Spreading Primary Health Care Technology

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WHILE inadequate knowledge of health conditions and their underlying causes as well as poor organization of services are considered obstacles to the implementation of primary health care, the availability of technology is not in this category. This is largely because primary health care is designed around existing technologies. For example, it is believed that the 'unnecessary' mortality of 0 to 5 year olds can be tackled with a relatively simple "package" of interventions, antenatal check-ups for pregnant women, along with tetanus toxoid administration and nutritional supplementation; immunisation of infants against six infectious diseases (diptheria, pertussis, tetanus, tuberculosis, poliomyelitis and measles); treatment of diarrhoeal diseases with oral rehydration salts, and of respiratory infections with antibiotics; and growth monitoring to prevent and 'treat' malnutrition (Rohde, 1982).

Indeed, an objective of primary health care is precisely to spread these and a few other technologies. Lewis Thomas has termed them "real high" technologies because they are addressed to significant problems, are effective, inexpensive and inconspicuous, in contrast with "halfway" technologies, such as cancer therapy or organ transplants, which are "simultaneously highly sophisticated and profoundly primitive. The major difference between these two types of technologies is, perhaps, the level of knowledge on which their dissemination depends. Sophisticated medical technologies are 'mystified'—the purview of a few—while primary health technologies are based on knowledge that can be transferred to a population at large.

Transferring knowledge or technology, however, has several preconditions and requirements. The system which is charged with delivering the technology must have the capacity, skills and management to reach its clientele. The technology itself must be acceptable to clients, which may call for its 'adaptation' to local conditions; and, therefore, the delivery system must also be capable of adapting it. Organization of clients may be necessary in order for them to benefit from the technology. Many primary health technologies are oriented to behavioural change among service providers as well as beneficiaries, for which well-worked-out educational strategies may be required. Thus, it is not possible to separate the attributes of a technology from those of the delivery system handling it or from the social milieu of its target population. Accordingly, this chapter explores some of the intricacies of primary health technologies, and identifies some conditions and requirements that must be fulfilled for their spread. A case study approach is used in which one primary health tool—the growth chart—serves as the paradigm for primary health technologies. The problems encountered in the spread of this technology through the health care system are discussed and some limitations pointed out. This case study has been presented in much greater detail in the context of a reviw of global experience with growth charts (Gopalan and Chatterjee, 1985).

Although growth monitoring is not currently being undertaken widely in the governmental health service system, it is one of the focal activities of the national Integrated Child Development Services (ICDS) scheme which involves health department personnel at all levels. The scheme seeks to deliver intergrated basic health, nutrition and education services to chidren in the 0-6 year age group and to reproductive-age women. At the end of the Sixth plan it covered a thousand administrative blocks throughout the coutry, and will be extended to serve another thousand in the Seventh plan period. Thus in terms of the dissemination of a 'simple health technology', growth monitoring in ICDS provides experimental evidence of considerable proportion. For the case study, six blocks in the States of Rajasthan and Haryana in which the ICDS programme had been in operation for at least three years were selected. Primary-level field workers, their supervisors, and medical personnel associated with the programme were interviewed, information and views being selected on all aspects of growth monitoring. A small sample of clients, in this case, mothers of children participating in the scheme or those enrolled themselves, were also included. In addition, available records were reviewed. To verify these field observations, other studies of growth monitoring have been examined. Several non-governmental health projects in the country undertake growth monitoring and reports of their experience have been drawn upon.

The Technology of Growth Monitoring

Conceptual Basis. The technology of growth monitoring is based on the scientific observation that growth is a sensitive indicator of nutritional status (Jalliffe, 1966). Because of the intimate relationship between nutrition and health, particularly in the child under five or six years of age, growth

* This study was undertaken in collaboration with Dr. C. Gopalan, Nutrition Foundation of India, and has been published as a Special Report of the Foundation (see Gopalan and Chatterjee, 1985).

monitoring also permits assessment of overall child health (WHO, 1978). In the early years of childhood, growth is rapid and any deviation from "normal" can be detected. Growth faltering calls for attention both to nutrition and to the possibility of infections.

It is believed that health workers can learn to identify children in whom growth is faltering using growth monitoring techniques, to provide them with the necessary care, and even to transfer this knowledge to mothers (Morley, 1973). It is this belief that has led to the inclusion of growth monitoring among primary health technologies. Its spread is advocated to enable the diagnosis of ill-health in young children and the provision of integrated nutrition and health services to them. In fact, it has come to be considered a crucial component of child health programmes. For example, it occupied pride of place in "GOBI" (Growth monitoring, Oral rehydration, Breastfeeding, Immunisation), UNICEF's world-wide strategy for improved "child survival and development" (Grant, 1983).

Application. Althouhg a variety of anthropometric measures, such as weight, height, arm-circumference, and so on, can be used to assess child growth, weight is regarded as the most sensitive and practical parameter (Jelliffe, 1966). A child's weight can be plotted at regular intervals against his or her age, giving a "weight-for-age" graph. While a single weight measurement is difficult to interpret, serial measurements can demonstrate a steady-state, an increase or a decline in a child's weight. Thus, the most common application of the concept of growth monitoring is found in the "growth chart," a tool predicated on the principle of regular monthly weighing of subjects and permitting visual examination of the growth pattern of an individual child (Morley, 1973; Morley and Woodland, 1979).

Weight measurements can also be 'standardised' for a given population of children, and 'reference' growth curves evolved. Comparing an individual child's growth trajectory with that of a healthy population permits one to determine whether the child is following the "Road to Health" (Morley, 1973). Thus, the growth chart, can be used for timely attention to illness or improper feeding underlying growth faltering.

The growth chart is commonly incorporated in a "Child Health Care" which records additional information on the child—his/her health "risk" factors, such as family socio-economic status, birth order, etc., history of illness, immunisation, and even feeding history. The use of this information along with the growth record permits a systematic and comprehensive approach to the diagnosis, maintenance or recovery of child health.

While growth charts are primarily individual records they can be used to assess the extent and severity of malnutrition in a population. Thus, growth charts can be used to target health-nutrition programmes, and to evaluate the effectiveness of interventions (WHO, 1978).

Because of its wide-ranging applications, growth monitoring may be unique among primary health care technologies. It is useful for preventive, diagnostic and curative health work. It is regarded as an 'objective tool' to select children for nutritional and medical interventions, such as supplementary feeding, immunization, deworming or nutritional prophylaxis, and to assess the impact of the interventions on child health. At the macro-level, growth charts can be used to prepare 'nutritional profiles' of populations and thereby as the bases for the formulation of health-nutrition programmes and policies. The growth chart also serves as a tool to educate health workers—from paediatricians to village-level personnel—and mothers about child health and nutrition, and to motivate them to improve the conditions and practices that affect these states.

Process. For its multiple potential, growth monitoring is well worth "spreading." However, the fulfilment of this potential depends to a great extent on whether the health system comprehends its principles thoroughly, and institutes adequate mechanism to follow through the process involved in its use. Besides requiring appropriate "hardware," (e.g. weighing scales and charts), there are several operational steps on which the utility of the technology depends. For example, scales need to be checked for accuracy and handled impeccably at the time of weighing. Weight reading must be taken carefully. A child's age must be correctly assessed, and his weight-for-age plotted accurately at every weighing. A sufficient number of weight points must be obtained on each child in order for his "curve" to be visualised and interpreted. Interpretation must be thorough, and apropriate "fellow-up" action must be taken to render this a useful tool. Thus, although growth monitoring appears simple, it calls for considerable skill and care. Workers must be appropriately trained and supervised to ensure reliable date and its proper use for health action.

Requirements for Effective Use

A system capable of the multidimensional activities involved in the implementation of growth monitoring is clearly its *sine qua non*. The various requirements and attributes of a system to spread such a primary health technology are presented in the form of propositions. While they are substantiated here by specific reference to growth monitoring, most or all of these propositions apply also to other primary health technologies.

Adequate Supply and Proper Maintenance Logistics: A Must—Although this may appear so obvious as not to deserve much considerations, inadequate supplies and poor maintenance of equipment may so severaly hamper the use of primary health technologies that the breadth of possibilities bears illustrations.

In growth monitoring, the supply and maintenance of two items—weighing scales and growth charts—are critical. Yet shortages of both are ubiquitously reported in both governmental and non-governmental growth monitoring programmes in India (Nutrition

Growth monitoring must be spread at the village-level. At currently-conceived health personnel: population ratios, it would require very high levels of organization for paramedics to monitor all children in their target populations.

Foundation, 1984) and other countries (e.g. Solon, 1983; Fajans and Sudiman, 1983). Besides increasing the burden on workers, such poor logistics make for sloppy results. Frequently, children most in need of growth monitoring may not have charts and therefore are excluded from the benefits of the technology. *Ad hoc* 'substitute' procedures diminish the utility of the technology. Shortages of hardware inevitably mean that the use of the technology is disrupted, and it is consequently devalued by workers and clients alike.

However, with its inclusion among primary health technologies, growth monitoring must be spread at the village-level. At currently-conceived health personnel: population ratios, it would require very high levels of organization for paramedics such as Auxiliary Nurse Midwives (ANMs) to monitor all children in their target populations. For example, Cowan has described a procedure by which ANMs in the project area of the Christian Medical College, Ludhiana monitor their target population of children in a selective, highly ordered manner, under the constant supervision of medical staff (Nutrition Foundation, 1984). Alternative techniques are used and much discretion is vested in the paramedical staff. Although the effective deployment of trained manpower has permitted the spread of growth monitoring in this instance, replication of this system on a larger scale would not be possible. Instead, the objective of universal coverage of young children with growth-monitoring is usually sought to be met by entrusting this technology to village-level health workers, such as community health volunteers, *dais* or child-care workers.

Although growth monitoring and the type of care possible with the Child Health Card were not included in the job descriptions of governmental community Health Guides, the *Anganwadi* Workers of the ICDS programme are 'public' village-level personnel. On her visits to ICDS centres, the author observed that *Anganwadi* Workers who had eight to ten years of schooling understood and performed the tasks of growth monitoring well (though not without errors). However, workers with fewer years of education had difficulty plotting weight date because they did not understand the graphical nature and 'time dimension' of the growth chart, and so on. As a result, was a time-consuming rather than a time saving tool and errors were frequent.

Recording weight data is indeed a sophisticated procedure, and not the simple one it is assumed to be. Even medical scientists are often confused (Bailey, 1984)! Anandalakshmy and Sindhu (1984) have pointed out that the conceptual basis of the growth chart requires high-level abstract reasoning to be understood. Educational level is important to attain such understanding, and hence the use of semi-literate village level personnel to spread growth monitoring is called into question.

The interpretation of growth charts is also a subtle and complex business. A health worker requires a fairly sophisticated knowledge of growth dynamics, and of the interrelationships of growth, feeding and health, to comprehend the information provided by a child's growth curve. Experience in the field has shown that 'complete' interpretation is difficult to achieve. In the ICDS blocks studied, workers focussed on a child's "grade" of malnutrition (i.e. his weight-for-age at a single point in time), paying little or no attention to his growth curve. A decline in weight was considered significant only when a child became severely malnourished. In the ICDS programme, severely malnourished children qualify for a double ration of the food supplement, and so the growth monitoring technology was being used only to identify such cases. Although the programme included other strategies for children exhibiting "early warning signs" of malnutrition, they were not being pursued because health workers failed to interpret growth curves properly. As a result the use of the technology was limited to its curative function, and its prime objective—early detection of growth faltering and *prevention* of severe malnutrition—was not being achieved.

These points illustrate the importance of training for the effective use of growth monitoring techniques: weighing procedures, recording, even matters seemingly as simple as determing a child's age. Workers need rigorous training in how to interpret growth data, and how to diagnose and treat the underlying causes of any adverse findings. The complete use of the technology requires that they also be taught how to instruct mothers on child feeding, illness prevention, and care. Health workers must be skilled in the entire range of tasks associated with its use if a technology is to meet its potential.

In addition to a system that can impart good initial training, continuous practical training and supervision are essential. The provision of "feedback" to workers on their performance is necessary to produce good results. These requirements imply that training in the use of the technology must be given to all levels of personnel, including physicians, paramedics and others who are "trainers." A lack of awareness among higher-level staff of the intricacies of growth monitoring or a lack of appreciation of field problems can be a serious constraint to its dissemination.

If the use of a technology such as growth monitoring is added on to the tasks of workers who have multiple responsibilities, it is likely to be less than optimal. While a "vertical" approach may overcome this problem, it is not desirable for primary care. Rather, there is a need for effective functional linkages with other services in order for the technology 'pay off.' For example, *anganwadi* workers must link up with health personnel in order to provide "follow-up" to growth monitoring. The "deploy-

ment" of all these persons is thus critical to the effective use of basic health technology. The size of the population a worker serves, i.e. access to clients as well as to 'trainers' and supervisors, and other responsibilities are also important factors.

The issues of workers' skills and deployment are also related to the problems of supply and maintenance discussed above. While paramedic workers may have the capacity to obtain and utilise growth information well, time and distance constrain their access to target populations. On the other hand, village-level workers have easier access to clients, but they are far away from the headquarters supplying charts, scales, repairs, etc. To overcome these handicaps, additional demands are inevitably placed on the service delivery system. The spread of primary health technologies may ultimately mean that 'quality' is traded off to quantity.

Technology must be User-Appropriate to be practicable. The corollary of using appropriately-trained manpower for dissemination is that the technology itself must be tailored to the skills of the workers involved. In other words, a "fit" between tool and user is essential. For example, in growth monitoring, the growth chart must be designed so as to be comprehensible to and useable by village health workers. On the contrary, it is often the case that the spaces provided on growth charts for plotting weights are unsuited to the large hand-writing of semi-literate workers. and they consequently had difficulty using them! This and other findings indicate that growth monitoring technology has yet to be adapted for use at the village level.

The issue of 'appropriateness' is confounded when the 'user' is inadequately specified, or when there is more than one intended user, the case with growth charts which are aimed at both village health workes and mothers. Experience has shown that 'cultural appropriateness' is also an important requirement of primary health technologies (Gopaldas *et al*, 1975).

Technology must be targetted but not exclusive. In addition to specified 'users,' health technologies must also have an identified target group. Growth monitoring is usually applied to children under six years of age. However, its utility to this large group may be at the cost of 'efficiency'. A growing group of professionals feels that it should be targeted only at children under three (Nutrition Foundation, 1984). They argue that this would reduce the load on workers and allow them to concentrate on children who are most at risk of malnutrition. Alternatives have been suggested for children over three.

However, the application of technology may also err on the side of 'exclusivity,' which would diminish its utility. Field enquiry in the ICDS blocks in Rajasthan and Haryana revealed that, at most sites, only 30-40 per cent of children registered in the programme were actually being weighed: bewer children under three than those between three and six years; more boys than girls; Children who lived far away from the *anganwadis*, and very lew from the poorest families. Thus, many of the children 'excluded,' were precisely those who were most in need of growth monitoring. Clearly while primary health technologies must be targetted for effectiveness, they must also be used in a way that does not exclude the needy.

Programme organization is a key requirement for efficiency. From the above discussion it is clear that the usefulness of growth monitoring technology is determined in large part by who is weighted which in turn depends on whether programmes specify a target group within the universe of children under six, whether they are "centre-based" or reach into homes, the extent to which they motivate mothers and children to participate, and so on. These are all aspects of programme design and organization from which a technology cannot be separated.

Efficacy depends on Integration with other service components. An effective growth monitoring system links 'growth charting' to the provision of appropriate health services. At the least, a growth-monitoring programme must aim to detect and deal with the common childhood infections, because growth faltering can be due to infectious illness. The value of growth monitoring clearly increases as the requisite health services are included within a programme. The most common service delivered with growth-monitoring is supplementary nutrition. Other services that may be provided are immunisation, anti-parasitic treatment, oral rehydration therapy, health and nutrition education and family planning. While the integration of these services with growth monitoring often also improves their coverage, their 'supply' is as critical to the success of growth monitoring as the supply of inputs for growth monitoring itself!

In the ICDS scheme, village-level *anganwadi* workers are entrusted with simple prophylatic treatments such as Vitamin A, iron-folic acid, deworming tablets and oral rehydration salts to back up their growth monitoring activities. Besides giving out these and the food supplements that are central to the programme, workers are expected to cousel mothers on child care and refer children in need to the next-level paramedical worker, the ANM. In practice, however, workers tend to link growth monitoring primarily to the provision of food supplements. Although they occasionally trace weight loss to illness and 'follow-up' by instructing mothers in appropriate care and/or notifying the paramedic to examine a child, these attempts are usually half-hearted, and so the effectiveness of this multi-faceted technology is diminished.

Other extant growth-monitoring programmes do not have built-in arrangements for follow-up health activities—or even down-play the need for them. For example, the Tamil Nadu Integrated Nutrition Programme, recommends a search for infection only if a child fails to thrive after three months of nutritional supplementation (Government of Tamil Nadu, 1979). The possible role of health interventions is de-emphasized because the programme is primarily a nutrition supplementation scheme. While growth-monitoring technology is intended as a basis for health care, in 'vertical' programmes such as this one

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obvious linkages are neglected.

In sum, while growth monitoring must be integrated horizontally and vertically with other health services be to truly useful, the implementation of health interventions is stymied by a lack of adequate training of workers, their time constraints, improper programme design, or other factors. A view of technology as an 'end' rather than a 'means' may be the basic cause of this problem (see Gopalan and Chatterjee, 1985).

Technology must be Evaluated to determine effectiveness. The number and complexity of requirements described suggest that the likelihood of proper conditions obtaining for the dissemination of a technology is small. This highlights the need to evaluate the performance of technologies within a given context, and to identify factors that may be constraining their proper use. The likelihood of evaluation results being used to improve a technology or a programme of which it is part is enhanced by built-in monitoring. Thus, evaluation must be part and parcel of efforts to spread a technology rather than an after-thought-for scientific, social and political reasons.

An important aspect of evaluation relates to the "tradeoffs" a health system makes to use a particular technology, and its relative cost-effectiveness. As primary health technologies are usually relegated to basic health workers whose time is not costed by the official health system, they are often not seen in this light. Where a health system has to attend to a wide spectrum of significant health problems with severe constraints of manpower and monetary and material resources, a technology must be able to provide direct benefits to health which justify any financial and manpower resources used.

One approach to evaluating a technology is to ask whether what is achieved by it could be achieved without it. In the case of growth monitoring, achievements depend on growth measurements being taken at regular intervals on a large proportion of children. However, examination of records kept by *anganwadi* workers in the ICDS blocks visited showed low coverage of their target populations, despite a high proportion of workers' time spent either on weighing children or motivating mothers to bring children to weighing sessions. Little time was actually spent on follow up and, consequently, "coverage" of the target population with successive steps in the application of the technology decreased, so that, eventually, little was achieved by it. Had this time been spent by workers on the education of mothers about child feeding and health, comparable results may have been achieved, calling into question the benefits of mechanical-applied technology.

Meeting objectives necessitates social organisation. The spread of primary health technologies depends on 'quantitative' and 'qualitative' interactions between 'providers' and 'beneficiaries.' While quantity refers to coverage, quality concerns the ability of providers to imbue in clients a desire for the technology concerned. Both these dimensions are related to the "social organisations" of clients—so that ultimately, the success of a technology comes to depend on this complex factor.

For example, the efficacy of growth monitoring is related to the participation of mothers in a weighing programme (the 'quantity' of interactions) and to their 'education' in its use and utility ('qualitative' interaction). Experience has shown that, besides being constrained by competing demands on their time, mothers' involvement in growth monitoring programmes is hampered by the lack of 'demand'. One approach to overcoming this has been to offer incentives (such as food supplements) to mothers to bring their children for weighing and other health services. Some programmes have been successful in overcoming the lack of participation by using social organisations such as Women's Clubs and Farmer's Clubs for the delivery of services including growth-monitoring (Arole, 1984).

'Demand creation' is also sought to be achieved through individual education and motivation of clients. It is believed that if mothers observe or participate in the processes of weighing and plotting, they can be made aware of the importance of weight gain and be encouraged to improve their child's weight by following advice given by the health worker (Rohde *et al*, 1975). However, it was observed in the ICDS centres that the majority of mothers were not interested in weighing their children because they could not comprehend the relationship of weight to their child's health. Thus, the technology was not 'accessible' to the majority of clients, and efforts to spread it would have to concentrate on breaking the cycle of 'no knowledge, low demand.'

In summary, the dissemination of primary health technologies has both supply and demand-side requirements. The chief ones that have emerged from a study of one technology, growth monitoring, have been described—supply and maintenance logistics, manpower, training and deployment, appropriateness and targetting of the technology, programme organisation, service integration, evaluation, and social organisation/client education. These needs most likely apply to other basic health technologies. In addition there may be other requirements that are more technology-specific!

Attributes of Primary Health Technologies

Primary health technologies also appear to have certain attributes which bear remembering when programmes are designed around them. A few of these are discussed below.

'Inherent limitations'. In our example, growth charts, weight-for-age measurements are used to assess nutritional status. They are thus predicated on accurate knowledge of age. A wrong estimate of age can result in a child being considered better or worse in nutritional status than he actually is, and thus diminish the utility of growth monitoring. However, it is not easy to obtain the correct ages of children in illiterate communities lacking birth records, and so the technology is 'inherently limited.' It may however be possible to overcome some limitations of a techno-

logy by ingenious programme planning and design.

Adaptation and Substitution are possible. Tne need to adapt a technology to specific local situations is fortunately accompanied by a potential to do so. However, adaptation or even substitution, where it is possible, is often difficult. An example is provided by the use of 'indigenous' equipment in growth monitoring.

Village-based growth monitoring programmes call for a weighing scale to be available in every village, but the costs of this are often prohibitive. To overcome this, some investigators have experimented with the use of local market balance (Nutrition Foundation, 1984). However, inappropriate "substitution" may also occur such as platform scales, use of registers instead of growth charts for recording weights, and so an.

Available Alternatives. Thus far the discussion of growth monitoring has been limited to growth charts based on weight-for-age measurements. However, the limitations of age data and other problems suggest that alternative "age-independent" methods of monitoring growth would be desirable.

However, although such measures as arm circumference and weight-for-height are available (Shakir, 1978; Nabarro and McNab, 1980). They too have 'inherent' and operational limitations! At the current time, there does not appear to be a growth monitoring technology which adequately fulfils "reliability, feasibility, utility and sensitivity criteria" set by the American Public Health Association (APHA, 1981), a situation which underscores the need for technologies to be used with full appreciation of their limitations.

Application Involves Ethical Choices. The 'selectivity that may be an inherent feature of a technology and the 'exclusivity' that may emanate from programme design both point to fundamental attribute of technologies—their ethical underpinnings. The importance of the characteristic will be underscored by providing examples of ethical choice in the application of growth monitoring.

As described earlier, there is wide variation in the "normal" anthropomentry of any population and so statistical procedures are used to demarcate levels of malnourishment. These demarcations are arbitrary, involving value judgements, and do not have particular physiological significance or "infallible prognostic value" (Gopalan, 1984). Yet, growth monitoring is used to select beneficiaries for specific interventions, in most instances benefits being made available only to a small proportion of children.

For example, in the Tamil Nadu Integrated Nutrition Project nutritional supplements are provided only to those children who are found to be severely malnourished. While this application of growth monitoring technology arises out of the desire of programme designers to improve the cost-benefit ratio of the nutritional supplementation scheme and is based on the finding that severely malnourished children are at much greater risk of mortality than moderately or mildly malnourished children (Chen *et al*, 1980), it loses sight of the arbitrary nature of the procedures used to grade children into defferent degrees of malnutrition.

Furthermore, the neglect of children who are moderately and mildly malnourished is a self-defeating strategy which Gopalan (1983) has termed a "nutritional policy of brinkmanship."

Political Implications That even "simple" health technologies are not free of political implications can be illustrated by growth monitoring, To evaluate nutritional status, a child's growth curve is usually compared with that of a "reference,' population. The most extensively-used reference standards are derived from data on Western populations (Stuart and Stevenson, 1959; Tanner *et al.*, 1966; WHO, 1978) but, their appropriateness has been questioned. Some scientists argue that the use of standards based on "dcveloped" populations, or even on the well-nourished in developing countries, sets unachievable goals for less weil-off communities, and unnecessarily inflates the malnutrition problem (Eusebio and Nube, 1981). Others maintain that such standards are useful as growth potential is more strongly influenced by environmental factors, such as nutrition, than by ethnicity (Habicht *et al.*, 1974, Stephenson *et al.*, 1983). Thus, the deliberate adoption of a lower "standard" would defeat the purpose of comparing a child's growth with his actual potential. It may amount to a 'political strategy' to keep less-developed populations at low levels of growth achievement. Similarly, since the manner in which "grades" of malnutrition are demarcated determines the extent of malnutrition in a population, "cut-off" points can be chosen so as to exaggerate or downplay the extent of malnutrition in a population. This is often done, for example, to reduce the numbers of undernourished children to proportions "manageable" within programme resources, "wiping out" malnutrition by a "redefinition of parameters" (Mitra, n. d.) !

Cost constraints. Besides such distortion of tcchnology to fall in with "practical resource constraints," there are, however, "real" cost constraints to the spread of technology. For example, the cost of growth monitoring may be so high as to prohibit its adoption by the health system at the national level. In illustration, one can examine just the cost of the weighing scales necessary. It has been estimated that a capital outlay of Rs. 3 lakhs and an annual recurring expenditure of Rs. 60,000 would be required to provide a single district of one million population with scales (Kumar, 1984). At the national level, an initial expenditure of Rs. 20 crores and an annual recurring expenditure of Rs. 4 crores would be required for the scales alone ! Stipends for village level-workers conducting the growth monitoring would amount to Rs. 55 crores per annum. In addition, the costs of growth charts, of training and supervisory inputs would need to be added. These expenditures would be infructuous unless other related services are provided. Thus, growth monitoring alone could consume a considerable proportion of the national health budget (see Chapter 8)! Although equipment may be 'donated' initially if programmes are envisioned on a

national scale, external assistanee may be counter-productive because 'adaptation' to local needs may be delayed or avoided altogether. Thus, the cost of manufacturing equipment and supplies locally is an important consideration for the long-run dissemination of a technology. In the short term, although a technology may be desirable, the resources it requires to be usefully operationalized may be impossible to martial.

Conclusions

To assess the capability of the health system to implement primary health care, field experience with a single primary health technology, growth monitoring, has been discussed. Although a technology may itself be 'simple' (growth monitoring is based only on a paper chart and a weighing scale !) a number of basic requirements must be fulfilled for a technology's potential to be met. Among these are: adequate logistics for the supply and maintenance of "hardware," appropriate training, deployment and supervision of manpower, proper programme organisation including integration with other services, targetted delivery, cultural acceptability, social organisation of clients, and evaluation. Clearly, with this list of requirements any programme could face severe operational difficulties. Several issues regarding primary health technologies emerge which are discussed briefly below, under 'economic,' 'social' and 'political' heads.

A. Economic Issues

The major 'economic' issue in health technology is the 'equity' vs. 'efficiency' question (Okun, 1975). Although high-cost technology is clearly seen as 'inequitable,' equity is the most important criterion for basic health technologies, for the major objectives of primary health care is to provide a basic level of health to all. On the other hand, efficiency is also important because the spread of simple health technologies must be at the same time "low-cost" and highly cost-effective".

However, the "low cost" of primary health technologies has not been adequately established. Considerations of cost must encompass organisational, manpower, logistics and 'hidden' costs besides the direct cost of equipment and supplies. In view of all these costs, 'efficiency' in the application of primary health technologies may be as important as equity. In fact, beyond a point 'quality' considerations might be more important than 'quantity.' As we have seen in the case of growth monitoring, large-scale applications of a technology may result in a mechanistic and ineffectual approach, while targetting the technology and ensuring additional inputs (eg, follow-up) may be far more "cost effective."

A given technology will be 'cost-effective' only in particular circumstances eg. at a specific level of development of the health service system, for it requires adequate development in order for results to be commensurate with the time, energy and financial resources expended.

This argument contrasts somewhat with that put forward by advocates of the "selective primary health care" approach (Walsh and Warren, 1980). A selective approach to the implementation of primary health care has been suggested on the premise that resources are limited, and hence that "total" primary health care is unattainable. This would mean that a large number of people would continue to be excluded from health care unless the 'prescriptions' are reduced to feasible proportions. Although growth monitoring is not included among the 'selective' primary health care interventions advocated, immunization, treatment of acute conditions (e.g. malaria), oral rehydration, the encouragement of breastfeeding, and other MCH, family planning and health education measures are listed. These interventions are largely aimed at young children and women in the childbearing years—the same target group that is the focus of growth monitoring operations. It has been proposed that these services can be provided sporadically (once every 4-6 months) through mobile health units. The cost "per patient contact" of such a strategy has been estimated as about one-fourth the cost of "total PHC" per caput.

However, this proposal overlooks several field realities that obtain in India (and most probably in other developing countries) from the 'mundane' (e.g. the inaccessibility of many villages by road transport but the existence (atleast in theory) of village-level health personnel to the profound—the attitudes of health service providers and the need for constant interactions between providers and clients. Even the implementation of 'selective' primary health technologies will require health services to be substantially upgraded. This will necessitate large resources.

B. Social Issues

The 'economic' issue of the cost of health technologies is inextricably linked to the social issue of their 'acceptability.' Primary health technologies are 'demand-oriented' and so clients' perceptions, attitudes and practices determine their acceptance, use and effectiveness. 'Cultural appropriateness' is of prime importance to the spread of a health technology. Unless appropriate, the technology will not be sought after by clients, it will only be perceived as having high opportunity costs. Even strenuous efforts by health workers will then be infructuous, and the technology will become 'costly.'

One aspect of 'cultural appropriateness' is the fit between the technology and the delivery system. Like pieces of a jigsaw puzzle, both these must interlock with the social milieu. It is the system delivering the technology that must adapt it to local conditions, and itself be amenable to changing in tune with local requirements. Although concern is often expressed about the extent to which communities can absorb a technology, it is more important to ask whether a given technology and the health infrastructure promoting it can adapt to community needs and constrainte.

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to their duties.

Vote of thanks was proposed by Mrs. Vikhono, Nursing Tutor, and a group of student nurses presented a role play on the year's theme which explained the theme more meaningfully and was enjoyed by all. The function came to an end with a grand tea party.

Miss Kirya Sole

WEST BENGAL

A one-day Workshop was conducted on February 21, 1987 at Imambara Sadar Hospital, Chiusurah, Hooghly, organised by Hooghly District Branch of TNAI West Bengal.

The subject chosen was 'Nursing Emergencies' for all categories of Nurses, Working in the hospitals of District, Hooghly.

The Objectives of Workshop were as follows:

(1) To provide opportunities for all categories of hospital Nurses to meet together and exchange their ideas in providing Emergency care to the hospital patients.

(2) To facilitate them to refresh their knowledge and provide nursing care promptly and efficient in Emergency situations at the hospital.

(3) To help them in self-development. Nurses from different hospitals of the district were very much interessed and there was very good response. The total number of those who attended was 31 participants, 49 observers and 15 guest members.

The methodology used in workshop was planary session, discussion, group work and group presentation. 5 major areas were selected on which Group worked, They were:

1. Heart Block and its management.
2. Diabeties and it management.
3. Burns (children 0-5 years) and its management.
4. Dog bites and snake bite and its management.
5. Easly detection of Breast Ulcer and Cancer.

After registration, the programme started with a short innovation. Secretary of District Branch of TNAI welcomed the gathering. Miss A. Pradhan Ex-A.D.H.S. (Nursing) of West Bengal inaugurated the Workshop. They stressed the need for a sound educational programme for the nurses and also emphasised on the need for such Workshops on Nurses' emergencies. Each session was chaired by Miss A. Pradhan.

Scientific Session I was arranged for lectures by eminent doctors and nurse teachers followed by discussions with the group. Scientific Session II started after lunch break. The session was mainly arranged for group work. The session started with a lecture on 'Legal Aspects of Nursing Emergencies' and introduction of group work.

The participants were distributed in five groups. Each group had a specific topic for discussion. Each group had its own leader and rapporteur and worked under the guidance of a resource person. Five resource persons were selected from hospitals, Regional Training School, GNM and ANM Training Schools.

The group work was presented before General Group and it was open for discussion. The session was concluded by the evaluation and vote of thanks.

Mrs. N. Ghosal

Primary Health Care Technology

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(C) Political Issues

Finally, one can examine a few 'political' issues, not unrelated to the economic and social ones discussed above. The most important is the issue of 'control' over technologies. Even though primary health technologies are intended to be spread to the population at large, the medical profession still exercises technical control over them, and the bureaucracy controls their administration. There have been few attempts at 'decontrol'. For example, while mothers are urged to bring their children to growth monitoring programmes, they are rarely taught how to conduct the weighing and charting themselves, much less to apply the findings to benefit their children. For that matter, even basic health workers are not taught the latter properly.

A related issue is the possibility that the aims of a technology may be subverted. Instead of "early detection" of child illness, growth monitoring can be used simply to select beneficiaries for feeding, or to collect information on mothers and children for family planning purposes. "Evaluation" of a technology implies assessing whether it is being used to achieve stated objectives, it is perhaps equally important to assess whether it is essential to doing so.

A third 'political' issue arises from the question—for whom is the technology intended? It is necessary to examine whether a technology really benefits the target group—or some other group, e.g., programme designers and administrators. Health technologies are not necessarily egalitarian in their consequences and so, if reducing differentials in health is an objective of policy, their application most be directed to benefit those most in need.

It is crucial to remember that health technologies do not function independently of the social, economic and political systems of which they are part.