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FRCH NEWSLETTER

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Vaccines: Fact, Fancy & Fallacy

By Dr. N. H. Antia

Life is a perpetual struggle for survival and the immune system is the body's defence against bacteria and other parasites which cause disease. This protection which is mediated either by antibodies or cells is highly specific for each invasive organism, contact with which induces a memory for subsequent recognition and destruction. Infants and children who have not yet developed such immunity are therefore more susceptible to many of the communicable diseases that affect us like diphtheria, pertussis (whooping cough), tetanus, tuberculosis, and measles. Exposing them to a minute dose of the same infectious organism, either killed or attenuated, which without producing the disease will nevertheless activate their immune system and protect them subsequently from the same disease. This process of immunization was known in China and India several thousand years ago for protection against smallpox.

Vaccines therefore provide an attractive means for protection of individuals and populations from communicable diseases and are a useful tool for their control. The worldwide eradication of smallpox, a major human scourge, through immunization has undoubtedly been a major achievement. This success however, remains an exception because of the nature of this acute disease confined to the human host and for which simple tools such as a highly potent vaccine which could be lyophilized and given by scratching the skin with a forked needle was available. Yet it took 175 years from knowledge to its implementation.

We have also had vaccines for tetanus, whooping cough, diphtheria, tuberculosis, poliomyelitis, rabies, measles and yet these diseases continue to take their unremitting toll. 500,000 die yearly of tuberculosis, 250,000 of tetanus, 30,000 of measles and around 200,000 new cases of polio are detected each year.

It is common knowledge that the root cause of communicable diseases lies in poverty and the associated malnutrition, lack of proper water supply, sanitation and unhygienic housing and environment. The following tables show how most diseases like tuberculosis, diphtheria and measles had started declining in Europe even before the cause of the diseases were discovered and had practically disappeared by the time vaccines and drugs were available. In contrast, the same diseases continue to take their toll in the poorer countries despite far better scientific knowledge as well as highly effective drugs and vaccines for their prevention and treatment. This clearly demonstrates the pre-eminence of socio-economic factors in the control of these diseases.

While vaccines and drugs are useful tools, experience reveals that they cannot by themselves solve the problem. Those well-to-do nations or those within each nation who do not wish to choose the correct and honest path of action because of personal vested interest in the existing order, continue to promote vaccines and drugs while only paying lip sympathy to the other far more important factors. Among these are the medical profession, the scientists, the bureaucracy and the politicians who see the poor only as a means of justification for their own comfortable existence.

India despite its vast scientific manpower and large research institutions has not yet produced a single new vaccine after Haffkine discovered the ones for plague and cholera at the turn of the century. We still have to go to

Continuing the Dialogue

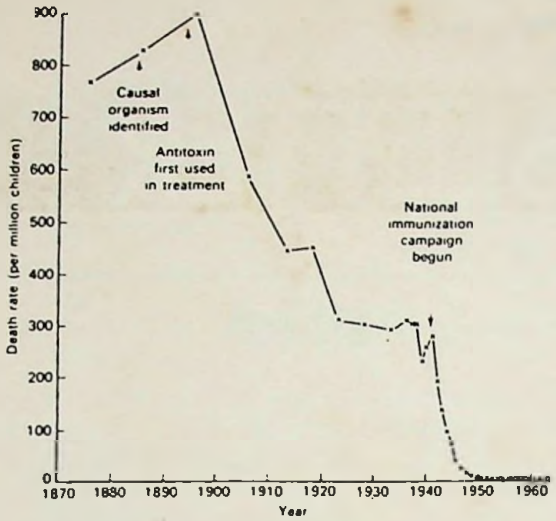
The FRCH newsletter was launched a year ago on an experimental basis not just to disseminate information on varied aspects of health, but also to create awareness among the people on a wide range of issues, from nutrition, drugs, therapeutics, child health and primary health care to finance, education planning and policies.

This, we hoped, would generate feedback from readers and also engender stimulating dialogue between interested individuals and groups. From the encouraging response we have received so far from readers, doctors and health experts we are spurred to continue and make the newsletter a permanent feature.

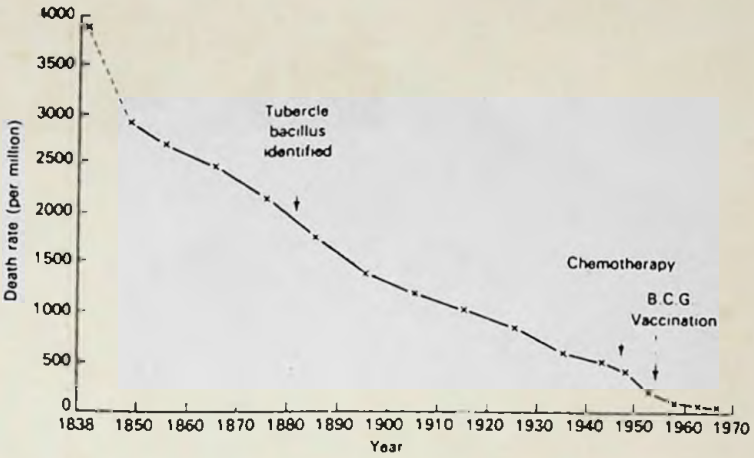
We will be dealing with varied issues of topical interest and concern. In this issue we are discussing different aspects of vaccines in view of the considerable interest created recently and the subsequent controversy. We are presenting here facts already publicised and some not so well known. We hope to state both sides of the coin and let the readers make their own judgement. The newsletter also contains information on the different activities of the FRCH.

We wish our readers
A Happy New Year

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Diphtheria: death rates of children under 15, England and Wales



Respiratory tuberculosis: death rates, England and Wales

a small country like Yugoslavia to purchase a strain of the measles vaccine and also for the technology for its mass manufacture. And perchance as in the case of leprosy we develop our own vaccines, we are discouraged by both our own peer scientists leave aside those of the West who while being sold almost entirely on recombinant and synthetic vaccines have no qualms on imposing a first generation armadillo derived vaccine on our people for experimentation. This despite the indigenous vaccine which is infinitely cheaper and in every other technical respects comparable to its western counterpart.

Our public sector drug industries cannot even after four decades produce sufficient vaccines for our needs while a ten year old private sector company can outstrip them using in a great measure indigeneous production technology. The recent much-publicised co-operative Vaccine Action Programme by our bio-scientists for producing the latest third generation vaccines only means giving a helping hand to their Western counterparts to try out their vaccines on our people, some of which are not approved for use in their own country. An illiterate population, a readymade scientific infrastructure and a tradition for overzealous and reckless committment to anything Western may fast turn India into a vast ground for human experimentation. While this may serve the needs of WHO and the USA, a few million dollars and a few scientific jaunts and exchanges will do little to enhance the self-respect of our scientists or stimulate original research. We are assured that the interests of the poor, who are invariably the subjects of these trials, will be protected. Reports such as of the Lentin Commission demonstrate how helpless our poor are even in the hands of those who are elected or paid to protect them.

There are also several inherent scientific problems and dangers with vaccines which scientists have often failed to realize or overlooked in their enthusiasm. Several disease processes are still ill understood and most vaccines developed are far from ideal. The advent of AIDS in both the first and the third world and the several acquired deficiency syndromes already present in the third world makes the danger of using live recombinant third generation vaccines a real one.

Technical uncertainties such as variation in vaccine efficacy due to either genetic or geographical factors, or lack of ways to measure protection or the hazards of immunization are never laid open to public view by our experts. Indeed one must be also open to the possibility that in certain conditions vaccines may not work at all.

The smallpox eradication programme provides a good case for enumerating factors that would allow vaccines to work. Acute diseases are more prone to vaccine control than chronic ones. The presence of diverse natural reservoirs of the pathogen may thwart eradication programme and a single shot delivery of life long protection is ideal for delivery logistics.

Dazzled by the glamour of quick technological solutions, good science for the understanding the basic pathological process of these diseases and developing of laboratory tests for preliminary screening of potential vaccines has been neglected. The need for the latter is a must particularly if second and third generation vaccines are to be tried out in multiple combinations. It would be vastly wasteful if not impossible to submit lay populations to trial vaccines and wait a number of years to see if there is a satisfactory significant reduction in cases of disease in that population. Epidemiology, the basis for understanding of community health as also field trials of vaccines is the most neglected of all our medical subjects so that we have to seek the help of western experts even after 40 years.

In the haste for using the 'latest' recombinant technology we seem to have lost sight of the simple technology such as the use of readily cultivable organisms which have been the basis of all our tried and tested vaccines to date.

Seventy per cent of our health services in India are in the private sector which is entirely curative oriented and caters for only a limited portion of our population who can pay for their services. Since communicable diseases, the most common killers and maimers chiefly affect the poor, their prevention and even treatment is almost entirely relegated to the public sector. Despite a eleven-fold increase in the Primary Health Centres from 725 to 8496 in 40 years together with the availability of drugs and vaccines for most of these diseases, communicable diseases continue to take an unacceptably high toll. There are often shortages of drugs and vaccines and it is difficult to main-

(contd on p. 12)

From Holism to Eradication & Beyond

Nerges Mistry

The practice of vaccination in China probably arose in the belief of the co-existence of species, a wise forebearer of the theory of natural selection. A disease was invited to enter the body so that it would not then ravage the person in its more deadlier form. This kept the vital forces of the body in balance and contributed therefore to its well-being. This then was the principle of immunization against smallpox which consisted of introducing pustular crusts of pox lesions in powder form into the nostrils.

The method was introduced into neighbouring India through the perennial trade traffic where it was sustained in the form of skin punctures or tikas. Active immunization, though never redundant, remained for subsequent centuries localized to the Orient probably due to other dominant advances in the West and was introduced to the Western world through Turkey via Arab mendicants and by adventurers such as Marco Polo. The same practice was baptised newly in 1812 by Edward Jenner's success in preventing human smallpox by injection of a related virus that infected cows. The procedure became known as vaccination from the term 'la vacche' meaning cow: this time, however, there was a difference. From the time of the ancients the goals of science had been wisdom, understanding the natural order and living in harmony with it. In the 17th century, guided by the doctrines of Francis Bacon, this attitude of integration was replaced to one of self-assertion. The goal of science became knowledge that could be used to control and dominate nature.

Diverse discoveries led to the resurgence of active immunization. Darwin's theory of evolution made meaning of why big fish eat little fish. Jacob Henle first and then Louis Pasteur showed that micro-organisms caused disease and that they themselves arose from other micro-organisms. Pasteur also introduced the concept of modified or attenuated vaccines.

One of his successors Albert Calmette utilised attenuated germs for anti-tuberculosis vaccination now popularly known as BCG. Another dimension was added by the team of Roux and Yersin who treated diphtheria with a serum raised against bacterial toxins; i.e. passive immunization with antibodies raised in another animal such as a horse.

Thus the purpose of vaccination was to provoke a specific immunological response to a selected agent or its component **(antigen)** with the expectation that it would result in the formation of protective serum factors **(antibodies)** or the development of immunity that is mediated by cells in blood and tissues known as lymphocytes and others that eat and digest micro-organisms; the amoeba derived phagocytes of Metchnikoff. With time, sufficient residual immunity remains, so that a heightened and more rapid immune response occurs upon a subsequent exposure to the same micro-organism **(memory)**.

These findings suffered from two flaws: the very emphasis on immunological mechanisms equated immunology absolutely with protectivity. Secondly, the discovery of immunology and infectious micro-organisms around the same time made possible the empirical conclusion that immunity was in evolutionary terms largely an anti-infectious entity. The first premise holds true to this day and may be selected by future science chroniclers as of one of those conclusions that led science astray. Jules Bordet moved beyond the second concept when he demonstrated alongwith Tchisovich that anti-bodies could also be induced by non-infectious agents like red blood cells and proteins and thus established that the immune system "could respond beyond limits of its happy intervention with infectious disease".

It seemed to many in the early half of this century that infectious disease could be controlled chemically rather than immunologically. By 1950s it was said that the earth was literally bathed in a dilute solution of antibiotics. A viable example of the theory of natural selection was seen by the spectacular response of the endogenous bacterial population to their catastrophe—transmissible antibiotic resistance first identified in Japan in 1959. This coupled with the striking lack of anti-viral compounds, the epidemics and pandemics of smallpox, polio and influenza and the failure of alternative measures such as vector control in malaria favoured the immunological approach. The conflict culture engendered by the two World Wars, the antibiotic era and the likening of the immunological apparatus to an army may have brought forth the transformation of not only the control of the enemy (ie bacteria/viruses/parasites) but eventually its eradication:

In the clamour, one point was probably forgotten. With the exception of Jenner's trials on cowmaids, most of the land mark experiments were performed as successful therapy of ongoing disease (immunotherapy). The jump, was towards preventive vaccination.

First Generation Vaccines

The years between 1970 and 1984 witnessed the development of 9 viral and 11 bacterial vaccines (Refer box on pg. 7). The first generation vaccines consisted of live attenuated or killed preparations of whole organisms grown either in synthetic medium or in human or animal embryo cultures or cell lines. In conditions such as tetanus where disease activity depended not on bacteria but on their toxins, chemical modification of toxins was achieved.

Global eradication of smallpox was realised with the last outbreak in Somalia in October, 1977. In May 1980, a certificate of eradication was issued by WHO. The story on man's part was that of a technomanagerial triumph. A vertical special immunization programme, better quality vaccines, personnel trained in preventive aspects of medicine, efficient delivery, reliable epidemiology and flexible operation tactics all helped towards defining the zero-incidence end point. Nature played a role too.

The most explicit question at the onset of the programme was whether there was a natural reservoir of the smallpox virus which would thwart the objective of eradication. Except for the human monkey-pox virus which could not sustain itself by inter-human transmission, none other was found. The second natural aid was the inherent acute nature of the disease itself, its quick infectivity and short incubation period which allowed anti-

(contd on p. 6)

Need for Alternative Approaches in Vaccine Development

Tannaz Birdi

The discovery that infectious diseases were caused by micro-organisms, provided the necessary explanation for the earlier observation that individuals could be protected against smallpox if they had been infected with cowpox earlier. In other situations also, injections of killed bacteria or live organisms of modified disease producing potential (attenuated) were shown to prevent disease. This resulted in the belief that the causative bacteria had only to be identified and isolated and a wide variety of diseases could be prevented and eradicated. Even though disease causing bacteria have been identified effective vaccines against most intracellular parasites are the goals of the future. The few vaccines, that have proved effective, are against toxins and viral infections, and the only spectacular success has been of the smallpox vaccination programme.

Why have the approaches used in the vaccine development against smallpox resulted in only limited success in other communicable diseases? In fact, in some cases the results were disastrous. The deep respiratory tract virus infection is one such example, where formalin inactivated virus was used to immunize children. Upon exposure to the live virus the requirement for hospitalisation in immunized children was 40% compared to the normal figure of 1%.

An effective vaccine must counter the methods by which pathogens (disease causing organisms) evade the body's defences, so that protective immunity can be generated. Let us examine the various methods of evasion used by pathogens and the importance of this in the designing of vaccines.

Influenza Virus

On encountering a pathogen, the body produces antibodies which are specific to the exposed antigens of the organism. Certain micro-organisms evade neutralisation by antibodies by frequently changing the antigens on their surface. The most well-known example of this is the influenza virus. To develop a suitable vaccine in these circumstances certain antigens which remain constant have to be identifed and purified or synthesised in sufficient amounts. Such antigens are then modified either structurally or by combining them to suitable carriers so that they evoke a strong protective immune response. The inherent problems in the designing of suitable carriers has been discussed in the previous article.

Tetanus and Diphtheria

Both these diseases are caused by the secretion of a toxin by the pathogenic bacteria. For these diseases vaccination has proved relatively simple and effective. An inactive form of the toxin is used to generate antibodies which are able to neutralise the toxin. After smallpox, these vaccines have proved to be the most effective even though environmental factors do pose a problem (e.g. tetanus in India).

Cholera

The recognition that cholera was a toxin mediated disease inspired hope that it could also be prevented by an inactive toxin vaccine. Studies are still in progress to find a suitable method to inactivate the toxin without losing its potential for generating an immune response. Meanwhile, the search also continues for a live attenuated vaccine. For such bacteria to be able to provide local protection they must be able to withstand the acidity in the stomach and penetrate the mucous secretions which are normally present in the small bowels.

Schistosomiasis

Schistosoma mansoni, the cause of intestinal flat worm infection exhibits on its surface the tissue antigens of the host. This allows the adult worm to escape recognition by the immune surveillance system. On the other hand, the disease itself can largely be ascribed to the hosts immune reaction to the schistosome egg. The hosts immune cells gather in large numbers around the egg and secrete toxic factors in an attempt to destory the egg. This results in inflammation leading to tissue damage with little effect on the schistosome egg. Therefore, vaccines which boost this reaction might be harmful. There is also evidence that certain kinds of antibodies (IgM) are generated in susceptible individuals that block the killing of the larvae by other antibodies (IgG). Under these circumstances an anti-idiotype (described in the previous article) vaccine may prove useful. Pilot studies in animals have reported success using such an approach.

Malaria

From the moment it enters the blood stream the malarial parasite takes only a few minutes before it reaches the liver, where it infects the Red Blood Cells (RBCs.) If the vaccine has to prevent infection of RBCs a high level of circulating antibody must be present to neutralise the parasite before it reaches the safety of the liver. The only way to maintain this high level of antibody is by regular boosters. Failure to achieve this is one of the major obstacles in this kind of vaccine. Therefore vaccines have to be developed against later stages of the parasite's life-cycle. Despite using a combination of antigens from different stages of the parasite's life-cycle there is reason to be cautious since it has failed to produce uniformly high levels of antibodies in volunteers. Even individuals with high antibody levels are not always protected against infection. Thus we cannot afford to rely merely on an antibody response and a cell mediated immune response is also required. Synthetic peptides have been used to generate such a response. The limited success has highlighted the problem that MHC (antigens which discriminate self from non-self) restriction of the immune response poses for peptide vaccines.

The phagocyte must present on its surface the antigens of the invading organism as well as MHC antigens. These

two antigens must combine in order to stimulate lymphocytes. If the individual's MHC antigens are unable to combine with the peptide then no response is generated. No single peptide sequence can be guaranteed to contain regions with the ability to bind all MHC antigens. Therefore, a cocktail of peptides that can bind to all MHC antigens must be developed.

Leprosy and Tuberculosis

Both these diseases are caused by Mycobacteria. The causative agent for leprosy is *M.leprae* while tuberculosis is caused by *M.tuberculosis*.

Mycobacteria exemplify those organisms which have evolved multiple methods of not only protecting themselves from attack by phagocytes but survive and multiply within them.

M.leprae has also developed a number of other ways of survival viz. Besides invading macrophages, *M.leprae* also finds protection from attack in immunologically privileged tissues such as the nerves where the immune response generated by vaccination may not be able to reach. In addition, some *M.leprae* antigens also generate suppressor cells. Because of the multiple means by which the organism protects itself from immune attack vaccine development is made increasingly difficult. In addition, as in the case with malaria, MHC restriction may also be involved.

Methods Used for Testing Vaccines

The monitoring of candidate vaccines so that only the most promising ones undergo field trials is imperative since large numbers of different vaccines are at present being developed. At present none are perfect since we cannot mimic disease processes completely in the test tube or in animals that are not naturally susceptible to the disease. Besides, immunology today offers no criteria to measure protection. The methods utilised fall into two broad categories. In the first, the reactivity of cells *in vitro* (isolated in a test-tube) is measured. The memory generated and the possible interactions between various tissues and their cell types is studied *in vivo* in animal models and human volunteers.

In Vitro Studies: These are especially important in infections where disease is the result of an absence of immune response to the pathogen or due to generation of suppressor cells. In such situations lymphocytes responding to the vaccinating antigen are checked for their ability to respond to the pathogen using a variety of immunological tests. This approach though it appears to be relatively direct has limitations since it does not account for memory or the interaction of cell types and can only serve as a preliminary test for the screening of various antigenic preparations.

In Vivo Studies: Disease or the lack of it is normally the outcome of the inter-play of a number of cell types. This interaction is difficult to mimic in the test tube and recourse has to be taken to experimental animal models. The animal most widely used is the mouse. Undoubtedly, while useful information for vaccine development is obtained by this approach it cannot always predict the kind of response that would be generated in man especially if the animal is not the natural host for the pathogen. Therefore, ultimately the vaccine preparations have to be tested on human volunteers for their ability to generate an immune response. Since these volunteers cannot be ethically challenged with the pathogen the two most commonly used parameters are antibody titres and hypersensitivity (allergy) reactions as measured by skin test positivity. An increasing number of studies have now shown that both these parameters are unreliable since they do not necessarily reflect protection.

Factors Influencing Response to Vaccines

Environmental Variation

Poor hygienic conditions and malnutrition which are inherent in most underdeveloped or developing countries would itself be a stumbling block. Nowhere is it demonstrated so well as in tetanus. Because of the life-long ingestion of the tetanus orally due to unhygeinic conditions, the Indian population is unable to respond to the tetanus vaccine.

Non-pathogenic bacteria in the individual's environment also influence the efficacy of a vaccine. This is highlighted by the results obtained in the vaccination trials with BCG. In Uganda 80% protection against leprosy was obtained after BCG vaccination while in Burma and India there was only 20% protection with the same vaccine. This discrepancy in the response to BCG was explained on the basis that environmental bacterial flora had preconditioned the individuals immune response to BCG.

Genetic Variation

The influence of genetics on the immune response and consequently on the disease profile is seen most strikingly in yellow fever, where only the Negroid population is prone to this disease and the Caucasian races are not affected.

It has been observed that though many people are sometimes exposed to disease causing bacteria only a few finally manifest the disease symptoms. Recent studies in basic immunology have shown that this is due to the genetic make-up of the individual. This results in each person handling the same cocktail of antigens differently. Therefore, some individuals because of their genetic make-up will not be able to respond to a given antigen and for them a vaccine is of no use. This is particularly important for diseases where the symptoms are due to a lack of response. An example of this is seen in lepromatous leprosy which is the result of a lack of response to *M.leprae* antigens. The figures of vaccination trials for leprosy have consistently shown that 40% of the non-responders could not be converted into responders suggesting that this group may be genetically incapable of responding to *M.leprae* antigens.

Effect of Multiple Vaccinations

Increasing effort and finances are being channelised into vaccine development as a measure to combat infections. This will result in individuals being vaccinated against a number of differing antigens. Basic immunologists have already recognised that an immune response generated against one set of antigens may reflect on the response to a second group of antigens. If this is applied to the future vaccination scenario where an individual will be vaccinated for a large number of diseases it is conceivable

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From Holism to Eradication

bodies induced by vaccination to neutralise the pathogen before establishment of infection. It was suggested that the smallpox eradication programme should serve as a template for other disease control or eradication programmes. This was not simply feasible since each disease had its own unique characteristics and methods of control that required strategies and tactics specific to that disease.

The success story of smallpox was shared by a few other acute viral and toxin dependent diseases. However, it was in the majority of diseases where vaccination failed where the rules of the survival game were drawn out.

The influenza virus played games by transforming itself, BCG worked (or did not work) unpredictably in different geographic locations. A type of attenuated polio virus reverted back to its pathogenic form and the whooping cough germ was found to be toxic for use. Apart from the technical flaws of vaccine design, most affluent countries controlled diseases through the fiat of improved socio-economic measures. Paradoxically, the failure of vaccination was manifested most in the poorer countries whose populations were affected the most.

Even with technically effective vaccines, there remained in these countries the problems of timing and delivery. Again for reasons not understood, induction of antibody in tropical countries was poor with live vaccines and many could not afford the protection accorded by expensive killed vaccines (polio). Toxoids given in areas where incidence of parasitic infection was high gave rise to life-threatening complications just as measles immunization could not be given to children with depressed cell-mediated immunity. It was especially difficult to make vaccines against diseases which were chronic or developed slowly. Even today no vaccine has been developed against any tropical parasitic disease.

Second Generation Vaccines

The efficacy of heat killed vaccines and the paramount need to abolish side-effects compelled replacement of conservative vaccines with second generation sub-unit vaccines. The concept practised since 1982 first in the tobacco-mosaic virus was the heir of two important advances viz. the development of in vitro tests purported to indicate protective immunity and the ability to separate, sequence and synthesise proteins. The second generation vaccines thus consist of one or several appropriate short sequences of bacterial or viral proteins (peptides) which by themselves can give rise to protective immune responses. In this way, besides conferring safety they would circumvent the strategy of the micro-organism to evade the immune system.

The protection and efficacy of such vaccines was reported in animal models and in vitro systems for diseases such as malaria, herpes and rabies amongst others. Their prime drawback was that when injected, some of these peptides were rapidly degraded by enzymes in the body. So another need of carriers was begetted.

Another worrier for the vaccinologists around the same time was the finding that organisms such as those causing pneumonia and typhoid amongst others had antigenic activity in non-proteins such as sugars and lipids. Vaccination against such organisms causing childhood diseases would be a failure since immune response to sugars develops only after the age of three. One approach was to couple the sugar to a protein carrier. Another was the brain-child of Bordet and the fertile field of immunogenetics.

In the 50s and 60s, Oudin identified protein determinants on anti-bodies to a given antigen which were unique in an individual or groups of individuals. These were fortuitously placed next to sites where anti-body bound antigen. He coined the term "idiotypy" meaning distinctive to describe this structure upon which Niels Jerne based his theory of immune regulation in 1974. It simply meant that several generations of anti-body responses were created to an antigen, each succeeding generation recognizing the unique determinant **(idiotope)** on the anti-body of the preceeding generation. In practice, it meant that antigens would not have to be constructed since the second generation of anti-bodies would contain the internal image of the antigen in the idiotope. These imaged antigens riding on human anti-bodies would be safe and effective. Though experimental results have been variable, historically, the impact has been resounding. Vaccinology could now move away from infectious diseases to attempt prevention of tumours or even auto-immune diseases where a causative agent need not be identified.

The old observation of Border that anti-bodies could be raised against self-proteins and cells was utilised by Ostergard 41 years ago for raising anti-bodies to animal reproductive hormones. Chemical modification of hormones that maintained fertility induced immunity that impaired female reproductive function. The first candidates were unsafe since they produced anti-bodies reacting to many more hormones than was intended. Using peptides to confer specificity, three female anti-fertility vaccines hit clinical trials in 1986; a male anti-fertility vaccine is also being pursued as is the expectation of ultimately producing vaccines *for* fertility. For the first time the greater risk lies in the use of successful vaccine.

Third Generation Vaccines

If second generation vaccines are to populate the earth, then how would they be produced in bulk amounts that would render them economically feasible. The search for growth material was helped by molecular genetics which allowed isolation of specific genes from organisms and placing them between genes of other live organisms **(vehicles)**. The vaccinia virus of smallpox fame, BCG, the unassuming coliforms that populate our intestines and yeast are all entrants to that exclusive vehicular club. The first attempt by Klein in 1981 was carried out with the virus of foot and mouth disease. Experimental recombinant vaccines have now been constructed for diverse entities as the cholera toxin and a protein of the leprosy bacillus. All are potentially third generation vaccine candidates. Potentially a single shot with live vaccinia BCG may serve as or a life-long vaccine for several diseases.

These are our desires on the fact of the inscrutable. But what will be the effect of these on the vehicle itself. Will it remain safe or evolve to a monstrous form beyond our control. In less dramatic circumstances, will the immune responses generated by several antigens block each other and how are these live vehicles to behave on trial with immuno-compromised individuals not only of the third

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It Can be Done, Says UNICEF

Nearly a quarter million children die every week in the developing countries due to vaccine-preventable diseases and malnutrition. While in 1950, the number of deaths of children below five was a whopping 25 million, the figure in 1980, fell to 16 million because of immunization; this despite an increase in the number of births.

Immunization, according the UNICEF, has been the success story of this decade. Only ten years ago, less than 5 per cent of children in the developing countries were vaccinated against diseases which took a toll of 4.5 million infants annually. In 1987, immunisation reached 50 per cent for DPT and 40 per cent for measles, thus saving over 1.3 million babies a year. The U.N. target for immunizing all children by 1990 seems now possible. Most of the deaths can be prevented by immunizing children against the diseases.

Measles takes a toll of 1.8 million lives. Almost all the deaths can be prevented by a single injection—if vaccination is available and parents know the importance of immunizing the child as soon as it is nine months old.

Death due to tetanus, which usually occurs in the first week of life, and kills 0.8 million babies, can be prevented by giving anti-tetanus injection during pregnancy and by ensuring that vaccination is available as part of basic antenatal care.

About 2.9 million children die from respiratory infections. Over half a million deaths due to whooping cough can be prevented by immunization. Most other respiratory deaths too can be prevented at a low cost if parents recognise the danger signs and use simple antibiotics.

One million deaths occur from malaria which can be drastically reduced at low cost if parents know the symptoms and seek timely help.

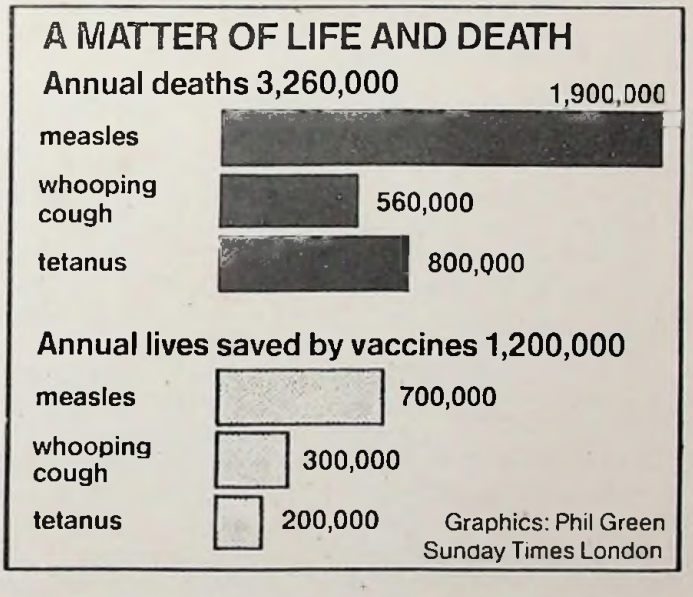
Diarrhoeal diseases take a toll of five million lives. Seventy per cent of the deaths are caused by dehydration, which can be prevented by oral rehydration therapy (ORT), a simple and cheap method that can be followed by all.

Immunization Schedule

Beneficiaries	Age	Vaccine	No. of doses
Infants	3-9 month	DPT	3
		Polio	3
		BCG	1
	9-12 months	Measles*	1
	18-23 months	DPT	1
		Polio	1
Children	5-6 years	DT	1**
		Typhoid	2
	10 years	TT	1**
		Typhoid	1**
	16 years	TT	1**
		Typhoid	1**
Pregnant Women	16-36 weeks	TT	1**

* Measles vaccine is available only at selected centres

** Two doses are given if not vaccinated previously.



Synopsis of development of *viral vaccines*

Years	Disease
1700-1900	Smallpox +
	Rabies +
1935-1945	Yellow Fever +
	Influenza –
	Mumps +
1955-1964	Polio ±
	Measles ±
1965-1974	Rubella +
1975-1984	Hepatitis B +

Bacterial Vaccines

Years	Disease
1885-1896	Diphtheria +
	Tetanus +
	Cholera –
	Typhoid ±
1900-1921	Bacterial Meningitis ±
	Pneumonia ±
	Tuberculosis ±
1933	Whooping cough ±
1948	Bacterial Dysentry ±
1968	Burns Organism –
1972	Bacterial Influenza –

Vaccine worked wholly (+), Partially (±) or not at all (–)

Panacea or Palliative?

Amar Jesani and Ravi Duggal

Universal immunization by the year 1990 (85% coverage) is being pushed as a vital key in the 'Health For All' (HFA) strategy. Four vaccines against six major diseases that affect a large proportion of the third world have because of UNICEF pressures become the international cornerstone of child survival programmes of national governments.

The DPT, BCG, polio and measles vaccines to protect against diphtheria, pertussis (whooping cough), tetanus, tuberculosis, poliomyelitis and measles, have been taken up by the Indian government under the Universal Immunization Programme (UIP).

Why this sudden interest and pressure now to protect the child population from these deadly diseases when these vaccines have been available for over two decades? Further more, why this concentrated high-profile programme of UIP when historically it is well established that vaccines have not been used wherever these diseases have been eradicated or controlled. First, we will look at the political economy of this new strategy, and then try to answer these questions.

The Political Economy

The HFA strategy that emerged out of the Alma-Ata declaration and the proclamation of a new international economic order (NIEO) by the United Nations are both significant departures in social, economic and political thinking. However, they have remained at the level of an intellectual exercise and a radical rhetoric without any ideological commitment. In actual practise it has only resulted in another medical techno-managerial exercise aiming at achievement of targets.

Like our society, health has also been divided and subdivided into target groups for each of whom specific programmes have been designed for achievement using (or if necessary even misusing) the technology. What is ironic is that many devotees of the Illichian critique of medicine of yesteryears have uncritically accepted this new superficially plausible approach. The EPI vaccine programme is another of these fetishes. Technology and the new ideology of modern medicine has succeeded once again and there is little to mourn about the death of the superficial critique advanced by Illich and his fellow thinkers.

This turning of tables has also inevitably brought about a setback to the liberal concept of holistic medicine. The germ theory has once again become the predominant ideological force, and the welfare of the human being as a whole, especially the under-privileged, has been relegated to the background and only suitable for lip sympathy.

It is officially argued that by undertaking an ambitious project with high technological and managerial inputs, at least some benefits will accrue to the people. Is this pragmatism in its extreme form as articulated by the professionals and intelligentsia or is it an admission of the programme's impending failure? We are not arguing here against the immunization against the six vaccine-preventable diseases and prevention of infant death. What is mooted here is the distortion that it injects into the public health services—the neglect of other vital health functions by it. The ideological diversion that such orientation creates must be fought.

In this context, it is necessary to mention two more points. Firstly, the western nations pushing these ideological and techno-managerial orientation themselves never brought under control or eradicated these six diseases through immunization or drugs. It is proved beyond doubt that these diseases, and for that matter most major communicable diseases came under control as people's standard of life improved. Health technology and health management played a very minor role. For that matter even in post-revolutionary USSR, China, Cuba or even the more recent case of Nicaragua which cannot be credited with controlling these diseases through mere universal immunization. And that proves the point further that though immunization was an extremely useful tool, as was the case in post-revolutionary societies, it is not sufficient in itself to control or eradicate major diseases in the underdeveloped world. In these countries, EPI is only a temporising palliative measure to avert deaths, predictably not for too long.

Secondly, in the context of the need of the capitalist system to stabilise to the last small village in the rural area and the need of expanding capitalist (private sector oriented) allopathic medicine to strike roots to the last person in the rural society (of course, to the detriment and bankruptcy of the indigenous and folk-healers), immunization carries its medicine with the syringe and needle very effectively to win people over to allopathy No doubt the indigenous medicine and folk-healers are on the retreat since long: immunization will, however, accelerate their death. And this is not just a figment of imagination. Immunization did perform this function in Western society in the late 1940s and the 1950s. There is no reason to believe that it would not do so in our coun try too. The pharmaceutical companies, both multi national and Indian, would only expect further expansion of their domestic market. And we all know what kind of drugs they push to maximise their profit. And the newly capitalised drug industry of ayurvedic medicine, we must add, is also not lagging behind. We know they have also come out with their brand of injections! And we must also add that none of the third world countries has the technology to produce any of these vaccines on a mass scale, not even India. So a bountiful booty awaits the multi-national drug companies with the implementation of UIP.

Child Survival or Population Control?

We have already mentioned that the diseases against which immunization is available have been controlled or eradicated in the affluent countries without vaccines or drugs. A significantly improved standard of living was responsible for this. Therefore, why are the underdeveloped countries being asked to launch a high-profile UIP and that too on the advice of countries which did not use these vaccines to control the diseases concerned?

The real reason is population control. In the sixties a

high-profile population control programme was launched in the third world. In spite of the phenomenal aid by advanced capitalist countries, right through the seventies, the expected fertility decline did not result. These countries are worried by the threat of "population explosion" in the third world (a nightmare for capitalism!) which will affect their own political system and quality of life. They are not wrong in thinking so because how would they be able to enjoy their luxuriant life-style (even when millions die of hunger) if their slice of cake has to be further subdivided. The irony is that even with a growing third world population (in comparison with the first world) their (first world) share of the cake has not declined; if at all, their share has grown, and that of the third world reduced, in spite of the latter's proportionate increase in numbers. Even the World Bank figures say so. And on the other hand, with a growing political and economic strength of the third world the amount of wealth that advanced capitalist countries can expropriate from the third world is at least apparently on the decline. Hence, the concern to drastically, reduce the population numbers of the third world.

The overt attempts at population control up to the present have failed as a strategy. In the mid-seventies, simple home economics dawned upon capitalism. It was realised that high infant and child mortality is a visible deterrent against fertility control so a new logic has emerged: if infant mortality is reduced drastically then, eureka! people will become active supporters of a small family size. Hence the answer that emerged was universal immunization against the major killer diseases. We too appreciate the basic concern for saving our children, and they must be saved. *But not through immunization alone.* They must be given a significantly better quality of life. This would mean a radical economic transformation and not universal immunization or Oral Rehydration Therapy or a small family size. And this would also mean an unparalleled structural change in society.

As stated earlier, HFA and NIEO talk about such changes (though not as radical as we think they should) but have not demonstrated an ideological commitment to put them into action. For instance, WHO has resorted to only techno-managerial solutions in promoting health development programmes. In its economic analysis, it stops at cost benefit analysis of, for instance, tropical disease programmes. Never has WHO actively supported economic transformation programmes as a pre-condition to child survival programmes. But its aim is not to change the social order, only perhaps to preserve it and make it more efficient for, as is increasingly evident, WHO is more of a Western than a world oriented health organisation.

Thus, we must reject the politics of immunization and the ideology behind it, though not the vaccines. There is no short cut to health, and definitely not through universal immunization.

Dr Amar Jesani, a medical doctor, and Ravi Duggal, a sociologist, are both research officers with the FRCH.

Designing Field Trials

Dr M Uplekar

Does leprosy vaccine protect a person against leprosy? Do influenza vaccines prevent a person from getting flu? Only a field trial with a large number of vaccinated people can answer such question provided the trial is correctly designed, carefully monitored and scientifically evaluated for its effectiveness.

A field trial is the penultimate stage in the development of any drug or vaccine. But little do people know about the huge amount of inputs needed in terms of time, money and energy before any drug or vaccine comes to the stage of trying out in the field for its effectiveness. Equally, they are unaware of the numerous factors that influence the outcome of the action of a drug or a vaccine on a group of subjects. While most of these are related either to the host (people), the parasite (disease causing organism) or the environment, even the scientists are in the dark about many of these chiefly because of the gaps in our knowledge about the immune systems and the defence mechanisms of the human body. For instance, trials to evaluate effectiveness of BCG as a protective vaccine against tuberculosis showed that while BCG provided about 80% protection in the U.K. and U.S.A., it gave little, if any, protection against tuberculosis to a sample of population in South India. While scientists have explanations for some of these discrepancies, they just do not have answers for many other questions like why yellow fever is absent or why is there not a single case of overt AIDS in India?

It is these intricacies that make field trials a must before application of any vaccine on a large scale.

How is a field trial conducted?

Experience over the years has helped develop a general protocol for field trials of vaccines, the finer aspects of which do vary depending upon the material to be tested. Any vaccine trial would generally be conducted in four stages:-

a) Pre-clinical phase: This is the most important one as the further phases of testing vaccine in human beings depends on the outcome of this phase. It involves testing safety and potential toxicity of test material in animals. It also includes evaluating pharmacokinetics (its fate on entering the body) and pharmacological responses (its actions on different body systems) in animals.

b) Phase I— On establishing its safety in animals, the vaccine in this stage is administered to healthy human volunteers to assess (in normal human beings) its safety and immunogenecity or its ability to provide immunity.

c) Phase 2 is designed to determine the appropriate dose and frequency of administration on a larger number of subjects.

d) Phase 3 consists in testing the vaccine in well defined population with proper controls.

The classical design has two aspects: Control and Randomization. We control experiments by making the

treatments in two groups similar for factors that we already know influence the outcome. Randomization is a way of combating the misleading effects of conditions with an unknown influence that we cannot control. It is only after a candidate vaccine is tried in the above stages successfully, that it is permitted for commercial use.

Importance of epidemiology

It is the epidemics and pandemics of killer diseases which first called for international co-operation. The big childhood killers are recognised in all parts of the world, the causative agents known and the immunological approaches are in the hands of experts. It should not come as a surprise that the most important killer diseases in the non-industrialised world are very similar, if not identical to the most important diseases the industrialised world knew in the last century. They are tuberculosis, diphtheria, pertussis, tetanus, measles and typhoid to mention some of the most important. These diseases could be controlled with the vaccines we already have. Natural immunity which is achieved by very early infection that either leaves a baby immune or dead occurs in a majority of children when their respective countries become developed nations.

Some of the important aspects of epidemiological information has become a subject of hot debate now in the context of the Indo-US vaccine action programme. It is stated that the project includes the conducting of field research on certain communicable diseases and their corresponding vaccines for which it will be useful to have access to well-defined populations of which an intensive health profile and demographic information will have to be made available. This epidemiological data which includes samples of blood, sera and cells are indicators of the genetic make-up of the population, collectively known as the herd structure. It is this structure which makes Indians immune to yellow fever and to some extent to AIDS. Those knowledgeable about developments in biological warfare resent parting with information on the immunological herd structures of our people that apparently provides a natural barrier against certain infections.

Epidemiological data thus forms a vital part of assessment before any vaccine trial commences. It is only on the basis of this data that a target population of appropriate size can be chosen.

The very purpose of conducting a vaccine trial systematically in the stages mentioned above is to establish its ability to prevent a disease. Immunological tests on blood or serum samples and cells must be available to determine the effects of vaccine such as skin testing or measuring the anti-body levels in vaccinated persons. It is not ethically possible to challenge vaccinated humans with a live organism or a virus directly, therefore a long term prospective study is needed to determine a vaccine's ability to prevent infection.

The different phases of a vaccine trial may appear simple from what is discussed above but the interpretation of their outcome is not without complexities. The result of the BCG trial is one example of the differences in the U.K., U.S.A. and India. It could be increasingly difficult if the disease for which a vaccine is being tried is misunderstood. In case of leprosy for example, the factors which control the natural evolution of the disease are incompletely understood, the incubation period is much prolonged and there is no diagnostic method currently available to identify sub-clinical leprosy. Some studies show that after vaccination, intercurrent infection, injury or stress in general may precipitate a reaction in patients suffering from leprosy. It is possible that a leprosy vaccine itself may precipitate reaction in sub-clinical leprosy, making it a 'manifest leprosy case'. This factor in itself will tend to increase the incidence of leprosy in the vaccinated group compared to the control group. A mistaken inclusion of undiagnosed cases or wrongly diagnosed cases of leprosy have also been shown to affect the statistical interpretation significantly. Increased efficacy in detection of new cases in a population under trial may itself lead to an artificial increase in disease incidence.

Complications of vaccinations, although uncommon, have been well documented in the smallpox vaccination programme. These include secondary infection at the site, cellulitis, generalised, vaccina and cozeme vaccination. Post-vaccinal encephalitis is a rare but fatal complication.

In treatment trials with immunogenic agents like interferons and interlenkin two adverse reactions are common and include fever, malaria, chills, dyspnose, chest-pain and tightness, wheezing, nausea, vomiting, tremor and skin rashes. Other toxic manifestations include hypertension, tachycardia, acute renal failure, diffuse capillary leakage, profound weight gain and pulmonary edema.

Cost effectiveness of vaccines

In the U.S.A. and U.S.S.R., a study was done on health and resource savings due to vaccination against measles during the periods 1963-72 and 1967-72 respectively. The net economical benefits for the periods covered were calculated at $ 1.3 billion for the U,S.A. and $ 266 million for the U.S.S.R. Cholera is a major contribution to the economic problems of many underdeveloped countries. It is estimated that an effective vaccine which would prevent the spread of cholera would reduce world expenditure for medical purposes by billions of dollars. It is widely accepted that successful vaccination programmes, such as the one which essentially eliminated polio in the U.S.A., resulted in a ratio of $ 100.00 saving of public tax money per year for every dollar spent on developing the vaccine.

Control and eradication of a disease are two distinct end points of vaccination procedures. Control to the point of eradication even in diseases such as tuberculosis, where vaccination is only partially effective can be achieved with intensive use of other control measures such as chemotherapy.

A comparison of the effect of vaccination on infectious diseases in a West Germany demonstrated that infections for which there is excellent treatment but no vaccination do not disappear (infections mononucleiosis and bacterial meningitis) while those for which there is no treatment (polio, diphtheria) are close to eradication because of vaccination.

Source: New Trends and Developments in Vaccines
Editors—A Voller and H. Friedman (1978)

Our Many Projects

A major activity of the Foundation is its many projects on health, both in urban and rural areas, sponsored by various funding agencies, including the government. We give below a few of them.

SCHOOL HEALTH

A school health project is being conducted by Dr Mohan Deshpande. It aims at giving school children of std. V, VI and VII basic knowledge of the human body, mind, nutrition, common health problems and correct health habits. Started in July '87, it will cover two urban and a rural school.

According to Dr. Deshpande, the existing concept of school health programme is inadequate. The present curriculum has very few topics on health, which do not offer comprehensive knowledge in an interesting manner and so fail to create health consciousness in students.

The six handbooks currently in circulation for teachers emphasise clean and healthy habits without scientific details of the body, diseases and environment, while the syllabus chalked out begins with the evolution of human beings, structure and function of the body and the effects of nutrition and environment on the body. This will logically lead to clean, healthy habits and create community health consciousness and responsibility, says Dr. Deshpande.

The preliminary study has been carried out as part of a grant from the Ford Foundation.

HEALTH EXPENDITURE

A Study by Ravi Duggal on health expenditure was started in September '86 to understand health financing at the household and macro level. The first part conducted in Jalgaon district sampling one per cent of the population has just been concluded and the data will soon be published and summarised in the future newsletter.

A new macro-level study to examine state health financing, with an overview of health services, including public health, medical and family welfare, has just commenced. This will last for a year. Case studies of selected states from different parts of the country is being undertaken to understand the performance of various health programmes within the perspective of their financing and planning.

This four-year study has been sponsored by the ICMR.

SEMINAR ON NGOS' ROLE IN HEALTH CARE

A three-day seminar on the role of non-government organisations in health care is proposed in March 1988.

Nearly 15 voluntary organisaions, representing different approaches and well known in their fields of activity, will participate alongwith government and funding agencies.

The objective is to gain better understanding of the various types of NGOs working in the field of primary and basic health care through discussions and to enable the major funding agencies to know the problems of the NGOs and, in turn, enable them both to utilise their funds to greater advantage.

(contd from p. 5)

Need for Alternative Approaches

that there may be interference amongst them and the outcome may fall short of expectations.

Vaccines are no longer sought on a hit-or-miss basis but by a painstaking process spanning many stages. A vaccine has to circumvent the strategies developed by pathogens to evade the hosts immune responses. The greater the number of strategies used by the pathogen, the greater is the difficulty in designing the vaccine. Therefore while some measure of success has been achieved with bacterial vaccines, where minimal evasion mechanisms are operative, no vaccines are available for parasitic diseases such as malaria where evasion of the immune response is achieved by multiple means.

Besides the disease process itself, the major stumbling blocks in achieving protection through vaccination are 1) the genetic and environmental variations encountered 2) the necessity of boosters to maintain immunological memory especially since live vaccines may not be feasible in the global AIDS scenario.

Even if a design conferring life-long memory is not possible, then short-term memory coupled intensively with other control measures such as antibiotics and or vector control maybe quite sufficient for the breaking of several transmission cycles of the pathogen.

Tannaz Birdi, a research officer at the Foundation for Medical Research, is an immunologist, working on the neuro-immunological aspects of leprosy.

(contd from p. 6)

From Holism to Eradication

world but with the advent of AIDS also in the first world.

We now try to ensure that our weapons grow powerful but that they do not recoil. We mutate the vehicles to render them safe, we clone within them growth factors that make them give long memory, we try out high speed micro-projectiles for delivering nucleic acids into living cells. Who knows, one day our own cells may carry genes for theses antigens.

Whilst we may philosophise on the past and the future, the present we must analyse. Vaccination has resulted in the eradication of one pathogenic species; of a few more it has brought their day closer and thus alleviated human suffering. For some diseases like leprosy and cancer, it has provided a possible form of therapy, not entirely without risk and also provided us with an additional tool to exterminate ourselves.

Perhaps it will even lay some evolutionary pressures selective enough and great enough to spur pathogens to develop new defences. Some day, however, when we have understood our ecological niche in the living world better, this very technology may show ways that allow us to co-exist with our pathogens. A revolution of minds gave us the first vaccines. It will take a second to get us out of them.

Nerges Mistry, immunologist, is a research officer with the Foundation for Medical Research and is currently working on neuro-immunological aspects of leprosy.

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(contd from p. 2)

Vaccines: Fact, Fancy & Fallacy

tain the cold chain even in cities. There is a sharp drop out in the receipt of second and third doses of immunization and the figures are often inflated because of pressure. But the major cause of failure has been the personnel. The medical officer of the Primary Health Centre is compelled to evaluate his immunization programmes purely on the number of vaccines delivered rather than the overall drop in the incidence figures. Unlike the family planning programmes people by and large seek protection of their children by immunization, yet the public services have been unable to deliver the goods which have been a part of their routine duties. Hence the vertical Expanded Programme of Immunization, an imposition by the UNICEF and WHO. Experience reveals that such programmes not only disturb other routine Primary Health Care activities but that they return to the original status when discontinued as observed in the case of malaria under the Multi-Purpose Workers Scheme. Without peoples participation and monitoring, the public system remains unaccountable except to their superiors. Socio-economic, educational and political factors therefore not only create the conditions for such diseases but also affect the delivery of the available drugs and vaccines.

The era of drugs and drug research for these diseases is now being replaced by that of vaccines. The substantial investments by WHO in its Tropical Diseases Research Programme has provided a great boost to scientists for research into newer and better vaccines and drugs for almost all tropical diseases while virtually neglecting research into social, economic and cultural factors which ultimately determine their control. This together with the decrease in research fundings of Western countries, Western scientists have taken in a large way to vaccine research for diseases of the developed world. It is interesting to note that countries like the USA are supporting research from military budgets for diseases they expect to encounter only when they enter the developing world.

We must realize that there are many other means of controlling communicable diseases like chemotherapy and chemoprophylaxis, vector control and isolation which are well within our grasp. Our most important resource are our own people. The expereince at Mandwa revealed that given the knowledge and technology semi-literate women could within five years transform the health status of their community and achieve many of the targets our health system hopes to achieve at the end of this century. The immunization rate rose 15 to 85% when they started giving the injections on a routine basis within their own villages. This also helped in the control of diseases like tuberculosis, leprosy, malaria and gastroenteritis and respiratory tract infections besides treating minor ailments. The infant mortality reduced from 122 to 66 the birth rate from 33 to 19 and the death rate from 14 to 5 per thousand.

Vaccines at best will provide us with an additional tool for reducing the high mortality from communicable diseases which affect the poor countries. But let us be clear that vaccines are also not the sole answer as some scientists will have us believe. To the scientists in the West, vaccine research provides an interesting intellectual problem as well as money, and jobs. A country like India cannot afford such elitist pleasures.

The newly propagated strategy of child survival using medical technologies like immunisation, and oral rehydration therapy the GOBI/FF of UNICEF without corresponding effort for socio-economic change can only be construed as another means of persuading the poor to accept the population control policy since all other means have failed; for this is an obsession with the West as well as with our own elite who see in the inevitable population explosion a threat to their life style and even survival. The almost unlimited international support for such programmes along with the rest of the international and national economic policies and programmes which are biased against the poor and the wretched of this earth only reveals the emptiness of the humanitarian facade of such programmes.

Dr. N.H. Antia is a surgeon interested in medical research and in Community Health. He is at present Director of the Foundation for Medical Research and also of the Foundation for Research in Community Health.

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FRCH NEWSLETTER

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Towards Computerised Medicare

By Dr. M.W. Upiekar, Dr. N.H. Antia, P.S. Dhumale

Can a personal computer undertake the work of a doctor and offer treatment for common ailments to patients? Though the very concept seems dubious and fraught with danger, SYMPMED I, an experimental project undertaken by the FRCH in conjunction with the Computer Maintenance Corporation proves otherwise, much to one's surprise. In the wake of the positive results, trials are being conducted at the government Primary Health Centre at Malshiras near Pune.

What is SYMPMED I?

SYMPMED I is an experimental computer programme capable of identifying cases which can be treated symptomatically and offering treatment. To document the safety involved in offering such a package, SYMPMED I was evaluated by comparing the prescriptions offered by the programme with those prescribed by a general practitioner after examination of the patient. The evaluation demonstrated that 78 per cent patients were offered prescriptions comparable to the ones given by the doctor and the rest advised to see a doctor. In no case was a patient offered treatment when s/he actually needed a doctor's attention. The evaluation confirms that a majority of problems encountered by the first-level medical personnel in developing countries are simple and repetitive in nature and are treatable at home or by a paramedic using a few safe essential drugs avoiding unnecessary visits to a doctor and thus expenses.

It has been amply demonstrated by many a community health project in the developing world, including our own "Mandwa experiment", that given simple training, encouragement and support, even a semi-literate villager can effectively provide primary health care to the people. This is possible because a majority of day-to-day health problems encountered by the 'first-level' medical or paramedical personnel are simple and minor in nature. These ailments are mostly self-limiting or treatable using a few safe and effective drugs. Providing 'primary' care for such illnesses needs neither the expertise nor expensive investigational support because of the very simple nature of the ailments and also because the treatment chiefly remains symptomatic. In most such instances, all that is needed for selecting drugs to provide relief is a good clinical history. The skills for elicitation of clinical signs are usually not called for. Frequently, examination using a stethoscope or other similar aids remains a part of the ritual chiefly for a patient's mental satisfaction. For a para-medic, the important task lies in identifying those minority of cases which need further examination and investigation by a doctory or referral to a hospital.

The efforts in making use of computers in medical diagnosis and treatment have hitherto been directed chiefly towards developing a tool to provide an aid to the memory of a clinicians and to widen their knowledge to help them formulate the differential diagnoses, investigations and treatment. Some higher programmes have also been employed for "applied symbolic reasoning" (artificial intelligence) for interpretation of clinical and laboratory data. Here, in view of the simple nature of a large proportion of problems encountered by the first-level medical personnel, the aim has been to translate a third world G.P.'s real-life approach in the dispensary into a computer programme. The objective is to provide awareness of a para-medic or even a lay person; to promote safe and informed self-medication, to avoid unnecessary visits to a doctor for trivial problems and costs involved in it as well as to promote use of home-remedies and ethical and essential drugs alone.

An analysis of outpatients case papers maintained by village health workers of the 'Mandwa project' and records of outpatients attending some G.P.s' dispensaries in Bombay helped to identify common symptoms encountered by the 'first-level' medical personnel (Table 1). It was found that a vast majority of the problem could be treated symptomatically — safely and effectively, using only those essential drugs listed by WHO that could be administered by a semi-literate community health worker even without a doctor's supervision. (Table 2). It was necessary only to prepare a list of instructions to go with the prescriptions, including use of home remedies whether possible and also side-effects of the drugs to caution the users. It was then possible to construct programmable algorithms for each symptom with a view to extract relevant information from the users about their illness for deciding the contents of the final prescription. The first step, for each symptom entered, was invariably to make users aware of those symptoms or sometimes signs, which if associated with the presenting symptom call for the attention of a doctor or reference to a hospital. This step helped in weeding out cases which cannot be handled by the computer. The remaining steps included questions to

probe deeper into the symptoms to make users elaborate on the problem exactly the way a doctor asks for the medical history.

The SYMPMED I knowledge base is thus designed to permit the programme to construct a symptoms file and a medicine file. The building block for SYMPMED I is an individual symptom. For each presenting symptom, there are sub-levels as mentioned above. For each symptoms or associated symptoms there is a set of drugs and instructions to be prescribed and one not to be prescribed. This constitutes the medicine file.

An IBM compatible personal computer with standard configuration is the only hardware requirement. A printer if made available will help to get printouts of symptoms

TABLE 1

List of symptoms included in the programme:

1. Fever
2. Cough
3. Running nose, blocked nose or sneezing
4. Headache
5. Diarrhoea
6. Sore-throat
7. Chest pain
8. Abdominal pain
9. Low backache
10. Burning or frequency of passing urine
11. Vomitting
12. Giddiness
13. Gas or indigestion
14. Constipation
15. Joint pains
16. Weakness
17. Itching
18. Miscellaneous: Passing worms
    Ear pain or discharge
    White discharge from private parts (women only)
    Painful menstrual periods
    Night-blindness
    Tingling of hands and feet
    Hiccups

TABLE 2

List of drugs included in the programme:

1. Acetyl salicylic acid
2. Alkaline mixture
3. Aluminium hydroxide
4. Aminophylline
5. Ampicillin
6. Benzyl benzoate
7. Chloroquine
8. Chlorpheniramine
9. Ferrous sulphate
10. Ispagula husk
11. Mebendazole
12. Metronidazole
13. Noscapine
14. Nystatin
15. Oral rehydration salts
16. Oxyphenonium bromide
17. Paracetamol
18. Pencillin
19. Piperazine
20. Promethazine
21. Salbutamol
22. Senna
23. Trimethoprim
24. Turpentine liniment
25. Vitamin A
26. Vitamin B-Complex

entered and prescription offered. The software includes MS-DOS (Micro Soft Disk Operating System) and Dbase III. It may be possible to eventually devise a portable hardware for the programme.

A preliminary evaluation of SYMPMED I is complete. The programme has been evaluated to compare the prescriptions given by the computer to those by the attending doctor after examination of the patient. For the preliminary evaluation only patients above 12 years of age were included. The evaluation has been done after first 500 cases.

Each new patient entering the G.P. 's dispensary where a personal computer was installed would first go to the computer. The G.P. 's assistant, who was also a doctor, would enter the symptoms of the patient, without guiding or leading him. The printouts of symptoms entered and treatment advised for each patient were numbered serially and kept aside. The patient would then go to the G.P. who would examine him and put down his notes and treatment prescribed on his own case paper numbered to match the computer printout for the same patient. The computer printouts and doctors notes for each patient were attached together. The comparison and analysis for evaluation of the programme was done after completion of 500 cases. It was a blind study as the prescribing doctor was unaware of the contents of the computer printouts.

In 78 per cent cases, the computer prescriptions generally matched with those given by the doctor. The actual drugs prescribed were not compared but the groups to which drugs belonged like analgesic-antipyretics, tranquillizers and hematinics, Non-essential drugs prescribed by the doctor, vitamins and tonics in most instances, were not taken into account while comparing. Of the remaining 22 per cent, half were advised by the computer to consult a doctor. Two per cent found that their symptoms were not included in the programme, while nine per cent presented with signs only like neck-glands, a swelling somewhere, doubtful yellowness of eyes, dental caries and so on where a doctor's confirmation after examination was essential before offering a prescription.

The important observation that merits mention is that among those 11 per cent who were advised to go to a doctor, there were a few who could have been given symptomatic prescription safely but in no case a prescription was offered by the computer where a patient actually needed doctor's attention.

Experience with SYMPMED I has confirmed our impression that for majority of day-to-day health problems of the masses in the developing world, a visit to a doctor can be avoided. A package like this would not only reduce a doctor's burden but also allow him to spend more time on cases which deserve his attention most.

Some important shortcomings of SYMPMED I approach for self-care merit mention. It is agreed that this approach defies certain principles of medicine as no clinical examination or investigation is performed or no diagnosis is committed before handing out the prescription. A step giving a list of probable diagnoses based on history alone could have been incorporated in the present programme also. However, the question is that whether diagnosis is necessary? Computer programmes are being developed as an aid to the process of decision making for rural health workers. But under circumstances such as this, if one goes by virtue of parsimony, diagnosis could be

a pointless diversion in the therapeutic process which is after all the one that interests the patient. Different expressions used by patients for a common symptom need to be considered while making the symptom file. Most importantly, the possibility of translating the programme into local languages needs further investigation lest the presence of a para-medic interpreter is always required. A busy G.P.s limitations are the limitations of SYMPMED I as well. Just as a G.P. may miss a diagnosis of pulmonary tuberculosis if a patient presents with cough and fever of less than a week's duration and no physical signs, our programme may also send the patient off with a prescription for a simple respiratory infection, of course with a warning to report to a doctor if the symptoms persist despite treatment, as the G.P. would do.

Would not simple flow-charts be useful and cost effective? If our own experience with village health workers of 'Mandwa project' is any indication, the diagnostic flow-charts could never be popularised among the workers despite conscious efforts to promote their use. The reasons found generally were that they had always to refer and cross refer to more than one flow-chart for each patient and that most charts ended up at the probable diagnoses when it was the suggestions about treatment they were most interested in. When computers are coming in a big way, even to the remote areas of the developing world and being used for administrative purposes and epidemiological data collection, it is only fit to develop programmes for a para-medic that could also be used by a lay person.

After refinement of the knowledge base and a larger field trial, SYMPMED I would prove useful to broaden a para-medic's or even a lay person's knowledge and awareness of a data for the treatment of illness. Its other cost-effective applications includes promoting safe, informed, primary, curative self-care with the use of home remedies and a few essential drugs, limiting dangerous self-medication, providing primary medical care to the workers of industrial units which do not employ a doctor and as an aid to the memory and knowledge of a village health worker.

Readers' Views

Dear Editor,

I saw your newsletter on vaccination (January-February '88) and found it very interesting with excellent articles. I congratulate you and your organisation for bringing out this newsletter.

Please also give me more information on the three-day seminar on the role of NGOs in health care.

I am personally interested in health expenditure and would like to have your report on this.

Dr. Nisar A. Siddiqui
Chief Executive Officer
Aga Khan Foundation
New Delhi.

★ ★ ★

The immunisation schedule mentioned by you in the Jan-Feb newsletter has been slightly modified. BCG is to be given from birth to one year and triple and polio vaccine from 6 months to one year, the interval between each of the three doses remaining the same. Measles is advised between 9 and 15 months. (Government of India, 1987).

The newsletter was thought-provoking and raised certain questions in my mind after reading the articles by various authors. These are:

1. Is population control against the interests of India?
2. What were the intentions of the six five-year plans if not socio-economic development?
3. If the plans failed, was it the fault of western countries, our intellectuals, our leaders, our people or our political system?
4. How long should we go on finding scapegoats for our own inadequacies?
5. Are there any instances where developing countries were used as guinea pigs for immunisation programmes because of which they suffered?
6. Do multinationals only exploit out people? Are not our kith and kin doing the same?
7. What constitutes indigenous medicine? What is its role in reduction of morbidity and mortality in the countryside? What hard evidence do we have to espouse its continuation?

I would very much like to be enlightened on these issues.

Dr. Umakant Warerkar
Civil Hospital, Solapur.

★ ★ ★

We read with interest about your school health project being conducted by Dr. Mohan Deshpande. One cannot deny the importance of such a project in moulding attitudes towards personal and community health.

Our association is keen on carrying out this educational experiment in Wardha city. Could you therefore send us detailed information on this. Our medical consultant will follow it up. Please also send us information about the seminar on NGOs' role in community health care.

A Patil
Rural & Urban
Development Research
Association, Wardha.

In Search of Cure

Vimaltai lives in Malshiras near Pune. The village with a population of nearly 2,500 has a primary health centre (PHC), with two qualified (M.B.B.S.) doctors, two multi-purpose workers (MPW), a nurse mid-wife and an auxiliary nurse mid-wife. There are three community health workers in the village. The PHC implements the national programme for the eradication of tuberculosis.

When Bhanudas Jadhav of Arogya Shikshan Kendra spoke to six people suffering from T.B. what emerged was a sad reflection of the woeful lack of basic awareness among the patients about the disease, ignorance about the importance of continuing the treatment and the serious consequences of discontinuing it. Needless to say this is mainly due to socio-economic reasons. But sadly the results can be fatal.

Frequent breaks in the treatment exposes one to the danger of the tuberculosis bacilli becoming immune to the drug which eventually has no effect on the patient, and the patient more often that not dies a slow death.

Another dangerous trend observed is the frequent change of doctors when quick improvement in health is not noticed. This leads to avoidable expenses and time, not to mention the hazards caused in the long run. Such a search for immediate cure is irrational.

Vimaltai is a representative case. In the last four years, she has visited any number of doctors from whom she started and discontinued taking Streptomycin injections several times. Finally she visited the PHC, and on the insistence of the doctor there took the complete the course of 90 injections. Yet her condition has not improved. The 45-year-old woman who had only recently completed the course of 90 injections still complains of persistent dry cough, giddiness, shivering and fever.

Did you consult the doctor about your persistent complaint?

Yes, I did. He has given me these blue pills and a bottle of medicine. He says my illness persists because I did not complete the course of injections four years ago.

Why did you discontinue the treatment?

I was feeling slightly better and the nurse was to be transferred. I was also getting bored in Satara, so I came back to Malshiras.

Why did you go to Satara for treatment?

Four years ago, I was suffering from cough and breathlessness. So Dilip's (son) father took me to a private practitioner, Dr. Kamble in Saswad. The doctor examined my sputum, took my X-ray and gave me some pills and medicine and also prescribed a course of 90 injections.

Did you take the medicine and injection regularly?

No, I took them whenever I had the money, may be three or four times a week for about three months. Vasant (son) then took me to the public hospital in Satara. With the help of the nurse next door I saw a good doctor who again advised me to take 90 injections.

So you restarted the injections there?

I took about 40 injections and stopped. I was feeling a little better and the nurse was to be transferred. So I saw no point in going to another doctor. Moreover, I was getting bored, so I returned home.

Did you fall ill again?

Yes. A few months later, I went to Aptebai (a retired nurse who has a private practice now) and she too told me to take the same injections three or four times in a week. So I started the injections again.

Did you feel better then?

No, I didn't. But I didn't get any worse either. At that time one Dr. Ukhali, a private practitioner, came to our village and I started taking injections from him for some time.

Did your health improve?

A bit. Then I went to Pune to the municipal Tarachand hospital as I was scared of going to the government-run Sasoon Hospital. They took my x-ray and again told me to take the injections. I then returned home and once again started taking injections from Aptebai. Around that time, Dr. Khandale came to the PHC here and I went to consult him. He too told me to continue with the same injections and I took 90 injections for 90 days from him, but still I don't feel better.

Did any of the doctors tell you what you are suffering from?

The PHC doctor told me later.

How much have you spent on treatment so far?

About Rs. 4,000/- to Rs. 5,000/-.

What did you feel when you first fell ill?

I wondered if I would survive.

Vimaltai now plans to continue with the blue pills given to her. In due course, she will perhaps consult more doctors and spend more money. But the moot question is will she be cured and when?

I H M P

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Are vitamin supplements necessary?

Many people believe they can improve their health by supplementing their diet with vitamin and mineral pills. Medical experts, however, continue to discourage the use of such supplements for several reasons. First, if you have a balanced diet and expose your skin to plenty of sunlight to increase vitamin D reserves, you will probably obtain all the vitamins and minerals your body requires. Pills that contain vitamins and minerals may not harm you, but you are unlikely to need the extra-large doses of vitamins and minerals that they usually provide. In some cases the very high doses that are often taken can be harmful. This is particularly true of vitamins that the body can store efficienty, such as vitamins A and D. Too much vitamin A causes skin changes, hair loss, enlarged liver and various symptoms in muscles and joints. Too much vitamin D leads to excess calcium in the blood, which can cause gastrointestinal and nervous disorders. An excess of vitamin B can cause nerve damage. Large doses of minerals may also be harmful. An excess of calcium, for example, may increase the need for magnesium, zinc and iron. Too much iron can lead to gastrointenstinal disorders.

The most important reason for discouraging the use of vitamin and mineral supplements is that such pills are unable to give you the health benefits that a well-balanced diet provides. A healthy diet is one that gives you most of your energy requirements from foods containing natural fibre and mostly unsaturated rather than saturated fats. Such a diet reduces the risk of heart disorders, many gastrointestinal disorders, and some forms of cancer. If your diet consists mainly of "fast foods," your risk of developing heart and various other disorders increases, regardless of how many vitamin tablets you take.

Vitamin and mineral supplements may possibly be of benefit to someone attempting to lose as substantial amount of weight over a relatively long period by dicting. In these circumstances, a physician should be consulted for advice on a safe weight-reducing programme and on the possible need for vitamin and mineral supplements.

While vitamins are useful in some diseases like beriberi and rickets these are rare and can be treated after diagnosis.

Unfortunately, the production and sale of vitamins over the counter has become a multicore business and tremendous pressue is brought on the consumers by extensive advertisement by the pharmaceutical industy who profit by the sale of unnecessary and expensive vitamins. Doctors too prescribe vitamins without any restrain to their sales for the benefit of the pharmaceutical industryat the cost of innocent people who place their full faith in them.

The public must be aware of this and safeguard their own interest.

Children in normal health do not need extra vitamins and minerals. Parents should encourage their children to eat a varied diet that includes as much fresh fruit and vegetables as possible. A child who has a piece of fruit rather than a chocolate as a snack will not require vitamin or mineral supplements or treatment for dental carries.

It is only natural that in a consumer oriented market economy an uncontrolled pharmaceutical industry will, like the tobacco industry, promote the use of unnecessary and even harmful vitamins, tonics and digestives using the the mass media like television rather than single nutritions diet or warn people against the danger of smoking.

In a consumerist economy we must be on our guard by obtaining correct knowledge from those who are interested in the welfare of the consumer.

FRCH invites applications from doctors with postgraduate degree in Medicine to work on a project for the Use of Computer in Health Care.

Knowledge about computers preferable but not essential.

Attractive remuneration is offered. Those interested may kindly write to:

Director,

The Foundation for Research in Community Health

84-A, R.G. Thandani Marg,
Worli,
Bombay - 400 018.

FRCH is a voluntary organisation that has been involved in health services research for over a decade.

FRCH invites applications from junior and senior researchers trained in social science and medicine.

The nature of research will be—field based action research, anthropological studies, surveys and evaluations. The areas of research includes primary health care, health financing and health education.

Attractive remuneration is offered.

Those interested may kindly write to:

DIRECTOR

THE FOUNDATION FOR RESEARCH IN COMMUNITY HEALTH

84-A, R.G. Thadani Marg,
Worli,
Bombay - 400 018.

Women's Work, Fertility and Access to Health Care

A socio-economic study of two villages in Pune district

The FRCH was represented on the Task Force on Health, constituted by the National Commission on Self Employed Women (and women in the unorganised sector) and conducted a study on the status of the rural labouring women. The Arogya Shikshan Kendra, a field based action research project of the FRCH, provided the study area in the drought-prone Purandar taluka of Pune district.

Few definitions are as controversial as that of 'women's work'. It is rather unfortunate that in most societies, except for that part of 'work' which fetches wages, all other labour performed by women, be it domestic, child-bearing or child-rearing, is considered 'non-work'. This makes her exploitation easier both inside as well as outside the home.

This study was an attempt to bring visibility to the varied aspects of work that rural labouring women perform all throughout their lives and its effect on women's health in terms of nutrition, maternity, access and utilisation of health services.

The study utilised a non-traditional methodology. The structured questionnaire though important is inadequate as a means of collecting information that is intimate and non-quantifiable. Hence, group meetings and personal interviews with women were initiated to gain an insight into their lifestyles. Expressions found through such informal discussions were relied upon as much as the responses in the structured interviews. This judicious mix of quantitative and qualitative data revealed interesting facts.

The project area has an agriculture based economy. Because of persistent drought, more than one fourth of the total population is engaged in some kind of wage labour. Significantly, female wage earners outnumbered male wage earners. There were 102 female wage earners for every 100 male wage earners; 93 per cent of the female wage earners were employed under the Employment Guarantee Scheme (EGS). While the men preferred private work because it fetched them higher wages, more often than not, women preferred EGS work because it guaranteed wages and provided equal wages to both men and women. Many a times, the wheat coupons were an added incentive for women to go in for EGS labour.

Contrary to the widespread belief that women's wages are only marginally supplementary to the family income, the study revealed that 20 per cent of the households were entirely supported by women. Significantly all these households had at least one adult male member.

The women contributed entirely to non-paid domestic labour (housework). Cooking, fetching of water and fuel as well as the daily household chores were done exclusively by the women with little or no help from the men. The other aspects of social labour that women performed were child-bearing and child-rearing, which were considered exclusively women's work, so were devoid of any contribution from the men of the household.

The study revealed that every woman paid a high personal price for the loss of each child that she bore. The data depicted a direct relationship between the death of children and the number of live babies that a women had. When all the children survived, the modal value of live births per woman was two and every dead child meant an added responsibility of two more live births on the woman. It is sad to know how many conceptions, abortions, still births and live births a rural woman in India underwent to finally have the desired family size of three children—two male and one female offspring!

The study reflected the poor access to health care even during the crucial period of childbirth. Most of the women delivered at home not because they wanted to but because they had no other choice. Inadequate stocks of medicine at the Primary Health Centre, lethargic health workers and the fact that the government health services were invariably linked with family planning had a negative impact upon the access or utilisation of these services. Hard earned wages were thus spent on private practitioners' fees.

Most of their lives, the women in the project area were simultaneously performing five tasks—paid wage labour, unpaid agricultural work, housework, child-bearing as well as child-rearing. A woman's life was so linked to her work and vice versa, that it was virtually impossible to separate the two. Unless a holistic view of women's lives was taken into consideration, most well-meaning reforms would work against women.

In conclusion, what is essential is not just reform or better implementation of existing legislation but a thorough requestioning of women's roles within and outside the home. Only then it will be possible for women to voice their political demands, to refuse alms and to demand what is their rightful due.

FDA's Dilemma

The National Institute of Health (NIH), U.S., recently released a study concluding that an aspirin every other day dramatically lowered the risk of a first heart attack in middle-aged men. Preliminary results were announced by the NIH in late January and published in the New England Journal of Medicine. Much to the dismay of the NIH and the FDA, drug companies in the U.S. immediately launched major advertising campaigns claiming that taking aspirin regularly can reduce the risk of a first heart attack.

The FDA chief immediately wrote to the ten aspirin firms warning that such advertisements would be harmful to public health and a violation of the federal law. Yielding to pressure from federal regulators ten major U.S. aspirin makers later agreed to drop such advertisements. Heaving a sign of relief Frank Young, head of FDA, said, "There is a tendency for people to try to change their behaviour on a single study. This is dangerous."

Study of Primary Health Centres in Maharashtra

The nationwide network of primary health centres (PHC) constitutes the backbone of health infrastructure in the rural areas. Success and failure of all public health programmes and the medical care services largely depend on the health of these PHCs. No plan for health care reform can ignore this strategic position occupied by the PHCs.

In 1984, a great expansion of the PHC infrastructure was carried out by the government. In one stroke the number of PHCs in Maharashtra was raised from 500 to 1,500, a three-fold increase. The population coverage of each PHC was brought down from around 100,000 to about 30,000. Further, the government decided to upgrade one out of every four PHCs. However, such a massive expansion of the PHC, though necessary in itself, is not sufficient to solve the problems faced by the health services. Moreover, expansion does not necessarily ensure improved quality of services. These may even deteriorate if the expansion is too rapid. The question of the quality of services and the reliability of data supplied by the PHC has been repeatedly questioned. It is also felt that the quality of services should keep pace with the expansion and the growing responsibility of managing the increasing number of health programmes. This is also intimately linked to the quality of health personnel, the problems faced by them and the support provided by the government and the local leadership.

The government of Maharashtra requested the FRCH to undertake a study to look into the qualitative and especially into the human aspects of the services, working conditions and the socio-political context in which the PHCs function. The government put at the disposal of the FRCH necessary funds to carry out the study.

The study was started in December 1986. The field work was carried out in two phases. In the first phase, two PHCs and one upgraded PHC now known as rural hospital (RH) were selected in consultation with the Directorate of Health Services. These three centres were treated as case studies and information collected using anthropological techniques.

The team consisted of a senior member of our staff, Dr. Amar Jesani a doctor with a strong sociological background, a trained female social scientist and a male investigator. Besides the quantitative data special emphasis was made to understand the human factors which play a predominant role in the operation of the PHC services, eg. interpersonal relationship between various categories of the staff, the perceptions of their role in the PHC set up, the interaction between them and the public, the political leadership and the higher echelons of the health services, the perception of the people about the PHC staff and services etc. The approach used was more of a qualitative understanding of an anthropological nature rather than the usual quantitative study and reaching of targets. This could only be achieved by a prolonged stay within the PHC and winning the confidence of the staff. The health personnel were interviewed using an interview guide. Small group meetings and individual interviews were carried out in the selected villages covered by the PHC. The first phase lasted from March '87 to December '87.

In the second phase, ten PHCs and two RHs were selected. The study team spent three to four days at each centre. Some of the important observations made in the first phase were inquired into and their reliability verified. The second phase was started in January 1988 and completed by mid-March.

B) This larger sampling was in order to eliminate any biases that may have arisen from the study of only three PHCs and to reconfirm the findings. The personnel of health bureaucracy of all levels were also interviewed.

A detailed report of the findings and recommendations will be published and submitted to the government of Maharashtra by September 1988.

In many nations, children are without food or health care or schooling because of a financial famine which cannot easily be captured by the TV cameras. In 1981, the net transfer of resources from rich to poor countries was over $ 40 billion. By 1985, the position had almost reversed.
Rich to poor aid $ 14 billion + loans $ 13 billion = $ 24 billion. Poor to rich repayments of the debt and interest $ 54 billion.

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1. World Commission on Environment and Development (WCED), "Our common future". — New Delhi: Oxford University, Press, 1987, p 383.

WCED re-examines the critical environment and development problems on the planet and formulates realistic proposals to solve them to ensure that human progress will be sustained through development without exhausting the resources of future generations.

2. World Watch Institute (WWI) and Brown, Lester, "State of the world: 1987". — New York: W. W. Norton, 1987, p 268.

The 1987 report assesses human-caused disruptions of global chemical cycles, evaluates the worldwide reappraisal of nuclear power after Chernobyl accident, profiles the accelerating urbanisation of the world's population, discusses the shift to reliance on markers in a growing number of countries and advocates new incentives in recycling materials and raising agricultural productivity.

Health Status of Indian People

Health Status of the Indian People, commissioned by the Indian Council of Medical Research (ICMR) has been produced by the Foundation for Research in Community Health (FRCH), Bombay. It is a data based document that provides an overview of health conditions in India, as well as of the state of its health care services. It is a supplement to the previous report of the Indian Council of Medical Research (ICMR)—Indian Council of Social Science Research (ICSSR), 'Health for all: An Alternate Strategy', published in 1980).

This publication presents data, collated from government sources, published research studies and evaluation reports, on the different dimensions of health that formed the scope of the ICMR/ICSSR Study Group's deliberations. Starting with an historical analysis of the development of health services in India, the existing organisational structure, and the nature of health expenditure patterns it briefly looks at such aspects of health as morbidity and mortality patterns, drug production and consumption, the state of the indigenous systems of medicine, the problem of hunger, the state of the environment, the health status of women and children, and issues in health education.

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FRCH NEWSLETTER

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Target Orientation in Health Care

Dr Amar Jesani

Setting goals for rapid achievement of better quality of life for the people of India has been a favourite past-time and populist activity of our government and its functionaries. After all, who can question the proposition that people deserve a better quality of life? This rhetoric, formulated and propagated as a part of the package of Nehruite socialism, has enabled the government to get the support of a broader cross-section of social and political currents in the first decade and a half, following independence. In the field of health care the slogan was the one raised by the Bhore committee and later incorporated in the policy statement of the first five-year plan: "that the service should be available to all citizens, irrespective of their ability to pay for it and that it should be a complete medical service, domiciliary and institutional, in which all the facilities required for the treatment and prevention of disease as well as for the promotion of positive health are provided". (Bhore committee report, vol. II p.6). Based on these principles and political slogans short-term and long-term goals were set to build an integrated health care service in the context of the so-called mixed economy model. It should also be noted that these goals set at that time are qualitatively different from what is currently prevailing under the name of targets. These goals were for plan implementation which did not fragment health care into targets for "health" but assumed that provision of integrated health care is one of the conditions for improving people's health. And above all these goals were for the progressive (time-bound) establishment of the national health service as a dominant sector of health care.

The currently prevailing target orientation has nothing to do with the above mentioned principles and goals. In fact, these principles and goals were never taken seriously and hence never implemented in true spirit. They were, in effect, buried with the publication and acceptance of the Mudaliar committee report in 1961. The history of health care from this year onwards is nothing but progressive replacement of these goals and principles with targets. The goal is no longer to provide universal free and quality integrated health care, but to achieve targets to improve certain indicators. Thus, at a broad policy level, target orientation is many many steps backward.

Health reduced to indicators

The WHO definition of health as "a state of complete physical, mental and social well-being" is not made a basis to evaluate achievements in the field of health care. For the concept of complete physical, mental and social well-being is so threatening that it immediately brings into focus not only the actual state of health care services and the state of socio-economic development, but also the quality of life of the common citizens of this country. Thus, for all practical purposes, attainment of health is reduced to indicators. This is not to say that indicators have no use in assessing achievements of health care. The improvement in the health status necessarily leads to the improvement in indicators. And health status improves not only due to the provision of health care, but rather due to general improvement in the quality of life. But the single-minded attack on the indicators does not necessarily lead either to the improvement in health status or to better quality of life for the people.

Thus, indicator-oriented targets take precedence over the health and achievement of targets over the care of people's health. The health care gets fragmented into indicators and targets. No amount of lip service to the integrated and community health can conceal such an ugly impact of target orientation.

People reduced to target groups

Inequality is a hallmark of all class societies. Inequality permeates in to all aspects of social life. Even in developed capitalist societies inequalities in health care is a well-known feature. Forty years of development in our country has in many ways accentuated inequality and majority of our people live below poverty line.

Those who are at the bottom of the socio-economic ladder are also at the bottom of the health ladder and are also more or less outside the care of health services. Consequently, they are not so healthy and therefore their health indicators are the worst. Naturally, they need special care, not only integrated health care, but also integrated socio-economic and political care. Hence such social stratas become "target groups". However, their health is misused by indicators and for indicators there are targets. Therefore, the targets are mainly for target groups, though in many other ways the targets stand on their own too. Targeting health care for target groups is desirable, even essential, but targeting targets for target groups can lead to unhealthy consequences. For such an approach ignores their real-life situation. It can substitute their real health needs by the needs of the indicators. Certain targets like population control targets can introduce newer methods of oppression and exploitation, and general terrorisation. This again puts statistics above the

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care of the target groups; getting work done by any means rather than educating people on health.

New bureaucratic culture

Target orientation is a favourite work method of all bureaucrats, including supervisors. The planners love it, too. For it absolves them of the moral and political burden of taking care of people's health. An illusion of achievement can easily be created. A false sense of well-being can be displayed. The new bureaucratic culture essentially substitutes statistical well-being in the place of human well-being. The bureaucrats and supervisors no longer manage and supervise health care but chiefly manage targets. For them the answer to corruption, irregularities, illegal private practice and scarcity of resources is not effective managment and rooting out corruption, but privatisation.

Since statistics become supreme (and not human beings), the medical paternalism is stretched to the extreme. Thus the size of the family is not determined according to the number of children people prefer to have (which in turn is determined by the socio-economic and cultural milieu in which people live), but according to the statistics of population growth. In labour abundant economy, who cares seriously for morbidity? But mortality is an issue which can get easily politicised. So mortality indicators and targets are important but morbidity and curative services are neglected. Population control yes, but enpowering women by giving contraceptive education is neglected. Our health services have enough money to pay huge incentives for sterilisations and copper-T but not enough for free curative services.

In short, the choice of indicators and targets is more to fulfil political and ideological needs rather than to operationalise integrated free health care for the people. Such target orientation and neglect of curative care leaves room wider open for the free operation of expanding private sector. Lastly, the target-oriented bureaucracy leaves no room for democratic interaction.

Target orientation seriously distorts the condition of workers and their work at the primary health centre level.

(i) In his presidential address to the Indian Association for the Study of Population, published under the title "For Whom the Target Tolls?" (1987), Prof. Ashish Bose criticised target orientation. He said, "On the basis of our study of both published data and the field situation, we can say that the performance figures are far from accurate and the target setting is ad hoc, erratic, arbitrary and unscientific" (emphasised in the original). The PHC workers are never able to comprehend the rationale behind the quantum of target given to them. Most of them are so confused that they have now found a ready answer: Target is part of the duty, part of the routine. Not only that, since supervisors, from the medical officer to the district health officer, insist only on targets, they have come to equate targe. practicing as the only routine work they have to do in the health services. The rest is cosmetic. Nobody questions them on why deliveries are not conducted or subcentre clinics are not organised. Thus, arbitrariness in target setting has led to a new work method—only target-oriented work.

(2) Our experience in the health service is that nobody is ready to give a guarantee on the accuracy of data, save for the data on sterilisation cases. Thus, although statistics is supreme, nobody is ready to own his or her own statistics of target achievement. They cannot do so because they know that the data is not accurate. Not only that we have seen some bureaucrats teaching doctors and supervisors how to report target achievement without actually achieving it. For instance, in the copper-T programme, Rs 9 as incentive money is used to buy a woman's signature on the form and a guarantee that if by chance any one comes for verification to testify that Copper-T is really inserted.

(3) In addition to reporting false achievements, the workers are compelled by the target orientation to compete with each other. As the quantum of target is bigger than the actual readiness of the people to accept the programme, such competition usually degenerates into conflicts, paying extra incentive (bribe) to the 'case'. There is no competition to take better care of the people. People are only objects of targets. Thus, such unhealthy competition leads to dehumanised relationship between the health workers, and between the health workers and the community.

(4) The unachievable quantum of targets empowers the higher bureaucrats to use non-achievement as a tool to punish those who are not in good books with them. The more vulnerable a health worker, the more harassment s/he faces. Thus, the auxiliary nurse midwife, socio-economically the weakest cadre, is always at the receiving end. This punitive use of targets has made life miserable for most of our lower-level cadres.

Undoubtedly, target orientation has created havoc in our health care services. It has left such a deep impact on the minds of our health workers that they just cannot think of their work in any other way. Mere suggestion of abolishing targets scandalises our health managers. Over two decades of target practicing has created such a situation that to affect any radical change in the health workers' orientation will be a very painful and time consuming task.

Women's Awakening & Health Yatra

SEARCH, a voluntary organisation, involved in health care and research on rural and tribal health problems in the tribal block of Gadchiroli in Maharashtra, organised a two-week awareness campaign, "Women's awakening and health yatra", with the help of the local villagers and four like-minded organisations. The educational and cultural 'yatra' included poster exhibitions on various issues related to women's health, immunisation, deforestation, environment and the employment guarantee scheme. A demonstration on the effective use of herbal medicines and a slide show on sexually transmitted diseases were also a part of the campaign. Blood examination for detection of anaemia, healthy child contest and clean-home-and-surrounding competition were an added attraction in the yatra. Group-songs, a programme on demystification and superstitions, a play enacted by SEARCH team entitled "When husband gets pregnant" and a keertan on 'poverty' drew huge crowds. The yatra moved to nine places. Altogether 25,000 people (almost half the population of the area) participated in the yatra. Nearly 1,500 people from 70 villages signed a memorandum against the recent decision of the Maharashtra government to charge heavy fee to all patients in the government hospitals and submitted it to the local M.L.A.s present.

Readers' Views /Replies

The questions raised by Dr. Warekar in the March-April newsletter merit a reply. We are prompted to do so because they represent the views of a majority of our intelligensia.

Q.1: Population control is not against the interests of India provided it is a free choice of the Indian people and not something foisted on them by technocrats to fulfil the expectations of their fiction technologies or to justify to western people the use of life-saving vaccines. The following paragraph represents some opinions of Dr. Barry Bloom, a reputed immunologist from the U.S. It is illuminating for several aspects.

"If highly effective and low-cost vaccines were developed, there are two major impediments to their use. One is the view in the developed countries that immunisation of children will only lead to more babies and simply exacerbate the shortages of food and resources in the Third World, and hence should not be supported. There are a number of objections to this line of argument, of which we shall mention only two. The first is a matter of historical fact: birth rates in no country of the world have decreased prior to a decrease in death rates. It is simply not possible to persuade people effectively not to have large families unless one can demonstrate that children will survive with sufficient frequency to care for them in old age. This persuasion may not take generations. There is data from Bangladesh indicating that reducing infant and child mortality has a profound effect on increasing the spacing between births. Finally, it may well be that immunology has an even more crucial role to play. Although not widely known by immunologists, there are two vaccines containing antigen determinants from the B-chain of human chorionic gonadotrophin) a hormone required for implantation, which are about to undergo clinical trials to learn if one can safely and effectively immunise the produce long-term but reversible reduction in fertility. Perhaps it will be possible some day simply to immunise against babies."

Those who prepare vaccines for population control must recognise the responsibility that they bear since because of their very ease, they have vast potential for misuse. The borderline between scientific arrogance and dementia is sometimes a thin one as proved by the Nazi holocaust of not too long ago.

If population-land ratio, limited world resources and poverty psychology are to be the criteria for overpopulation, then it is also true that some of the most overpopulated countries are also the richest and that all population control effort should be aimed at the Western industrial economies whose energy consumption levels are manifold higher than that of India. Thirdly, overpopulation is not yet the cause of poverty and must not be made its whipping child while blithely forgetting our apathy to bring about other meaningful changes. Our people in fact are still our one abundant capital resource.

Q.2, 3 & 4 (On intentions of the six-year plans and who was responsible for their failure): If there has been a failure it is the joint responsibility of all Indians. However, since our intellectuals are expected to have acquired a process of thought and capability of analysis and speech, then our gullibility, short-sightedness and silence make us bear the largest burden of responsibility. It is we who have failed in our commitment to our underprivileged countrymen. As for other countries all we can say is that even nations have to occasionally look at themselves in mirrors.

Q.5 (instance of a developing country being used as a guinea pig for which it suffered): The most recently publicised instance is of the genetically engineered rabies vaccine produced by the Wistar Institute and tested surreptiously on cattle in Argentina in 1987. When the Argentinian govt. discovered that the tests were being conducted, all inoculated cattle were destroyed and the Wistar personnel thrown out of the country.

If there are any more instances, we would not expect to hear of them. But given the instances of marketing and trials of banned drugs in Third World countries and the experience of Bangladesh with the drug multinationals, there is little reason to accept genetically engineered vaccines in good faith. Particularly so since their efficacy, at the moment, is of dubious value.

Precedents or not, should our people be guinea pigs or ethical bypasses.

Q.6: I agree with the question that Indian companies, like multinationals, also exploit our people, though I fail to see why the existence of two exploiters should justify condoning either one of them. Unfortunately, multinationals, with all their potential for good, are aligned with the centre of what the Norwegian anthropologist Galtung refers to as the network of global exploitation. It is considered good strategy to oppose the bigger exploiter.

Q.7 (on indigenous medicine and its role in reducing morbidity and motality): For indigenous medicine, we walk more by faith than by sight. By all means let us review the evidence. Would the editor please take note.

Nerges Mistry & Tannaz Birdi
Research Officers,
The Foundation for Medical Research
Bombay.

* * *

Dear Sir,

Your newsletter on vaccination was very informative as I too am involved in community medicine in Manchester and lecture in primary health care at the university. I am also doing work in immunisation at present and was interested to read the article by Dr. Antia in the Jan/Feb issue.

Dr. Di Chisholm
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Better Use of Medical Care

Dr. M.W. Uplekar

Patients themselves cannot escape the charge that, they by their own attitude and actions, have contributed in a devastating fashion to the incidence of needless drug use... They have pressured a physician to prescribe, even against his better judgement. They have become prescription shoppers, going from one physician to the next to obtain a multiplicity of medication.

M. Silverman & P.R. Lee
Pills, Profits and Politics.

Most practising doctors would readily agree with these views, particularly the general practitioners' or the 'family doctors' who represent the initial contact between the patient and the medical establishment. Few realise that the root of this problem in the practice of medicine lies in its professional structure itself. Over the centuries, both the public and doctors themselves are convinced that the very nature of the profession is such that its actions are certain to be beneficial. Medical knowledge is not thought to consist entirely of factual or technical information. It is claimed to be both an art and science. Few realise that there are reasons for becoming ill and very often the doctor is not the most appropriate person to consult. Don't we know of the many instances where not only a cure is elusive in a disease state but the consultation(s) lead to a worsening condition and perpetual patienthood?

The public has had scant education in acknowledging that it's they who have to be in charge so far as their own health is concerned. It's they who have to decide how to live, whether to see a doctor, which doctor to see, how soon to go and whether to take the advise offered. People have been left incapable of determining themselves, when outside help is needed and when it is not! ... Who else but the medical community itself can perform this role of educators in an appropriate manner? Is it expecting a bit too much from the so called noble profession? Unfortunately, the answer seems to be yes... in the present circumstances at least!

Finding the right doctor

In no other country probably, so many systems of medicine are practised and that too with official sanction, as they are in our country. There are all kinds of doctors and the distinctions among them must be confusing to the doctors themselves, leave apart the lay people. The problem is compounded by making the field of medical practice—free for everyone! Anybody is allowed to practice anything that s/he feels will fetch profit although it may or may not be related at all to the many years of training and qualifications received. Haven't we reached the extreme now with the innumerable quacks with fake medical qualifications establishing their unaccountable flourishing practices even in the metropolitan cities of our country?... with thousands of those, having spent almost half of their lives in getting a questionably meaningful medical education already frustrating in surplus!

This undoubtedly can lead people nowhere but to a state of utter confusion. Having asked to write a few tips for the patients to help them choose a right doctor, this writer, despite being a doctor himself is worse confounded and would rather look upon experienced patients in a community for a word of advice. Our doctors are fond of putting up boards displaying their names and their "hard earned" sesquipedalian qualifications. Can we not just make them spell out all their degrees and in which system of medicine they are trained, making them write it down in the language of the community they serve? This may help solve many problems. Otherwise streptopenicillin injections given for TB and B-complex injections given for weakness will continue to take their toll unchecked.

A few tips may be mentioned to warn against poor medical practices. If you are taking more than three medicines daily, you are probably receiving poor medical advice, unless you have a serious medical problem. If nearly every visit to the doctor results in an injection or a new prescription, there may be a problem. Fortunately, we have a free choice of doctors. If you cannot communicate with your doctor effectively, seek another. Ask about any tests you do not understand. If your questions are not adequately answered, go somewhere else. Be wary if the doctor recommends a costly service when you are not aware of any problem. Find a doctor who suits you, even if you must change doctors several times. But when you find a satisfactory situation stay with it. Change early but not often.

Remember that your doctor is human too. The doctor is faced with a continual barrage of complaints about problems that may not have solutions. Don't use doctors for trivial problems.

Most illnesses are symptomatic and the treatment too remains symptomatic. Be happy to receive just words of reassurance from your doctor if s/he feels that no drug treatment is going to serve any purpose and also be willing and prepared to pay for the words of advice.

Health Education

Health education must be a priority, as sharing knowledge will empower people to take charge of their own health. But attitudes change slowly. To try and change too much at once will be self-defeating; first concentrate on changing those attitudes which will make the most difference to the people's health.

Health education is allocated Rs. 13.2 crores of the total health budget of Rs. 3,393 crores.

Helping Doctor Help Yourself

Dr. M.W. Uplekar

A visit to a doctor can be a mysterious experience. A medical consumer must try to understand the procedures a doctor follows when she comes across a patient. It is only with the active participation of a patient that a doctor can come to a precise conclusion and based on it, give a correct prescription.

Most people do not realise that every doctor uses a similar process to learn a patient's medical history. An allopathic doctor, whether a family doctor or a super-specialist, is trained to organise information about an illness under five headings.

1. Chief complaint(s).
2. History of present illness.
3. Past, family and personal history.
4. General examination.
5. Systemic examination.

Chief complaint(s)

This is usually the first information sought by the doctor. The purpose of this is to establish the priorities for the rest of medical history process. Be sure you express your problem clearly. Know in advance how to state your chief complaint or what bothers you most. Sometimes you may go to the doctor with more than one problem and you may not know if the problems are related. Be clear and precise about it". The doctor can then investigate each of these areas. Tell your problem as it is. If you have a sexual problem, do not say that you are "tired and run down". If you are afraid that you have cancer, don't say that you came for a "routine check-up". Patients who ramble on about irrelevant details are their own worst enemies. An honest description of your problems is your best guarantee that your problems will be attended to correctly.

History of present illness

Here the doctor wants to establish how long you have had the problem. Cough or fever of a few days, a few weeks or a few months duration have different connotations for the doctor. Be sure that you know the answer to this question in advance. If you are uncertain as to the date the problem began, state the uncertainty and tell what you can. Don't just say "I don't remember". Tell what you can, "I began to feel feverish in the middle of last month but the cough started only a week ago". The doctor can then determine the starting point for the illness. You must then provide the information about how your illness has progressed. Remember that its entirely on what you tell that the doctor reaches a conclusion and decides your treatment.

The past, family and personal history

The doctor also needs more background, information about your general health. Here, the information that did not appear important, earlier may be relevant. Patients often try to hide information about previous medication. Birth control pills, analgesics, vitamins and laxatives are medication that are frequently not reported. On occasion, each of these may be important in diagnosis or treatment of your problem. Prsonal history includes bowel and other habits, sleeping patterns etc. Family history is important in predicting or diagnosing conditions like bronchial asthma, diabetes, heart disease, migraine etc.

General and systemic examination

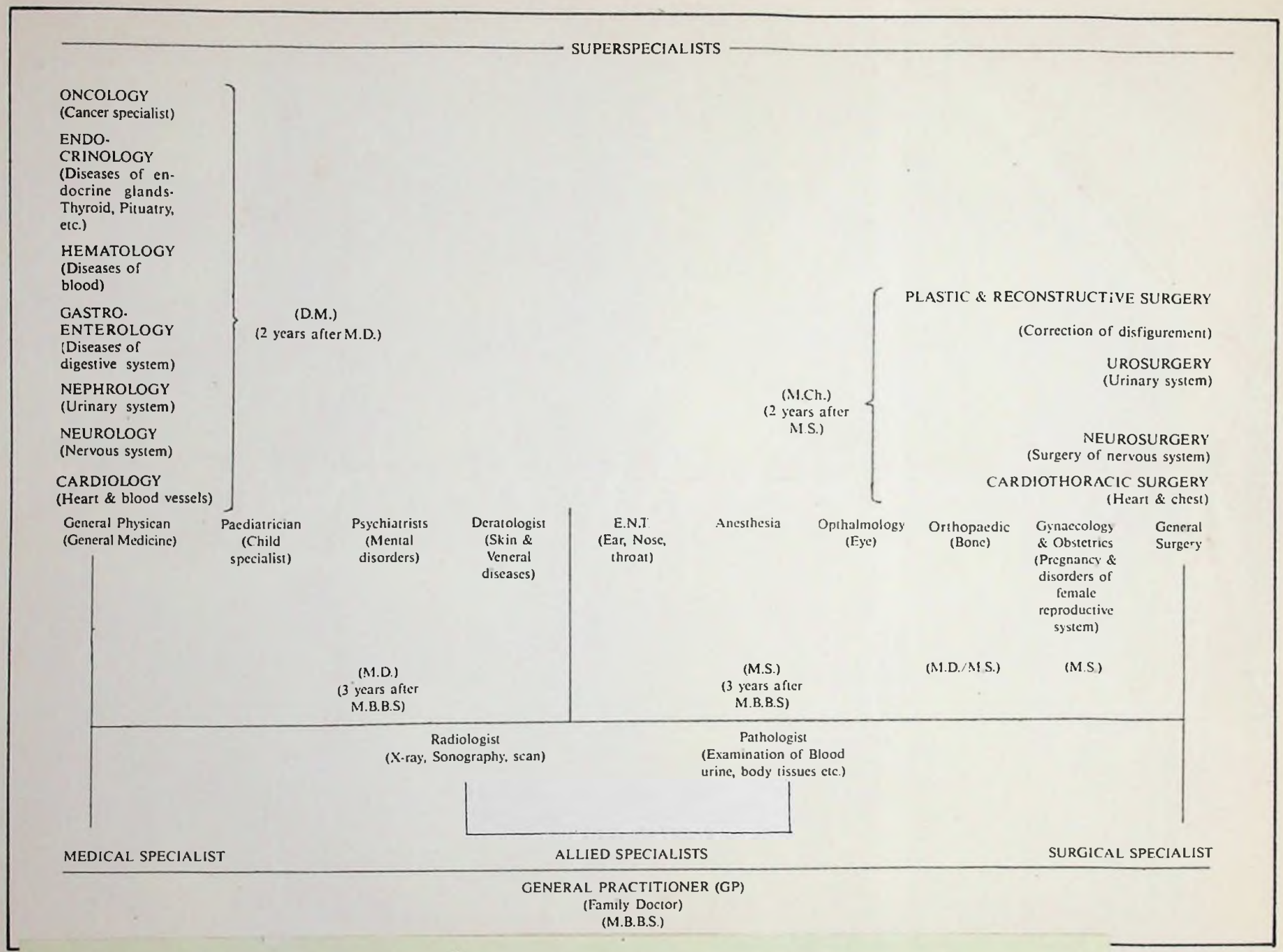
This is the next step in which the doctor will check your pulse, blood pressure and look generally for any abnormal findings from top to toe like yellowness of eyes a swollen gland or a skin patch etc. He will then perform examination of different systems like the nervous system, cardiovascular, respiratory system etc. Mostly, a detailed examination of the affected system will only be done with a cursory examination of other systems. This will be based on the clues provided by you while narrating the history of your illness.

A doctor has three major sources of information. The medical history, the physical examination and laboratory tests. Depending on the illness any one of the three may be the most important. For instance, diseases like migraine, epilepsy or angina pectoris may be diagnosed on history alone and there may not be any abnormality detected either on examination or in the laboratory tests.

This is all about what a doctor trained in allopathy should follow when s/he looks after patients. Does this really happen when you go and get treated by your doctor? It's for you to remember and see when you visit your doctor next time.

Since it's you who is going to consume the medication, it's for you to understand the importance of each drug and treatment. Ask your doctor to write out the instructions. It's all the better if you know the name of each drug you are taking. In case the drug doesn't agree with you or produces any unwarranted effects, you could safely avoid it's use in future. If you are confused ask questions: "Could you go over that again? How much will this cost? Are there any risks to this drug? I don't understand what this medication is for?" And once you are convinced, stick to the doctor's instructions. Sometimes patients take too much medication. They feel that if a little bit is good, a lot is better. If pills are good, injections are better. All drugs are alien to the body and basically must be considered poisonous. When used in excess, you may encounter increased side-effects.

Today, visits to the doctor frequently are requests for medication. If your satisfaction with the doctor depends on whether or not you are given medication, you are working against your own best interest. If you go to a doctor for a cold and request a shot of injection, you are asking for poor medical practice. Is it not common sense that for the same disease there cannot be a strong medicine that will ensure a quick cure and a weak medicine that will entail a slow recovery? Then, why force a doctor prescribe unwanted medication? Why not help the doctor help yourself?



Note: Publication titled " Social Aspects of Leprosy " is available at FRC and "Health in People's Hand" will shortly available.

School Health: Which Way to Go?

Dr Mohan Deshpande

"The child shall enjoy special protection and shall be given opportunities and facilities by law and by other means, to enable him to develop physically, mentally, spiritually and socially in a healthy manner. . ."

In these words the United Nation declared the rights of the child in the 1950s. Will this dream be ever realised in our country where a large number of children are left without education, proper nutrition and health care? Children who go to school are not better off in these respects.

The School Health Committee was appointed by the govt. of India to assess the present standard of health and nutrition of school children and suggest means of improving them. Emphasis was laid on health education in its report. But the school health programme since then has been reduced to 'health-check up' and 'mid-day-meals'. It has become almost an aimless routine exercise as a part of reaching 'targets' filling up of school health cards, with undue emphasis on routine, hurried check-ups by busy doctors. The programme goes without any participation of teachers and students. Despite some lessons in the text books, at the end of the schooling, the student is left without basic knowledge about health and disease in actual practice. Therefore, learning is reduced to merely passing the examinations. This makes no impact on application of health education in actual life. In fact, school health programme has had an implied negative connotation viz., creating more educated people who are solely dependent on doctors and are almost completely unable to look after their health themselves. Sex education, unfortunately, is still a topic of controversy and a clean healthy attitude towards heterosexual colleagues is far from reality. Menstrual superstitions continue to exist even amongst educated people.

A very striking observation on this was made in a survey conducted by the Homi Bhabha Science Education Centre, Bombay. The survey on the areas of interests of school children found that 72 per cent of all questions (about science and technology) that the children asked were health related. This shows that school children have greater interest in human biology and health. It is sad that the elders involved in school health do not satisfy this need of children.

We do not see any reason why school teachers and students cannot actively acquire health knowledge, when semi-literate village women health workers can. They should do even better. This would also help proper implementation of all our national health programmes.

This has been amply shown by the Kerala experience. The mere spread of education to girls has resulted in effective family planning, reduced infant maternal mortality, and optimum utilisation of medical services. It should, however, be noted that education is not the only factor in improving health standards. Other factors viz., socio-economic situation, nutrition, sex-biases and other cultural factors, sanitation and drinking water are certainly important. Health education will have a qualitative impact on all these factors if aimed at 'self-awareness, confidence and demystification of health knowledge. In fact, getting educated in health should become a cultural asset for an individual and society.

School teachers are almost completely ignored in our school health programme. We feel that teachers are of immense importance. They certainly have great potential to get trained in health and are already equipped for imparting health education as they command respect and love from the children. But today, they are diffident about their own health. They do not even question their own family doctors and their prescriptions which often are irrational. They even harbour older and newer superstitions about health. Their role in school health is confined to measuring of weights and heights of the children.

So we need to have a radically different and fresh perspective if we wish to see any visible improvement in school health programme. The methods and techniques of health education will have to be radically different from the outdated traditional ones, which only have a deadening effect on learning. The lessons on health in text-books need to be rewritten and modified and more importantly, they should be taught in a different way. Children should be able to relate whatever they learn to their own observations and experiences.

One of the most important and essential 'equipment' for health education is most widely and easily available: one's own body. Observing one's own body, feeling (palpitation) and listening (auscultation) will give the most authentic experience. Experiments in nutrition, optics, dissection of animals will add to the knowledge. Apart from imparting this knowledge, other methods can be employed for self-expression and evaluation viz., group discussions, group poster-making, essay competition, one-act plays and health games. Fortunately, now there is a wide range of new well-tested effective techniques of participatory education, which can be used even in health education.

So the objectives of school health should be:

1. To impart simple but comprehensive knowledge about health and diseases to teachers, and via them to students.
2. To remove the fear-complex about health knowledge, to demystify medical knowledge, and to teach how to question.
3. To make the teachers and children to take active interest in their own and community's health.
4. To help them know the existing medical services, how best they can be utilised, their deficiencies and limitations.

* * *

Traditional Medicine

At least two-thirds of illness are treated first by traditional methods, either by consultation with a healer or at home. Although the intention is to integrate this major source of health care into the national PHC programme. Only Rs. 43 crores out of a total health budget of Rs. 3.393 crores have been allocated to the development of Indian systems of medicine.

What is New?

1. Reed Evelyn, "Problems of Women's liberation: a Marxist approach"—New York: pathfinder's press, 1970, p.96.
2. Reed Evelyn, "Sexism and science"—New York: Pathfinder's press, 1981, p.190.
3. Hanson Joseph and Reed Evelyn, "Cosmetics, fashions and the exploitation of women"—New York: Pathfinder's press, 1986, p.138.
4. Reed Evelyn, "Woman's evolution: from matriarchal class to patriarchal family"—New York: Pathfinder's press. 1981, p.491.
5. Maheshwari Shriram, "Rural development in India: a public policy approach"—New Delhi: Sage publishers, 1985, p.231.
6. Faden Ruth R. and Beauchamp Tom L., "A history and theory of informed consent"—New York: Oxford university press, 1986, p.392.
7. Taylor steven and Bogdan Robert, "Introduction to qualitative research methods: the research for meanings"—New York: John Wiley, 1984, p.302.
8. Khandewale S.V., "Small farmers and viability schemes"—Nagpur: ICSSR, 1984, p.158.

Book Reviews

1. Faden Ruth R., "A history and theory of informed consent"—New York: Oxford University Press, 1986, p.392, Price Rs.345/-.

Informed consent has often been a perplexing area of biomedical and research ethics. In this volume authors provide an analytical framework for reasoning about informed consent, clarify the ambiguities surrounding the rights of patients and subjects, and enable physicians and research investigators to place ethical decisions on a principled basis. This framework is based on philosophical, psychological and legal considerations.

2. Taylor Steven J. and Bogdan Robert, "Introduction to qualitative research methods: the search for meanings"—New York: John wiley and sons, 1984, p.302, price Rs.320.

This is the 2nd edition of the book, first being in the year 1975. The book can be used as a guide to important non-statistical research tools for the social sciences. The first half of the text focuses on the application of the techniques—how to actually conduct a study. The second half of the book is selection of articles that provide specific examples of research reporting drawn from the author's experience; these studies illustrate, how the methods presented earlier are employed in actual practice.

Health in People's Hand

This novel and unique work was undertaken by Dr. Guy Poitevin of the Centre for Cooperative Research in Social Sciences, Pune.

Sponsored by the Indian Council of Social Science Research (ICSSR), New Delhi, this report qualitatively analyses the scheme of "health by the people" conducted in the remote Velhe and Mulshi areas Pune district.

The study concentrates on primary health care as a matter of social process and observes the emergence and evolution of "self-health". Primary health care issues have been investigated by focussing on the dialectical relationship existing between the levels of health consciousness and the forms of mass organisation on the one hand and the prevalent local social, cultural, administrative and power structures, including those of the public health system, on the other.

The reciprocal determination of the following factors has been highlighted as a necessary pre-requisite for the success of any health development scheme;

—spreading of health knowledge

—awakening of a socio-cultural and socio-political consciousness

—autonomous and self-reliant alternative efforts of health care.

This study surveys the nature, extent and forms of the mutual correlation while considering health as an inalienable dimension of an overall process of socio-cultural and socio-political awakening.

A specifically important aspect was the inclusion of gender dimension. Anthropological analyses of women's role in the traditional and ritualistic cure practices where they occupy pivotal position provide a rationale for an almost exclusive priority workers. This study shows us the necessity of the gender parameter as one of the main sociological criteria for evaluation of any primary health care system.

The report in its analysis mainly concentrates on the following three categories

i. Identity and role of health animators.
ii. Health practices as activities of health care and collective health actions as attempts of mass mobilisation on community health issues.
iii. Health action.

Social Aspects of Leprosy

Leprosy as a disease has a unique feature in the sense that unlike most other diseases it stigmatises the afflicted person. This study aims at exploring and critically understanding the socio-cultural, economic and political correlates of this stigmatising disease. The study has been carried out in both leprosy high endemic and low endemic areas and focuses around differentials, if any, due to endemicity.

The study places stigma in the context of political economy and the entire social structure. It rejects the behaviourist approach and examines the stigma against leprosy in terms of the general discrimination existing in an exploitative society—a society in which the basis of relations of production are differentiation, discrimination, domination, alienation and ostracism.

The survey was carried out in 22 villages spread over six districts.

The principal objective of the study was to explore and understand the stigma associated with leprosy, both from the perspective of the patient and the general population.

Edited by Saroj Iyer with the co-operation of Manish Mankad and secretarial assistance from Anuradha Naik. Produced by the Foundation for Research in Community Health, 84-A, R. G. Thadani Marg, Worli, Bombay-400 018, registered under the Bombay Public Trust Act. Printed by Modern Arts and Industries, A-Z Industrial Estate, Lower Parel, Bombay.

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Frch NEWSLETTER

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The National Tuberculosis Programme and Its Implementation

Debabar Banerji*

India can justly be proud of its achievements in developing a public health approach to the problem of tuberculosis in the country. There are three distinguishing features of this achievement: very early in the process, India had moved away from the traditional methods which were being applied in Western countries and develop its own approaches to suit the local conditions; India has made the pioneering effort to develop an interdisciplinary approach to formulate a nationally applicable, socially acceptable and epidemiologically effective National Tuberculosis Programme (NTP) for the country; India's contributions in the form of formulation of the NTP was globally recognized and these have formed the bases of tuberculosis programmes in many of the developing as well as developed countries of the world.

B.K. Sikand of the New Delhi Tuberculosis Centre had pioneered organized domiciliary treatment of tuberculosis cases in the early forties. P.V. Benjamin (an Indian) of the Union Mission Tuberculosis Sanatorium, Madanapalle, had started conducting epidemiological surveys using the obeiously rudimentary tool of tuberculin test in the late thirties. When, in the wake of the Bhore Committee recommendations, he became the Advisor in Tuberculosis to the Government of India, he took the initiative, along with C.G. Pandit, to conduct the national sample survey of tuberculosis in 1954-56, which is still considered a classic epidemiological study. This tradition of epidemiological survey was continued by scholars like Raj Naraian and Frimodt Moller, who have carried out outstanding longitudinal surveys and experimental epidemiological studies, which once again gave India the distinction in offering conclusive evidence to the scientific world that B.C.G. does not provide protection to adults against tuberculosis.

Before the findings concerning B.C.G., Halfoan Mahler had joined Benjamin in launching the National B.C.G. Campaign in the fifties. India, again, has the distinction of carrying out the path-breaking study to demonstrate that home treatment of tuberculosis patients is as effecacios as sanitorium treatment at the Tuberculosis Chemotherapy Centre at Madras in the late fifties.

Benjamin and Mahler, again, provided a perspective to the then Prime Minister of Jawaharlal Nehru and the Health Minister Rajkumari Amrit Kaur to set up the National Tuberculosis Institute in Bangalore in 1959 with the specific mandate to make tuberculosis services available to the larger masses of the patients who are at that time unable to gain access to the services. Apart from the disciplines such as epidemiology, health administration, clinical medicine, therapeutics, microbiology, public health nursing and X-ray engineering, a still more distinctive feature of NTI was that it also had positions for a social science group to make contributions to the formulation of the National Tuberculosis Programme by giving what can be called a social science dimension to the data obtained by epidemiologists. This was most remarkable. Social science data were used to demonstrate that a large proportion of the existing tuberculosis patients in the country are actively seeking help from diferent health institutions all over the country—in other words, they have a "felt-need" for the services; social science data also made a critical contribution in evolving a procedure for diagnosing tuberculosis cases in remote rural areas; the data also made it apparent that a tuberculosis programme must be built up as an integral part of the general health services—as it dealt with the problem of suffering of the tuberculosis patients, the programme was designed to sink or sail with the general health services; and the data also demonstrated clearly the enormous epidemiological potential of a "felt-need" oriented tuberculosis programme.

Diagnosing tuberculosis cases in rural health institutions through sputum examination of chronic cough cases, treating the diagnosed cases with chemotherapy by building a sound system of treatment organization in rural areas, and developing a system to refer the doubtful cases for more refined diagnosis and treatment at the Tuberculosis Centre at the district headquarters (DTC), formed the sheetanchor of the NTP. The DTC was entrusted with the responsibility of providing training and logistic support to workers in the health institutions, apart from having a sound information system to keep track of all the tuberculosis cases who are diagnosed and treated in the district, including the two way referal of the cases with the health institutions.

The contours of the NTP were finalised after they were field tested in the entire Anantapur district of Andhra Pradesh. NTI served as the training centre for the staff of the DTC and by 1983-84, the programme has been implemented in 353 districts of the country; in that year

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13,08,880 tuberculosis patients were treated under the NTP

Almost a quarter of a century after the formulation and implementation of NTP, it is apparent that still a very large proportion of the infectious tuberculosis patients, who are literally knocking at the doors of the health institutions of the country, are still being thrown back with bottles of cough mixture. This is a cruel irony. While health workers are ordered by national and international authorities to catch hold of children and immunize them against the six diseases about whose size and extent we know so little, the organization finds itself helpless in providing services to the hundreds of thousands of tuberculosis patients who are literally begging for treatment in various health institutions.

Worse still, of the limited number of tuberculosis patients, who are finally diagnosed in the various health institutions and DTCs, only a small fraction are offered the treatment services as envisaged in the NTP. The health organizations at the national and state levels should thus be considered as the biggest of the 'defaulters': they are responsible for death and agonies of hundreds of thousands of the tuberculosis patients of the country. The principal reason for this unforgivable default of the health services of the country is the indifference of the political, bureaucratic and the public health leadership. Over and above, has been their pre-occupation with such massive "vertical" or target-oriented programmes as those for malaria, family planning and mass immunization.

The consequences of this neglect has been devastating for the sufferers of tuberculosis in this country. When the services they got in different health institutions were found to be grossly inadequate, the patients were forced to fall prey to the exploitation of X-ray centres and bacteriological laboratories, private medical practioners and the drug industry. The most heartrending aspect of this dilemma of the tuberculosis patients is that, in spite of their efforts, they finally do not get the needed relief and they continue to suffer till they die of the disease. This dilemma was graphically described in the case study presented in the FRCH Newsletter of March-April 1988. Imrana Qadeer, who had worked for over a year in nine villages in Sonepat district of Haryana also got numerous instances of such cases of inadequately treated tuberculosis. Earlier, Klaus van der Veen, working in Valsad district of Gujarat, also provided numerous such instances. One can say on the basis of the data available that the suffering of the tuberculosis patients due to cruel neglect of those who are supposed to implement the NTP has reached epidemic proportions, calling for urgent action.

The solutions are very obvious and straightforward. There is a crying need to improve the quality of public health practice in India. This will ensure strengthening of health services, right down to the level of the health guides. Along with this strengthening of health services, there will be almost automatic strengthening of the NTP, which will ensure that those who are seeking services at various health institutions received effecacious treatment so that their suffering is allievated and they do not have to fall a victim of various types of medical exploiters.

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The Mandwa Experience

FRCH conducted a ten year experiment in 30 villages of north Alibag district known popularly as the Mandwa project. Since neither the public nor the private health sector could provide the services needed by the villagers, one woman from each village was trained to undertake as many health functions as possible. About 80% of all health needs could be met by them even for diseases like malaria, leprosy, gastroenteritis, including tuberculosis.

Surprisingly they could detect tuberculosis in the early stages most effectively by observing the cardinal symptoms. Following confirmation of diagnosis by the FRCH doctor they not only ensured regular treatment including the giving of streptomycin injections but also convinced the patients to take precautions for spread of the disease to others like, disposal of sputum and sleeping away from the other family members. They also detected new cases in the family in the arlier stages.

While the vast infrastructure of the public health care system fails to ensure early detection and regularity of treatment and the private practitioners over charge the poor who eventually default, there exists in every village the potential for the early detection and regular treatment and prevention of dissemination of tuberculosis as of many other major diseases at very low cost.

For this the medical profession needs to develop respect for the intelligence and ability of village folk, to give them information in a simple manner and language which they can understand and encourage and support them to undertake those functions which are within their capacity and yet beyond the reach of the health professionals; not to mystify a and create fear about health and illness.

Since it is virtually impossible for a patient to have regular access to the available health services and self help is feasible in health it is time we move from the top-down delivery of health approach to make health a people's own programme in which the medical profession participates in the manner required by the people. Why cannot the village woman be trained to give streptomycin injection for tuberculosis and for immunization as done in Mandwa?

Lessons from BCG

Nerges Mistry*

The story of BCG is a multifaceted one: of history, personalities, science, and also of confusion, surprise and disbelief. This story is worth telling because it has an important but often overlooked message of basic research and for practical disease control policies today.

BCG owes its origin to the transformation (attenuation) of the bovine tubercle bacillus *Mycobacterium bovis* during the course of 231 passages in a broth containing ox-bile. This process took 13 years from 1906-1919. The resulting organisim was called Bacillus-Calmette-Guerin (BCG) after the two Frenchmen who had nurtured it. It proved non-pathogenic in calves and guinea-pigs and in 1921, it was administered live into the mouth of a young baby whose mother had died of tuberculosis (TB). The infant survived both, disease-free and without apparent side-effects. Encouraged by these results, Calmette conducted a series of tests in animals which suggested that the vaccine was safe and that *it imparted a degree of resistance to challenge with virulent tubercle bacilli when given in a live form but not when killed chemically or by heating.* By 1928, vaccination by BCG was delivered to 50,000 French children—some still contracted tuberculosis and some died but Calmette claimed that most were effectively protected by his vaccine.

Then trouble began. At first came a vitriolic attack from Greenwood claiming that Calmette's evidence of protectivity through the vaccine was flawed. In 1929, there occurred a disastrous incidence in Lubeck, Germany, where a laboratory accident led to the mistaken labelling of human tubercle germs as BCG: of 251 children inoculated, 72 died with fulminating tuberculosis. Confidence in BCG evaporated and Calmette died broken-hearted in 1933.

Nevertheless, interest in BCG remained unshaken and in the 1930's a series of controlled trials were organised in several areas of the world in order to assess objectively the protection imparted by BCG against TB. *The results have been confusing in their lack of consistency, providing upto almost 80% protection in some populations—but little or no protection at all in others.* The most quoted examples are the Medical Research Council trials of BCG against TB in British school-children, begun in 1950, which showed good protection for over 20 years and the most recent trial carried out in south India by the WHO and the Indian Council for Medical Research in which no protection was evident. In the United States, two trials initiated in 1937 and 1950 gave protective values ranging from 73-6% respectively. The favorable result of 73% was manifest only over a follow-up period of 30 years.

As is often the case, the experts disagreed on the reasons for these differences. But through these very differences arose several theories that have laid the norms for investigation of both basis and procedure of prevention schedules not only for tuberculosis but for other tropical diseases with complex pathogenesis.

BCG vaccination successfully delineated diseases which were caused as a direct result of specific metabolic activity of viable/active causative agent. Since killed BCG failed to bestow protection, it meant that pathways mediating protection were also activated via specific albeit undefined activities of the live BCG vaccine. *An extension of this reasoning implies that in such diseases (tuberculosis, leprosy), generation and administration of so-called inert protective determinants of the causative agents even through the most sophisticated technologies is not likely to succeed in preventing the disease.*

The second important fall-out of the variation in results of the BCG trials was in the framing of the concept that vaccination was not "writing on a blank slate". Some theories attributed the variation to flaws in trial designs, differences in the genetic background, to *M. tuberculosis* between populations. These matched the general observation that protection by BCG increased proportionally to the distance from the equator.

A more favored explanation however is the variation in the structural components (antigens) of the tubercle bacillus in different parts of the world. The apparent failure of BCG in south India has been attributed to the fact that a high proportion of the tubercle bacilli are of a strain which is less virulent in guinea pigs than is the organism of Europe and N. America. The most popular explanation today however would attribute these differences to regional differences in the atypical or environmental mycobacteria which sensitize local populations and alter their response to BCG.

This argument is acceptable since it is widely recognised that BCG strains maintained in different laboratories have changed over the past 60 years and now differ considerably between one another. It should be expected that some of these changes have significant immunological implications *and as with all live vaccines, there is always a looming risk that the organism through extensive passaging may recover its disease causing properties or through selection processes mutate to a form with unpredictable ones.*

A sharper analysis of the BCG control programmes reveals that satisfactory protection is apparent when the vaccine is administered to younger age groups (even in south India, protection could be detected in children below 5 years of age) or if the programme has been evaluated for a period of over twenty years. The former indicates that vaccination may be most efficacious in *some* populations when superimposed on a background of minimal environmental sensitization. Indeed some environmental mycobacteria are suspected to suppress subsequent attempts at immunisation. This scenario is not exclusive to TB. and is known to occur in tetanus infections. The latter highlights the problems in judging the efficacy of a vaccination programme. Since the long term duration of BCG afforded protection is virtually unknown, it becomes difficult to judge the contribution of other factors such as improved chemotherapy, or rise in socio-economic status as harbingers of health vis-a-vis BCG.

Another singular disappointing feature in this whole puzzle is our inability to predict whether a given BCG will impart a useful degree of protection versus tuber-

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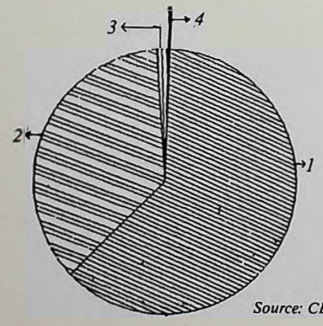
Tuberculosis Control in India: A Bird's Eye View

Mukund Uplekar*

Problem	Factors: Private Level	Factors: Government Level	Possible Remedies
a) Poor detection and reporting, Delayed diagnosis	Lack of awareness: Patient neglects cough and fever as 'usual' Low morbidity in early stages: Symptoms do not hamper their routing Who knows 'TB' is notifiable? Doctors delay the detection by not investigating in early stages, Prohibitive costs of investigations Facilities for investigation available only at PHC. Patient prefers to go to private doctors. Private doctors do not refer to PHC for fear of losing the case.	Lack of awareness: Patient neglects cough and fever as 'usual' Low morbidity in early stages: Symptoms do not hamper their routine Overcrowded OPDs in public hospitals. Early case easily missed X-ray facilities and supply of films irregular and limited Sputum examination unreliable General lack of commitment and indifference to patients.	1. Study patient's perceptions about the disease, their knowledge and awareness about the treatment 2. Preparing health education material essentially keeping in mind patient's perception. 3. Making sputum examination compulsory for all cases of productive cough more than fifteen days duration. All cases of cough more than fifteen days to be X-rayed. 4 Continuing education for private doctors about diagnosis and treatment. 5. Seeking active participation from private doctors; making notification of TB mandetory. o. Giving clearcut guidelines about administrating BCG vaccine to private doctors in particular. 7. Suggesting a few effective and uniform drug regimes all over the country. 8. Providing health education material to doctors for distributing to patients. 9. Helping private doctors trace defaulters. 10. Ensure regular supply of drugs and X-ray films. 11. Promoting drug regimes containing Streptomycin in view of patient's love for injection. 12. Allowing health workers give injections at patients' own houses.
b) Improper treatment	Lack of knowledge among doctors about correct drug regimes Stress on injections and tonics alone as the returns are good	Lack of knowledge among doctors about correct drug regimes Too many drug regimes are 'recommended'—confusion about which regimes for which patient.	
c) Poor patient compliance	Diagnosis and implications of the disease *not* disclosed. Patients gets complete relief very soon and stops treatment on their own. Costs of treatment prohibitive Undue' faith in injections. Patients feel that when injections are over the treatment is over	Diagnosis and implications of the disease *not* disclosed. All drugs not made available to all TB patients. When the patient discovers that 'better' drugs are available in 'private' he goes to private. But when the money gets over he runs back to government dispensary. All drugs are not available at all places. Patients tend to go to bigger hospitals 'Undue' faith in injections. Patients feel that when injections are over the treatment is over.	
d) Inadequate treatment	Lack of knowledge and confusion about drug regimes and their correct duration and the rationale of short course chemo-therapy High default rate Inadequate/unreliable supportive investigational facilities. Costs prohibitive.	Lack of knowledge and confusion about drug regimes and their correct duration and the rationale of short course chemo-therapy Criteria for cessation of therapy not well defined. Inadequate/unreliable supportive investigational facilities.	
e) Inefficient prevention	Lack of knowledge and awareness about protective effect of BCG vaccination and environmental sanitation.	Lack of knowledge and awareness about protective effect of BCG vaccination and environmental sanitation.	

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PROBLEM OF TUBERCULOSIS IN INDIA



1 – Uninfected 62.0 %
2 – Infected and Not Diseased – 36.0 %
3 – Non Infectious Cases – 1.5 %
4 – Infectious Cases – 0.4 %

Source: CBHI, "Health Atlas of India: 1986". New Delhi: GOI, 1986.

Morbid Statistics of Tuberculosis

- ★ 10 million Indians suffer from TB
- ★ Amongst them, 2.2 to 2.5 million are infectious
- ★ 4,00,000 Indians die of TB every year
- ★ 19 out of every 1000 Indians suffer from TB

Source: National Tuberculosis Institute, "Defeat TB, now & for ever",Bangalore: NTI, 1985

COMMUNITY HEALTH CELL
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Bangalore - 560 001.

Health Education: Blaming the Victims

Mohan Deshpande*

"Anybody can get TB.
Rich people and poor people can get TB.
Young children and old can get TB.
People in villages and people in cities can get TB.
Good and bad people can get TB.
Men, Women and children can get TB"
—A health message

Health education seeks to induce changes in personal and community attitudes and behaviour that promotes healthier living. It aims at making people behave in a manner which is different from their present behaviour. This change in behaviour is required when there exists a big information-gap between the current medical knowledge and the knowledge amongst the people. Therefore the health-messages are based on information. Information provides justification for the message. Where the laws, orders and instructions fail, information works. The logic is fine and appropriate in a democratic society like ours, but this logic has allowed selective information to be used for getting across convenient messages, taking advantage of popular ideas and emotions.

The effects of such selective information are disastrous. Selective information although utterly factual in itself, is utterly false when seen in the context of the socio-economic milieu, as amplified by the health-message quoted above. Such a health-message completely conceals the relationship between poverty and Tuberculosis (TB). People also happen to know some examples of rich people getting TB, although rare. They remember these cases because they are worth remembering. Thus the half truth becomes the whole truth.

People, by now, also know that it is the germs and not the fate that causes TB. (Thanks to the 'health education'). "Mycbacterium tuberculosis (human type) is practically the only causative agent of tuberculosis in our country" (Defeat TB, Now and For Ever, National Tuberculosis Institute, Bangalore, 1985), and then how can the germs discriminate between the rich and the poor? So, the germ theory of disease comes as a great help to 'educate' people. Thus ". . . rich or poor, villager or cityman, woman or man, young or old can get the disease (TB). (Defeat TB, Now and Forever). But who do the germs enter and cause disease in a particular person? Surely, it must be his fate. Why do poor people get TB more often? It must be their fate.

Another message that TB is curable and controllable in the present socio-economic situation, is based on various bacteriological and sociological half-truths such as:

* People are superstitous and irrational. They do not go to doctors in time. Those who follow doctor's instructions will get cured fast and completely and will lead a healthy life.

* Although TB is curable (since it is caused by germs and we have very effective anti TB drugs), people are unwilling to take the treatment and solve the problem. "No programme howsoever feasible and scientifically sound it may be, could possibly succeed if the community for which the programme is meant, do not accept it and do not co-operate with health agencies and do not utilise the available facilities to the maximum extent." (Defeat TB, Now and Forever).

All the following central issues thus are concealed:

* Relationship between poverty and TB.

* Nonavailability and lapses in the health services. As D. Banerji writes "The community diagnosis revealed that because of weakness in the services, a very large number of tuberculosis cases who were actively seeking help were not even diagnosed as cases of tuberculosis."

Similarly studies of treatment defaulters in TB programmes indicated that organisational, managerial and technological lapses rather than lapses on the part of the patients account for the bulk of the problem. Yet health educators focussed upon the lapses of the patients and were the instrumental in diverting attention from the far more serious lapses in the services. (D. Banerjee: Health Education & Community Health Behaviour)

* Cost of the treatment from the so-called efficient private health sector. The treatment of the disease itself is very expensive at the private hands. It is further escalated by the addition of irrational drugs like malts and tonics, and the cost of prescribed food, such as milk, eggs, chicken etc.

* All the other problems involved in continuation of treatment including transport and loss of wages.

* Inability to follow the instructions of health education (if any) because of socio-economic problems. Then, if the patient does not get well, it is his fault (or fate, if the blaming authority is more magnanimous).

* Inability and unwillingness of the private doctors to solve the problem. Wide scale malpractice. Failure to notify the disease. (No where in the booklet "Defeat TB, Now and Forever", there is any reference to notification of TB as an important duty of the doctors. The booklet is meant for the general practitioners.)

* Low morale of the patients on account of all above factors and the disease itself.

Barring all the above factors, health education today is well and fine, presenting a rosy picture—an almost afairy tale of cure and control of TB. If the fairy tale fails to be realised, blame the victims. That is the easiest way out.

Health education imparted by many private doctors is no less important, as usually a general practitioner is the first contact for many TB patients. Apart from his epidemiological knowledge (the celebrated germ theory) he also has several prejudices against the poor, which affects the health education he gives. Also the profit motive plays a havoc. Implicit in his behaviour at every stage of management, there is an attempt to hide the information or create false impressions about the disease. Many times. the doctor does not provide diagnosis of TB even when suspected. Delayed diagnosis prevents patients from go-

(contd on p. 8)

SANJEEVANI

Rupashree Sinha*

Sanjeevani, a twenty-year old Auxillary Nurse Midwife (ANM). She had heard about the nursing course on the radio and applied. Her small world had earlier consisted of housework and tailoring. Her idea of a nurse's job consisted of a hospital complex, dedicated patient care and fixed hours of work. When she joined the ANM course, she found that a different kind of nursing skill was being imparted to her. Nevertheless she adjusted to the idea of rural health work.

Her first placement was in a sub-centre. Luckily, her sub-centre had a building built by USAID, albeit opposite a cemetery. But she soon found that the sub-centre building was occupied by the Sarpanch whose field was adjacent to the building. Her clinic room was full of Sarpanch's family and henchmen. The village had also been generously granted a quarter for the Lady Health Visitor (LHV), by USAID. But this was being occupied by workers who were constructing a temple nearby and for which villagers had collected one and half lakh rupees. The LHV quarters had gradually become bare of electric wires and fan. The previous LHV had left in haste after a lot of harassment and threats, leaving behind unused medicines and instruments.

But like several enthusiastic newcomers, Sanjeevani took upon herself to behave efficiently and put things in order. She spoke to the Sarpanch about her right over the sub-centre building. The Sarpanch in turn reminded her that she belonged to the same community as he. He even traced back a distant relationship with her parents.

She sought the Medical Officer's help who told her to do whatever she could. She was puzzled, since she was taught in the training school that she could look up to the Medical Officer Incharge, in case of any trouble. She soon found out the reason for the doctor's inertia. He had very good relations with the Sarpanch and often shared his cup of tea with him. So he did not have a heart to severe this congenial relationship. One of the new LHVs tried to support her efforts. But she was severely threatened by the Sarpanch. When the LHV was gone, the Sarpanch called Sanjeevani and told her that she was like his daughter so why should she trouble herself with all this. She should live quietly in the village and do her work.

Thus Sanjeevani bears this carrot and stick game.

It is not that she never got to live in the sub-centre building earmarked for her. Once when (USAID) senior officials were visiting, the Sarpanch had obliged her by giving her access to the quarter for two full days. After that she had to go back to the village but which had no water and toilet facility. Still she has adjusted. She has other worries. She has to walk 8 kms. to and from the sub-centre, five days a week because none of the villages she visits has public transport facility. She hardly has any medicines to distribute except ferrous sulphate. She also has to motivate atleast six family planning (i.e. sterilization) cases every year. Last year (her first year) she worked hard and promoted three sterilisation cases. But at the end of January she faced a lot of pressure from district officials and was therefore forced to buy three more cases for Rs. 600/-. She had to borrow the money from her parents. At the end of the year she was awarded Rs. 50/- for her efforts. Sanjeevani has nothing else but to cry and laugh alternately at her helplessness and absurdity of the situation. She moaned, "when my parents were advising me not to, I had defiantly taken up this job. I wanted to prove myself".

The question is, "does Sanjeevani have to suffer for her dreams?".

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culosis. Prediction through skin testing with protein derivatives of tubercule bacilli-cultures (PPD) is reportedly proven to be misleading: even so it is extensively used as a surrogate measure of immunity in several ongoing leprosy vaccine trials. *The fact is that till today we have no test-tube measurement of protective immunity.*

Despite the continued uncertainty, BCG has been used increasingly widely throughout the world, its use being expounded incessantly by the Expanded Programme of Immunisation conducted by the WHO. More recently, the scope of prevention by BCG has been widened to include leprosy because of the similarities in the etiological agents of these two diseases. Astonishingly, protection to leprosy via BCG is more consistent than protection against tuberculosis. Moreover future third generation vaccines aim to protect against several tropical diseases by introducing so-called "protective" genes of organisms in BCG which will serve as a vehicle.

Dissemination of this message of vaccination has been excessively effective and therefore also counterproductive. It has left health personnel at all levels, let alone the layman, so mesmerized, that they can see no alternative to vaccines in disease control programmes. To dissent from this view is to be considered a victim of delusion.

Whether all this is a policy of statistical hope or despair is a debatable point. The range of results appear to suggest that BCG is likely to give *some* degree of protection. On the other hand, it is maintained that BCG is the only available tool for prevention of TB in much of the world today and that just a chance of protection is better than no protection at all. Currently, India seeks to locate a BCG strain more compatible to the indigenous make up of its inhabitants. *It is almost a certainty however that beneficial effects will never be 100% either with BCG or any other vaccine. The cause of failure to some extent is technical, otherwise it lies chiefly in poverty, ignorance and errors.*

Where benefits of vaccination are marginal and their source ambiguous, a country with fragile economic resources is justified in asking-at what cost BCG vaccination. *To invest extravagantly in dubious immunization programmes either self-made or foisted is loss enough. To divert precious resources towards these from more tested and obvious measures such as general betterment of health through socio-economic uplift borders on foolishness on part of our policy planners.* The lessons from BCG are clear. Do we have the wisdom to grasp them?

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Books

Book Reviews

Manish Mankad*

1. Maiti Asok Kumar (Dr.), "Rural Profile: Halting Change in Mode of Production: A Study of the Comprehensive Area Development Strategy"—New Delhi: Inter India publications, 1987, p. 249; Rs. 190/-.

The main objective of this micro study is to examine some social and economic consequences of the Comprehensive Area Development Strategy in the rural backwaters of West Bengal. A wide range of social, economic, ecological and agro-economic information collected in bench-mark survey (1975) before the corporation started working and in our re-surveys in 1980 and 1981, after five years of experimentations were examined to analyse the "forces" and "relations" of production and to evaluate the efficiency of the strategy. In the light of this examination, this study seeks to indicate the future scope of the strategy aimed at the removal of poverty, unemployment and reduction of disparate income-distribution.

2. Laws Priscilla, "X-rays: More Harm than Good?"—Philadelphia: Rodale press, 1977, p. 248; Rs. 100/-.

Author, herself, an environmental activist, has written this book after her consumer's guide to x-rays, 1974 received a great response.

This book was written in the hope that describing & discussing the common problem encountered by x-ray users will help others to avoid some of the pitfalls, and to understand and evaluate currently accepted x-ray practices. It offers an unbiased consideration of the problems associated with the use of diagnostic x-rays, from the perspectives of both patients and health care professionals in the broader context of our moder health crisis.

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New Additions

1. Cutting Pauline, "Children of the Siege"—London: Pan Books, 1988, p. 208.
2. Shakti, "Women: Self-help & Naturopathy"—Bombay; Shakti, 1988, p. 69.
3. Kapoor D.P. (Dr.), "Kapoor's Family Medical Guide"—Bombay: S.S. Publishers, 1988, p. 48.
4. Meghalaya Govt. of, "Census of India: 1981, series-14, Maghalaya, General Population Tables and Primary Census Abstract"—Meghalaya: Director of Census Operations, 1988, p. 172.
5. McDonnell Kethleen (Ed.), "Adverse Effects: Women and the Pharmaceutical Industry"—New Delhi: Ashish Publishing, 1987, p. 206.
6. Jolly K.G., "Family Planning in India, 1969-84: A District Level Study"—New Delhi: Hindustan Publishing, 1986, p. 287.
7. Swaroop Satya, "Introduction of Health Statistics"—Edinburgh: E & S Livingston Ltd., 1969 p. 343.
8. Flavin Christopher & Durning Alan B., "Building on Success: the Age of Energy Efficiency"—Washington: World Watch Institute, 1988, p. 74.
9. Sarkar R.L. & Lama Mahendra, "The Eastern Himalayas: Environment & Economy"—New Delhi: Atma Ram & Sons, 1986, p. 647.
10. Ford Foundation, "Action for Welfare and Awakening in Rural Environment (Anubhav series)"—New Delhi: Ford Foundation, 1988, p. 36.

Following publication are available at FRCH library.

1. "**Health Status of Indian People**"—*Sonya Gill (Ed.), p. 225.*
2. "**Social Aspects of Leprosy**"—*Manish Gupta, Amar Jesani, Ravi Duggal, p. 123, Rs. 35/-.*
3. "**Women's Work, Fertility and Access to Health Care**"—*Manisha Gupte & Anita Borkar, p. 200, Rs. 20/-.*

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ing elsewhere. Patient is hooked on symptomatic treatment for a variable initial period. No X-ray or sputum examination is done, because the patient loses his meagre resources in these investigations. Anti-TB treatment is started only on the basis of history and clinical examination. Patient feels better in a few days. The doctor takes the credit of "catching the disease in time, otherwise it would turn into TB". Patient feels lucky and relieved. He is also saved from stigma, isolation and probable dismissal from job. Patient stops the treatment when he feels better. It is also very expensive, especially with irrational drugs like malts and tonic injections. Naturally, there is no need to notify the disease which goes undiagnosed. No word is spoken against superstitions about the disease. A clever doctor knows that rituals and sacrifices do not seriously threaten a patient's life. Patient comes back to him eventually. Some doctors allow and even encourage superstitions. These are just a few instances of malpractice but they have adversely affected the knowledge and notions of the disease amongst people.

We ought to know that people will not follow the health messages as there is a wide gap between health messages and their reality. The content and the intent remaining same, health education—however interesting and novel, will not make a dent on people's lives. But on the contrary, "through a continuous persuasion, people are encouraged to adopt attitudes and beliefs which create an acceptance of the conditions in society and further create an impression that these conditions are the result of their own behaviour. Over a period of time, people come to accept these myths unquestioningly and passively accept illhealtn as an inevitable part of their lives". (Taking Sides).

In the absence of people's health movement, we do not expect a different picture inspite of the health—education as it exists in its present form today.

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High Technology in Medicine

In this issue, eminent members of the medical profession have expressed their thoughts on the controversial subject which generally goes under the term of High Technology in medicine. While High Technology is commonly equated with the glamorous and much publicised latest expensive dramatic innovations, whether it be equipment like CT or MRI scanners or operations like coronary artery bypass or kidney transplantation, Dr. Sethi informs us that this so called High Technology is seldom synonymous with efficacy and certainly not with cost effectiveness. The advent of simple, cheap, safe and highly effective measures such as anti-turberculosis drugs like streptomycin and rifampicin has not only permitted the vast majority of tuberculosis patients to be treated on a domiciliary basis eliminating the need for prolonged sanatorium treatment, but has also eliminated the need for major surgical intervention like thoracoplasty and lung resection at one time considered as the latest High Technology. If detected early and with proper compliance, diseases like tuberculosis, leprosy and malaria can be readily cured and the disease controlled. Immunization at a cost of Rs. 17/- per child can also prevent the morbidity and mortality from most of the prevailing childhood diseases like tetanus, whooping cough, diptheria or poliomyelitis. Likewise home made oral rehydration therapy can vastly reduce the toll of annual lives from gastroenteritis. If effectiveness and cost are the chief considerations then these and a host of many similar examples are surely the outstanding high technologies of today which if properly utilised could transform the health status of our entire nation even under the existing appalling social and economic conditions which are the causes of the majority of the killing and maiming diseases that affect our people today.

Instead of reaching this cheap and effective high technology to our people, the major emphasis as well as the medical manpower and financial resources have been diverted to the glamorous but extremely low cost-effective technologies imported from the affluent countries. Those countries have solved most of the problems that are still our major health hazards. Even in affluent countries it is questionable whether prolongation of life 'at any cost' using expensive technology is justifiable among the aged, when the quality of resulting life is often a vegetative existence. Even in these countries the exponentially increasing cost of such 'High Technologies' is now under question. Instead low cost, more effective methods like prevention of smoking, healthier diet and pollution control are preferred to uncontrolled expenditure on the treatment of cancer or heart disease.

Why then the rapidly increasing trend for adopting these low cost-effective technologies in a country where the major disease pattern is eminently suitable for cheap low cost yet highly effective technologies which are readily available to us? The answer lies in many factors that work for the former and against the latter. The introduction of technologies is initially determined by the medical profession which looks to the West for all new ideas and innovation like the rest of our elite. They are unaware, or deliberately choose to ignore the problems of the majority of our people who live in rural areas or even in the adjacent urban slums. Having adopted the expensive Western habits and lifestyle, it is more conducive for them to cater to the small affluent section of the urban society than to the poor masses. The small segment of our society which has the capacity to pay for service suffers more from the diseases of the West like cancer, heart diseases and stroke. The mass media which caters to their tastes has with the help of the medical profession succeeded in dramatising developments of medicine in the West and thus creating a demand: unfortunately neither the cost, the dangers, nor the poor long term results which are published in reputable international scientific journals are conveyed to the uncritical audience. They are not informed that 20 to 40 per cent of the vessels dilated by coronary angioplasty will reocclude within four to six months (New England Journal of Medicine, 22 September, 1988) and that a major epidemiological evaluation of cancer by the National Institutes of Health in the USA has revealed that except in a few rare cancers of childhood there has been no significant increase in survival in the past two decades despite the expenditure of billions of dollars in research and treatment (Blair III J.C and Smith E.M., "Progress against Cancer",-New England Journal of Medicine, 8 May, 1986). Information is seldom provided to the lay public on simple and cheap remedies as this is not newsworthy nor on the dangers of overinvestigation like excessive exposure to x-rays, overuse of vitamins and antibiotics or of dangerous drugs like EP forte banned in other countries. All this tends to create a false impression that modern medicine is necessarily High Tech and expensive. This is fostered not only by the medical profession but also by the other beneficiaries viz. the pharmaceutical and instrumentation industry.

The Sree Chitra Tirunal Centre for Science and Technology, Trivandrum, a centre of excellence in cardiac surgery has demonstrated that even coronary bypass surgery can be undertaken at much lower cost than in the

private sector. Their indigenous development of the cardiac pump and heart valves has greatly reduced the cost of open heart surgery. It is unfortunate that this is not emulated or even appreciated by the professionals in other centres who insist on imported equipment.

Costly sophisticated equipment often lies unutilised for lack of servicing and spare parts and is improperly used because of lack of trained manpower. There is also temptation to overutilise expensive equipment, especially in the private sector, to recover the cost of the investment and earn profit. 'Unnecessary reference' and 'kickbacks' are common knowledge with investigations like CT scan in private diagnostic centres. Another unfortunate example is when terminally ill and aged patients are kept alive by artificial measures.

The exercise in the latest expensive imported technology is not only restricted to the private sector; this has set a trend which is copied by the public sector in the medical college hospitals diverting the meagre public health resources from cheap and effective, preventive, promotive and curative health services which would serve the needs of the masses. This also inculcates wrong values in the education of doctors for the needs of our country.

Technologies like CT scan, lithotripsy or kidney dialysis and transplantation has created moral and ethical problems for those who cannot afford them but who nevertheless will go into massive debt to provide these for their near and dear ones. There is no limit to the consumer demand that can be generated by "pushing" these technologies as well as drugs in an area where consumer resistance is at its lowest. It has also led to unscrupulous practises in obtaining donor kidneys from the poor for the rich; this has been well documented in the medical as well as the lay press (Bombay, November 22-December 6, 1987).

The small Westernised affluent section of our society demands that the latest technologies must be available for their benefit regardless of the cost. The medical profession which also belongs and caters to this minority is more than willing to oblige, as this provides them kudos as well as a highly lucrative source of income. Who then must decide the appropriateness of technology for the need of our people as a whole under the existing financial restraints of our country's economy? This should be the task of those who have been elected by the people as well as of the bureaucracy who are paid to look after their interests.

Unfortunately, even our highest elected leaders and office bearers from the Presidents to the Chief Ministers are themselves responsible for distortion of the health scene because while paying pious lip service to the improvement of the health of our people, and especially of the underprivileged, they are willing accomplices of those who wish to promote inappropriate technology. It is they who lend their support by inaugurating expensive private medical institutions and equipments which service their needs; and even here while they proudly acclaim that these institutions and their doctors are next to none in the world, when it comes to their own treatment they have no hesitation in going abroad utilising the scarce resources of our poor country and its precious foreign exchange. How can elected people's representatives who misuse our public resources prevent the enormous drain of our country's wealth by the rich in the name of Health for All by 2000 AD? It is time the people themselves were made aware of this, for only they can decide as to how they can best protect their own health and interests.

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Privatisation and New Medical Technology

Ravi Duggal*

Defining Privatisation

Privatisation does not mean only the existence or the growing of the private sector. It refers to a relationship of the private sector with the public sector. Thus privatisation is a process. It is a process that has been going on for a long time and has accelerated in recent years due to certain developments in the health sector globally.

Privatisation may be best expalined through the forms it takes.

(1) Divestiture (transfer of ownership): This involves the selling out of public provision to the private sector. Isolated cases of such privatisation may be cited from the past but this form of privatisation is still in an infantile stage in India, but it could become a major trend in the coming years.

(2) Contracting: This is a very common form of privatisation that exists globally. Certain hospital functions, construction activity, purchasing, programme implementation, management, leasing out for a short period, etc., are the common types of this form of privatisation which is rampant in India even in the health sector.

(3) Source of income: Privatising the source of income, like "fee-for-services" in public hospitals and health centres has been a dominant trend globally since the late seventies. This is increasing in India at a very fast pace.

(4) Strengthening the Private Sector: This form of privatisation is the historically dominant form. Its main characteristic is that public resources are used for the development of the private sector-the public sector provides the inputs (medical education, soft loans, tax concession, etc.,.) and the profits are appropriated by the private sector from the population.

There is also another emergent trend, which however cannot be labelled as privatisation. The trend is one of corporate control of the health sector. This has been aided largely by the new medical technology and more efficient forms of administration and management which has made the operation of private health services more profitable. One may call this process "corporatisation".

Relationship Between New Medical Technology (NMT) and Privatisation

The new high technology medicine along with more efficient managerial and administrative methods is accelerating the process of privatisation.

(Contd. on p.12)

Humane Technology Needed

P.K. Sethi*

I always feel a little uneasy when it is claimed that modern medicine has achieved a high-technology status and that, if all countries could spare more money and manpower for health care, the benefits of high technology would reach everyone. It seems to me that the use of expensive and complicated gadgetry in medicine is being confused with sophistication and good science. The common assumption that modern medicine possesses a high scientific content can, with good reason, be questioned. It was only comparatively recently, perhaps during the last century, that a scientific approach to medicine was adopted; this has undoubtedly resulted in some quite remarkable achievements. However, I suspect that some of them have thrown us off balance and that we have become not only rather proud but also disdainful towards traditional healing practices.

While I hold no particular brief for traditional medicine, I am quite clear that, by and large, most medicine, even as practised in the affluent societies of the West, remains largely empirical. The facade of modern medicine tends to overwhelm us; the inner content has so far remained rather weak and tentative. What family doctors were supposed to do in the past with very little technological back-up, modern hospitals are attempting to do by making use of ever more impressive-looking gadgetry. This has resulted in very expensive health care. It does not require much insight to realise that the replacement of a simple mercury manometer with an electronic digital display system in no way improves our understanding of disease or even the accuracy of our technical interventions.

It is rather humbling to realise that some of the most valuable components in the art of healing remain nontechnological; one hopes that they will continue to be so. This is what Professor Attinger identifies as the supportive role that healers have always been called upon to fulfill. It is what providing comfort and reassurance is all about. The actual methodology used has little to do with the causal mechanisms of disease. Some may argue that this role perpetuates superstition and often obstructs progress but it cannot be denied that it is none the less a very important and necessary function of medicine. Call it the placebo effect if you like, or invoke the induction of endorphins to explain and legitimise its success in painful situations, but its value cannot be denied. In fact, a lot of research in medicine ultimately leads to explanations of practices which our forerunners found useful, mainly as a result of accurate observation and correlation.

It is in this context that one has to understand and respect the beliefs and cultures of diverse societies and not reject traditional healing methods as outright quackery. It seems unreasonable to force the belief system of Western society on to other societies with very different, but in no sense inferior, belief systems. Honest heart-searching is necessary by advocates of modern institutional health care. How much of their success depends on totally nontechnological interventions with dubious scientific foundations? Once the intellectual cobwebs are removed, restructuring can lead to more humane, less expensive, and socially just health care.

The often-cited spectacular advances in medicine, including organ transplants, coronary bypass surgery, and joint replacement surgery, really stem from the fact that we have not understood the basic causal mechanisms of most diseases. We do not know why kidneys fail, why coronary arteries get choked, what causes rheumatoid arthritis, or why cancer occurs. We deal with effects rather than causes and so we resort to some very expensive technical interventions that can be likened to fire-fighting. If we understood the basic causes, the expansive methods would not be needed.

How then can one label such interventions as high-technology medicine? It is true that the instruments and machines employed may incorporate some of the latest developments in applied engineering, but they do not unravel the mysteries of disease. We tend to equate expensive instrumentation with high-science medicine. I would categorise such interventions as using halfway technology, not high technology.

True high-technology medicine, to my way of thinking, is that in which the basic disease processes have been unravelled. Treatment then quickly becomes simple, inexpensive and effective. The treatment of some vitamin deficiency diseases, common endocrinal disorders, and a limited number of bacterial infections are cases in point. History will show that these examples truly represent the great achievements of modern medicine.

Let us distinguish, therefore, between halfway technology and high-science medicine. The former is impressive but expensive and does nothing to the disease process *per se*; the latter is disarmingly simple, much less expensive, and directly affects the disease.

Of course, a lot of expense may be incurred in research work that ultimately leads to the tackling of disease mechanisms in a fundamental way. Modern research is not cheap but this is where scarce resources should be used. The crucial instrument needed for such work is an incisive intellect capable of asking the right questions. What we need to support and encourage is the creation of an environment where pointed questions can be raised fearlessly without the risk of being smothered by powerful lobbies representing the interests of the medical-industrial complex.

It has been repeated *ad nauseam* that there is a very intimate relationship between technology and society, each influencing the other. What is often overlooked, however, is the stratified societal structure of developing countries with an upper 10% consisting of the urban affluent class and a lower 90% of poor urban and rural people. The former wield political power and are the decision-makers; the latter are often treated as if they do not matter.

The upper 10%, many of whom have adopted the lifestyle, culture and value systems of the West, look to the advanced countries and want their own countries to have the same kinds of medical facilities as are available there. Being the decision-makers, they control the technology filter *(1)* that allows only their needs to be referred to

(Contd. on p.11)

Technology in the Service of Indian Patients

M.S. Valiathan*

What distinguishes the twentieth century practice of medicine from that of earlier centuries is its growing dominance by technology. Technology has cast its mantle not only of medical superspecialities but also on the practice of medicine at the village level. The fact is that no branch of modern medicine, urban or rural, can dispense with technology today. No one would deny that a rural dispensary would or should have a blood pressure apparatus and a supply of disposable devices such as crystalloid packs, syringes and needles, gloves and urinary catheter. These and many other items are the product of technology which has more to it than meets the eye. The design and development of a reliable and durable blood pressure apparatus which a dispensary needs is as difficult as the design and development of disposal syringes and urinary catheters. As we go further, we would discover that the problem of design and development are a mere fraction of the challenge of manufacturing these articles without sacrificing their quality or escalating the price. The demand in India for medical devices of all kinds, ranging from simple disposable syringes to complex pacemakers, has already crossed Rs. 350 crores and is expected to reach a staggering figure of Rs 1,000 crores by 2000 AD when the Indian population will exceed 900 million. This is a distributing prospect from the point of view of what is not happening in India in the field of research, development and manufacture of medical devices today.

While the rural sector in medicine is much larger and much less supported than the urban sector in our country, it is clear that neither can be ignored by the health planner. Whereas the rural sector must be provided with basic health care needs at the primary level, one can hardly dismiss the health care demands of a steadily growing and vocal middle class who are admittedly a minority. However, as Dr. Gopalan has pointed out 'a minority of even just five per cent means over 40 million people' in India! Therefore a survey of the demand for medical devices in the country must take a total view of all societal needs and speciality requirements.

Table 1: Market Survey for Medical Devices

Field of Application	Cost of the Annual consumption of devices (in lakhs)
Vascular Surgery	30.0
Nephrology	65.0
Orthopedics	224.0
Cardiology & Cardiothoracic Surgery	541.2
Ophthalmology	824.4
Anaesthesiology	1000.0
Transfusion Devices	5060.0
Dental	12360.0
Devices for general use	14415.0
TOTAL	34539.6

The global demand for medical devices according to American estimates was reckoned to exceed three billion dollars a few year ago. As the Indian demand was unknown, Sree Chitra Tirunal Institute, Trivandrum conducted a survey in 1985 on the basis of information obtained from teaching and non-teaching hospitals, medical and surgical specialists, trade organisations, published literature and a questionnaire. The survey was urban oriented but did not altogether leave out the demands of the rural sector for dental materials, catheters and many other items. A summary of the findings of the survey is given in Table 1 which speaks for itself. It is true that a variable proportion of the demand is currently unmet simply because the products are too expensive for the patients and hospitals. If a Foley catheter costs Rs. 45, a bottle of dental filling material Rs. 370 and a box of surgical sutures Rs. 200, it is not surprising that they remain beyond the reach of many institutions. The high cost of medical devices is a direct result of our policy of meeting the demand by imports or by the production of items under licence. The negative consequences of this policy are many and they will continue to multiply. In the first place, it will oblige us to pay hundreds of crores in hard currency for the import of devices and technology and limit their benefits to the affluent among our patients. Secondly it will ensure that our payments will support the research development effort for biomaterials and devices in Western countries and Japan. Thirdly it will act as a soporific for our scientific and industrial communities who would feel no compulsion to harness their capabilities for the indigenous development and production of biomaterials and medical devices.

Medical technology goes beyond biomaterials and medical devices and covers instrumentation which is a vast field in itself. Medical devices range from humble disposables such as catheters, syringes and plastic bags to complex disposables such as oxygenators. They also include surgical implants for every speciality, heart valve, hip prosthesis and hydrocephalus shunts being prominent examples. Similarly instrumentation ranges from sphygmomanometers and portable ECG machines to highly complex CT Scanners. A policy on the development and production of medical devices and instruments has been crying out to be made and implemented because the present conditions are highly unsatisfactory. The policy must identify the categories of devices and instruments which should be developed on the basis of large scale or day to day needs and indicate those which are infrequently needed and could be left for imports. The strategy for development must operate at three levels to enfranchise the talent which undoubtedly exist at the collegiate, professional and industrial levels. At the primary level, medical and engineering colleges can and should conduct research jointly on a wide variety of basic problems in relation to devices and instrumentation technology which will work to their mutual benefit and the advancement of medical technology. The strength of biological materials, adaptation of biological form and

(Contd. on p.II)

X-rays: More Harm Than Good?

S.G. Kabra*

It is plain to even the most casual observer that "Diagnostic Clinics" or "X-ray Clinics" pepper the streets of urban, and a good deal of semi-urban India. More often than not, these clinics are independent of hospitals and have made X-ray facilities as readily available as photocopying services. From an estimated 10,400 units in 1975, the number now exceeds 30,000, according to a report of the Bhabha Atomic Research Centre (BARC). It is estimated that about 9 crore persons are X-rayed in our country, every year, out of which 5 crore are less than 30 years of age. This proliferation of X-ray services is apt to be regarded as "a sign of progress" and public awareness of X-ray is such that an X-ray examination offers a tremendous psychological boost to a patient much the same way as an injection would.

What is not generally known is that diagnostic X-rays today constitute, as a whole, the biggest man-made source of ionising radiation, whose potential for harm equals that of ionising radiation emanating from a nuclear explosion. Judiciously and safely used X-rays are, of course, of immense value in modern medicine. Used otherwise, X-rays cause more harm than good not only to patients, but also the public at large and their future generations. Ionising radiation in any form and in any dose increases the risk, in exposed persons, of developing cancer and their progeny of being born malformed.

The Division of Radiological Protection (DRP), of BARC, entrusted with the task of surveying X-ray units in the country to detect, and advice about, radiation hazards, found it impossible to keep up with the explosive increase in the number of these units. Though started in 1957, DRP had, till 1976, surveyed only 9% i.e. 946, of the estimated 10,400 X-ray units in existence at that time. The situation has only worsened over the years.

The Atomic Energy Regulatory Board (AERB) constituted by the Government of India in November 1983 is now entrusted with the responsibility of developing and implementing appropriate regulatory measures aimed at ensuring radiation safety in all applications involving ionising radiations envisaged in the Atomic Energy Act, 1962.

The status of radiological protection in small hospitals and clinics that constitute 95% of the total diagnostic units in the country "is so poor that most of the excessive exposure cases are reported from them" says the survey report of the DRP. The causes of excessive exposures detected are improper layout of these installation (85% of the small hospitals and clinics surveyed and 60% of the large hospitals), and lack of protection measures in 25% to 90% of the small units.

The reports says: "in short, the unawareness of radiation hazards, inadequate plan of installation, poor performance standards of the equipment, lack of necessary protective devices, and above all a commercialisation of the use of X-rays for medical diagnosis and consequent indiscriminate use" are some of the major factors to unwanted exposures.

The results of the prevalent improper use of diagnostic X- rays are:.

1. Excessive radiation dose to the individual to be X-rayed.
2. Radiation of parts of the body other than those required to be exposed to X-rays.
3. Radiation to persons other than the patient.

The "WHO Manual of Radiation Protection in Hospitals and General Practice" prescribes clear-cut guidelines for X-ray personnel which have also been prescribed by the AERB in its safety booklet for diagnostic X-ray units (AERB Code No:SC/MED-2, Safety Code for Medical Diagnostic X-ray Equipment and Installations). These safety measures are almost universally ignored in India. Though the flouting of these basic safety norms is so open and obvious, it is most unfortunate that it does not attract the attention of the health authorities.

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(Abrigded version of the article "Beware of X-Rays", SDMH Journal, Vol. 11(4) pp. 249-54. Reproduced with the permission of the author.)

Medical Engineering

In the Electromedical field, 86/87 has been a successful year with a 55% growth in turnover over the last year, a major portion of the growth coming from exports. The Division got a prestigious order for installation of a CAT—Scanner, a Catheterisation Laboratory, and Gama Camera at the Bir Hospital, Kathmandu. For the first time in the country the Division has installed a new product for crushing kidney stones with the success rate of 85% through extra-corporeal shockwaves called LITHOSTAR. This has already started treating patients with kidney stones. The Division also installed sophisticated Bi-plane Angiography with digital subtraction angiography, CAT—Scanner and Gama Camera at Batra Hospital, New Delhi, which was inaugurated by our Hon. Prime Minister. *Thanks to the emphasis laid on health in recent Government budgets, the business prospects for this Division will continue to be good.*

Source: Siemens Annual Report, 1986-87.

TECHNOLOGY An association of methods, techniques and equipment together with the people using them.

APPROPRIATE HEALTH TECHNOLOGY Technology that is scientifically sound, adaptable to local needs, acceptable to those who apply it and to those for whom it is used, and that can be maintained by the people themselves in keeping with the principle of self-reliance with resources the community and country can afford.

Adapted from the Alma-Ata Report on Primary Health Care (from the Seventh general programme of work covering the period 1984-1989, Health for All Series, No. 8, 1982).

Source: World Health Forum Vol. 8 1987.

Tragedy in Transplantation

Nerges Mistry*

P, a 23 year old harijan girl suffered from chronic renal failure for a period of three years. By virtue of familial connections, she was maintained on hemodialysis at a leading private hospital in the city by Dr T. whom she came to like and depend on. As her condition deteriorated the frequency and duration of the dialysis sessions increased bringing in its wake several complications. It was in early 1988 that Dr. T first suggested the possibility of P undergoing renal transplantation. Because of a modicum of education, P was aware of the cost this would entail, both to herself and her family and was initially reluctant. It was then that Dr. T informed her that she had little choice since her dialysis would be stopped from mid 1988. The will to live, the pressures of a fiancee and the terror of her condition if dialysis was stopped made her agree to undergo renal transplantation.

Her large coterie of brothers and sisters vehemently refused to test themselves as donors, despite persuasion. Faced with the task of finding a donor for herself, P took account of her financial burden. Along with the immunosuppressants that would have to cover her for a post operative period of one year, the total wavered at an impressive sum of Rs. 75,000-1,00,000. An agent, supposedly vetted by Dr. T, materialised and informed her that the donor which he would procure would have to be paid at least a sum of Rs. 40,000. The agent also assured her that his part of the fees would be a paltry sum of Rs. 3-4000. The hospital authorities were also quick to notify her that she would have to bear the charges of private day and night nursing a month after the procedure. And after she was discharged she would have to reside in the premises of a recuperation sanatorium at the rent of approximately Rs. 300 a month.

For a girl whose life vacillated between 'home' under a building staircase and the dialysis room, life became arduous. A session of dialysis was often followed by trudging long hours through town armed with addresses of Trusts, Institutions, Service Clubs and individuals. Each day the arrival of the postman was a momentous event rocketing to hope and a rosy future or abject despair. Some did not even reply, others were sympathetic but unhelpful-the chief cause being that they could not aid cases where the donor was extrafamilial. On that knowledge a leading nephrologist who had offered to help out with the supply of immunosuppressants also suddenly withdrew his offer. Some aid was however obtained and the end of the summer left P with a sum of approximately Rs. 40,000.

With no thought given to the gaping deficit, the doctor went ahead with his efforts to seek a donor. P was hereafter hospitalised. Tissue typing was performed and the agent forthwith found a donor who was for reasons unknown, not selected.

A month later a second donor, a man of about 30 years of age was earmarked and admitted for investigations. With a probability of a tissue match less than 1:500, it appeared astonishing that he shared a partial match with P. The acid test of cross-matching was performed thrice. At the first instance it appeared to be a failure. P was told by the hospital staff that it did not work because her blood was too 'hot' probably due to her 'intemperate diet'. After the third try however he was declared to be a suitable donor. The cost of his investigations, his hospital stay and medications were also laid additionally at P's door.

P was worried about the funding. The funds collected would be totally decimated after the procedure, leaving nothing for post operative medication. Moreover, the agent's patience appeared to be running out. Pressurising for payment was resorted to almost daily. Being appraised of P's condition, a reputed doctor belonging to the same hospital strongly advised against her undergoing

(Contd. on p.7)

Unrelated Living Donor Kidney Transplantation

B. N Colabawala*

Advances in medical technology always generate impacts on societal structure and its ethical values. To ignore this interaction between society as a whole and the part of it constituted by the medical profession, would be intellectual dishonesty. The evolution of kidney transplantation programmes in our country is one such example today.

The social, economic and moral impacts of kidney transplantation programmes are perhaps not fully appreciated. To sustain such programmes the medical profession needs the help of society in various facets such as economic, social reorientation of attitudes, legislation, rehabiliation of patients and many other areas. The professionals therefore duly obliged to society to set norms and standards which can be acceptable within the ethical values of society.

Ethical and other issues will always be there even in areas of living related or cadaver kidney transplantation programmes; but they are reasonably amenable to compromise. On the other hand the onset of unrelated living donor transplants with its abhorrent aspect of "sale of human organs" poses a different set of ethical values. The fundamental issue in these unrelated living donor transplants is whether society is prepared—or should—condone this commercialisation and trafficking in human organs. The process is medicated by unscrupulous brokers and agents. The donors are picked up from the economically weaker and educationally lacking sectors of society. They are lured by the offer of Rs. 20,000 to 40,000/- for the sale of one of their kidneys. It is more doubtful if he has given well informed and uncoerced consent. Do his family members know about the procedure and do they agree? Does the kidney go to the best matched recipient or to the highest bidder? Is a long term follow up of such donors maintained? Is there a possibility of subsequent blackmail by the donor or his family?

Organisations and societies concerned with transplantation all over the world have condemned such transplants

(Contd. on p.7)

Opportunity Costs of High-Tech Medical Diagnostic Equipment

Ramesh Awasthi*

The costs of most of the modern diagnostic equipments like Computed Axial Tomography (CAT) scanner or whole body scanner run into several millions of rupees. The total investment with all the establishment that goes with these high-tech machines such as the special building, shielding and air conditioning is even greater.

When we go in for high-tech diagnostic equipment we never consider the opportunity costs, i.e. to what alternative uses the same money be put and what are the returns. A small exercise of comparing opportunity costs reveals startling results.

Let us consider a base of 10 million investment in a high-tech medical equipment such as CAT scanner and calculate the expected turnover per year:

	Rupees (in thousands)
Depreciation @ 10%	10,00
Interest on capital @ 15%	15,00
Maintenance @ 5%	5,00
Operating personnel	1,00
Running costs	3,00
Other overhead expenses	1,00
Total costs	35,00
Profits on investment @ 25%	25,00
Total turnover per year	60,00

Average charge per patient = Rs. 1,500.
Number of patients to cover costs—4,000 per year.

In order to consider the alternatie uses of an annual expenditure of Rs. 6 millions in other fields of health care we have examined the Performance Budget of the Govt. of Maharashtra, 1988-89.

Comparison Table
For an annual expenditure of Rs. 6 million:

	CAT Scan	Primary Health Centre	Rural Hospital
No. of patients diagnosed	4,000	25,000	40,000
No. of patients treated	Nil*	20,000	40,000

* The CAT Scan is only for diagnostic purposes and has no therapeutic use.

Alternatively, an annual budget of Rs. 6 million can provide:

Basic medicine requirement of
77 Primary Health Centres, including
462 Subcentres and
2310 Health Guides covering 2.3 million population.

Source: 1. Performance Budget, Dept. of Health & Family Welfare Govt. of Maharashtra, 1988-89.
2. NGOs in Rural Health Care, Vol. One: An Overview. Amar Jesani, Manisha Gupte and Ravi Duggal.; FRCH; 1986.

* DR. RAMESH AWASTHI is the Senior Research Officer at the Foundation for Research in Community Health, Bombay.

(Contd. from p.6)

the transplant. Visits to other leading doctors for solutions/help were fruitless. Legal or ethical viewpoints did little to ease P's predicament.

For P, it was now the point of no return-she was committed to undergo the transplant with her life. It finally took place.

The isolation area where she was placed would have done bedlam proud. Worse, the transplanted kidney started showing signs of rejection after an uneventful period of 3 weeks. The small stock of oral immunosuppressants provided by the hospital became superfluous. Injections of Cyclosporin A, worth Rs. 1,000 had to be injected every 2 days. For those who cared for her, getting sufficient injections became a race against time. Over the next month or so, P's condition sporadically deteriorated to such an extent that even Cyclosporin was stopped. Approximately five weeks later a second surgical procedure was done and the rejected necrosed kidney removed. The end seemed only a matter of time, nevertheless for the next 5-6 weeks dialysis was performed almost round the clock. About 3 months after the transplantation, P breathed her last; sans life, sans hope, sans everything.

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(Contd. from p.6)

and some countries have laws prohibiting them. The protagonist of such programmes in our country offer very facile arguments to suit their purpose. It is argued that an individual is free to donate his kidney and why should society interfere. But the freedom of an individual to act as he likes is always circumscribed by the needs of the greater good and ethical values of society. They argue that if a poor man earns some money thereby, what is the harm? The question is, what does he do with that money? In any case is our society reduced to such degradation that the only way we can help a poor man is by asking him to sell one of his organs? The final argument is that there is shortage of kidneys for transplantation and hence why not use whichever source we can to "save a life?"

It has been suggested that such transplants should be allowed under strict supervision based on specific guidelines and safeguards. The question is that in the current state of our morality who is going to form the guidelines and who and how are we going to ensure the safeguards.

It is true enough that both the profession and society face this issue squarely, before the whole procedure goes into the realms of criminalisation.

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Arogya Shikshan Kendra

FRCH involvement in community based health programmes began with our first field based experiment at Mandwa, a rural area in North Alibag, Maharashtra. This primary health care project focussed on health education as an important component to achieve its goals of health. Based on this experience gained at Mandwa, a more detailed field action based Health Education Project was commenced in April 1987, with two of our senior researchers, Dr. Ramesh Awasthi and Manisha Gupte setting up the field office named Arogya Shikshan Kendra (ASK), at village Malshiras in Purandar taluka, at Pune district. The project area extend to 18 villages with a population of 30,000. The Indian Council of Medical Research (ICMR) has sponsored this project for the next five years starting from 1st January 1988.

During the first year the emphasis was mainly on collecting information through various base lines surveys and so far, the following eleven surveys were completed:

1 Socio-Economic Survey of Balutedaar Families:
All the 685 Balutedaar families in the 18 villages were covered in this survey.

2 Techno-Economic and Occupational Health survey of artisan castes:
All artisan caste families in 18 villages have been surveyed for their present technology, traditional links as well as market relationships *vis-a-vis* raw materials and finished goods.

3 Women's Work, Fertility and Access to Health Care:
This study conducted in two villages namely Mavdi and Pondhe was sponsored by the Task Force on Health of the National Commission on Self Employed Women (And Women in the Unorganised Sector).

4 Child Birth and Child Death:
Every ever married woman has been surveyed in two villages—Vanpuri and Tekavdi. Information has been collected about morbidity, pregnancy, delivery, immunisation and infant death.

5 Death and Birth Records:
Death and birth records maintained by the PHC and Gram Panchayats for the last ten years have been analysed.

6 Case Paper Analysis:
All case papers of Malshiras PHC for one full year were studied.

7 Survey of TB Patients:
All TB patients on the records of the PHC were interviewed for their socio-economic background, history of disease, its treatment and the changes occuring in their personal and social relationships because of the disease.

8 Home Remedies:
Detailed information has been collected from women about household remedies with regard to common ailments like fever, cold and cough, diarrhoea and other health problems.

9 Survey of Traditional Birth Attendants (TBAs):
Qualitative information has been collected on the socio-economic background and delivery practices of the TBAs in the project area.

10 Survey of Devrushis and Traditional Healers:
Extensive information has been collected about 25 persons who dispense traditional medicines and/or conduct rituals for health problems.

11 Survey of Balwadi Teachers:
The existing balwadis in the project area were contacted and all the balwadi teachers were interviewed for their socio-economic background and teaching practices.

Other Activities

1 Training of TBAs:
In an effort to make an impact on the infant mortality rate, monthly meetings of all the TBAs in the project areas have been held wherein their experiences and problems were discussed. Since June 1988, they have started maintaining death and birth records of their respective villages for ASK.

2 Starting of Balwadis:
The gram panchayats, Tarun Mandals and Mahila Mandals were encouraged to start balwadis to facilitate the monitoring of immunisation status, malnutrition and other ailments of pre-school children as well as the intellectual development of small children. Balwadis have now started functioning in Pondhe, Rise, Khopdewasti, Pise, Amble (Ramwadi) and Vanpuri.

3 Training of Balwadi Teachers:
Balwadi teachers are now, being regularly trained in the health care of children, innovative and informal techniques of teaching.

4 School Health:
With a belief that school children can also, become health conscious and can actively participate in the management of their own health care, from June 1988, a health education programme in schools was also commenced.This programme has now been extended to schools in eight other villages.

5 Ralegan Shindi and Prohibition:
Shri Anna Hazare who steered the development work at Ralegan Shindi was invited by the village elders and the Tarun Mandal. Anna Hazare came to Malshiras and commended the efforts of the locals in the enforcement of prohibition. Since then, liquor has not been sold in the village and this example has also been followed by the neighbouring villages.

6 Tarun Mandal Guide:
It was found that misconceptions existed about the procedures of registering a Tarun Mandal with the Charity Commissioner due to lack of information. A detailed guide in Marathi explaining the procedure of registering a Mandal with cyclostyled copies of the required application forms were prepared by ASK and made available to aspiring youth groups.

7 Environmental Awareness:
During November 1987, ASK and Shri Bhuleshwar Vidhyalaya (Malshiras) jointly organised an inter-school essay and poster competition on 'Drought and Trees'. Informative articles and documents on this issue were cyclostyled and sent to all the schools in the 18 villages. This year, a survey of water resources in

Malshiras and Pondhe is being undertaken and a display of exhibits as well as elocution and essay writing contests are being organised on 'Conservation and Mangement of Water'. These programmes have been sponsored by the Department of Environment, Government of India.

8 Mahila Mandals:
The formation of Mahila Mandals have been encouraged so that through such regular contacts the health of women and children can be improved. So far, Mahila Mandals have been started in Vanpuri, Waghpur and Malshiras village. Since March 1988, 50 to 60 women have regular weekly meetings in the Gram Panchayat building at Malshiras. The Mahila Mandal has discussed and acted upon many women's issues. The village leadership and the people of this village have extended their full support to the Mahila Mandal. A Working Committee was elected in May 1988. Women were motivated to open saving and recurring deposit accounts with the bank and 55 women have opened their accounts with the bank.

9 Women's Co-operative:
The Mahila Sahakari Udyog Mandal, a co-operative economic activity has been started under the auspices of the Malshiras Mahila Mandal with the land made available by the village. NORAD, the Norwegian government's agency for development has given the grant-in-aid (for building, machinery and working capital) to put up an industrial unit to prepare blankets from raw wool which is locally available. The implementation of the project is in progress.

10 Training of women for the wool-project:
Training of women in every aspect of the economic activity is essential if a women's co-operative has to be managed by women themselves. Hence three women of the Mahila Mandal were sent for training in wool processing, spinning and weaving under the supervision of Dr. Dwarkanath Lohia at 'Manavlok', Ambejogai, Dist. Beed.

Future Programmes

During our work in the last one year cordial relations have developed with various institutions like gram panchayats, the PHC, schools and banks and we have received uninhibited co-operation from them in our work.

As per the requirements of the project, our work has been extended to two other PHC areas namely Supa and parinche. In Supa PHC area (Tal. Baramati) we shall be working only through the health functionaries while the Parinche PHC area (Tal. Purandar) will be the control area.

Upon request from the Health Committee of the Pune Zilla Parishad, ASK has extended the health education activities to 14 villages of Shirsufal PHC area, Baramati taluka. In Malshiras PHC area, however the educational activities will be enhanced with their content and extent enriched further.

The main indicators chosen for evaluation of the health education programme are as follows:

1 Ante Natal Care (ANC) Tetanus Toxoid (TT) immunisation and self identification of high risk cases.
2 Supplementary feeding.
3 Immunisation of children (BCG, Polio, Triple (DPT) and Measles).
4 Diarrhoeal deaths and deaths due to Lower Respiratory Tract Infection (LRTI).
5 Tuberculosis incidence and regularity of treatment.
6 Utilisation of health services (curative and preventive).

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Kasare Project

The idea of Kasare Project originated from the socio-economic study of Ralegan Shindi undertaken by FRCH in 1986-87. Ralegan Shindi, a small village in Parner taluka of Ahmednagar district in Maharashtra is now known as an ideal village, a model of rural development. Special features of Ralegan's development have been its local leadership, people's participation in all development programmes including voluntary offer of free labour (Shramadaan) in the implementation of each project. Moreover, the entire development effort has been taken up without any significant funds from donor agencies; the financial inputs have been from well-known government schemes which are also available to any other village. This village, under the guidance of Anna Hazare, a village elder, has paid special attention to the programmes of reducing social and economic disparities in the village society like removal of untouchability, community marriages, community lunch and special economic programmes for Harijans. This process has laid the foundation of all-round development in Ralegan Shindi. The unified drive of the village people themselves has brought about the remarkable change in Ralegan over a short period of ten years.

In an effort to find out whether such a similar self-help process could be initiated and replicated, FRCH undertook this project at Kasare, a small village in Ahmednagar district. This project is being initiated by a trained social worker belonging to the same village.

Mobilisation and Organisation

Development work based on Ralegan Shindi model began in Kasare village from April 1987. The work was initiated by holding regular discussions with the villagers on the importance of various features of Ralegan's development and motivating them for taking up similar development effort in their own village.

Villagers from Kasare who are working and staying in Bombay were motivated to get organised to contribute towards the development of their village. A registered society called the "Shree Biroba Gram Vikas Society" was founded by them. This enhanced the motivation of the other villagers to make similar contributions for the cause of development.

At the village level, a Central Village Advisory Committee (CVAC) has been set up to inspire participation

of all people. In view of the critical importance of women's participation in all development activities, a women's group 'Kalika Mahila Sangha' has been organised wherein all development schemes are discussed, decisions are taken and implementation reviewed. This group contributes Rs. 28/- per month towards the running of the public library in the village. They also run a chit-fund scheme among the members and also supervise the functioning of the Balwadi.

The Balwadi has been reactivated with the joint collaboration of the Tarun Mandal, CVAC and the Mahila Mandal. Financial and other material support has also been received from the parents and through donations. Efforts are being made to organise a training camp for Balwadi teachers from Kasare and other neighbouring villages with the help of some institutions in Pune. After reviewing the functioning of the primary school, donations were raised to provide educational aids for the school. Upon receipt of a grant of Rs. 12,000/- from the Panchayat Samiti to construct additional class rooms, the villagers unanimously decided to offer Shramadaan for the required construction. An additional grant was also sanctioned by the local MLA. Upon approval from the villagers, a public library was started in the community hall with contributions from the Gram Panchayat, local individuals and organisations. A separate library room is being constructed with financial help from the Biroba society.

Economic Programmes

During 1987, when the village was facing severe shortage of fodder, the Biroba society arranged for an interest free loan of Rs. 10,000/- for a three year period and 5 persons were sanctioned loans for fodder cultivation. This has helped the villagers in cultivating fodder as well as in getting good quality jowar and bajra seeds at reasonable prices. A sheep rearing programme sponsored by the Social Centre and a poultry scheme jointly sponsored by the State Bank, the Panchayat Samiti and the Social Centre have been undertaken by the Mahila Mandal. Sheds were prepared and 100 poultry birds were distributed to each member. This scheme has succeeded in providing a regular income to the women.

Several other loan proposals for the purchase of Jersey cows, pair of bullocks, bullock carts, oil-engines, afforestation schemes and digging or deepening of wells are also awaiting sanction. Two bore pumps have been set up in two wadis (hamlets) of Kasare village with financial assistance from the Social Centre and the full co operation of the local residents. Both the bore pumps yielded water and are in good condition. 35 women have been motivated to install smokeless chulhas in their homes. Two local potters have been trained by CASTFORD Pune, to manufacture smokeless chulahs locally.

In Conclusion

The Ahmednagar based organisation called 'Social Centre' also working in Kasare village, pays interest on bank loans taken by people, lends it tractor free for land leveling and also gives its oil-engines for irrigation purposes at a nominal rent. Thus, in every scheme sponsored by this organisation, there always is an element of subsidy or free-gift to the people. This mode of development has created a sort of dependence of the people on this organisation. People look to every development programme as an opportunity to get some thing free and they have started thinking that development by self-help or only through government schemes is not possible.

It is a tough task to get people out of this dependence-syndrome and to bring them to accept the Ralegan model of development by self-help. We are sure that committed work with the people will bring about an attitudinal change. Regarding the same, Anna Hazare also expressed confidence that sooner or later people do not appreciate the importance and dignity of self-help and start participating whole-heartedly in the development efforts.

In order to study to what extent an organisation could create dependence among the people and how it affects the development work, we have extended our work in two neighbouring villages where there has been no organised development effort so far. At this stage, we are holding discussions with various sections of people to understand the situation in these two villages.

The Kasare Project was initially supported from the Ford Foundation's general grant to FRCH. Presently the "India Development Services" (IDS) has extended financial support to the Kasare Project for three years.

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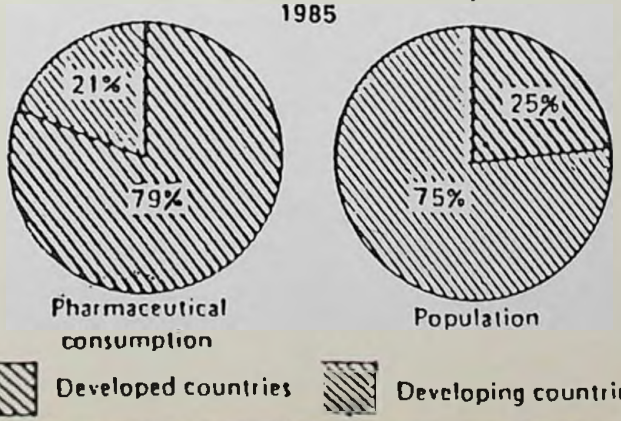
The World's prescribing patterns

Between 1300 and 2500 million people out of a world population of 5000 million have no regular access to essential drugs. And according to the World Health Organisation's *World Drug Situation* (1988), the immense inequality between north and south has widened during the last decade: drug consumption has increased by an average of 9.6% each year in the developed world and by 7.2% in the developing world.

Leading therapeutic groups and products respond to the needs of developed countries. In developing countries there is little is litte effective demand for the drugs that are most needed. (For example, H_2 receptor antagonists were among the five leading products in all the regions of the world in 1985.)

According to WHO, of the 500 new chemical entities marketed in the world between 1975 and 1984, only 30 were real therapeutic advances. The report predicts that the success of generic preparations in the United States will probably bring some changes to the market: in 1984 their sale provided American consumers with savings of about $ 236 m.

Source: British Medical Journal, Vol 297, 30 July, 1988.



(Contd. from p. 4)

design to specific functions, matching of prosthetic materials with tissues in terms of biomechanics, newer methods to evaluate toxicology - the agenda for their joint effort is endless. At the secondary level, surgeons and engineers must interact with appropriate inputs from the industry to create new devices and technologies such as a Charnley prosthesis or a deBakey graft which improve the lot of many thousands of patients. 'Jaipur-foot' is an excellent example of what can be achieved in India at this level. The tertiary level in the scenario must witness the emergence of an industry which will manufacture all that had been identified for production in the original policy.

A policy for the promotion of medical technology can scarcely be implemented unless one can forsee the possible hurdles to development. The very absence of a policy, weakness and lack of direction of research programmes in the professional colleges, apathy of the medical and engineering professions towards devices technology, lack of confidence in oneself and the country's technology, obsession of the industry with production under licence, state regulations which permit dumping by foreign manufacturers in the name of free trade and many other hurdles to development can be immediately identified. They are listed not as a deterrent to effort. On the contrary their identification in advance will make it less difficult to overcome them.

Long ago our legendary King, Bhartrihari, described three types of men in the increasing order of merit. Those who never start because of the fear of hurdles: those who retire half way when hurdles confront them; and lastly those who persist in the face of hurdles. Let us therefore begin and persist until the technological bounty makes a qualitative change in the standards of our patient services.

Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum

Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum represents a new trend which seeks to promote the joint culture of technology and medicine and attempts to answer some of the problems we have noted. Set up as an Institute of National Importance by an Act of Parliament in 1981, the Institute has a modern hospital for cardiac and neurologic diseases and a technology wing which develops materials and devices for medical applications. Whereas the bulk of hospital services are claimed by poor patients who pay little or nothing, the technology wing consists of a series of laboratories for technical evaluation of materials, polymer chemistry, polymer technology, biomaterials technology, biosurface studies, thrombosis research, toxicology, pathophysiology, vivarium and so on. These laboratories interact with the hospital which provides the clinical inputs for technology development at all levels. The technology for disposable blood bags which is essential for a national or regional transfusion service and was developed by the Institute has already gone into commercial production with the annual capacity of two million bags. A humidifier, disposable oxygenator, urine bag, heart valve and several other devices are in the pipelines thanks to the joint efforts of the engineers and physicians on the one hand and the recent arousal of industrial interest on the other. The example of Sree Chitra Trirunal Institute needs to be multiplied to meet the national demands for development in biomedical technology.

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(Contd. from p.3)

technological and research institutions, which in turn look to the West for inspiration. The needs of the lower 90% are ignored or set aside. Even if some of us learn to distinguish between expensive halfway technologies of dubious value and real high-technology medicine, the decision-makers will still favour halfway technologies in response to intensive sales campaigns conducted by the medical- industrial complex of the West, which treats health care as a market commodity. And so our scant resources are frittered away as our hospitals are increasingly equipped with advanced gadgetry that may be impressive to observe but is of very limited value in dealing with society's health problems.

No technology is suitable for all cultures. Furthermore, as societies change, there has to be a perpetual updating of the nontechnological role of medicine. Why should hospitals or old people's homes take over functions that families can and still do fulfill in the developing world? Such family roles, considered impractical in industrially advanced countries, should be carefully nursed and encouraged.

This requires a demystification of professional knowledge. Medical care and a healthy life-style can be explained to ordinary people *(2-4)*. Modern communication technology should be harnessed for sharing health care information with people. There is, of course, a danger here. If people in the Third World were shown how common ailments are treated in the advanced countries the results could be disastrous. This would amount to importing the belief system and culture of an alien society; the strength of traditional knowledge and human relationships, which offer at least some solace and relief, would be eroded. High technology is almost always a double-edged weapon.

Finally, the concept of the body as a mere machine should be questioned. It has been useful in respect of unifactorial diseases but is unlikely to be so against most multifactorial illnesses.

A technology is needed that is more humane, more philosophical, more equitable and more in keeping with belief systems, while denying any place to superstition and mythology. Self-reliant coping with illness should be encouraged; passive overdependence on expensive institutional medicine should not.

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"Health in People's Hand: Grass-root processes of a primary health animation project in rural areas"- Poitevin Guy and edited by Anantharam Saraswathy, p.169.

(Contd. from p.2)

By its very nature the new genre technologies (especially of the electronic and computer aided variety) has made concentration of monopoly capital even more simpler and the control easier. This is true for all sectors of the economy but more so for medicine.

The NMT has opened new avenues of corporate investment that is going to bring out far reaching changes in the structure of health care delivery. NMT has brought various forms of privatisation are early signs, and corporatisation the virus that helps complete the cycle.

In a country like India where basic health care is still a dream for the masses, the fast paced introduction and proliferation of NMT is only strengthening unequal health care distribution. NMT and privatisation go hand in hand. Corporatisation follows and adds strength to it.

Historically the introduction of modern medicine, its technology and practices have been characterised by an enclave sector pattern of development. During the colonial period modern health care was available/accessible to those in civil and military services. Introduction to the periphery was largely restricted to setting up of civil hospitals at the district level which had very restricted access. Provincial governments did make some efforts in setting up dispensaries in 'mofussil areas' but they were too few to have had any impact. In fact it was the missionaries who made successful attempts at introducing modern medicine in quite a few remote and difficult access areas. In the post-independence period, the State undertook the responsibility of providing health care to the periphery but the development has been very gradual to the extent that even today there is only one 6 bedded PHC with two doctors and about 8-10 paramedics placed at subcentres for about one lakh population. In the public sector hospital services are only available at the district level through a 100 to 200 bedded civil hospital for 2 to 3 million population.

(To be concluded)

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