



Glimpse

international centre for
diarrhoeal disease research, bangladesh

NEWSLETTER

ISSN 0253-7508

Volume 5

Number 1

January-February 1983

TRUSTEES SEEK TO ENSURE CONTINUED ICDDR,B RESEARCH LEADERSHIP

In a review with major implications for the ICDDR,B, the Board of Trustees spent considerable time and effort at its December meeting relating program to budget.

*Importantly, the Board decided that, given the difficulties and uncertainties of fund-raising in the current economic climate, the ICDDR,B budget must be based on conservative revenue estimates.

The Board said the Centre's fundamental goal should be to keep its basic staff and facilities small enough to be adequately supported by the lowest annual revenue that reasonably can be expected.

The Board approved a 1983 budget of \$6.5 million. While this is \$2 million more than the amount spent, after budget cuts, in 1982, the extra money will not permit program expansion, the Board noted. For much of the extra funds will go for the newly-mandated WHO salary scale increases, towards reducing the Centre's operating deficit, and for a contingency fund. In this regard, the ICDDR,B Director was instructed to set aside \$700,000 to start a "Reserve Fund". This amount comes from an operating budget credit balance of \$914,000 remaining in 1982 after total donor contributions of \$6.48 million.

In another major effort, the Board participated in an intensive review of all ICDDR,B programs, partly based on the early 1982 findings of an External Review Committee.

In a day-long presentation, the Board gave special attention to the importance of gearing the Centre's overall conceptual framework and setting of priorities to best meet the ICDDR,B's mandated goals.

Emphasized was the importance of accumulating, within programs and across the Centre as a whole, funds not specifically assigned to on-going projects—so the Centre always will be in a position to take advantage of new research opportunities, as they arise. Such contingency planning, the Board said, would prevent the ICDDR,B from stagnating and rapidly losing the leadership it has achieved in many research areas.

This leadership position, the Board said, must be fostered, and

should form the basis for research priorities. Some projects will have to be delayed or dropped to achieve this end, the Board maintained.

In another important decision, the Board voted to adopt WHO pay-benefit scales for all ICDDR,B employees. Under this change the salaries and benefits of international employees will be adjusted to exactly coincide with those of WHO.

In other actions:

1. The Board welcomed four new members, re-elected another, and expressed its gratitude to four out-going members. Dr. David Bradley was re-elected, and was made Board Chairman, replacing Dr. M.A. Matin, whose

(Contd. on Page 8) ▶

HEALTH MINISTER OPENS TRUSTEE BOARD MEETING

Bangladesh's Health Minister lauded the ICDDR,B's role in controlling the spread of diarrhoeal diseases in the country, and said that increasing collaboration between the Centre and Bangladesh's national health institutions would be mutually beneficial.

Maj. Gen. Shamsul Haq, opening the December meeting of the ICDDR,B Board of Trustees of which he also is a member, cited the Centre's progress in developing a cereal-based oral rehydration solution. He urged the Board to devise increasingly effective

ways of sharing knowledge gained and new techniques developed at the Centre with other, especially Third World, countries. He also commended the Centre's collaborative ventures with Saudi Arabia and other countries.

Turning to Bangladesh, he said he hoped new and proposed extensions of the Centre's maternal-child health family planning programs to other parts of the country will be as successful as they have been in the Matlab Demographic Area. ■

UNPRECEDENTED CHANGE SEEN IN CHOLERA STRAINS

Nearly 10 years after it was replaced by another strain and totally disappeared from this nation, a virulent type of cholera bacteria suddenly resurfaced here with a vengeance in 1982.

Within three months, the returned "classical" strain caused a major epidemic in five separate areas of this small Ganges River delta nation. Moreover, "classical" replaced its predecessor strain "El Tor" as the main cause of cholera—at least momentarily.

This is the first time such a phenomenon has been seen anywhere, a group of scientists reports in the April 9th issue of "Lancet," the prestigious British medical journal. For while El Tor had been known to replace classical cholera, the reverse never had happened. Thus, once replaced by El Tor, classical cholera never had reappeared in any country, except for a few isolated cases in a part of India near Bangladesh.

While both cholera types are dangerous, the new strain causes more severe illness. For this and other reasons the unique occurrence raises vital questions about how and why it took place. Of utmost interest is whether classical cholera has acquired new, crucial biological characteristics that give it advantages over the El Tor strain that once pushed it into oblivion.

"This issue is critical," says Dr. William B. Greenough III, Director of the International Centre for Diarrhoeal Diseases Research, Bangladesh (ICDDR,B), where the return of classical cholera was detected.

"For if classical cholera could adapt and change here it might do so elsewhere. Furthermore, an understanding of the mechanism of such a change may be a key to learning to control the global spread of cholera."

The discovery of the re-emergence of classical cholera and its victory over El Tor was made by ICDDR,B scientists last fall, when they fought to curtail the death rate as simultaneous cholera out-



CHOLERA is a killer disease if not treated early. It dehydrates fast, often resulting in death. But with proper and timely rehydration most deaths can be averted.

breaks occurred in different areas of Bangladesh.

Funded by about 30 nations and some U.N. and other agencies, the ICDDR,B is the world's sole international center devoted entirely to studying the causes, preventives, treatments and cures for diarrhoeal diseases. Cholera is the best known and most deadly of such diseases worldwide.

The study of the demise and return of classical cholera in Bangladesh is worthy of first class scientific sleuthing. For, as the ICDDR,B researchers explain, the classical strain was native to and continuously present in Bangladesh (once East Pakistan) from its discovery in 1883 until 1973. Moreover, for all but the last ten years, the classical strain was the

sole cause of cholera epidemics in what is now Bangladesh.

In other parts of the world, El Tor (first isolated here in 1905) caused epidemics in the late 1930s, 1944 and in 1957-8. In Bangladesh, only a few El Tor cases were seen, in 1963 and 1964. However, by 1966 in neighbouring India, El Tor had eliminated classical cholera, just as it has done in all other parts of the world since 1960.

In Bangladesh, however, the first significant El Tor outbreak did not occur until 1968; and, over the next four years, only sporadic cases were seen.

Then suddenly, in 1973, El Tor totally replaced the classical strain in Bangladesh. For six years thereafter, until October 1979, not a single case of classical cholera was detected in Bangladesh—out of thousands of cholera bacteria samples isolated from victims and from the environment. And over the next three years, until late 1982, a total of only 11 classical cholera cases was seen.

"Then came Fall 1982, the fall being the worst cholera epidemic period," says Dr. Greenough. "On September 3rd and 4th classical cholera was isolated from two severely ill patients living in different areas."

Over ensuing weeks, while the vast majority of a growing number of cholera epidemic cases was being caused by El Tor, increasing numbers of classical cases were detected, in different parts of the country. By late December, classical cholera accounted for more than 90 percent of the cholera epidemic then raging in five separate areas.

Three facts about this new classical cholera outbreak are important, Dr. Greenough says. First, classical cholera suddenly reappeared simultaneously in different areas, striking victims who had had no apparent contact.

Second, the newly-emergent classical and the then-predominant El Tor strains struck the same type of victims, causing indistinguishable symptoms. Children under age nine were the commonest victims; while for adults aged 15 to 39, females had significantly higher attack rates than did males.

Crucially, the classical cases were more severe. They quickly led to very acute dehydration, the main cause of death in cholera

cases. Classical victims were more likely to die or require hospitalization.

Also important, says Dr. Greenough, is the fact that, compared to El Tor, classical was more readily acquired—by direct contact rather than by the usual means of infection: the drinking of cholera-infected water.

"This is a seeming paradox," he explains. "For our scientists found that significantly more El Tor than classical bacteria were detected on people's hands after they had washed with infected water. Yet, despite this apparent advantage for El Tor, classical bacteria spread more readily. One of the things we'd really like to explain is why.

"We suspect the answer may lie in another finding: that close crowding between women and children in family groups living in slums provided an efficient setting for spread of the new strain. For the infection spread more within families than among neighbours. From this we surmise that only a low dose of classical was needed to cause infection—and that we failed to pick up this dose because it was below the level easily detected on hands or in water."

Finally, adds Dr. Greenough, the most important part of the ICDDR,B discovery concerns the chemical and biological nature of the newly-found classical bacteria. For this strain appears indistinguishable from classical samples isolated in Bangladesh a decade and more ago, as well as from the 11 classical samples taken from patients in the prior three years.

"This suggests," Dr. Greenough explains, "that, beyond the standard traits used to classify and categorize El Tor versus classical cholera, there must be other, more critical biological characteristics that have given this newly-emerged classical strain an advantage over other cholera strains."

While many questions now must be answered, he continues, ICDDR,B scientists are giving two top priority: What is the nature of the advantage of the new classical strain? And, must protection against that characteristic be a part of the new cholera vaccines now under development?

"If we could find these answers," concludes Dr. Greenough, "and if we could learn how a new cholera biotype can achieve a biological advantage great enough to enable it to displace existing strains—our

NORWALK VIRUS: Cause of mild diarrhoea in one-to-two-year-olds

The interaction between infectious diseases and children's nutritional status was observed in a longitudinal study in two Bangladesh villages. An intensive village-based surveillance system was used to determine the occurrence and frequency of infectious diseases, in a cohort of 197 children aged 2 to 60 months.

The study was conducted at the ICDDR,B's Matlab field research area. All births, deaths and migrations in the area have been recorded since 1966. Hence, the accurate ages of children are known. Two typical villages, Enayetnagar and Sepaikandi, were selected for study. In 1978, Enayetnagar had 904 residents in 145 households, and Sepaikandi had 884 residents in 184 households (6.1 persons per household). Between March 30, 1978 and March 28, 1979, female field workers (FFWs) recorded all useful information: rectal temperature in case of fever, number and consistency of stools, visible blood or mucous in the stool, vomiting, virulent nasal discharge, cough, skin rash, virulent ear drainage, anorexia, and other symptoms. During diarrhoea the FFWs also noted signs of dehydration and obtained rectal swabs for detecting enteropathogens.

A physician visited the children every week, reviewed the information recorded by the FFWs, examined the children and, based on predetermined definitions of illness, coded and categorized the previous week's illnesses.

This study was supported by the ICDDR,B, with a grant from the National Institute of Health, USA, and funds from the Centre for Vaccine Development, the University of Maryland School of Medicine. Dr. Black performed the work in Bangladesh while assigned to the ICDDR,B from the Bureau of Epidemiology, the Centers for Disease Control. Dr. Harry B. Greenberg and Dr. Albert Z. Kapikian from NIH; Dr. Kenneth H. Brown from Johns Hopkins University who had been assigned to ICDDR,B; and Dr. Stan Becker from the ICDDR,B were Dr. Black's co-authors for the paper, "Acquisition of Serum Antibody to Norwalk Virus and Rotavirus and Relation to Diarrhoea in a Longitudinal Study of Young Children in Rural Bangladesh," published in the *Journal of Infectious Diseases*, Vol 145, No: 4; April 1982. The GLIMPSE version appearing in this issue has been adapted from the original manuscript.

A group of very small viruses called "27-nanometer" or "27-nm," and particularly one of the group called "Norwalk agent," appear to be important causes of diarrhoeal epidemics among older children and adults in developed countries. The importance of such viruses in developing countries is unknown. However, in three such countries (Bangladesh, Ecuador and the Philippines) children acquire at a young age antibodies to Norwalk virus—suggesting this virus may cause diarrhoea in babies.

A study was done in the Matlab area of Bangladesh to determine whether Norwalk virus is an im-

portant cause of diarrhoea in young children. The study also looked at "rotavirus," a known important diarrhoeal agent, to see whether changes in rotavirus antibody levels coincided with rotavirus infections, either symptomatic or asymptomatic.

Finally, the study sought to compare, by serologic means, the age at which children become infected and the seasonality of infection, for Norwalk versus rotavirus, in a developing country. To perform the study, the researchers took blood samples from children at the study's outset and at four-month intervals (early April, August and December 1978 and March 1979.) To detect Norwalk virus antibodies in the blood, they used the blocking radioimmunoassay; and to detect rotavirus antibodies they used the binding ELISA technique.

They found that the prevalence of Norwalk virus antibody was 7 percent in children under age six months, increasing to 100 percent in four-year-olds. Children who did not have detectable Norwalk antibodies initially were significantly more likely to show a four-fold antibody increase over the year.

The most increases occurred in one- and two-year-olds, re-

amed high in year three, but dropped to low levels in year four. For children for whom samples for all three periods were available, 30 (24%) of 127 children showed a single Norwalk antibody increase, and 3 (2%) showed two increases. The incidence of increases occurred in the December-March period, with low incidences in the other two periods.

For rotavirus, the incidences of four-fold antibody increases were high in children of all ages, and peaked in children 14-to-25-months-old. While incidences were highest from December-March, there were substantial increases in the other two periods. This was consistent with the researchers' earlier findings that rotavirus diarrhoea occurs year-round in the study area, increasing slightly in the cool, dry months. (Table 1)

Comparing their blood-antibody level findings with diarrhoeal cases, the researchers suggest that rotavirus infection is far more frequent than the study's stool examinations showed. While only 5 percent of diarrhoeal episodes could be linked to rotavirus, a previous study in the same area had shown that 67 percent of children had, over 16 months, an increase in rotavirus antibodies.

Moreover, in the current study, 53 percent of 110 children for whom all blood samples were available had shown one increase in rotavirus antibodies, and eight percent had shown two increases during one year. Diarrhoeal episodes with rotavirus in the stool occurred only in 16 percent of 92 four-month periods in which there was an increase in rotavirus antibodies.

The discrepancy between high antibody levels and low detectable infection rate, the researchers say, most likely can be explained two

ways: by transient infections not severe enough to cause diarrhoea and missed because stool samples were taken routinely only once a month; and/or because asymptomatic rotavirus infections may have had too few viral particles to be reliably detected by the ELISA test.

Another finding was a high correlation between four-fold increases in rotavirus antibody levels and diarrhoeal episodes in young children. Thus, when they had rotavirus-related diarrhoea, 5 (83%) of 6 children under one-year-old also showed a large increase in rotavirus antibodies, as did 10 (53%) of 19 children aged 12-23 months, and none of five older children.

To learn what protective role rotavirus antibodies may play, the researchers compared, for each period, levels of rotavirus antibodies with numbers of symptomatic or asymptomatic infections.

Briefly, they found that children with low rotavirus antibody levels had a substantially greater risk of rotavirus infection than did children with more antibody. However, circulating antibody apparently does not offer sufficient protection from illness in young children. For 99 percent of children with rotavirus infection had antibodies, often a large amount, before their infections. Also, young children with large antibody levels still had a six-fold higher risk of rotavirus infection than did older children with similar antibody levels.

Given these and other researchers' findings, the ICDDR,B team concluded that it is possible antibody is not protective per se—but reflects a child's cumulative exposure to rotavirus, resulting in a neutralizing, type-specific antibody. They noted, too, that other work in animals suggests that local

intestinal antibody may offer more protection than does circulating antibody.

As to Norwalk virus, the team sought to learn whether some of the diarrhoeal episodes may have been caused by it. They compared diarrhoeal cases where no pathogen was found in stool during two periods: with and without four-fold increases in Norwalk virus antibodies. For each period they found that children with high antibody levels had 0.3 more diarrhoeal episodes than did children without high antibody levels—suggesting that some of the Norwalk infections lead to diarrhoea.

Overall, the children averaged 5.6 diarrhoeal episodes for the year. Based on the antibody increase rates and the fact that excess infections occurred in children with substantial antibody increases, the researchers estimate that Norwalk virus caused 1 to 2 percent of the diarrhoeal episodes seen. Furthermore, because there appear to be several other 27-nm viruses that are serologically distinct and are not detected by the blocking radioimmunoassay for Norwalk virus, the scientists add, other 27-nm viruses may account for an additional fraction of childhood diarrhoeal episodes.

Moreover, the researchers say, as has been seen in developed country children, Norwalk virus-caused diarrhoea in Bangladeshi children may be less frequently associated with dehydration than is diarrhoea caused by rotavirus or enterotoxigenic *E. coli*. Thus, of 31 children under age 10 treated for diarrhoea in a Bangladesh hospital who did not have rotavirus, enterotoxigenic *E. coli*, *Salmonella*, *Shigella* or *Vibrio cholerae* detected in their stools, only one showed serologic evidence of Norwalk virus infection.

Finally, citing other scientists' work, the researchers warn that in addition to the illness and possible death resulting from rotavirus-and Norwalk virus-caused diarrhoea, even sub-clinical infections may cause problems.

Adult volunteers given Norwalk virus developed an abnormal intestinal histology, characterized by mucosal inflammation, absorptive cell abnormalities, villous blunting and crypt hypertrophy, even in the absence of diarrhoea. These changes were associated with malabsorption of fat and xylose, and decreased levels of (Contd. on page 7) ▶

Table 1. Incidence of four-fold increases in titer of antibodies to Norwalk virus and rotavirus in children in rural Bangladesh during a one-year interval, subdivided into four-month periods.

Pathogen, incidence	Four-month periods			One year April-March
	April-August	August-Dec.	Dec.-March	
Norwalk virus				
Observed*	4.6 (161)	3.1 (156)	22.4 (142)	28.8
Age-adjusted	5.9	3.2	22.2	...
Rotavirus				
Observed*	17.1 (154)	22.2 (150)	25.5 (127)	63.9
Age-adjusted	16.3	22.3	26.7	...

* Data are no. of increases in antibody titer per 100 four-month periods or per 100 child-years of observation (no. of periods). All paired comparisons of age-adjusted incidences for each pathogen revealed significant ($P < 0.001$) differences.

Health Care Is Crucial to Successful Fertility Control

Adapted from: "The Demographic Impact of the Family Planning—Health Services Project in Matlab, Bangladesh." Authors: Dr. James F. Phillips, ICDDR,B; Dr. Wayne S. Stinson, American Public Health Association; Shushum Bhatia, Dept. Population Dynamics, Johns Hopkins University; Makhlisur Rahman, ICDDR,B; J. Chakraborty, ICDDR,B. Published in "Studies in Family Planning," Vol. 13, No. 5, May 1982.

In a study with major implications for population planners worldwide, an ICDDR,B team has found that contraceptive services, coupled with good follow-up and primary health care, can dramatically reduce population growth in a poor, rural traditional population—simply because there's an unfulfilled demand for effective birth control methods.

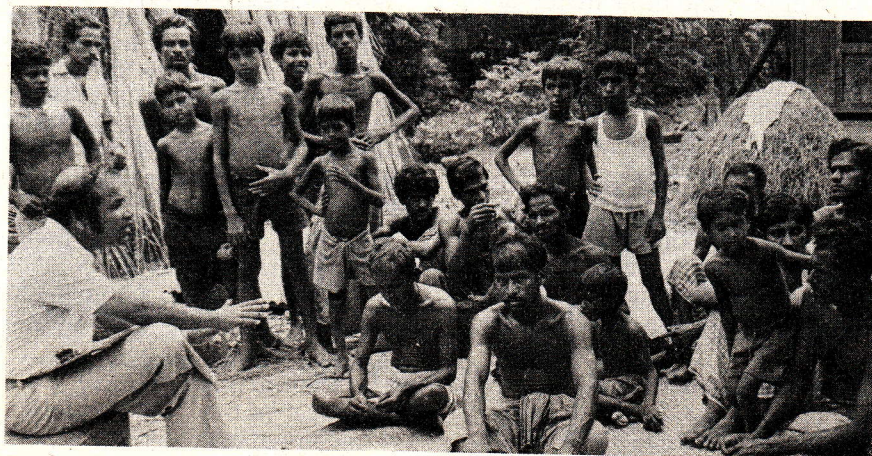
This finding supports one of the major arguments that lie at the heart of the decade-long debate over how to most successfully and swiftly reduce fertility. The results strengthen the view that convenient, inexpensive and effective contraceptive services can have a major impact—even in the absence of social and economic change.

Many population planners argue that significant reduction in fertility and mortality only can occur if social and economic conditions change first. Bangladesh often is cited in support of this view, since some proponents of this position maintain that two decades of family planning services have yet to produce results. The Matlab findings support a more optimistic viewpoint.

The study found that significant birth reductions can be achieved and sustained, by offering a comprehensive contraceptive care program. This program consists of a wide choice of methods, and effective, sympathetic follow-up, by trained paramedics for real and perceived contraceptive problems, as well as highly effective health services to reduce deaths from diarrhoea and tetanus.

In its most dramatic result, the study showed a 22-to-25 percent fertility difference for the first two years between treatment and comparison areas—mainly due to a marked fertility drop among women aged 30 and over. Specifically, for 30-to-40-year-olds, the birth rate was 27 percent lower in the treatment area; and for those 35 and over the difference was 50 percent, unprecedented in recent years anywhere in the world.

The researchers cautioned, however, that it's impossible to determine the extent to which the project's success was due to



EXPERIENCE of the FPHSP indicates that intensive educational and promotional campaigns should coincide with the high conception season.

family planning strategies alone, versus to concomitant follow-up and effective control of diarrhoea and tetanus-caused deaths.

The study was conducted at the ICDDR,B's Matlab Demographic Surveillance Area, encompassing 149 villages and about 168,000 people, where demographic surveillance data have been shown to be complete and accurate for 15 years. Contraceptive services effects therefore could be evaluated by dividing the territory into treatment and comparison areas; and then simply tabulating vital data for the entire area, and updating census data for 1974 with successive birth, death and migration data.

The current study, called the Family Planning—Health Services Project (FPHSP), was launched in 1977 by the ICDDR,B's predecessor, the Cholera Research Laboratory. The FPHSP, which continues today, followed an earlier study, the Contraceptive Distribution Project (CDP) that had the same aim: to determine whether the provision of contraceptive supplies per se can increase contraceptive use by fulfilling a latent need.

Established in 1975 at Matlab, the CDP employed elderly, illiterate females or "dais" who distributed pills and condoms to women in their homes.

After an initial three-month success period contraceptive use declined, and demographic effects were limited to the first year. Since

the project initially had been successful, this suggested the existence of a demand for contraceptives that perhaps could be better-fulfilled by expanded services and more intensive follow-up and care.

One of the major limitations, it was suspected, was the nature of the female workers. While knowledgeable about their villages, they were too old to have practiced contraception, and had not been trained to deal with side effects. Thus, they lacked credibility as family planning workers, and only infrequently were relied upon for contraceptive advice. Moreover, the situation was exacerbated by their relatively low local social status. They simply lacked enough prestige to be effective agents for social change.

The FPHSP sought to correct this deficiency, as well as to shift the emphasis from merely distributing contraceptives to comprehensive contraceptive care—including frequent and regular visits to women, whether or not they were birth control users; a wide choice of convenient methods; and effective health measures—most importantly oral rehydration therapy and, where necessary, referral for severe diarrhoea victims, as well as immunization against tetanus.

Under the FPHSP, literate, young, local married women from influential families were hired as

female village workers (FVWs.) They were intensively trained for six weeks in contraception, field visiting techniques, and basic reproductive physiology. Also, over the first year they were trained weekly in the treatment of diarrhoea, injection of tetanus toxoid, basic nutrition and other maternal-child health tasks. In the service area the FVWs visited all households fortnightly, to provide primary health care and family planning services, as well as health referral advice.

The treatment and comparison areas were divided into groups of 20 villages (20,000 population), where a sub-centre was manned by a Lady Family Planning Visitor (LFPV), who was a government-

certified paramedic with 18 months' training, and a senior male health assistant (SHA) who was in charge. Moreover, there was one medical officer, who supervised tubectomies at Matlab, conducted medical rounds in the field and continuously trained paramedics.

Under the new system, contraceptive use in the treatment area went from 10 percent in October 1977 to 34 percent by the end of 1978, where it remained until 1981. At this time, Copper Ts were offered to women in their homes, and by the end of 1982, prevalence rose to 37 percent.

As noted earlier, overall treatment area fertility was 25 percent lower than for the comparison area—whereas it had been only 8

percent lower prior to the FPHSP. Also, while the most dramatic effects were seen in women 30 and over, the program had a sustained effect as well on younger women.

Interestingly, initial contraceptive use was dominated by DMPA (Depo Medroxy-Progesterone Acetate.) However, as alternatives were introduced—most notably tubectomy and the Copper-T—the proportion of DMPA users declined. Significantly, the absolute use of DMPA remained relatively constant. Thus, as more methods were added, more women became protected—suggesting that a wider choice contributes to overall levels of contraceptive protection. ▶

FEMALE VILLAGE WORKERS: THE CRUCIAL LINK

The Matlab experience has pinpointed the importance of the Female Village Workers (FVWs) who deal directly with contraceptive acceptors and prospective users. It turns out that FVWs are a decisive factor in the success of the FPHSP.

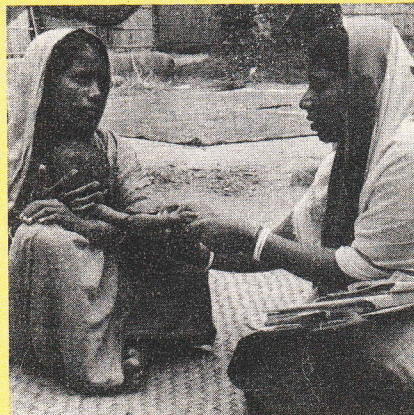
Under the FPHSP, literate, young, married local girls were hired as FVWs. They initially received six months training, and later a one-day-a-week follow-up for the project's first 12 months, under the direction of the physician-in-charge. From the second year the FVWs met fortnightly to present progress reports, receive refresher training, and occasional instruction in new MCH or family planning activities.

The FVWs treat minor ailments and complaints during regular visits to village homes. More serious problems are referred to Lady Family Planning Visitors (LFPVs), based at four Matlab-area sub-centres. The LFPVs are government-certified paramedics, with 18 months' training. Cases beyond the LFPVs' competence are referred to doctors at the central Matlab clinic. The FPHSP physician-in-charge is based at Matlab, but visits each sub-Centre for the fortnightly meetings, and trains the paramedics and the FVWs.

The FVWs functions are to:

- *Motivate and advise eligible women, and discuss with them services offered;

- *Provide oral contraceptives, condoms, vaginal foam, etc.;



THE FVWs provided not only contraceptive services, but also for mothers and children a battery of health-care services, that took care of diverse primary health needs, including real and perceived contraceptive side-effects.

- *Arrange appointments at a sub-centre or Matlab for women desiring IUDs, tubectomies, etc.;

- *Follow up users, attempt to treat actual or perceived side-effects, and refer complications;

- *Remove sutures after a tubectomy;

- *Educate mothers about proper nutrition, especially during pregnancy and lactation; and provide information about nutrition for babies and older children;

- *Educate mothers about proper hygiene during pregnancy, delivery and the pre-natal period; supply iron and folic acid tablets to women in the last tri-mester of pregnancy; and give tetanus toxoid injections to all women before a baby is born;

- *Train mothers to prepare oral rehydration solution (ORS) for diarrhoea treatment;

- *Through regular interviews, record baseline information on family size, contraceptive use and health information;

- *Maintain records of all births, deaths, divorces, marriages and migrations; and conduct sample surveys as required.

During the 1981-2 period, MCH functions were augmented with immunizations against measles for children and tetanus for mothers; high risk pregnancy screening and referral; and community-based traditional birth attendant training. As a result, the FVWs' designation was changed to "community health workers," to more accurately describe their role. Under the FPHSP, 80 FVWs covered a population of about 80,000. A FVW typically has at least seven years' formal education, is married with children, uses birth control, and is from a highly regarded local family. Most women meeting these criteria come from relatively prosperous families. Recruiting them to be FVWs requires careful attention to religious and cultural norms, which impose constraints on women's extra-familial roles.

Training

The FVWs' training was done in three stages: three weeks' orientation; four weeks' pre-service training; and one-day-a-week in-service training for 12 months.

During orientation, FVWs were acquainted with the program, the ICDDR,B and the available technical, administrative and medical facilities. They were assigned to work in their respective villages with ▶

Specifically, when a new method was introduced at Matlab two things happened: more people used contraception, thanks to the choice variety available; and old methods were displaced by a new method, due to switching. Many women preferred DMPA or pills to other methods available in their homes. But in 1982, when Copper Ts became available in homes, many women abandoned pills and DMPA.

And, last but not least, the study showed that the FPHSP has been able to alter the total fertility level, but not the marked seasonal variations prevalent in rural Bangladesh. The researchers concluded that "seasonality has more pronounced effects than contraceptive services—effects that are dampened in absolute but not relative terms by widespread fertility control."

their uneducated counterparts from a previous family planning program.

During pre-service training, the FVWs learned to keep accurate research and service records. Also, during the initial two weeks they were taught anatomy and physiology; family planning methods; contraceptive side-effects and how to treat them; follow-up schedules for diverse contraceptives; and principles of motivation. This was followed by two weeks' field practice, in which they were closely supervised and guided by male supervisors and the project physician.

Finally, each week for the first year, they gathered at the area sub-centre for 5-6 hours' in-service training and discussions of problems faced in the field. After the first year, these meetings were held every fortnight. The project physician attends these meetings, and the FVWs escort to the sub-centres clients with problems beyond their ken. At these meetings the supervisors also evaluate the FVWs' performances.

Workers are constantly evaluated and compared. Since pay raises and contract extensions are based on performance ratings, work motivation has been high. Initially, the FVW replacement rate was 10 percent, but this declined with time, due to high attrition among ineffective workers. ■

Adapted from "Training Community Health Workers in Rural Bangladesh," by Shushum Bhatia, published in "World Health Forum," 2 (4): 491-494 (1981).

Based on their findings, the researchers pointed to six implications:

1. Fertility in Bangladesh can be readily reduced by making contraceptives easily available. However, the effects are likely to be temporary, without trained workers who systematically follow up and attend to users' needs.

Since poverty, as well as illness and death due to infections and disease, is widespread in rural Bangladesh, users cannot distinguish side-effects from other illnesses, and cannot afford treatment. While rural couples will experiment with new contraceptives, they will not keep using them unless real and perceived contraceptive health problems are cared for by trained, sympathetic, village-based paramedics.

2. Wide-ranging programs, such as the FPHSP, will be substantially more effective and sustained than ones based on having unskilled workers who merely distribute one or two types of contraceptives. Still, it was impossible to assess how much of the success of the FPHSP was due simply to providing a large choice of contraceptives. For integration of MCH with family planning seems to improve program performance, by directly affecting family planning care. The

question of whether comprehensive MCH services, aimed at reducing illness and death, can directly affect fertility should be addressed in future research.

3. The reasons for seasonal fertility swings despite FPHSP successes need to be studied and taken into account by planners. Intensive educational and promotional campaigns should coincide with high conception seasons.

4. Research shows no evidence that reproductive motives have been affected by the FPHSP. Increases in the impact of the FPHSP appear to have been in response to operational improvements in service delivery, rather than to changes in reproductive motives. Whether such motives can be influenced by health service interventions or other policies is a critical question that must be investigated at Matlab over the next few years.

5. More research is needed to learn why several Matlab villages have contraceptive use rates of more than 50 percent, while others have less than 10 percent. The answer will permit inferences about what determines the program's success.

6. Means now must be found of how best to translate the Matlab FPHSP successes to other areas of Bangladesh and the world. ■

NORWALK VIRUS

(Contd. from page 4)

intestinal brush-border enzymes. Moreover, rotavirus diarrhoea appears to be associated with similar histologic changes; and children with rotavirus diarrhoea often have increased reducing substances in their stools, an indication of reduced digestion and absorption

of carbohydrates.

Thus, the researchers conclude, these clinical and subclinical infections, perhaps in concert with other viral and bacterial intestinal infections, may contribute to malabsorption and chronic diarrhoea in some children. ■

International Conference on ORT Scheduled

A major international conference on oral rehydration therapy (ORT) will be held in Washington, D.C. June 7-10, to increase professional and lay awareness of the value of ORT in the control of diarrhoeal diseases.

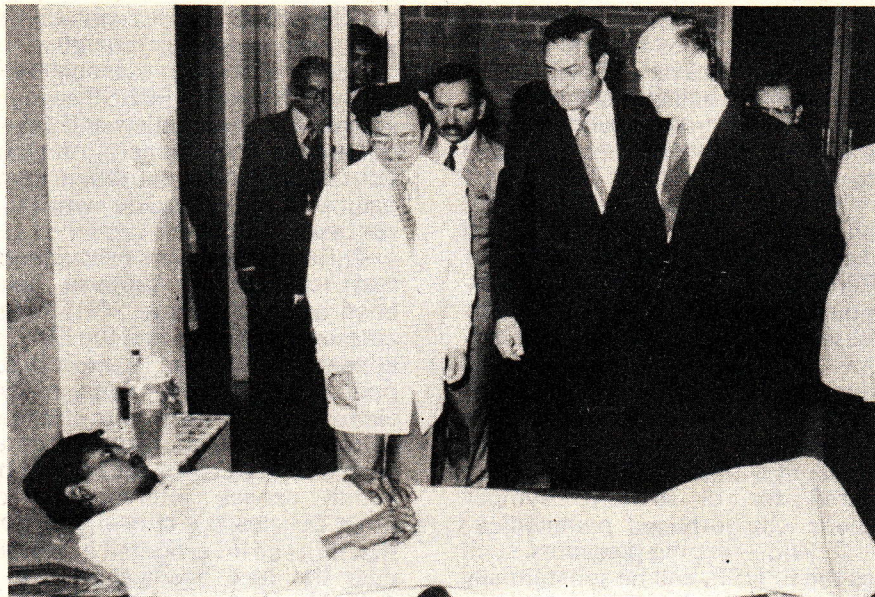
Experts from developed and developing countries will participate in the discussions, which will take place just prior to the NCIH International Health Conference, scheduled for June 13-16. The ORT conference will be sponsored by U.S. AID, in cooperation with

the ICDDR,B, UNICEF and WHO's Diarrhoeal Disease Control Program.

A Technical Advisory Committee, comprised of representatives of the sponsoring organizations and outside consultants, has developed the agenda, including plenary and panel sessions. On the agenda is discussion of ORT, its justification, practical utilization, program experiences, and issues related to its implementation. There also will be a session on future directions, including research.

The conference will be an open meeting, but registration will be required. ■

THE AGA KHAN VISITS ICDDR,B



VISITING the ICDDR,B hospital is Prince Karim Aga Khan (right)

Prince Karim Aga Khan, spiritual leader of the World's Ismailia Muslims, toured ICDDR,B facilities in January, while visiting Bangladesh. He was particularly interested in the Centre's Urban Volunteers Training Programme, and research on the cereal-based ORT solution.

Earlier, the Aga Khan Foundation, a non-communal organization based in Geneva, donated US \$100,000 to support research and application of a rice-based ORS.

The improved ORS, which contains rice instead of sugar, has generated a lot of interest among researchers and health workers worldwide. For rice-based ORS may prove to be a simple, easily available therapy that not only rehydrates diarrhoea patients, but simultaneously provides nutrition, especially important for young diarrhoea victims who are at greatest risk. ■

TRUSTEE HONOURED



Dr. Jan Holmgren

Dr. Jan Holmgren, an ICDDR,B trustee and Director of the Bacteriology Department, Göteborg University, Sweden, received the 1982 Anders Jahre medical prize, for his studies on the mechanism of disease and prevention in cholera. He shared the prize with Dr. Bjornar Olaisen of Norway, honoured for his studies on genetic markers in serum proteins, especially in the complement system.

Each year, two Anders Jahre medical prizes are given to Scandinavian scientists, one to those over age 40, and the second to those below 40. Dr. Holmgren's prize includes a gold medal and 200,000 Norwegian Crowns (US \$40,000). This year's senior prize went to Prof. Flemming Kissmayer-Nielson of Denmark, for his research on immune reactions in relation to transplantations. ■

TRUSTEE BOARD MEETING

(Contd. from page 1)

one-year tenure as chairman expired.

*Dr. F. Assaad, Director of WHO's Communicable Diseases Division, Geneva, replaced Dr. A. Zahra.

*Maj. Gen. Shamsul Haq, Minister, Health and Population Control, Government of the People's Republic of Bangladesh, replaced Bangladesh's previous member, Prof. A.Q.M. Badruddoza Chowdhury.

*Dr. Yoshifumi Takeda, of the

Research Institute for Microbial Diseases, Osaka, Japan; and Dr. David Bell, Chairman, Department of Population Science, Harvard University's School of Public Health—replaced Drs. C.C.J. Carpenter and Omond Solandt.

2. Reappointed Dr. William B. Greenough III to a two-year term, starting July 1983; and established a Search Committee to find a new Director for when

Dr. Greenough's six-year tenure ends in 1985.

3. Reappointed for 3 years as Associate Director for Resources Development Mr. M.R. Bashir.
4. Established the Donald Mackay Memorial Fund in honour of Dr. Mackay's contributions to the health of Bangladeshi tea garden workers. ■

EDITORIAL BOARD

Members : Dr. Thomas C Butler, Dr. Ayesha Molla, Dr. S C Sanyal, M. Shafiqul Islam, A K Azad, Md. S I Khan
Editor-in-Chief : Dr K M S Aziz Associate Editor : Shereen Rahman Design & Photography : Asem Ansari

Published by Dr. KMS Aziz, for and on behalf of the International Centre for Diarrhoeal Disease Research, Bangladesh, G P O Box 128, Dhaka 2, Bangladesh. Telex no 65612 ICDD BJ. Photocomposed and Printed by Eastern Commercial Service Limited, Dhaka, Bangladesh.