	e_x	${}_nq_x$	l_x	${}_nL_x$	e_x
0	0.07884	100,000	94,481	62.30	0.06863	100,000	95,196	66.01
1	0.01578	92,116	364,974	66.60	0.00707	93,137	370,970	69.85
5	0.00358	90,662	452,499	63.65	0.00333	92,479	461,627	66.34
10	0.00341	90,337	450,917	58.87	0.00000	92,171	460,856	61.55
15	0.00860	90,029	448,211	54.06	0.00000	92,171	460,856	56.55
20	0.00540	89,255	445,071	49.51	0.00735	92,171	459,164	51.55
25	0.01454	88,773	440,639	44.76	0.01255	91,494	454,601	46.91
30	0.01087	87,482	435,034	40.39	0.01573	90,346	448,178	42.48
35	0.00000	86,531	432,656	35.80	0.00614	88,925	443,260	38.12
40	0.01968	86,531	428,399	30.80	0.01576	88,379	438,412	33.34
45	0.05186	84,828	413,144	26.37	0.02436	86,986	429,632	28.83
50	0.05695	80,429	390,696	22.68	0.05957	84,867	411,696	24.49
55	0.08107	75,849	363,872	18.89	0.03427	79,811	392,219	20.88
60	0.16529	69,700	319,698	15.34	0.16447	77,076	353,689	16.53
65	0.18450	58,179	264,061	12.88	0.07236	64,399	310,346	14.29
70	0.00000	47,445	237,225	10.23	0.33389	59,739	248,831	10.21
75	0.51903	47,445	175,662	5.23	0.40323	39,793	158,851	9.08
80	0.95785	22,820	59,453	3.18	0.00000	23,747	118,737	8.53
85	1.00000	962	13,080	13.60	1.00000	23,747	83,710	3.53

Annexure 3. Abridged life-table for combined rural areas by gender, based on observed mortality in 2000

Age (years)	Male				Female			
	${}_nq_x$	l_x	${}_nL_x$	e_x	${}_nq_x$	l_x	${}_nL_x$	e_x
0	0.05982	100,000	95,813	66.42	0.05244	100,000	96,329	67.38
1	0.01346	94,018	373,037	69.63	0.01725	94,756	375,101	70.09
5	0.00618	92,753	462,332	66.55	0.00361	93,121	464,766	67.29
10	0.00190	92,179	460,459	61.95	0.00269	92,785	463,303	62.53
15	0.00359	92,004	459,194	57.07	0.00645	92,536	461,187	57.69
20	0.01306	91,674	455,374	52.26	0.00467	91,939	458,622	53.05
25	0.00400	90,476	451,476	47.92	0.01137	91,510	454,947	48.29
30	0.01154	90,114	447,971	43.10	0.01157	90,469	449,728	43.81
35	0.00894	89,074	443,379	38.58	0.00822	89,422	445,273	39.30
40	0.02276	88,278	436,365	33.90	0.01357	88,687	440,427	34.60
45	0.02623	86,268	425,686	29.63	0.02476	87,484	432,005	30.04
50	0.03015	84,006	413,699	25.37	0.04456	85,318	417,086	25.74
55	0.07286	81,474	392,527	21.08	0.03896	81,516	399,642	21.83
60	0.09312	75,537	360,100	17.54	0.11314	78,341	369,545	17.61
65	0.16794	68,503	313,754	14.08	0.13941	69,477	323,171	14.54
70	0.30360	56,999	241,732	11.42	0.24810	59,791	261,871	11.49
75	0.26780	39,694	171,895	10.30	0.34271	44,957	186,268	9.45
80	0.37500	29,064	118,072	8.16	0.33620	29,550	122,914	8.08
85	1.00000	18,165	119,056	6.55	1.00000	19,615	115,803	5.90

Annexure 4. Abridged life-table for combined rural areas by gender, based on observed mortality in 2001

Age (years)	Male				Female			
	${}_nq_x$	l_x	${}_nL_x$	e_x	${}_nq_x$	l_x	${}_nL_x$	e_x
0	0.05219	100,000	96,347	68.35	0.03891	100,000	97,276	71.08
1	0.02020	94,781	374,529	71.10	0.01650	96,109	380,632	72.94
5	0.00503	92,866	463,163	68.53	0.00529	94,524	471,369	70.14
10	0.00686	92,399	460,411	63.87	0.00239	94,024	469,556	65.50
15	0.00503	91,765	457,673	59.29	0.00237	93,799	468,437	60.65
20	0.00459	91,304	455,471	54.58	0.00578	93,576	466,527	55.79
25	0.01258	90,885	451,564	49.82	0.00926	93,035	463,021	51.10
30	0.00664	89,741	447,215	45.42	0.01779	92,174	456,769	46.55
35	0.00980	89,145	443,541	40.71	0.01085	90,534	450,212	42.35
40	0.00761	88,272	439,678	36.09	0.01319	89,551	444,802	37.79
45	0.01880	87,600	433,882	31.35	0.00317	88,370	441,149	33.26
50	0.03123	85,953	423,055	26.90	0.01694	88,090	436,719	28.36
55	0.07166	83,269	401,427	22.68	0.02410	86,598	427,771	23.80
60	0.11394	77,302	364,490	19.24	0.07279	84,511	407,176	19.33
65	0.15297	68,494	316,277	16.40	0.13222	78,360	365,897	15.65
70	0.25974	58,017	252,410	13.90	0.19252	67,999	307,267	12.65
75	0.20230	42,947	193,016	12.91	0.24155	54,908	241,382	10.08
80	0.29333	34,259	146,171	10.55	0.34266	41,645	172,550	7.49
85	1.00000	24,210	215,093	8.88	1.00000	27,375	139,308	5.09

Annexure 5. Abridged life-table for Abhoynagar and Keshobpur by gender, based on observed mortality in 2000 and 2001

Age (years)	Male				Female			
	${}_nq_x$	l_x	${}_nL_x$	e_x	${}_nq_x$	l_x	${}_nL_x$	e_x
0	0.04978	100,000	96,515	72.30	0.04756	100,000	96,671	68.90
1	0.00626	95,022	378,659	75.07	0.01110	95,244	378,438	71.33
5	0.00304	94,427	471,414	71.53	0.00313	94,187	470,195	68.11
10	0.00000	94,139	470,695	66.74	0.00312	93,892	468,724	63.31
15	0.00155	94,139	470,332	61.74	0.00722	93,598	466,303	58.50
20	0.00810	93,994	468,064	56.84	0.00642	92,923	463,123	53.91
25	0.00764	93,232	464,379	52.28	0.02046	92,326	456,908	49.24
30	0.00582	92,520	461,252	47.66	0.01337	90,437	449,162	45.22
35	0.00463	91,981	458,841	42.93	0.00986	89,228	443,941	40.80
40	0.01500	91,555	454,345	38.11	0.02256	88,349	436,760	36.18
45	0.01299	90,182	447,984	33.66	0.01107	86,356	429,388	31.96
50	0.02457	89,011	439,588	29.07	0.03374	85,399	419,793	27.29
55	0.04503	86,824	424,346	24.74	0.04877	82,518	402,527	23.15
60	0.07858	82,914	398,283	20.78	0.09706	78,493	373,421	19.21
65	0.12217	76,399	358,661	17.34	0.15525	70,875	326,866	16.01
70	0.22236	67,065	298,045	14.41	0.23846	59,871	263,665	13.49
75	0.23542	52,153	230,068	12.82	0.21997	45,595	202,899	11.93
80	0.30222	39,875	169,247	10.99	0.29338	35,565	151,740	9.59
85	1.00000	27,824	269,057	9.67	1.00000	25,131	189,425	7.54

Annexure 6. Abridged life-table for Mirsarai by gender, based on observed mortality in 2000 and 2001

Age (years)	Male				Female			
	${}_nq_x$	l_x	${}_nL_x$	e_x	${}_nq_x$	l_x	${}_nL_x$	e_x
0	0.06130	100,000	95,709	63.64	0.05090	100,000	96,437	70.06
1	0.02640	93,870	369,533	66.77	0.01841	94,910	375,446	72.80
5	0.00963	91,392	454,761	64.54	0.00684	93,163	464,221	70.13
10	0.00652	90,512	451,086	60.14	0.00196	92,526	462,175	65.60
15	0.00646	89,922	448,158	55.52	0.00307	92,344	461,014	60.72
20	0.00773	89,341	444,980	50.87	0.00413	92,061	459,355	55.90
25	0.00952	88,651	441,145	46.24	0.00187	91,681	457,976	51.12
30	0.01661	87,807	435,389	41.66	0.01487	91,510	454,147	46.21
35	0.01576	86,349	428,341	37.33	0.00826	90,149	448,884	41.87
40	0.02176	84,988	420,315	32.88	0.00774	89,404	445,291	37.20
45	0.02292	83,138	410,926	28.56	0.01469	88,712	440,302	32.47
50	0.02393	81,232	401,302	24.17	0.03912	87,409	428,494	27.92
55	0.08056	79,288	380,472	19.70	0.01360	83,989	417,090	23.95
60	0.13252	72,901	340,351	16.21	0.07109	82,847	399,509	19.25
65	0.20858	63,240	283,223	13.30	0.09846	76,957	365,841	15.53
70	0.34882	50,049	206,602	11.15	0.18797	69,380	314,295	11.95
75	0.25469	32,591	142,205	10.78	0.31819	56,338	236,875	9.14
80	0.34014	24,291	100,798	8.62	0.35047	38,412	158,404	7.24
85	1.00000	16,028	108,487	6.77	1.00000	24,950	119,758	4.80

Annexure 7. Number of livebirths by gender, person-years lived by women, and age-specific fertility rates per 1,000 person-years lived for 5-year age groups of women aged 15-49 years, and surveillance area in 2000

Field site			Age group (years)						
			15-19	20-24	25-29	30-34	35-39	40-44	45-49
Abhoynagar	Livebirths	Male	72.0	85.0	58.0	36.0	10.0	1.0	0.0
		Female	53.0	72.0	46.0	21.0	11.0	2.0	0.0
		Total	125.0	157.0	104.0	57.0	21.0	3.0	0.0
	Person-years of mothers		1,144.3	1,029.1	882.8	704.0	666.7	604.7	457.0
	Age-specific fertility rate		109.2	152.6	117.8	81.0	31.5	5.0	0.0
Keshobpur	Livebirths	Male	29.0	39.0	21.0	19.0	3.0	0.0	0.0
		Female	32.0	25.0	17.0	11.0	8.0	0.0	0.0
		Total	61.0	64.0	38.0	30.0	11.0	0.0	0.0
	Person-years of mothers		540.7	490.4	404.5	374.5	294.5	243.0	180.1
	Age-specific fertility rate		112.8	130.5	94.0	80.1	37.4	0.0	0.0
Mirsarai	Livebirths	Male	58.0	174.0	96.0	81.0	25.0	6.0	2.0
		Female	72.0	172.0	97.0	82.0	33.0	8.0	0.0
		Total	130.0	346.0	193.0	163.0	58.0	14.0	2.0
	Person-years of mothers		2,440.2	1,762.2	1,357.4	1,315.1	1,177.2	953.4	823.0
	Age-specific fertility rate		53.3	196.3	142.2	124.0	49.3	14.7	2.4
Satkania	Livebirths	Male	24.0	81.0	42.0	25.0	14.0	4.0	0.0
		Female	36.0	58.0	48.0	32.0	24.0	6.0	0.0
		Total	60.0	139.0	90.0	57.0	38.0	10.0	0.0
	Person-years of mothers		883.1	585.1	422.1	403.2	397.0	307.1	291.8
	Age-specific fertility rate		68.0	237.6	213.2	141.4	95.7	32.6	0.0
Patiya	Livebirths	Male	24.0	117.0	93.0	46.0	25.0	4.0	0.0
		Female	23.0	100.0	92.0	51.0	20.0	6.0	2.0
		Total	47.0	217.0	185.0	97.0	45.0	10.0	2.0
	Person-years of mothers		1,427.4	1,124.5	999.1	837.0	878.0	631.0	463.6
	Age-specific fertility rate		32.9	193.0	185.2	115.9	51.3	15.9	4.3
Lohagara	Livebirths	Male	22.0	44.0	34.0	23.0	11.0	1.0	0.0
		Female	15.0	59.0	43.0	19.0	12.0	3.0	0.0
		Total	37.0	103.0	77.0	42.0	23.0	4.0	0.0
	Person-years of mothers		519.3	349.4	306.4	231.5	221.7	189.3	178.2
	Age-specific fertility rate		71.3	294.8	251.4	181.4	103.7	21.1	0.0
Sher-e-Bangla Nagar	Livebirths	Male	39.0	74.0	52.0	36.0	9.0	1.0	0.0
		Female	45.0	53.0	49.0	15.0	16.0	1.0	0.0
		Total	84.0	127.0	101.0	51.0	25.0	2.0	0.0
	Person-years of mothers		808.8	785.8	700.8	536.5	483.4	345.6	241.4
	Age-specific fertility rate		103.9	161.6	144.1	95.1	51.7	5.8	0.0
Lalbagh	Livebirths	Male	26.0	50.0	35.0	20.0	10.0	1.0	0.0
		Female	30.0	51.0	34.0	19.0	11.0	3.0	0.0
		Total	56.0	101.0	69.0	39.0	21.0	4.0	0.0
	Person-years of mothers		653.5	570.6	487.1	409.7	328.0	283.9	164.1
	Age-specific fertility rate		85.7	177.0	141.7	95.2	64.0	14.1	0.0

Annexure 8. Number of livebirths by gender, person-years lived by women, and age-specific fertility rates per 1,000 person-years lived for 5-year age groups of women aged 15-49 years, and surveillance area in 2001

Field site			Age group (years)						
			15-19	20-24	25-29	30-34	35-39	40-44	45-49
Abhoynagar	Livebirths	Male	64.0	76.0	62.0	34.0	21.0	3.0	0.0
		Female	63.0	86.0	51.0	26.0	4.0	5.0	0.0
		Total	127.0	162.0	113.0	60.0	25.0	8.0	0.0
	Person-years of mothers		1,221.1	1,122.7	961.0	781.5	735.3	667.0	511.8
	Age-specific fertility rate		104.0	144.3	117.6	76.8	34.0	12.0	.0
Keshobpur	Livebirths	Male	39.0	38.0	22.0	16.0	3.0	0.0	1.0
		Female	27.0	37.0	31.0	12.0	5.0	1.0	0.0
		Total	66.0	75.0	53.0	28.0	8.0	1.0	1.0
	Person-years of mothers		545.8	463.2	411.8	369.3	322.7	238.5	198.2
	Age-specific fertility rate		120.9	161.9	128.7	75.8	24.8	4.2	5.1
Abhoynagar and Keshobpur	Livebirths	Male	103.0	114.0	84.0	50.0	24.0	3.0	1.0
		Female	90.0	123.0	82.0	38.0	9.0	6.0	0.0
		Total	193.0	237.0	166.0	88.0	33.0	9.0	1.0
	Person-years of mothers		1,766.0	1,585.9	1,372.8	1,150.8	1,058.0	905.5	710.0
	Age-specific fertility rate		109.2	149.4	120.9	76.5	31.2	9.9	1.4
Mirsarai	Livebirths	Male	68.0	181.0	101.0	81.0	28.0	6.0	1.0
		Female	58.0	150.0	111.0	82.0	29.0	6.0	1.0
		Total	126.0	331.0	212.0	163.0	57.0	12.0	2.2
	Person-years of mothers		2,440.7	1,862.1	1,315.9	1,355.7	1,233.3	976.8	865.8
	Age-specific fertility rate		51.6	177.8	161.1	120.2	46.2	12.3	2.3

Annexure 9. Bride and groom's age at marriage by previous marital status for urban surveillance areas 2000

Age (years)	Previous marital status									
	Single		Married		Divorced		Widowed		Total	
	Grooms	Brides	Grooms	Brides	Grooms	Brides	Grooms	Brides	Grooms	Brides
10-14	1	40	0	-	0	2	0	0	1	42
15-19	42	97	1	-	0	12	0	0	43	109
20-24	50	30	1	-	2	7	0	1	53	38
25-29	29	19	5	-	5	5	0	0	39	24
30-34	12	1	4	-	3	3	0	0	19	4
35-39	2	1	5	-	1	4	0	0	8	5
40-44	1	0	2	-	1	0	1	1	5	1
45-49	0	0	2	-	0	0	0	0	2	0
50-54	0	0	1	-	0	0	0	0	1	0
55-59	0	0	0	-	0	0	1	0	1	0
60-64	0	0	0	-	0	0	1	0	1	0
65+	0	0	0	-	0	0	0	0	0	0
All ages	137	188	21	-	12	33	3	2	173	223

Annexure 10. Bride and groom's age at marriage by previous marital status for rural surveillance areas 2000

Age (years)	Previous marital status									
	Single		Married		Divorced		Widowed		Total	
	Grooms	Brides	Grooms	Brides	Grooms	Brides	Grooms	Brides	Grooms	Brides
10-14	0	74	0	-	0	1	0	0	0	75
15-19	99	672	2	-	10	28	0	1	111	701
20-24	221	337	7	-	16	31	1	0	245	368
25-29	257	58	12	-	23	21	2	7	294	86
30-34	150	7	6	-	7	10	4	3	167	20
35-39	27	1	7	-	6	7	5	0	45	8
40-44	5	0	7	-	1	1	3	0	16	1
45-49	1	0	8	-	0	1	6	0	15	1
50-54	0	0	0	-	0	0	3	0	3	0
55-59	0	0	1	-	0	0	1	0	2	0
60-64	0	0	0	-	0	0	1	0	1	0
65+	0	0	1	-	0	0	1	0	2	0
All ages	760	1149	51	-	63	100	27	11	901	1260

Annexure 11. Bride and groom's age at marriage by previous marital status for rural surveillance areas 2001

Age (years)	Previous marital status									
	Single		Married		Divorced		Widowed		Total	
	Grooms	Brides	Grooms	Brides	Grooms	Brides	Grooms	Brides	Grooms	Brides
10-14	2	68	0	-	0	0	0	0	2	68
15-19	53	372	3	-	3	32	1	1	60	405
20-24	183	202	2	-	16	17	1	2	202	221
25-29	149	37	7	-	18	14	2	1	176	52
30-34	98	5	9	-	11	4	3	0	121	9
35-39	22	0	6	-	5	4	2	0	35	4
40-44	3	0	5	-	1	1	6	2	15	3
45-49	0	0	0	-	0	0	5	1	5	1
50-54	0	0	4	-	0	0	1	0	5	0
55-59	0	0	1	-	0	0	0	0	1	0
60-64	0	0	0	-	1	0	2	0	3	0
65+	0	0	0	-	0	0	1	0	1	0
All ages	510	684	37	-	55	72	24	7	626	763