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Epidemiology of hepatitis E virus (HEV) infections in Matlab - some preliminary findings

Hepatitis E virus (HEV) infections result in serious morbidity and mortality, especially among pregnant women. A study was conducted in a rural Bangladeshi population in Matlab to determine the age-specific population seroprevalence of antibodies to HEV and other hepatitis viruses. Of 1,134 specimens tested from a representative population random sample, 146 (12.9%) had an anti-HEV IgG titre above cutoff of 40 WRAIR units/ml, implying a definite past infection. Seroprevalence was lower among women (11.1%) than among men (15.0%). Anti-HBc (hepatitis B core) was present in 380 of 1,080 (35.2%) tested individuals, anti-HCV (hepatitis C) in 14 of 917 (1.5%) tested individuals, and anti-HAV (hepatitis A) in 116 of 124 (93.5%) tested individuals. These results suggest that viral hepatitis, including HEV, is a significant public health problem in rural Bangladeshi populations which warrants further attention.

Hepatitis E virus (HEV) infections cause a substantial burden of sporadic and epidemic disease worldwide, and are recognized as the only cause of enterically transmitted non-A, non-B hepatitis (1). The virus is thought to be endemic in many developing countries, although the greatest historical burden of disease has been confined to South and Southeast Asia. For most infected patients HEV infection is asymptomatic, but in 20-30% of cases, primarily in adolescents and young adults, it is accompanied by signs and symptoms of acute viral hepatitis including jaundice. The disease is self-limiting, and no chronic sequelae or carrier state has been documented (2,3). Mortality from HEV is low in the general population (~1%), but pregnant women hospitalized for HEV disease in their 2nd and 3rd

trimesters experience a case fatality rate >20% (4,5). This elevated mortality, the cause of which is poorly understood, remains a unique characteristic of HEV. Membrane rupture, spontaneous abortion and stillbirth are also associated with HEV infections during pregnancy. Poor neonatal outcomes have been observed in infected pregnant women, with reported neonatal mortality of up to 25% (6-8).

The average incubation period of HEV is about 40 days. Clinical illness may last between two and four weeks, with signs and symptoms ranging from malaise, fever and anorexia to hepatomegaly and overt jaundice. Viraemia persists from two to three weeks, ending soon after the onset of symptoms. An antibody response to HEV is detectable soon after infection, with peak titres coinciding with the onset of clinical symptoms. Anti-HEV IgM titres drop sharply several weeks after infection, and anti-HEV IgG titres remain elevated for a few months. Many studies have suggested that circulating IgG also diminishes dramatically a few years post-infection, sometimes to undetectable levels (9,10). It is unclear whether anti-HEV IgG provides long-term protection against future re-infection (1,11). Faecal shedding of HEV has been observed up to a week before clinical illness, continuing into early convalescence (11). This has been suggested as a means by which transmission is maintained between outbreaks.

Current treatment for HEV involves the supportive management of acutely ill patients. Preventive measures, based on recommendations for Hepatitis A virus (HAV), have been suggested for travellers to endemic areas, which include the avoidance of unsafe drinking water and uncooked fruits, vegetables and shellfish (12). Both active and passive immunoprophylaxis have been successfully achieved in animal models (13). Several candidate human vaccines have been designed, some of which are currently undergoing phase II and III trials (1,13), opening the possibility for eventual prophylaxis against HEV infection.

Little is known about the burden of hepatitis E disease in Bangladesh, except for scant clinic-based case-series. No population-based research has been conducted in either urban or rural populations. There is both direct and indirect evidence that the virus contributes significantly to disease in Bangladesh, although no outbreaks have yet been reported in the literature. There is, however, clinical and empirical evidence of HEV in Bangladesh, as reported by various reference laboratories in Dhaka and by the local press (unpublished).

One objective of the Matlab HEV study was to determine the age-specific population seroprevalence of antibodies to HEV in a rural population of southern Bangladesh. The study design was a random population serosurvey

and participants were selected from the Maternal and Child Health/Family Planning (MCH-FP) cohort of the Matlab Health Research Programme of ICDDR,B: Centre for Heath and Population Research. The population from which the representative sample was drawn consists of 110,000 people inhabiting 67 villages, under the Matlab Health and Demographic Surveillance System (14). Trained field workers interviewed the selected individuals (or guardians for selected children aged 1-18 years of age) at their homes to collect detailed socioeconomic and risk factor data and a small fingerstick blood sample from each consenting participant. The interview and blood specimen collection were repeated 12 and 18 months after the baseline survey. This report includes only results from the baseline survey.

The anti-HEV IgG diagnostic assay was conducted by laboratories of the Dept. of Virology of the Armed Forces Research Institute of Medical Sciences (AFRIMS) in Bangkok, Thailand. AFRIMS is a recognized global leader in the field of HEV diagnostics, and a regional reference laboratory for hepatitis viruses. Although commercial antibody assays are available, the appropriateness of using these clinical assays for epidemiologic studies is questioned. The AFRIMS ELISA uses a recombinant HEV antigen based on open reading frame 2 (ORF 2) of the Sar-55 strain of HEV. The assay, when performed as described previously (15), with modifications (16), achieved 96% sensitivity and 98% specificity.

Of 1,134 specimens tested from the baseline population random sample, 146 (12.9%) had an anti-HEV IgG titre above an established cutoff of 40 WRAIR units/ml for definite prior HEV infection. Given the limited amount of serum available from fingerstick specimens after anti-HEV testing, any remaining serum was first tested for anti-HBc, then anti-HCV, and finally anti-HAV. We found anti-HBc antibodies in 380 of 1,080 (35.2%) tested individuals, anti-HCV in 14 of 917 (1.5%) tested individuals, and anti-HAV in 116 of 124 (93.5%) tested individuals. All non-HEV tests were conducted using Abbott Murex EIA format tests (Table 1).

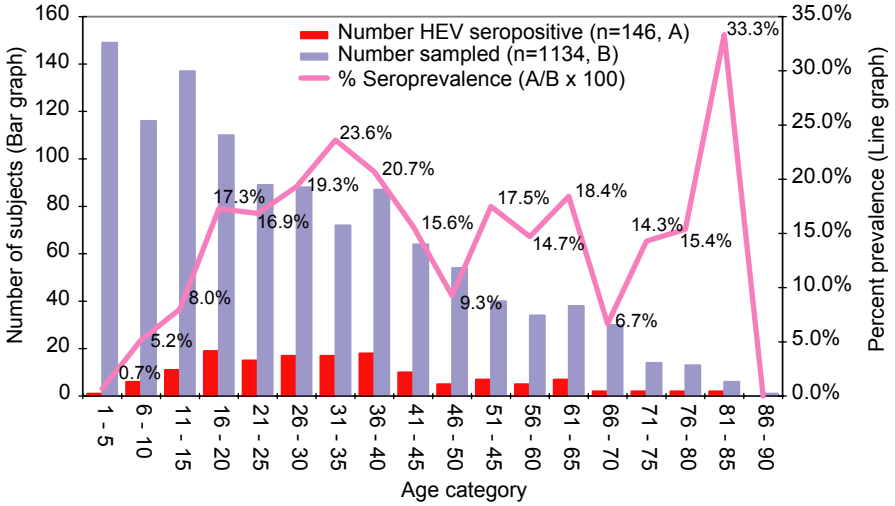
Table 1: Seroprevalence of Viral Hepatitis Infections in Matlab (2004-2005)

Antigen	EIA Assay	Tested (n)	Positive (n)	% Prevalence
HEV Ig	WRAIR	1,134	146	12.9
Anti-HCV (IgG)	Murex	917	14	1.5
Anit-HBc (Total)	Murex	1,080	380	35.2
Anit-HAV (Total)	Murex	124	116	93.5

As shown in Figure 1, the age-specific seroprevalence increases dramatically in adolescence well into the second and third decades of life, with a peak 24% seroprevalence in the 31-35 age group. This is an unusual epidemiologic

distribution for what is thought to be an enterically transmitted virus, and has been previously described in similar studies in Nepal, India and Egypt (1). The 33% peak in seroprevalence in the 81-85 year age category is likely an artefact of the small sample (n=6) for this age category. Population seroprevalence in this sample was lower among women (11.1%) than men (15.0%); this phenomenon is largely consistent across age categories.

Figure 1: Age Specific Seroprevalence of Anti-HEV Antibodies (Anti HEV Ig ≥40 U/mL, n=146)



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Comment

These data represent the first reported rural community-based seroprevalence survey of HEV and other viral hepatitis in Bangladesh, in a representative, random population sample. The data suggests a previously undescribed substantial burden of hepatitis virus infections from a typical rural community of Southern Bangladesh. HEV, especially, is an unrecognized problem of national significance in Bangladesh, which likely contributes to population morbidity as well as to the high level of maternal and neonatal mortality documented in Bangladesh.

The epidemiology and risk factors for HEV infections in rural Bangladesh are poorly described and research is presently underway in the ongoing Matlab HEV Study to address these gaps.

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Accuracy of demographic indicators measured by geographical reconnaissance

Each year fieldworkers from the Ministry of Health and Family Welfare attempt to visit all households in Bangladesh to collect extensive data in an activity termed geographical reconnaissance. We compared national estimates of crude birth rate; infant mortality rate and crude death rate calculated using data collected through geographical reconnaissance with results obtained from a sample vital registration system of the Bangladesh Bureau of Statistics and with the Bangladesh Demographic and Health Survey. While the estimates of crude birth rate were broadly similar, estimates of infant mortality rate were 75% lower and estimates of crude death rate were 40% lower from geographical reconnaissance than from the other systems. Given the substantial commitment of resources devoted to generating these data, and their inaccuracy, steps to streamline the process should be considered.

For the last four decades fieldworkers from the Bangladesh Ministry of Health and Family Welfare (MOHFW) have collected extensive population-based upazila level data under an activity termed geographical reconnaissance (GR). Currently GR includes the collection of data on 64 indicators and the prevalence of 14 selected communicable diseases, and requires 4-6 months to collect and compile (1), disrupting the fieldworkers' other mandatory activities. The accuracy of the indicators collected through GR has never been thoroughly assessed.

We compared national estimates of crude birth rate; crude death rate and infant mortality rate calculated using data collected through geographical reconnaissance with results obtained through a sample vital registration system from the Bangladesh Bureau of Statistics (BBS) (2) and with the Bangladesh Demographic and Health Survey (BDHS) (3). The BBS's sample vital registration system uses a nationally representative sample of 500 primary sampling units. Each of these units consists of 250 households that are monitored by a local registrar to record all vital events when they occur (2). The BDHS uses interviewers who inquire about vital events in the previous five years from a nationally representative cluster sample of households.

GR does not involve sampling, but attempts to count all residents each year. The GR data for this study were assembled in two different ways. First, two rural upazilas from each of the six divisions were selected in 2000 for joint monitoring by the Ministry's Unified Management Information System (UMIS) Unit and ICDDR,B as part of the implementation of the new information system for a five-year (1998-2003) Health and Population Sector Programme (4). The selected upazilas had socio-economic characteristics and health care service delivery infrastructures that were judged typical of the division as a whole. Compiled geographic reconnaissance reports for 2000-2002 were collected and assembled for the selected upazilas and then the rates were extrapolated

to the division and nationally. Second, the UMIS unit reported crude birth rates from GR data for the year 2002 for all rural upazilas, by division and nationally (5).

The crude birth rates differed by division and by the method used for estimation (Table 1). The year-to-year variation in division level crude birth rates was less in the data collected by the BBS in the sample vital registration system, than in the GR data for two upazilas/division. The crude birth rates estimated from extrapolating the rates from two upazilas per division are similar to those obtained by using data from all rural upazilas in the division. Khulna division had the lowest crude birth rate in all three years according to GR, but Barisal division was lowest by the sample vital registration system. Sylhet division had the highest crude birth rate according to both estimates based on GR in 2000 and 2002, but according to the sample vital registration system Rajshahi division was the highest in 2000 and Dhaka division in 2002.

Table 1: Crude birth rate⁺ by division

Divisions	Geographical reconnaissance				Sample vital registration system		
	Extrapolation from two upazilas per division			All rural upazilas in the division			
	2000	2001	2002	2002	2000	2001	2002
Barisal	21.4	22.8	21.6	25.0	19.2	19.4	19.0
Chittagong	25.5	27.7	22.4	26.3	21.3	21.2	21.5
Dhaka	25.7	26.0	24.7	26.0	20.7	21.1	22.6
Khulna	19.5	19.9	20.3	22.1	21.0	20.0	20.7
Rajshahi	26.3	25.1	27.1	24.5	21.4	21.2	20.6
Sylhet	26.4	20.5	27.8	28.7	21.0	20.6	19.7
All divisions	24.5	24.0	24.1	25.4	20.8	20.7	21.0

⁺Per 1,000 population

The infant mortality rate differed markedly depending on the source of the data. The rates were lowest according to GR, approximately 4 times higher in the sample vital registration system, and yet higher again in the BDHS, which reports infant mortality average during the previous five years (Table 2).

Table 2: Infant mortality rate* by division

Divisions	Geographical reconnaissance			Sample vital registration system			BDHS
	2000	2001	2002	2000	2001	2002	2004
Barisal	10	11	7	57	54	63	61
Chittagong	13	3	20	63	63	56	68
Dhaka	8	7	12	62	62	48	75
Khulna	33	27	22	58	52	47	66
Rajshahi	15	19	21	63	64	67	70
Sylhet	10	15	14	62	64	68	100
All divisions	14	13	16	62	60	57	65

⁺Per 1,000 live births

The sample vital registration system consistently reported a 40% higher crude death rate than GR (Table 3).

Table 3: Crude death rate* by division

Divisions	Geographical reconnaissance			Sample vital registration system		
	2000	2001	2002	2000	2001	2002
Barisal	3.7	4.9	4.6	5.0	5.1	5.5
Chittagong	2.0	1.3	3.1	5.3	5.1	5.0
Dhaka	1.7	2.0	2.1	5.3	5.4	5.6
Khulna	4.6	4.3	4.0	5.2	4.8	5.4
Rajshahi	5.2	5.9	3.9	5.5	5.3	5.6
Sylhet	2.7	2.5	3.9	5.5	5.4	5.3
All divisions	3.2	3.4	3.4	5.3	5.2	5.4

*Per 1,000 population

Detailed upazila level estimates of key demographic indicators are available for a subset of unions within Abhoynagar and Mirsarai Upazilas where ICDDR,B maintains a demographic surveillance system. The surveillance system has been in operation in a randomly selected one-sixth sample of households in 5 out of 8 unions of Abhoynagar since 1982, and a randomly selected one-fourth of households in 7 out of 16 unions of Mirsarai Upazila since 1995 (6). Geographic reconnaissance reports of these two upazilas were assembled for four years. We directly compared geographical reconnaissance data from the same unions with the ICDDR,B surveillance.

The reported crude birth rates are quite similar from both GR and ICDDR,B surveillance, however the neonatal mortality rates, post neonatal mortality rates, infant mortality rates and crude death rates are significantly lower in the GR compared to ICDDR,B surveillance in both upazilas (Table 4).

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Comments

The annual collection of GR data by MOHFW fieldworkers is a massive operation that disrupts the provision of mandated services to their clients both at home and at static sites for about 4-6 months. This analysis suggests that the vital events data collected by GR is not comparable to other measures of vital events that use a more rigorous methodological approach. The reasons why GR figures are not comparable may include inadequate probing, pre-conceptions of the fieldworkers about the area and residence of households,

Table 4: Key demographic rates indicators in the surveillance unions of Abhoynagar and Mirsarai

	Abhoynagar				Mirsarai			
	2000	2001	2002	2003	2000	2001	2002	2003
Crude birth rate+								
GR	20.8	22.0	22.2	21.4	20.2	19.8	20.9	19.8
Surveillance	23.3	22.7	25.4	22.4	24.5	24.2	24.4	24.8
Neonatal mortality rate*								
GR	4.7	14.7	14.4	11.9	12.4	15.2	12.8	10.0
Surveillance	34.1	32.2	25.0	41.8	44.9	34.0	26.9	37.5
Post-neonatal mortality rate*								
GR	13.6	10.4	8.4	9.7	6.5	7.9	7.4	5.3
Surveillance	14.9	6.0	10.7	13.9	18.6	14.3	16.2	19.8
Infant mortality rate*								
GR	18.3	25.1	22.9	21.6	18.9	23.1	20.2	15.4
Surveillance	49.0	38.2	35.6	55.7	64.5	48.3	43.1	57.4
Crude death rate+								
GR	4.2	4.4	3.9	3.7	2.8	4.2	2.9	3.4
Surveillance	5.9	4.7	6.1	6.4	7.6	6.7	6.9	8.2

+ Per 1,000 population * Per 1,000 live births

limited professional supervision and little critical systematic review of GR data at any level. Potential problems of misclassification include labelling neonatal death as stillbirths, low reporting of early neonatal deaths, and reporting of neonatal death as post-neonatal death by the respondent who may or may not be the mother. The inaccuracy of the vital events data suggests that other GR data may also not be reliable.

Fieldworkers report that the most commonly used GR data are total households with identification details for the preparation of the monthly advance tour programme, the number of children below one year of age for planning immunization sessions, the total number of married women of reproductive age for the distribution of contraceptives, contraceptive users and method mix for performance reviews. Given the substantial commitment of government resources in generating these data, and their incompleteness, steps to streamline the process should be considered. Specifically, a sampling methodology whereby fewer households are visited could provide representative data more quickly and at lower cost. Second, a shorter form targeting fewer outcomes that are unavailable from other data would further reduce time and cost.

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Effect of temporary out-migration of husbands on use of contraception in a rural area of Bangladesh

Temporary migration for work abroad, or elsewhere in Bangladesh, affects a large proportion of families in certain areas. In the ICDDR,B surveillance area in Mirsarai (Chittagong district), about one-quarter of married women aged 15-49 years report that they have a husband living away from home. Analysis of surveillance data for the period 2001-2003 indicates that contraceptive use, even of permanent methods, is lower among these women. The absence of some husbands for extended periods reduces the contraceptive prevalence rate for the whole area considerably, which should be taken into account when assessing the coverage of family planning services for areas with high out-migration. Targeting women with a husband living away from home with counselling could improve their preparation for using contraception when he visits or returns home. Further research is in progress to assess the impact of separation on fertility rates.

Since 1992, about 200,000 Bangladeshis have been recorded as migrating abroad for work each year (1). Migration for work, either abroad or elsewhere in Bangladesh, affects many families, particularly in certain areas. For example, in one of the ICDDR,B surveillance areas in Mirsarai (Chittagong district), about one-quarter of married women of reproductive age, 15-49 years, report that they have a husband living away for work: 8% in Bangladesh; 17% abroad (2). Studies on migration and fertility often focus on couples who have migrated together. This study aimed to assess the extent to which having a husband living away from home affects use of contraception among married women.

The study population included all currently married women aged 15-49 years under surveillance in Mirsarai. The Health Systems and Infectious Diseases Division (HSID) of ICDDR,B has conducted health and demographic surveillance in 7 unions of Mirsarai upazila (sub-district) in Chittagong District since 1999 (5 unions since 1994). The sampling fraction is 1 in 4 households and about 6,900 married women are under surveillance. Data collected in routine quarterly interviews with married women, included socio-demographic information on household members, change in marital status, and migration in/out (date, reasons and destination), reproductive health status, pregnancy and birth outcome; use of contraception, method and source of supply. The study compared age- and parity-specific contraceptive prevalence rates (CPR) for married women who were recorded in three migration status groups for the whole of the period 2001-2003: husband living at home, husband away in Bangladesh (>60days), and husband abroad (>60 days).

Socio-demographic characteristics of married women

In the first quarter of 2001, there were 6,277 married women aged 15-49 years under surveillance in Mirsarai, of whom 333 (5%) had a husband who had been away for less than 60 days (not classified as out-migration until 60 days). The other 5,944 women were in three migration status groups: a) 4,459 (71%) had a husband living at home; b) 1,068 (17%) had a husband living abroad (>60 days); and c) 417 (7%) had a husband living elsewhere in Bangladesh (>60 days).

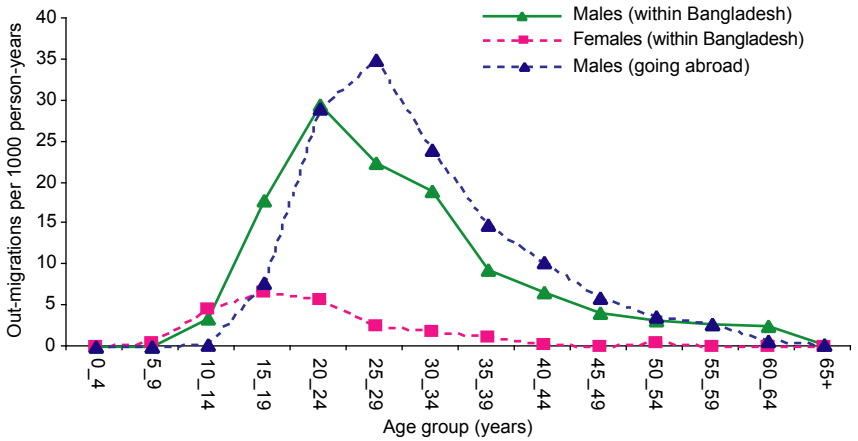
The age distribution of women in the three migration status groups was slightly different, with a higher proportion aged 20-29 years among those with a husband living away: 41% of those with a husband abroad, and 41% of those with a husband living elsewhere in Bangladesh, compared with 35% of those with a husband at home. This reflects the peak ages of 20-34 years for male out-migration from Mirsarai (Fig.1).

Pattern of out-migration from Mirsarai

Work was the main reason for out-migration of males from Mirsarai surveillance areas during 1999-2002, accounting for about 50% of the out-migrations. Work was a less common reason for females to migrate (10%): their main reason for moving being marriage (40%). The rate of out-migrations for work was highest between ages 15-24 years among females, and between ages 15-34 years among males (Fig.1). The peak for out-migrations of males was at ages 20-24 years, and at slightly older ages (25-29 years) for those migrating abroad. Most of the 1,311 out-migrations for work by males were to another sub-district of Bangladesh (49%), or abroad (47%). Most of the 232 out-migrations for work by females were to another sub-district of Bangladesh

(82%), and very few were for work abroad (0.4%).

Figure 1: Rate of out-migrations from Mirsarai for work, by sex and age: 1999-2002



Parity, pregnancy and contraceptive prevalence

Women living apart from their husband due to his work-migration were more likely to be in the early stages of family formation, compared with those with a husband living at home (referent group). Women with a husband living away were more than twice as likely to have no children, and 50% more likely to have only one child, compared with those not living apart ($p<0.05$). On the other hand, a much higher proportion of those not living apart from their husbands had three or more children: 56% versus 38% ($p<0.05$). The proportion of women pregnant was also significantly lower for women with a husband living abroad (5%), compared with those not living apart (9%). It was highest for those with a husband living away in Bangladesh (12%).

In the first quarter of 2001, contraceptive prevalence (any method) was significantly lower for women with a husband living abroad (7%), compared with those with a husband living elsewhere in Bangladesh (46%), or at home (63%). The effect of the high proportion of women with a husband living away is seen on the overall CPR for all women, which was 55% (Table 1). There was relatively more reliance on traditional methods by women with a husband living away: 71% of users with a husband was abroad, and 32% of those with a husband living away in Bangladesh reported using traditional methods, compared with only 19% of family planning users living with a husband. Use of modern methods, and even the more permanent methods, was significantly lower for women with a husband living away, compared with the referent

group living with a husband at home. The only exception was a slightly higher use of condoms reported by women with a husband currently living away in Bangladesh.

Table 1: Proportion of married women aged 15-49 years using contraception in Misarai, by husband's migration status in 2001

Contraceptive status of married women[1]	Percentage of married women in different groups			
	All women[2] (n=6,277)	Husband living at home (referent) (n=4,459)	Husband away in Bangladesh (n=417)	Husband abroad (n=1,068)
Using any method	54.5	63.2	45.6*	7.2*
Traditional	15.5	11.7	14.6**	5.1*
Condom	2.7	3.4	4.8**	0.0*
Pill	16.8	22.0	16.3*	0.4*
Injection	10.4	14.1	5.5*	0.1*
IUD	1.8	2.4	0.7*	0.1*
Tubectomy	5.7	7.5	2.9*	1.4*
Norplant	1.5	2.1	0.5*	0.1*
Pregnant	7.6	8.5	11.8**	5.1*
Others not using	38.1	28.3	42.6**	87.7**

[1] The figures are based on use in the first quarter of 2001 by 5,944 women who were in the same migration status group throughout the year.
[2] Total includes 333 women with a husband absent (<60 days).
* Proportion is significantly lower than for the referent group with husband living at home
** Proportion is significantly higher than for the referent group with husband living at home

The average quarterly CPR for modern methods over the period 2001-2003 for the three migration status groups, and for all women, is shown in Table 2. CPR was significantly lower at each parity level (0, 1, 2, 3+) for women who were living apart from their husbands. However, CPR increased with parity, whether or not the husband was living away from home. Among women with a husband living at home, CPR was within the range 51-62% for all age groups (Table 2). On the other hand, CPR varied quite considerably between age groups of women with a husband living away in Bangladesh. It was higher at ages 15-19 (52%) and 45-49 years (64%), compared with ages 20-44 years (22-44%). Again, the effect of the high proportion of husbands living away from home is seen in the very low CPR (modern methods) for all 6,277 women (41%), compared with the CPR for women living with their husband at home (58.0%).

Further data analysis is in progress to assess the effect on fertility rates of women with a husband working away from home. This is complicated by the lack of information on visits home, which are likely to be more frequent if the husband works somewhere in Bangladesh than if he works abroad. Preliminary analysis suggests that the average annual fertility rate (births per 1,000 women aged 15-49 at the beginning of 2001) over the period 2001-2003,

was not much lower for women with a husband living away in Bangladesh (95 per 1000), compared with women with a husband living at home (104 per 1000). Not surprisingly, the fertility rate was much lower among women with a husband living abroad (34 per 1000). After standardizing for age, the fertility rate was 68% lower among women with a husband living abroad, and 14% lower among those with a husband living elsewhere in Bangladesh. The extent to which there is `catch-up' fertility following return of husbands from extended periods living away needs to be considered. It may be that fertility of age cohorts of women is not greatly reduced by periods of absence of husbands. However, the large proportion of couples who are living apart in Mirsarai does reduce period fertility.

Table 2: Contraceptive prevalence rates (modern methods) and marital fertility rates, by husband's migration status, age and parity: Mirsarai, 2001-2003

Parity and age groups (years)	All Women		Husband's migration status for the whole period 2001-2003					
			Husband living at home (referent)		Husband away in Bangladesh		Husband abroad	
	No. of women	CPR	No. of women[1]	CPR[2]	No. of women[1]	CPR[2]	No. of women	CPR
Parity								
0	564	13.5	157	22.3	12	0.3*	13	0.0*
1	1,129	26.8	386	38.6	21	20.2*	29	2.3*
2	1,394	43.4	683	54.8	27	40.1*	54	2.0*
3+	3,190	48.9	1,860	63.7	42	45.0*	98	6.1*
Age group								
15-19	865	40.4	442	55.4	11	51.5	16	0.0*
20-24	1,217	39.3	563	57.8	24	43.8*	44	5.9*
25-29	1,093	41.3	510	62.1	16	21.9*	39	0.2*
30-34	1,176	41.6	595	59.2	19	36.0*	48	8.7*
35-39	1,001	40.3	508	57.1	17	28.4*	20	0.0*
40-44	682	41.9	351	57.6	9	22.2*	17	6.4*
45-49	243	35.0	117	51.1	6	63.9	10	0.0*
15-49	6,277	40.5	3,086	58.0	102	36.6*	194	4.1*

[1] Number of married women in the first quarter of 2001

[2] Average quarterly contraceptive prevalence rate (% of women using modern methods) in the period 2001-2003 for women who were in each migration status group for the whole of this 3-year period.

* Proportion is significantly lower than for the referent group with husband living at home

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Comment

Mirsarai surveillance area is not intended to be representative of rural Bangladesh, Chittagong Division, or even the district. Nevertheless, the CPR (modern methods) among all married women aged 15-49 years under surveillance in the first quarter of 2004 (37%) was the same as that for the division as a whole found in the Demographic and Health Survey of 2004 (3). It is not known what proportion of married women in the division have a husband living away from home, but it seems likely that the CPR is affected to some extent. In Mirsarai, the absence of about one-quarter of husbands has a considerable effect on the CPR for the surveillance area as a whole. When only women currently living with a husband are considered, the CPR for modern methods is 55%, and 60% for non-pregnant women. On this basis, the area has coverage of modern methods of family planning reasonably comparable with the highest performing division, Rajshahi (CPR 58%). Assessment of family planning coverage needs to take into account temporary out-migration in areas where this is common. Family planning services should target women with a husband living away with counselling on how to prepare for using contraception when he visits or returns home, or to adopt a more permanent method if intended family size has been achieved.

References

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3. National Institute of Population Research and Training. Bangladesh demographic and health survey 2004. Dhaka, National Institute of Population Research and Training, 2005:70.

Surveillance updates

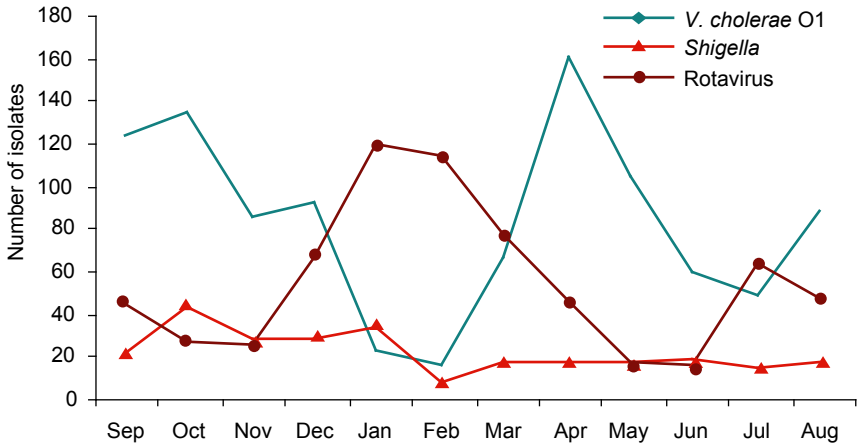
With each issue of the HSB, updates of surveillance data described in earlier issues will be provided. These updated tables and figures will represent the most recent observation period available at the time of publication. We hope these updates will be helpful to health professionals who are interested in current patterns of disease and drug resistance.

Proportion of diarrhoeal pathogens susceptible to antimicrobial drugs: September 2004-August 2005

Antimicrobial agent	*Shigella* (n=255)	*V. cholerae* O1 (n=992)
Nalidixic acid	41.2	NT
Mecillinam	100.0	NT
Ampicillin	56.7	NT
TMP-SMX	38.8	1.0
Ciprofloxacin	99.6	100.0
Tetracycline	NT	50.4
Erythromycin	NT	58.3
Furazolidone	NT	0.4

NT=Not Tested

Monthly isolation of V. cholerae *O1,* Shigella *and Rotavirus: September 2004-August 2005**



* *V. cholerae* 0139 was not found during the above period

Antimicrobial resistance patterns of 43 M. tuberculosis ***isolates*****:**
November 2003-May 2005

Drugs	Resistance type		Total (n=43)
	Primary (n=40)	Acquired* (n=3)	
Streptomycin	16 (40.0)	1 (33.3)	17 (39.5)
Isoniazid (INH)	4 (10.0)	1 (33.3)	5 (11.6)
Ethambutal	3 (7.5)	1 (33.3)	4 (9.3)
Rifampicin	2 (5.0)	0 (0.0)	2 (4.7)
MDR (INH+Rifampicin)	1 (2.5)	0 (0.0)	1 (2.3)
Any drug	19 (47.5)	1 (33.3)	20 (46.5)

( ) column percentages * Antituberculous drugs received for 1 month or more

Antimicrobial susceptibility of N. gonorrhoeae ***isolated during April-June 2005 (n=21)***

Antimicrobial agent	Susceptible (%)	Reduced susceptibility (%)	Resistant (%)
Azithromycin	100.0	0.0	0.0
Ceftriaxone	100.0	0.0	0.0
Ciprofloxacin	14.3	0.0	85.7
Penicillin	9.5	14.3	76.2
Spectinomycin	100.0	0.0	0.0
Tetracycline	14.3	4.8	81.0
Cefixime	100.0	0.0	0.0

Antimicrobial susceptibility pattern of S. pneumoniae ***among children <5 years during April 2004- August 2005***

Antimicrobial agent	Total tested (n)	Susceptibile (%)	Reduced Susceptibility (%)	Resistant (%)
Ampicillin	59	97	3	0
Cotrimoxazole	60	23	3	73
Chloramphenicol	59	88	0	12
Ceftriaxone	59	95	5	0
Ciprofloxacin	60	90	7	3
Gentamicin	54	44	2	54
Oxacillin	57	96	4	0

Source: Data obtained from children participating in PneumoADIP surveillance - a joint collaboration of ICDDR,B and Dhaka Shishu Hospital which has been conducted in Dhaka Medical College Hospital, Chittagong Medical College Hospital, Sir Salimullah Medical College Hospital, ICH-Shishu Sasthya Foundation, Chittagong Maa Shishu O General Hospital, Dhaka Shishu Hospital, Kumudini Hospital-Mirzapur, and ICDDR,B's urban surveillance in Kamalapur, Dhaka and rural surveillance in Mirzapur, Tangail.

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Photo: A paramedic taking a small fingerstick blood sample from a woman. (Courtesy of Dr. K. Zaman)

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