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CONTENTS

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EDITORIAL

THE PROBLEM OF THE AGED

Human body is, the most wonderful machine which the Nature has ever ordained but like all other machines it also wears out with use and time and hence the question is what is and what should be its span. It differs from country to country and race to race, the average expectation of life at birth varying from about 40 to 75 years in current estimation. Several factors which seem to operate in this matter are climate, race, heredity, food, tradition, national income, standard of living, prevalence of disease, standard of environmental sanitation, knowledge nnd practice of health, quality of medical and health services etc. It is true that in the Western countries as in Russia people live long years, some reaching even 150 years ; in India too, there are records of long span of life in certain individuls for others to emulate them.

Although ageing is a natural and inevitable process in the living the condition of oldness can be considerably delayed and premature death averted to lead a longer average span of life as we have now partially succeeded to achieve in India. Better knowledge and application of health measures resulting in reduction of infant, maternal and general death rate and improvement of environmental conditions have increased our expectation of life at birth from 32 years in 1931 to about 54 years in 1975 and it is on its way to improve further in future. Such a condition is highly desirable but it is accompanied by a series of problems e.g. national, social (community and familial) and personal (physical, psychological and socioeconomic). These may be briefly referred here.

(a) *National*—With reduceed death rate and almost untouched birth rate there has been an alarming population growth with consequences now well discussed and well-understood by the people.

(b) *Social*—Aged persons can be real handicap to the family and society due to financial inadequacy, idle role in family and community, breakdown of joint family system.

(c) *Personal*—Sudden drop of income following retirement may leave the person with unfulfilled responsibilities like education and marriage of sons and daughters absence of shelter ete. Progressive physiological deterioration of body functions, frequent illness due to old age diseases, viz diabetes, polyuria, high blood pressure, asthma, heart trouble, cataract and partial blindness and deafness, and tuberculosis and paralytic conditions etc. There is also reduction of mental functions along with that of physical activities. Sometimes there is nervous breakdown and psychological set back arising out of financial difficulties and sense of neglect. In a recent survey in Calcutta and suburbs 72 percent of persons between 60 and 65 years received no pension, 66 percent had no provident fund, 16 percent had no reserve money and 36 percent had little money; 48 percent were underfed and many of them were living practically unattended. In this connection the readers are referred to the two recent books one entitled "Our Elderly" by Dr. J. D. Pathak of Bombay and the other "The problem of the Aged" by Col. Barkat Narain of New Delhi both of which are intended to direct our attention to the problem and need for community action. Both have been reviewed in this journal (2 & 3).

In fact, Geriatric Medicine is a growing science although it was wellknown to the ancient Indians who prescribed various remedies like Kaya-Kalpa and yogic exercises and dietetic regime. If the society is to make a suitable response to the members of the ageing population it will have to look at the problem from the following view points: (1) extension of age of retirement whereever possible. (2) creating an environment where unattended old people may remain as useful member of the society or family : 3) providing facilities and services for those in whom ageing process leads to malnutrition, disease, social isolation and personality deterioration; (4) establishment of public and private guidance and treatment clinic; (5) provide recreational and religious discussion centres to keep them mentally engaged and cheerful; (6) introduction of gerontology and geriatric studies and training courses in medical colleges; 7) enactment of a legislation on the lines of British law of National Assistance Acts of 1948 to overcome financial dependence on friends, relations and even sons and daughters which is often very vexing. Some countries provide old age pension but this may not be possible in our country under the present circumstances but certainly suitable plans can be made to help them financially in return of some types of services. After all, the society should remember*.

"Youth gives you vigour and the old knowledge and wisdom".

S. C. Seal

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3. Barkat Narain (1979) "Problem of the Aged" Skin Institute of public science charitable Trust. New Delhi. Reviewed in I. J. P. H. **23**

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GERIATRICS

Col. Barkat Narain*

Geriatrics is a branch of Gerontology and medicine which is concerned with all the aspects of the health of the aged—preventive, clinical, remedial and rehabilitative service.

Gerontology may be defined as a scientific approach to all aspects of ageing, i.e. health, sociological, behavioural, economic, environmental, etc. It is a multi-disciplinary field.

Ageing is a universal process and should be regarded as a normal biological phenomenon. From the biological and psychological points of view, ageing starts with a slow degeneration process of bodily organs and is characterised by a reduction in the ability to adapt to environmental changes and to the stresses of living. Responses to stress are slower and the elderly need much time to adjust in psychological states. No one knows when old age begins. Biological age is not identical with one's chronological age. The process of ageing varies with individuals and even in the same individual different organs age at different periods. Some begin to look old at 50 while others look young at 65 and 70. For statistical purpose the chronological age of 60 and above is considered as old age. This is the accepted old age for social security and pension schemes.

Ageing is a global problem

For individual human beings, the 20th Century has meant a major increase in the life expectancy particularly in the more developed countries. Prior to 1950s, there was hardly any data on life expectancy available for many of the developed countries and practically none for the developing countries. The past decades have witnessed gradual, and in some cases dramatic, increase in the life expectancy of people in some of the regions of the world (see table No. 1). This achievement has been due to the improvement in socio-economic conditions, improved public health and preventive services and advances in medical technology.

Increase in life expectancy has brought about a demographic increase in the ageing population of the world. The projected continuous reduction in gross reproduction rates and continued increase in life expectancy in all regions of the world will result in increased ageing of the world population in the near future as shown in table No. 2.

In most countries, the phenomenon of ageing in human population is having a profound effect upon the structure and functions of the family, the work force and economic

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policies, the goals and organizations of health and social services and the policies and practices of the Government.

Extent of the problem in India

The problems connected with old age are relatively new in India as in most of the developing countries. Untill recently, the concern of the scientists in the medical profession was largely limited to the promotion of health and prevention of diseases of the vulnerable groups consisting of infants, pre-school and school age children and the expectant and the lactating mothers. The health and the social and economic needs of the young in growing population were all absorbing.

This limitation of interest was the heritage of a time of relatively short life expectancy when a small protion of the population servivived beyond the middle age and the group above sixty was scarcely visible. It posed very few, if any, general social problems. Furthermore, the life style of the early period was such that the role and care of the aged required minimum intervention from agencies outside the family. In India, as part of the social and cultural pattern, it was considered rhe duty of the family to minister to the needs of the elderly relatives. The old people were, in many families and are still, held in great respect.

With improvement in socio-economic conditions and health services, these is a reduction in infant mortality and early childhood through immunisation, control of infectious and contagious diseases, eradication of small pox and continued efforts to eradicate malaria and control of other insect—borne diseases. As a result, there has been an increase in the life expectancy from 27 years in 1947 to about 53 years today. The family welfare programme has also contributed to this increased life expectancy. This has brought about a gradual increase in the population of people 60 years of age and above. (see Table No. 3).

Implication of increased longevity

Longevity has an implication on the structure of the family. When the elderly were few, there was a place for them in the social structure of the community. Past values and traditions supported older persons in the family and the community.

As a result of industrialisation a large number of educated and technically trained persons from the rural areas are moving away from the villages leaving the elderly persons behind. Those who are anxious to take the elderly people with them, find it difficult to do so because of the limited accommodation and a feeling that the new physical and social environment may not suit the elderly people. Moving to new environment means adaptation to new and unfamiliar physical conditions which is difficult for the elderly.

The other implications relate to the changing health needs of the elderly persons. Such needs and conditions differ significantly from those of the young. With increased longevity there is a related increase in the chronic illness and long term disability requiring new approaches to medical care and delivery of health and social services. Special efforts will have to be made for health and social manpower requirements and training for meeting the health and social needs of the ageing

population. Finally, there are special implications with regard to the economic security, housing, health services, education, transportation and facilities for recreation.

Health problems of the aged

Health problems of the aged are an integral part of the social and economic mileu of the community-proverty being the basic factor. Illnesses in the elderly are manifested by a variety of physical and psychological symptoms. These diseases are generally of a long term nature which had been neglected in the middle age or even earlier.

Morbidity and mortality rates are higher in the elderly persons because of low resistance and lack of adaptability to the changing environmental conditions (physical and social), to the stress of living and the degerative changes that have been taking place in the human system organs. The elderly have a higher threshold of putting up with pain and minor disabilities and seldom complain much. The sedentary nature of their living and reduced activities mask the early symptoms of cardiovascular and pulmonary diseases and certain other ailments.

The most common diseases resulting in disability and incapacity are the cardiovascular and cerebrovascular, respiratory and diseases of the locomotor system. There is an increase in the incidence of malignancy, diabetes and accidents in the elderly person. In addition, they may develop infection of the urinary tract, renal calculi, enlargement of the prostate, glaucoma and cataract. There is reduced effectiveness of perception, vision and hearing.

Aged patients may also display some psychiatric disturbances, largely somatic in origin and frequently reversible.

Preventive health services

In the conventional sense the phrase 'preventive service' means immunisation of infants, pre-school and school age children, maternity and child health and improved enviromental sanitation. Nutrition is a very important factor in promotion of health and prevention of diseases. So far Geriatrics is the last area to be associated with preventive means in the minds of the majority of the physicians, yet prevention is not only most important when dealing with elderly people, but it can actually be a life saving factor in the aged patients.

In the aged, prevention is seldom primary, i. e. total prevention of disease, but mostly secondary, i.e. prevention of deterioration of the existing conditions. Objectives of preventive health care for the aged are :

(1) To preserve, as far as possible, the physical health of the individual as age advances ;

(2) To maintain their mental health ; and

(3) To preserve their social standing.

The objectives can be achieved by means of (a) health education, and (b) routine health check-ups.

(a) *Health Education*

If affects the elderly in promoting and maintaining health and preventing physical and mental ill heath and disability. Many problems of ageing can best be taken care of

if health education is imparted to them in their middle years. They should be told about healthy living, mental health, dental health, proper nutrition, prevention of accidents, proper use of leisure and how to prepare for retirement and old age. Health education is also of great value in making people aware of the existence of health service and its utility. The general public has to be educated to accept that increase in the aged population is a natural consequence of improvement in the social and health services and that old people have a rightful place in society.

(b) *Routine health check-up*

It is a valuable medium for health education and for early detection of disease and its treatment. Health examination should start as soon as possible from the age of forty-five. At that time it has a great value, not only as a means of detecting incipient diseases, but as a basis for health promotion. Thorough physical examination includes blood pressure readings, ECG, X-rays, complete urine, stool and blood tests. In doubtful cases, sugar tolerance test, blood chemistry, liver and kidney function tests are also essential. In the elderly persons scanning for malignancy is a must.

These tests combined with personal and family history can reveal if the person has hypertension or diabetes or a tendency towards diabates. Early stages of any degerative disease, which the elderly persons will be prone to can be found out at this time. Early detection and prompt treatment can cure the malady or prevent further deterioration.

Routine health check-ups act as extension technique in creating health consciousness and a desire for healthful living in the young and the elderly persons.

Nutrition

One of the major problems of old age is nutrition. There is enough data available to indicate that with advancing years changes occur in biochemical and physiological characteristics, tissues and cells which impair their functions. Changes in the intestinal mucosa impair the absorption of nutrients. As a result of these factors dietary deficiencies may occur. Due to loss of teeth and ill fitting dentures consistency of food for the elderly persons should be suitable for mastication. An element of roughage in the food is necessary to maintain bowel movement and counteract the tendency towards constipation.

Adequate fluid intake must be maintained especially during summer. Water can be consumed in the form of milk, butter-milk, nimbo pani (lemon water), fruit juices, etc.

There is a reduction in energy metabolisms in the e derly due to loss of tissue and reduced activity. Therefor, the calories intake in the elderly persons over 60 years should be about 25% less than those for normal adults, i.e. about 1800 for male and about 1600 calories for female in temperate climate. There should be no decrease in other nutritional needs like protein, fat, etc. but there is a special need for adequate amount of vitamins, especially 'C' and 'D', calcium and iron. Care should be taken so that the elderly do not get over-weight.

Prevention of accidents

The incidence of accidents increases in old age. Such accidents generally result in fracture, mostly of the pelvic and the head of the femur. Osteoporosis is considered to be one of the major causes.

To prevent these accidents, houses and other facilities should be designed to provide optimum safety and convenience for all age groups, including disabled persons. Special attention should be paid to the construction of floors, stair-cases and bath rooms. The floors and steps of stairs should be non-slippery. Carpets, rugs or other floor covering should be fixed in such a manner that there is no danger of tripping. Bath rooms and stair-cases should be provided with hand-rails. This will give support to the aged person when moving about in the bath room or climbing the stairs. Tables, chairs and other furniture in the room should be so arranged as to provide free movement without the risk of hitting against them. The rooms should have good lighting and ventilation. A dim light should be kept on to assist the elderly to go to the toilet or move about at night or in the dark.

Falls

Apart from the accidents, the elderly persons are prone to falls due to a number of reasons, such as dizziness caused by anaemia, low blood pressure or high blood pressure and arrhythmias. Certain normal movements like bending the head backward or turning it suddenly to one side can result in a fall. Taking aspirin to relieve aches and pains, sleeping pills or drugs for high blood pressure may cause 'vertigo' which may also result in a fall.

Those who have had an attack of dizziness or a fall may be constantly apprehensive of insecurity and fear. It is advisable to consult a physicien for treatment and reassurance in such cases.

Exercise

It is essential that the elderly person should have a regular programme of some form of physical activity and exercises compatible with the physical and temparamental status of the individual. Exercise improves blood circulation and helps to preserve the muscle tone. It is good for mental and social health. Recreation and hobbies are necessary to avoid boredom and prevent the aged from getting lonely, particularly those who are living alone.

Rehabilitation

It is an integral part of medical care. W.H.O. has defined rehabilitation as "The combination and coordinated use of medical, social, educational and vocational measures for training or re-training the individual to the highest possible level of vocational ability. Rehabilitation of the aged patients is most important to boost their physical, emotional and mental attitude and gives them confidence to look after themselves. This improves their social status.

Research

Research is basic to formulation of plans and implementation of programmes and services.

In the developed countries research is going on in the field of biometry, sociology, demography, health, psychology and economics as related to the elderly group. Research centres in Gerontology have been set up in many universities and medical institutions. It may be necessary to organise multi-disciplinary research involving the disciplines mentioned above.

Evaluation

It is useful to learn whether the correct assessment was carried out to identify the social and health needs of the elderly group, and if the staff had the correct attitude and skills to perform their duties properly, such assessment will help to formulate suitable training programmes. Evaluation helps to determine which programmes should be continued with or without modifications.

It is also essential to evaluate if the existing agencies, infrastructure and resources were adequate for the programme and if they were fully utilised.

In fact, evaluation is necessary if the complex process of providing social and health services for the aged has to be administered efficiently, effectively and economically.

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Table—I

Expectation of life at birth in selected countries of the world

Country	Year	Age in years		Total
		Male	Female	
1. Egypt	1961	51.6	53.8	52.7
2. Ethiopia	1970-75	36.5	37.6	38.1
3. Kenya	1970-75	48.3	51.7	50.0
4. Mauritius	1974	61.9	67.3	64.6
5. Nigeria	1970-75	39.4	42.6	41.0
6. Sudan	1970-75	47.5	49.9	48.6
7. Brazil	1970-75	58.5	64.4	61.5
8. Canada	1973	69.5	77.0	73.3
9. Mexico	1972	61.0	69.0	63.0
10. U. S. A.	1973	67.6	75.4	71.5
11. Afghanistan	1970-75	39.9	40.7	40.3
12. Bangladesh	1970-75	35.8	35.8	35.8
13. Burma	1970-75	48.6	51.5	50.1
14. India	1971-76	50.1	48.8	49.5
15. Indonesia	1970-75	46.4	48.7	47.6
16. Iran	1970-75	50.7	51.3	51.0
17. Iraq	1970-75	51.2	54.3	52.8
18. Japan	1973	70.9	76.3	73.6
19. Malaysia (West)	1969	63.8	66.7	65.3
20. Nepal	1970-75	42.2	45.0	43.6
21. Pakistan	1970-75	49.9	49.6	49.8
22. Philippines	1970-75	56.9	60.0	58.5
23. Singapore	1970-75	67.4	71.8	69.6
24. Sri Lanka	1970-75	66.3	69.3	67.8
25. Thailand	1970-75	55.4	60.8	58.1
26. France	1973	69.5	77.3	73.4
27. Germany (GDR)	1967-70	68.9	74.2	71.6
28. Germany (FRG)	1973	67.8	74.4	71.1
29. U. K.	1970-72	68.9	75.1	72.0
30. Yugoslavia	1970-71	65.3	70.1	67.7
31. Australia	1970-75	69.3	75.6	72.5
32. New Zeland	1970-75	68.9	75.2	72.1
33. U. S. S. R.	1970-71	65.0	74.0	69.5

Source : 1. Demographic Year Book, U. N. 1973
2. World Health Statistics Annual Vol. 1, 1973-1976 W. H. O.
3. Population Council Report No. 2 (7th Edition, October 1975, New York)

Table—2

Population estimates for 1970 and projections 1985 and 2000 by major regions

	Year	Total Population	In thousands Population 60 yrs and over	% of the total population
World Total	1970	3,631,696	290,697	8.0
	1985	4,933,463	406,759	8.2
	2000	6,493,642	584,605	9.2
More developed regions	1960	1,090,297	153,741	14.1
	1985	1,274,995	188,602	14.8
	2000	1,453,528	231,105	15.9
Less developed regions	1970	2,541,501	137,024	5.4
	1985	3,758,468	218,474	6.0
	2000	5,040,114	353,917	7.0

Source : Population Division, Department of Economic and Social Affairs, U. N. General Assembly (Working Paper No. 37—December 1971).

Table—3

Census		Million	% total populatiotion
1961	60 yrs and above	21.5	4.9
1971	do	28.6	5.2
1976 (midesti mate)	do	32.1	5.3
1981 (esti-mated)	do	37.1	5.5
1986 (projec-tion)	do	43.4	5.9
1991 (projec-tion)	do	51.2	6.4

Source : Registrar General of India (1976).

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URBAN AGED POPULATION—A SOCIAL STUDY

Dr. S. K. Mehrotra[1], Mr. D. N. Pandey[2] and Dr. S. B. Dabral[3]

Introduction

Since independence achivements of modern medicine have enhanced the life span of Indian people through the control of major communicable diseases and improved social conditions. Thus it has brought to the forefront the social, medical and psychological problems of the aged people. Although ageing is a normal, inevitable biological phenomenon but no one knows, when old age begins, and the details of the disabilities incident to the ageing process. So far in India only one rural based community study on social medical problems of the aged people was carried out by Baldeo Raj et al (1970). Hence in this study the social and medical problems confronted with, urban aged people has been studied.

Material and Methods

For the study a survey was carried out among the aged persons (55 years and above) in the registered families of the urban health centre, Loha Mandi of the department of Social and Preventive Medicine, Medical College, Agra. Through door to door visit to these elderly persons during January to May, 1975 their social data e. g. age, sex, marital status, religion, occupation, literacy status, nature of family, economic status etc. and morbidity status were recorded on a predesigned schedule. A total of 178 aged persons representing 6.88 percent of the total population were studied.

Observation

The aged population (55 years and above) constituted nearly 6.9 percent of the total registered population (2586) of the Urban Health Centre, out of which 53.4 percent were males and 46.6 percent were females.

Majority (34.3%) of the persons were in the age group of 60-64 years with predominance of females over males, while in other age groups males were more than females (Table 1).

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Table—I

Distribution of age and sex

Age Group (Year)	Sex				Total		Percent age of total Population
	Male		Female				
	Number	Percent	Number	Percent	Number	Percent	
55-59	24	25.3	20	24.1	44	24.72	1.7
60-64	29	30.5	32	38.5	61	34.27	2.4
65-69	16	16.8	10	12.1	26	14.61	1.0
70-plus	26	27.4	21	25.3	47	26.40	1.8
Total	95	53.4	83	46.6	178	100.00	6.9

84.8 percent were Hindus followed by 13.5 percent Muslims and 1.7 percent Sikh. Regarding the marital status of these aged 99.5 were marrid, including 22.5 percent widow, 11.8 percent widower and 0.50 percent were bachelor.

Among the aged population only 38.7 percent were educated and rest of them (61.3%) were illiterate. As a whole literacy level was much higher among males (54.7%) than females (20.9%) and among the educated ones again males had higher qualifications than females.

Table—II

Sex-wise economic status of aged population

Income group (Rs) per capita/month	Sex				Total	
	Male		Female			
	Number	Percent	Number	Percent	Number	Percent
Below—25	16	16.8	1	14.5	28	15.7
26—50	30	31.6	33	59.7	63	35.4
51—75	22	23.2	16	19.3	38	21.4
76—100	13	13.7	15	18.1	28	15.7
101—plus	14	14.7	7	8.4	21	11.8
Total	95	53.4	83	46.6	178	100.00

The largest aged population (35.4%) fell in the income group of rupees 26.50 per capita per month while the smallest one (11.8%) was having rupees 101 and above as per capita income per month. As a whole more than 50 percent of the geriatric population had per capita income less than Rs. 50 per month (Table II). The average per capita income in males and females was Rs. 57.5 and Rs. 54.6 respectively.

All the females were housewives while amongest males maximum (32.6%) were labourers followed by businessmen (24.2%). The remaining were service holders (12.6%), pensioners (16 8%) and 13.7% were unemployed.

Nearly 72 percent of the elderly population were living in joint families while the remaining were in nuclear families. More than 52.0 percent of the aged were dependent on family members for their livelihood.

Approximately 43 percent aged population showed illness during the period of survey. Amongst these sick persons females suffered more (73.7%) than males (26.3%). The respiratory tract infections (bronchitis, emphysema, asthma etc.) other than pulmonary tuberculosis cases were maximum (31.6%) followed by skin infections (15.8%) and diarrhoeas and dysenteries (14.5%), nutritional deficiencies (11.8%) and miscellaneous group (10.5%). The miscellaneous group includes helminthic and parasitic diseases, viral fever, probably dengue (five cases) and accident (1 case).

Table—III

Sex-wise morbidity of aged population.

Morbidity	International code No. W.H.O. 1967	Male		Female		Total	
		Num.	%	No.	%	No.	%
1. Dysenteries and diarrhoeas	004, 006 & 009	3	4.0	8	10.5	11	14.4
2. Tuberculosis	010-019	2	2.6	3	4.0	5	6.6
3. Nutritional deficiencies	260-269	1	1.3	8	10.5	9	11.8
4. Ocular lesions	077, 360 & 374	—	—	4	5.3	4	5.3
5. Respiratory diseases	490, 493, 518 & 519	7	9.2	17	22.4	24	31.6
6. Skin infections	680-686	3	4.0	9	11.8	12	15.8
7. Arthritis and Rheumatism	710-715	1	1.3	2	2.6	3	4.0
8. Miscellaneous	061, 126, 133 & 882	3	4.0	5	6.6	8	10.5
Total		20	26.3	56	73.7	76	100.00
Percentage of total aged population			21.0		67.5		42.7

Discussion

In India urbanisation, industrialisation and increasing life span has enhanced the community health problems particularly of the ageing population and requiring therein the community assistance to fight its triple evils of proverty, loneliness and ill health. The aged population (55 years and above) has increased from 7.87 percent (Census, 1961) to 8.24 percent (Census, 1971) while in this study 6.9 percent were aged beiug maximum i.e. 2.4 percent of the population in the age group of 60—64 years which is in accordance with the 1971 Census population e.g, 2.61 percent. Aged males were more than aged females against 8.9 percent males and 8.18 percent females of 1971 census. The observed sex ratio of 874 females per 1000 males is slightly higher than 1971 Agra Corporation census sex ratio of 833 per 1000 males ; 84.8 percent geriatric persons were Hindus which is in accordance with the 1971 census were 88.09 percent in Urban areas of Agra (Chandresehar, 1972). Amongst the aged population 99.5 percent were married including 22.5 percent widows and 11.8 percent widower, whicd is almost similar to 1971 census figure, the respective percentages being 97.92, 29.34 and 10.15 (India, 1975). 38.7 percent aged people were literate which is higher than India's literacy rate of 29.0 percent (Census, 1971). Literacy and higher educational qualifications were obviously more in males than females. 51.1 percent geriatric cases were of low economic status having per capita income less than Rs. 50/- per month. More than 52.0 percent aged were dependent on their family members, the majority being represented by the female aged as they had no source of income. Amongst males 30.1 percent were either unemployed or on meagre pension.

The morbidity status of these aged people revealed that 42.7 percent had some illness during the period of study, the illness rate being higher in females than males. Beldeo Raj et al (Loc. cit) also found 52.2 percent disease prevalence rate amongst the aged population in a rural area of Lucknow but however, they observed illness rate more in males than in females. The morbidity pattern of the studied geriatric population showed that the majority i.e. 31.6 percent persons had respiratory tract infections other than pulmonary tuberculosis followed by skin infections (15.89%) and diarrhoea and dysentery (14.5%) while Baldeo Raj et al (Loc. cit) found major illness to be helminthic infestations (28.0%), ocular lesions (27.4%), arthritis (17.1%) and respiratory illness (15.2%). This difference may be due to the long period of study confined to urban registered families.

The psychological stresses and strains and impacts of urbanisation and industrilisation was not much in the studied population because 72.0 percent aged people were in joint families and were taken care of by their offsprings. There was no frank case of mental disorder.

Summary

Aged population amongst the registered families of urban health Centre, Loha Mandi, Agra were 6.9 percent, the majority being males of 60-64 years. Nearly 95.5 percent were married and more than 60.0 percent were illiterates. Approximately 52.0 percent were of low socio-economic status and dependents. 42.7 percent aged people had some

morbidity, predominantly respiratory illness, skin infections, diarrhoea and dysenteries. Psychological disorders were not observed.

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CONTROL OF CHOLERA EPIDEMIC ARISING FROM PAINGANGA PROJECT, MAHARASTRA, 1977

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Introduction

The Painganga Project in Maharashtra consists of construction of a dam and canals on the Painganga river. The project is situated near the tri-junction of Yeotmal, Parbhani, and Nanded districts, the river forming the boundary between Yeotmal and Parbhani districts. The nearest taluka headquarters are Pusad in Yeotmal district, 38 km to the north and Kalamnuri in Parbhani district, 18 km to the east of the project.

In February 1977, about 2,500 labourers were employed by different contractors on the project work, and resided with their families in temporary hutments scattered on both banks of the river near the site in an area of about 10 sq. km. They used water from wells in the vicinity and also river water partially stagnated because of a temporary bridge over the river. Constructed latrines were not available for this population and the river banks were used for defecation. In adddition to this population, about 2,500 individuals comprising of employees of the Irrigation and Power Department and their families resided in a colony on the Yeotmal side of the river. The water-supply to this colony consisted of piped chlorinated water from a well. No Medical Officer was stationed at the project site to provide health care to this population.

The Medical Officer I/C Civil Dispensary, Kalamnuri, was informed on 17th February 1977 that cholera/gastro-enteritis cases had occurred at the project site and that two deaths had already taken place. The Medical Officer immediately rushed to the site along with the Medical Officer I/C Primary Health Centre, Masod, who happened to be visiting him, to investigate the report, and to start anti-epidemic measures. Subsequently other officers visited the site for control of the epidemic. The mesures taken for control of this epidemic and the results obtained have been reported as they are likely to be of interest to those who may have to shoulder the responsibility of containment of such an epidemic.

Material and Method

A rapid epidemiological investigation of the reported outbreak was carried out. Arrangements for treatment of the patients

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were made at the project site. Stool samples in V.R. fluid and rectal swabs in Alkaline Peptone were sent to the laboratories for bacteriological diagnosis. Measures were taken to ensure safe water supply and to break the transmission at the site. Different authorities were notified of the outbreak.

On realization that a large number of labourers have fled from the site due to fear of cholera, the villages and districts of their origin were found out. The health authorities of these areas were notified, and the district authorities were requested to take steps for conferring legal powers necessary to control the epidemic. Surveillance teams were formed to keep under observations the villages/areas andthe labourers migrating there to prevent/detect/manage cases of cholera by taking immediate suitable measures.

Results and comments

Results of Epidemiological Study :

A rapid analysis of the situation led to the view that the epidemic was water-borne and was probably caused by consumption of river-water stagnated on the upstream side of temporary bridge. Residents of hutments consuming water from this source reported occurrence of gastro-enteritis, while none occurred in the residents of the colony supplied with piped chlorinated water. Attacks were recorded in both sexes and at all ages. A child who had visited the project site for half a day, had consumed stagnant water while eating food brought with her, had immediately gone back to her native village and started having severe gastro-enteritis three days later, and thus provided additional circumstantial evidence.

Clinical and bacteriological diagnosis

Clinical examination of patients showed severe dehydration and other manifestations typical of cholera. Bacteriological examination of a sample taken from the stagnant pool of water did not show presence of *V. cholera*, but showed that it was unfit for human consumption, with the presence of 1800+ coliform organisms per 100 ml. Stool samples and rectal swabs were positive for *Vibrio Cholerae* (El tor) of Hikojima, Inaba and Ogawa serotypes.

Management of cases in Isolation Ward

An isolation ward was started in the rest-house at the site with the staff of 5 medical officers, 6 nurses, 2 sanitary inspectors, 2 block level supervisors, 3 vaccinators and 5 attendents. Adequate stock of all necessary equipment, drugs and rehydration fluids were provided. Concurrent disinfection was carried out using 10% phenyle. Out-door treatment facilities for the popu'ation resident at the site were also provided. The distribution of patients admitted to the ward according to the district of their origin is shown in Table I, All of these patients were staying at the site in the period of previous one week.

Table I

Attacks and deaths due to cholera in Isolation Ward, Painganga Project, according to villages and district of origin

District	Number of villages of origin	Attacks	Deaths
Yeotmal	35	105	5
Parbhani	23	54	2
Nanded	4	6	—
Osmanabad	1	2	—
Akola	1	1	—
Total	64	168	7

Provision of safe water-supply

Police constables were posted round the clock at the stagnant pool to prohibit the use of this water. A survey at the site revealed the presence of several wells in use which were all insanitary. Samples of water were not collected from wells, for bacteriological analysis but daily disinfection of these wells with bleaching powder was started. When supprise checks revealed that some samples had no residual chlorine while some samples showed super chlorination, Horrocks test was performed and chlorination at a proper dose twice daily was ensured. Tankers were used for safe, chlorinated water for workers working on the construction of dam and canals extending for about 5 km on the left bank and 7km on the right bank. Sanitary Inspectors and other staff were given ortho-toludine reagent and were instructed to carry out checks to ensure that there was development of a distinct yellow colour in treated water, as demonstrated to them.

The weekly market held on sundays at the site was not banned in view the inconvenience to the population. However, precautions were taken to minimise chances of transmission of infection. A special sanitary squead was posted to ensure provision of safe water supply, anti-fly measures, and protection of edibles from exposure.

Control of Centrifugal Spread

As soon as the cholera epidemic broke out at the site, a large number of labourers fled in panic and started going back with their families to their original villeges. The main challange was to prevent/detect/control the centrifugal spread of cholera from the site to these villages spread over an extensive region by the migrating population. Information collected from the various subdivisional officers and contractors at the site revealed that the labour strength had dwindled daily from about 2600 on 14.2.1977 to about 1,200 by 21.2.1977. Enquiry regarding the villages of origin of the labours revealed data presented in Table I.

Coordination

The area of control operations thus extended over at least three districts, under the jurisdiction of Deputy Director of of Health Services of two public health circles. A Control Centre for activities in Yeotmal district was established at the Project site and that for Parbhani district at Kalamnuri, and a close contact was established between the two. With frequent communication and meetings, the whole control operations were coordinated in such a way that a senior officer was continuously in command of the total operations.

Notification

As requested by the district authorities the Government of Maharashtra declared on 28.2.1977 under section 16(1) (a) of the Hyderabad Infectious Diseases 'Act (Act XII of 1950) that Parbhani and Nanded districts were threatened with cholera and appointed the respective District Health Officers as Cholera Controlling Officers, with special powers conferred on them. Similarly on 25.2.1977, under section 2(1) of the Epidemic Diseases' Act (Act III of 1897), Yeotmal district was declared as threatened due to cholera.

Surveillance

For prevention and early detection of cholera in migrating labourers and other population, villages and areas likely to be visited by them and river-side villages were kept under surveillance. For this purpose, surveillance teams were formed, 6 in Parbhani district covering 34 villages and 6 in Yeotmal district covering 48 villages. Each team was led by a Medical Officer, and other members generally consisting of 2 auxiliary nurse midwives and 2 vaccinators. A separate vehicle was provided for each team. Team members were to visit villages according to schedule given to them and contact the Sarpanch and Police Patel in each village. They were then to ascertain if any attack/death due to cholera or gastro-enteritis, had occurred in the village, in which case *a panchnama* was to be carried out. The Medical Officer was to start anti-cholera inoculation work with the help of A.N.M. and ensure disinfection of wells with the help of vaccinators. Every evening the team-leaders of Parbhani district were to report to Kalamnuri and those from Yeotmal district were to report to the project site.

From 10.3.1977, the surveillance was intensified further in Parbhani district, by addition of 10 Medical Officers, 4 Sanitary Inspectors, 4 Malaria Inspectors, 16 Malaria Surveillance Workers, 16 Vaccinators and 12 A.N.M. The additional paramedical staff, instead of forming mobile teams, was posted at the villages where cases had occurred. Medical Officers were posted in four selected villages with all provisions necessary for management of cholera. On some occasions, domiciliary treatment of patients with intravenous infusions was also arranged. The District Health Officers, Nanded, was informed about the names of villages from which some labourers had come to the site and was requested to take anti-cholera measures.

It was noticed during the surveillance that cases of cholera had occurred in 37 villages of Yeotmal district and 27 villages of Parbhani district, including some villages from where no one had gone for works at the project. The distribution of the cases according to the method of detection and residence at the time of occurrence is shown in Table II. Table III shows the time-distribution of cases treated at the site and of those detected during surveillance, according to dates of onset.

Table—II

Cholera cases and deaths occuring at Painganga Project and detected in surveillance

District	Number of villages reporting cases	Population of villages reporting cases	Number of cases			Number of deaths	Case fatality %
			treated at Project site	detcted in surveillance	Total		
Yeotmal	37	44, 445	105	174	279	18	6.5
Parbhani	27	40, 522	54	44	98	6	6.2
Nanded	—	—	6	—	6	—	
Osmanabad	—	—	2	—	2	—	
Akola	—	—	1	—	1	—	
Total	64	81, 967	168	218	386	24	6.4

Table III

Onset of cholera cases occurring at the project site and cases detected in surveillance

Period	Cases occuring at Project site	Cases detected in surveillance	Total Cases
14-16 Feb	3	—	3
17-19 Feb	2	2	4
20-22 Feb	68	8	76
23-25 Feb	37	23	60
26-28 Feb	32	31	63
1-3 March	14	92	106
4-6 March	11	95	66
7-9 March	1	1	2
10-12 March	—	6	6
13-15 March	—	—	—
Toal	168	218	386

It is evident from Table III and Graph 1 that the occurrence and subsidence of cases at the site is followed a few days later by occurrence and subsidence in the surrounding areas of Yeotmal and Parbhani district as detected by surveillance. Stool samples from some of the cases detected in surveillance were positive for *V, cholerae*.

Protection of Water Supply :

In the villages covered by surveillance, daily disinfection of water was ensured by the visiting teams with the help of local residents. In the villages where running water formed the source, the place from which water was to be collected was fixed and a person was posted at that place with freshly prepared solution of bleaching powder, for addition of a few drops to the pots. Occurrence of cases indicates transmission before disinfection of wells was started, or food-borne and contact spread of cholera.

Anti Cholera Inoculations :

The surveillance teams also carried out the work of giving anticholera inoculations, and more than 1,15,000 inoculations were carried out at the site and the villages under surveillance.

Control of Fairs :

Two fairs, each drawing about 25,000 persons, were due in the vicinity of the site in two adjacent talukas of Parbhani district. The Executive Magistrates on request banned the fairs under section 17 of the Hyderabad Infectious Diseases Act, 1950, in view of the risk of dissemination of cholera.

Publicity :

All the labourers and their families were informed through their contractors and leaders to use treated water only and to report for treatment at the earliest in case vomiting/ diarrhoea developed. The residents of villages in the vicinity were similarly informed through tehsildar, police patel and gramsevaks.

Conclusions :

On occurrence of an outbreak of cholera at a project site, a large number of labourers panicked and started migrating back to their original villages. An appreciation of the potential danger of centrifugal spread of cholera enabled anticipatory measures to be taken. Coordinated control operations with mobilization of resources, formation of surveillance teams and promt containment measures, enabled control of the epidemic at the site as well as in the surrounding area.

Acknowledgement

Many individuals participated in the control operations. We must mention the contribution of Dr. P. B Adhange, District Health Officer and Dr. M. V. Pandit, Assistant District Healt Officer, Parbhani, and Dr. W. G. Hadole, District Health Officer, Yeotmal. Dr. B. L. Deshmukh, Assistant District Health Officer, Yeotmal, was I/C Isolation Ward and provided valuable information. Dr. V.P. Misale, Medical Officer I/C Civil Dispensary, Kalamuri, initiated the control measures. The bacterial isolations were made at Public Health Laboratories at Aurangabad and Nagpur, and Microbiology Department Medical College, Aurangabad.

INDIAN JOURNAL OF
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CHOLERA IN RAJASTHAN

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Introduction :

The geographic distribution of cholera has considerably changed ever since the introduction of El Tor vibrio. Certain states of India, which were free from the disease have become endemic foci whereas seven to ten states used to report cholera prior to appearance of El Tor in the country. The state of Rajasthan, till 1960., was considered as non-endemic area for cholera (Seal, 1960[1], Patnaik and Kapoor, 1967[2]), and in the event of an outbreak the disease was considered to be imported from other endemic states or countries and from fairs and festivals.

Material and Method :

The present study is based upon the observations and the activities of the State Cholera Combat and Cholera mobile teams and the records of the Medical & Health Directorate of Rajasthan. It highlights the current status of cholera and extent of the problem in the state for the period 1968 to 1977. It also presents some of the observations of he cholera control programme which has been initiated in collaboration with various medical colleges of Rajasthan, in the year 1972-73. The diagnostic criteria till 1974 for labelling a case as cholera was that in an outbreak even if few stool samples were found to be positive for cholera the entire outbreak was labelled as cholera outbreak taking a safer attitude for containment action and was documented accordingly. In the surveillance component of the programme stool samples of all cases of acute gastroenteritis and cholera are being bacteriologically confirmed since the year 1975.

Observations :

Morbidity and Mortality

The number of notified cases and deaths due to acute gastroenteritis and cholera in Rajasthan during the years 1968 to 1977 are depicted in Table No. 1. It is observed from the table that the state of Rajasthan experienced three outbreaks of cholera in the decade. In the year 1973, outbreak of cholera was recorded in district Bundi, in 1974 in district Udaipur and in 1977 in district Dungarpur. In these outbreaks the districts reported about 100 cases of cholera.

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Table—I

Notified cases and deaths due to acute Gastroenteritis and Cholera in Rajasthan during the decade (1968-1977)

Year	Acute Gastroenteritis			Cholera		
	Cases	deaths	case fatality rate/100	Cases	deaths	case fatality rate (%)
1968	4623	179	3.87	28	3	10.71
1969	8822	479	5.42	42	7	16.66
1970	4353	130	2.98	—	—	— —
1971	5728	110	1.92	1	0	— —
1972	9323	145	1.55	340	18	5.29
1973	5969	95	1.59	83	4	4.81
1974	5161	136	2.63	720	13	1.80
1975	13674	193	1.41	45	2	4 44
1976	4748	113	2.37	4	3	12.50
1977	2965	126	4.24	257	9	3.53
Total	65,396	1,706	2.60	1540	59	3.83

On further analysis of the data the case fatality rate during the decade for acute gastro-enteritis was observed to be 2.60 percent, and for cholera 3.83 percent. The case fatality rate for cholera and acute gastro-enteritis for the years 1968 to 1972, and 1973 to 1977 were compared, the later period denoting the cholera surveillance programme.

The average case fatality rates were 6.8 and 3.17 in the years 1968 to 1972 and 2.74 and 2.038 percent in the years 1973 to 1977 for cholera and acute gastroenteritis respectively. The cholera surveillance may be one of the factors responsible for the changes in the case fatality rates.

Seasonal Variations

The seasonal trend of cholera in Rajasthan was typical in nature. The seasonal index has been worked out for a period 1973 to 1977 (Sen Gupta, S.K. 1975[3]). The peaks were noted in the months of June and September. The seasonal index for cholera for the country and Rajasthan was almost in consonance as most of the cases occurred in the months of May to October showing the peaks in the months of August and October (Table No. 2).

Table—2

Seasonal Index in Incidence of Cholera in Rajasthan

Months	Rajasthan (1973-77)	India (1964-74)
January	— —	76.00
February	— —	65.34
March	76.46	62.40
April	— —	94.28
May	15.93	98.90
June	579.82	101.30
July	47.79	112.40
August	91.33	157.13
September	327.08	124.60
October	41.41	141.55
November	13.80	88.80
December	6.38	77.30
	1200	1200

Districts Affected

The number of districts reporting cholera improved with the launching of cholera surveillance programme since 1972-73. In the years 1973 to 1977 as many as 20 districts of the state reported acute gastroenteritis and 10 districts reported cholera cases out of 26 districts of Rajasthan, in the quarter ending September (Table 3).

Table—3

Districts Reporting Acute Gastroenteritis and Cholera in Rajasthan During the years 1973-77

Quaters	1973		1974		1975		1976		1977	
	AGE **	Cholera	AGE	Cholera	AGE	Cholera	AGE	Cholera	AGE	Cholera
I Ending March	12	1	12	—	9	—	11	—	11	—
II Ending June	18	1	17	2	16	1	14	3	15	4
III Ending September	14	1	11	5	17	5	20	5	14	10
IV Ending December	15	1	12	—	13	4	13	1	9	4
Total districts involved the years	22	3	19	5	20	8	23	7	23	11

* Total No. of districts in Rajasthan 26
** ACUTE GASTROENTERITIS

Although cases of acute gastroenteritis were reported earlier. the notification of cholera cases improved after the programme of surveillance was adopted. During the last five years of the cholera surveillance programme i.e., (1973-77) number of cholera reporting districts showed a constant rise as in the year 1973 only 3 districts reported cholera while in the year 1977 11 districts reported cholera in Rajasthan.

In the earlier decade only 6 districts notified cholera incidence (Sharma, R. et. al.[4]) It was further observed that the number of districts reporting cholera incidence for one year was eight, for two years five, for three years one (Banswara), for four years two (Udaipur and Jaipur), and continuously for five years only one district reported namely, Ajmer. Four districts namely Bharatpur Bundi, Dungarpur and Kota showed appearance of cholera for the first time during the year 1977, in the surveillance period. From the figure it is obvious that the cholera remained confined to the south east part of the state. Therefore it may de assumed that cholera has entrenched in the district of Ajmer which reported it for all the five years. The area is well connected with road and rail and is a seat of national and international fairs like 'Pushkar' mela and 'Urs' fairs. This possibly explains the persistence of cholera in Ajmer and propogation in the adjacent districts However further detailed studies are needed to confirm such a belief.

Endemicity of cholera

The endemicity of cholera in the state was determined by calculating the persistence level for each district which was measured by the number of weeks during the preceding 5 years (1973 to 1977) during which one or more cholera cases were reported, and this is expressed as percentage of total weeks during the period. (Sen Gupta S. K. 1975[5]).

$$PL = \frac{\text{No. of reporting incidence}}{\text{Total No. of weeks during 1973-77}} \times 100$$

The PL so worked out for each district is depicted in Table No. 4. The highest PL was recorded (6.94) in two districts namely Jaipur and Udaipur while four districts had the PL less than one. Six districts of Rajasthan reported PL below two, districts reported below three and nine districts had not reported any incidence of cholera.

Table—4

Percentage level of Cholera in the Districts of Rajasthan

Districts	Persistence level
Ajmer	2 31
Alwar	2.69
Banswara	1.92
Bharatpur	1.15
Bhilwara	0.38
Bikaner	1.15
Bundi	0.38
Chittorgarh	0.38
Churu	1.54
Dungarpur	2.31
Jaipur	6.94
Jhunjunu	3.08
Kota	1.15
Sawai Madhopur	1.15
Sikar	1.15
Tonk	1.15
Udaipur	6.94
*Remaining districts	Nil

*The districts, Barmer, Ganganagar, Jaiselmer, Jalore, Jhalawar, Nagaur, Pali and Sirohoi reported nil incidence of Cholera for the period 1973-77.

Serotype of cholera vibrio

Table No. 5 shows serotype of *vibrio cholerae* isolated during the period 1975 to

Table—5

Serotype of Cholera Vibrio isolated during 1975-77

Year	AGE cases	Stool samples examined	Percent	Cholera cases	Percent	Serotype I	O	H	UN	*
1975	13674	682	4.98	45	6.89	26	16	—	3	
1976	4748	690	14.53	24	3.48	5	16	1	5	
1977	2965	2437	82.19	257	10.54	27	30	—	200	

AGE : Acute Gastroenteritis

I : Inaba

O : Ogawa

H : Hikojima

UN : El Tor for further not classified

* : Classical cholera vibrio not found.

1977. It is recently that medical colleges in state of Rajasthan have started bacteriological confirmation of cholera cases except S. M. S. Medical college where it was done previously also. For phage-typing isolated strains are sent to the Director W. H. O. International Referral Centre at CALCUTTA. There has been a marked rise in number of specimen examined over the years, 4.9 percent in the year 1977. Only El Tor vibrio has been isolated replacing classical cholera vibrio.

The first case of El Tor was isolated in the year 1968 in Rajasthan. (Sharma. R. et al[5]) and thereafter all the stool samples, subjected to bacteriological confirmation showed El Tor as causative agent.

Conclusions

The state of Rajasthan has been categorised as non-endemic area for cholera and cases earlier reported have been labelled as imported. However from the observations recorded it is seen that cholera has now established its foothold in the state of Rajasthan.

The characterstics of the El Tor vibrio namely, its adaptability and ability to survive in environment and causing sub-clinical and ambulatory cases might also be responsible for persistence of cholera in Rajasthan, as in the other endemic parts of the country.

Finally this study points to the fact that there is indeed a great need for the surveillance of the disease in the state as there is in other parts of the country, which are endemic for cholera. This certainly requires strengthening of referral Public Health Laboratories, education of the health staff for prompt notification of cases and collection of specimen samples, beside other detailed epidemiological investigations, in addition to the usual measures of prevention and control.

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We are very thankful to the Medical and Health Directorate of Rajasthan specially to Dr. B. K Mitra and Dr. O. P. Khattar, Dy. Directors of Medical & Health Services Rajasthan, for allowing us to utilize the needed available information for this study.

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CHEST DISEASES AND TUBERCULOSIS IN A SLUM COMMUNITY AND PROBLEMS IN ESTIMATING THEIR PREVALENCE

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Introduction

Considerable ill health and deaths in the community are caused by respiratory diseases, especially acute infections[1]. Aside from this reason, the problem of respiratory diseases needs more attention from public health workers, also in the context of tuberculosis control Diagnosis of pulmonary tuberculosis at the general health institutions from among the chest symptomatics attending them is a key activity under India's National Tuberculosis Programme (NTP)[2]. This is also supposed to satisfy the needs of the symptomatic patients attending these health institutions. Utilisation of general health institutions by chest symptomatics, which has direc bearing on tuberculosis case finding at these institutions, depends largely on adequacy of relevant services there. However, of the total new out-patients aged 10 years and more attending a general health institution, about 7% are reported to have chest symptoms, nearly 6% of these symptomatics being cases of tuberculosis[3]. Thus, even if the general health institutions are equipped to diagnose and treat all tuberculosis cases from among the attending chest symptomatics, about 94% of the remaining chest symptomatics are still not adequately dealt with, diagnostic facilities for non-tuberculosis respiratory diseases being scarcely available at these centres. It is possible that they receive some kind of treatment, though it cannot be said that majority of them are satisfied. If on the other hand the community situation is considered, of the total chest symptomatics of 7 days or more duration comprising 11.1% of the entire community, only about 1.6% are reported to be cases of tuberculosis[4]. Thus, whether in the community or at a general health institution, majority of the chest symptomatics suffer from non-tuberculous conditions and without adequate provi ion for satisfying their needs, may find the visit to a health institution unrewarding. In order to plan

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for providing proper relief of chest symptoms through the general health institutions, information on the extent and nature of various respiratory diseases prevalent in the community is necessary. Presently, knowledge on these is meagre, owing to complex nature of a study required to diagnose respiratory disease through a community survey.

The National Tuberculosis Institute (NTI), in an attempt to develop a methodology for conducting a study for prevalence of chest diseases and tuberculosis in a community, undertook a survey in a slum area in Bangalore city. The material in respect of the paediatric age group (0-14 years) from the study has already been reported[5]. The objective of this report is to study the following among the population of the slum area :

1. The proportion of various kinds of sickness.
2. The problems of estimating the prevalence of different chest diseases including pulmonary tuberculosis in the community.

Methods

The study was conducted with the collaboration of the Church of South India (CSI) Hospital, Bangalore where facilities for investigation and diagnosis of chest diseases were available. The slum area in question was selected, as it was one of the areas adopted by the CSI hospital for rendering comprehensive medical care and the services were virtually free of cost to the patient.

Initial examination

The entire population of the slum was registered on individual cards and each person was advised to attend the health centre of the CSI hospital located in the area. At the centre everybody was questioned for presence or absence of symptoms pertaining to any system and subjected to a miniature (70 mm) X-ray chest. X-rays were interpreted by two readers independently at NTI, as normal or abnormal. Children in 0-9 years were, in addition, tuberculin tested with 1 TU RT 23 and the reactions were read after 72-96 hours. Persons with indurations of 10 mm and over diameter were considered tuberculin positive.

Further investigations

Persons with chest symptoms and/or with any abnormal shadow on chest X-ray at the time of initial examination were eligible for further investigations. In addition, all children in 0-4 years age, who were tuberculin positive and/or malnourished were also eligible for these. Further investigations consisted of the following :

a) Soon after initial examination : (i) two sputum specimens were collected from each of the eligibles, spot and overnight (OV), on house-to-house visits. From persons unable to bring out sputum, two laryngeal swabs were obtained. The sputa were examined by direct smear microscopy. Sputum specimens as well as laryngeal swabs were cultured for Mycobacterium tuberculosis followed by identification and drug sensitivity tests on positive cultures ; (ii) detailed clinical examinations of eligibles were carried out by Medical Officer (MO) at the local centre followed by blood, urine or stool examination prescribed by the MO.

b) After 6-8 weeks of initial examination : those who were sputum negative at the earlier examination, had the following additional investigations at the local centre : (i) fresh clinical examination by the MO ; (ii) a 70mm X-ray of chest ; (iii) two samples of sputa, collected and examined as before.

c) Special investigations and review : if the MO, on the basis of these investigations and earlier ones, was unable to come to a diagnosis in the case of some persons, he would refer them for diagnosis to a consultant panel at the CSI hospital. The panel was composed of a thoracic surgeon, a paediatrician, a physician, a radiologist and a tuberculosis specialist (epidemiologist, NTI). Facilities for special investigations like clinical assessment by concerned specialists, bronchoscopy, bronchography, tissue biopsy, ECG, etc. were provided for at the paediatric and respiratory clinics of the hospital on the advice of the consultant panel. The cases were further reviewed by the panel and in the light of the results of all the findings, the final diagnosis was made. In a case where the special investigations advised by the consultants could not be undertaken, a likely diagnosis was ultimately made by them on the basis of clinical examination, sputum and X-ray investigations, each carried out twice at an interval of 6-8 weeks.

Persons who needed specialist care, hospitalisation or any kind of treatment were provided with the same by CSI hospital, as and when required.

Material

Age and sex distribution of the entire slum population is given in Table 1. Material in respect of 1537 persons in the age group 0-14 years, has already been reported[5]. Coverage for clinical examination, X-ray and sputum tests were high ranging from 93.5 to 81.2% (Table 2) except in paediatric age group where spntum examination coverages were low, for reasons given in the earlier report[5]. Of the persons who were referred for the opinion of the consultant panel, 67 (62.6%) in paediatric age group and 57 (55.9% in age group 15 years and over required by it to undergo special investigations. Of them 88% and 47.4% respectlvely could be persuaded to undergo the investigations. In Table 3 is presented distribution of the special investigations ordered, large X-ray of chest being the single investigation most frequently asked for.

Table 1

Registered population by Age and Sex

Age Group	Male	Female	Total
0- 4	329	296	625
5-14	474	438	912
15-24	248	263	511
25-34	241	220	461
35-54	337	285	622
55+	82	100	182
All	1711	1602	3313

Table—2

Coverage of Examinations

Age Group	X-ray		Clinical		Sputum		Special Investigations		
	Eligible	Examined %	Eligible	Examined (I exam)* %	Eligible	Examined %	No. referred for consultant panel review	No. referred for special investigation (% of col. 8)	Investigated (% col. 9)
1	2	3	4	5	6	7	8	9	10
0-14	1537	91.9	531	96.4	531	58.0@	107	67 (62.6)	88.0
1 +	1776	81.2	508	91.7	508	93.5	102	57 (55.9)	47.4
All	3313	86.2	1039	94.1	1039	75.4	209	124 (59.3)	69.4

*Coverage for II examination 90.8, 82.6, 86.7 per cent in 0-14, 15 + and all ages respectiveiy.

@Coverage 92% in 5-14 year age group.

Table—3

Distribution of special investigations ordered by consultant panel

Age Group in yrs.	No. of persons referred for special investigations			Number of special investigations ordered**					
	Single investigation	More than one investigation	Total	Large X-ray of chest	Specialist assessment@	ECG, X-ray of other systems or chest fluoroscopy	Bronchoscopy and Bronchography	Lymph gland biopsy	Blood, sputum urine stool exam.
0-14	45	22	67	38	26	4	8	5	14
15+	43	14	57	18	34	4	12	1	8
Total	88	36	124	56	60	8	20	6	22

**Figures in each of the cells not mutually exclusive

@Either at cardiac or respiratory or paediatric clinics

Results

Symptoms

In all, 2841 persons were questioned for presence or absence of symptoms. Of 1408 in age group 0-14 years 668 (47.4%) and of 1435 in age group 15 years and over 759 (51.6%) reported to have sickness of any kind (Table 4). Prevalence of sickness in 15 years and over age group increased with age and was the highest in those aged 55 years and over.

Table—4

Sickness by age

Age	Persons questioned	No. reported sick
0-14	1408	668 (47.4)
15-24	421	191 (45.4)
25-34	361	169 (46.8)
35-44	318	174 (54.7)
45-44	178	107 (60.1)
55 & over	155	98 (63.2)
Total	2841*	1407 (49.5)

*14 persons X-rayed were not questioned.
Figures in bracket indicate percentages.

Table 5 presents sickness by systems, each sickness occurring alone or along with others. Thus, a person having sickness pertaining to more than one system is shown in more than one cell. It is seen that respiratory system symptoms were the commonest in all the age groups. The prevalance of sickness by respiratory system symptoms in age group below 34 years and above. Its rate of increase with age wasalso higher in older age groups i. e., in population 35 years and over.

In age group 15 years and over population, sickness pertaining to other systems like skin, nervous system, etc. considered jointly, was the second largest group (Table 5). These

Table—5

Prevalence of sickness* by systems among persons questioned**

Age group	Symptoms pertaining to @				
	Resp. system	G. I. system	Fever alone	ENT	Others
0-14	398 (28.3)	82 (5.8)	44 (3.1)	24 (1.7)	50 (3.6)
15-24	123 (29.2)	25 (5.9)	4 (1.0)	5 1-2)	65 (15.4)
25-34	109 (30.2)	38 (10.5)	16 (4.4)	5 (1.4)	62 (17.2)
35-44	117 (36.8)	19 (6.0)	6 (1.9)	12 (3.8)	70 (22.0)
45-54	75 (42.1)	15 (8.4)	3 (1.7)	3 (1.7)	42 (23.6)
55+	66 (42.6)	6 (3.9)	2 (1.3)	10 (6.5)	47 (30.3)
Total	888 (31.3)	185 (6.5)	75 (2.6)	59 (2.1)	336 (11.8)

*Each sickness occurring alone or along with others. Figure in each of the cells not mutually exclusive.

**Shown in Table 4.

@ Of 1073 children in 0-9 year age 223 had mal-nutrition. For others, information not collected.

Figures in bracket indicate percentages.

showed increasing proportions with age and in 55 years and over group it had come closer (30.3%) to the proportion of respiratory systems (42.6%), than in any other age group.

Radiological abnormality of chest

Among 1413 persons X-rayed in 0-14 years, 64 and of 1442 persons X-rayed in 15 years and over age group 81 had any radiological abnormality in chest (Table 6). The

Table—6

Prevalence of respiratory radiological abnormality by age

Age Group	Number X-rayed	Number with respiratory radiological abnormality
0-14	1413	64 (4.5)
15-24	425	16 (3.8)
25-34	361	16 (4.4)
35-44	320	15 (4.7)
45-54	181	19 (10.5)
55+	155	15 (9.7)
Total	2855	145 (5.1)
5+	2282	117 (5.1)

Figures in bracket indicate percentages

proportion of persons with radiological abnormality in age group 45 years and over was significantly higher than that in the younger age groups.

Respiratory system abnormality

Persons who had radiological and/or clinical evidence of respiratory system involvement with or without symptoms, were classified to have "Respiratory System Abnormality" and are presented in 4 broad categories (Table 7) as active tuberculosis, inactive tuberculosis shadow, pneumonitis and other non tuberculosis conditions. This was done since final etiological diagnosis could not be made in a proportion of cases who failed to undergo special investigations (Table 2). Nevertheless, broad categorisation on the basis of initial and follow up examinations could be arrived at by the consultant panel. Upper respiratory infections and heart diseases have not been presented in the report. Excluding 14 persons who were not questioned for symptoms though X-rayed, of the remaining 2341 persons (Table 4), 172 were diagnosed to have respiratory system abnormalities with or without X-ray lesion (Table 7). Details of 71 children aged 0-14 years found to have respiratory system abnormality are already presented[5]. Among 1433 persons in age group 15 years and over, 101 were found to have repiratory system abnormality of any kind.

Of total 172 persons diagnosed to have respiratory system abnormality in all ages, 130 (75%) had non tuberculosis etiology : 104 with pulmonary radiological abnormality and 26 without (Appendix Table). Another 13 persons were diagonsed as having active pulmonary tuberculosis : 6 sputum positive and 7 sputum negative radiologically active

Table—7

Age-wise distribution of respiratory system abnormality* with or without X-ray lesions

Age group	Active Tuberculosis			Other non TB			Total
	Sputum pos.	Sputum negative X-ray active	Inactive tuberculosis shadow	Pneumonitis X-ray abnormal	X-ray abnormal	X-ray@ normal	
0-14	—	5	3	52	4	7	71
15-24	—	—	4	10	2	3	19
23-34	1	—	6	5	3	—	15
35-44	1	—	5	8	1	4	19
45-54	3	1	5	7	4	1	21
55+	1	1	6	4	4	11	27
Total	6**	7	29	86	18	26	172
+	6**	4	27	63	18	22	140

*Persons having radiological and/or clinical evidence of respiratory system involvement with or without symptoms.

@Not included in Table 6.

**One, without X-ray abnormality, not included in table 6.

disease. The remaining 29 of the total persons with respiratory system abnormality were classified to have inactive tuberculosis.

Of the 1 5 persons with respiratory radiological abnormality in all ages, 12 (8.3%) and of the 172 persons with respiratory system abnormality, 13 (7.6%) were diagnosed as (Table 7) having active pulmonary tuberculosis (sputum positive and negative).

Prevalence of sputum positive cases in the population 5 years and over in age, on the basis of two collections at the time of initial examinatton (Table 6 and 7) was 0.26% (6 of 2282 persons X-rayed); prevalence of total active pulmonary tuberculosis (sputum positive) being 0.44% (I0 of 2282 persons X-rayed.)

Discussion

The study of prevalence of chest diseases in a community is operationally difficult. For such a study, services of a well equipped cardio respiratory clinic should be available. An area was therefore selected for this study which was under comprehensive health care of the Church of South India (CSI) hospital and

necessary diagnostic facilities were available there. Still, all the special investigations advised could not be carried out, since a substaintial proportion of persons (30.6% of eligibles), who were asked to undergo them failed to do so. This was inspite of considerable efforts made by field investigators of the NTI and Medical Officer and Social Workers of the CSI hospital responsible for providing comprehensive health care in the area. The factor of non-cooperation underlined the feasibility of applying complicated diagnostic methods to the community, without which diagnosis and estimation of chest diseases were difficult to obtain. In contrast, necessary investigations and their coverages for establishing the prevalence of respiratory tuberculosis were adequate. Thus, 86.2% of the eligibles underwent X-ray investigation, 86.7% clinical examination, both at the area centre and in 75.4% of the eligibles sputum collections could be made on house-to-house visits. The somewhat generous criteria of eligibility for sputum examination in age group 0-4 years was responsible for overall lower coverage for sputum examination. Had the eligibility for sputum examination been uniform for all ages, the coverage would have been over 90%[5].

The problem of arriving at final etiological diagnosis in a sufficiently large number of eligibles could not be overcome in a study of this nature, where accurate diagnosis of various conditions was dependent on application of complicated special investigation tools to a large community. In view of the low coverage (47.4%) for the special investigations among persons aged 15 years and more, prevalence of different chest diseases in the community are not presented in the study. Instead, these diseases are presented in 4 broad categories (Table 7).

It is also pertinent to point out that of the 1,039 persons clinically examined by the Medical Officer of the local centre, 209 (20.1%) were referred to a panel of specialists for diagnosis of chest diseases and 124 59%) of those referred, needed special investigations (Table 2 & 3). The above data, in a way, highlights the operational problems and the nature of services and resources required for proper diagnosis of chest diseases.

Prevalence of chest symptoms as well as others in this study was considerably higher than that obtained from the community surveys in rural areas by house-to-house questioning[4,6]. A possible reason could be that the population in the present study belonged to an urban slum. But the more likely reason could be methodological differences between the present study and those referred to above. The method of symptom elicitation by doctors at a centre set up in the slum with the prospect of X-ray and other investigations on the spot, might have led to higher symptom elicitation in this study.

Symptoms pertaining to respiratory system was commonest in all the age groups in the area under study (Table 5). Similar finding was reported from rural areas too[6]. Overwhelming proportion of persons with respiratory system abnormalities (92.4%) as well as of those with radiological abnormalities in chest (91.0%), had conditions other than active pulmonary tuberculosis. This underlines the size of the problem of non-tuberculous chest diseases in th area. If situation as this prevails in the rural community as well, adequate services are needed in the general health institutions to cope with it. The ability of the general health institutions to deal with chest symptomatics in general

and those with utilisation of the existing services by the chest symptomatics. This assumes importance in the contest of India's National Tuberculosis Programme[2], as success of tuberculosis case finding depends on increased utilisation of the health institutions by the chest symptomatics in the community.

It may be interesting to discuss the feasibility of diagnosis of chest diseases at the peripheral health institutions in rural areas. It is true that 145 of the 172 persons with respiratory system abnormalities in this study (Table 7) were diagnosed to have such conditions as pneumonitis, and active or inactive pulmonary tuberculosis, which are possible for a centre to identify if facilities of clinical, sputum smear and blood slide examinations along with X ray chest are available. These investigations were routinely made available to be the single special investigation asked for most often (Table 3). Whereas, X-ray chest was thus found to be the most relevant investigation vis-a-vis chest diseases, provision of this facility at all the peripheral health institutions is not practicable and response of symptomatics on referral to the district centre for X-ray is reported to be meagre[3]. Again, some of the other chest diseases as bronchiectasis, chronic bronchitis, emphysema, malignancy, pulmonary fibrosis etc., taken together, would constitute a sizeable group, which will not be easy to diagnose in the peripheral health institutions in a long time to come. Symptomatic relief after clinical assessment of the patients attending such institutions remains, therefore, the only answer for the present. Awareness, in the mean time, is growing for the need of research in developing simpler health technology to diagnose and treat chest diseases, especially applicable in rural areas[1].

Whereas in this study, prevalence of sputum positive cases (2.6°/00) on the basis of two samples in population aged 5 years and over (Tables 6 & 7) was similar to that found in Bangalore city in 1955-58 (2.4°/oo)[7,8], prevalence of sputum negative active tuberculosis was comparatively lower. This could be attributed to a different criteria of diagnosis adopted in this survey. For example, in the present study, diagnosis of first survey sputum negative active or inactive pulmonary tuberculosis was made by the panel of consultants on the basis of results of all investigations taken together, including those of subsequent follow up with X ray and sputum or other examinations. Compared to this, generally reported prevalence rates of sputum negative active pulmonary tuberculosis[7,8] are based on a single X-ray interpreted by two independent readers and an umpire and two sputum examinations only. Hence possibility of over diagnosis[9,10] of radiologically active sputum negative pulmonary tuberculosis was minimised in this study.

Summary

1. The entire population of a slum area of Bangalore city, comprising of 3313 persons was registered, questioned for symptoms and offered chest X-ray at a centre located in the slum itself. Those, who had any chest symptom and/or X-ray abnormality, were offered detailed examinations, namely, clinical examinations, repeated examinations of sputum for tubercle bacilli, and further chest X-rays.

2. Of the total 2855 persons X-rayed and/or questioned, 1039 needed detailed examinations and about a fifth of the latter required referral to a consultant panel for diagnosis of chest diseases. Further, about 60% of those referred to consultants needed special investigations. Thus, the study of

prevalence of chest diseases in the community needed considerable facilities and were operationally difficult. It is envisaged that similar problems will also be faced if peripheral dispensaries are to make proper diagnosis of chest diseases, due to the need for referral of large number of patients and provision of complicated diagnostic facilities at the referral hospitals.

3. The study seeks to quantify the problem of chest diseases and tuberculosis in the slum community. Largest proportion of the sick persons were found to have complaints referable to the respiratory system. Of the persons diagnosed to have any respiratory system abnormality, more than 90% had non tuberculous chest diseases, mostly pneumonitis ; and only 7.6% had active pulmonary tuberculosis.

4. It is concluded that in the community under study, the size of the problem on non tuberculous diseases of the chest and operational problems in their diagnosis were considerable.

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Appendix Table

Diagnosis of other non-TB conditions (other than pneumonitis)

Diagnosis	Basis of diagnosis			
	X-ray abnormality		X-ray	Normal
	With detailed investigation (a)	With initial & follow up (b)	With detailed investigation (a)	With initial & follow up exam. (b)
Bronchiectasis	5	2	—	—
Non-specific pulmonary scar	5	1	—	—
Emphysema	3	1	1	1
Malignancy	1	—	—	—
Tropical eosionophilia	—	—	4	—
Bronchial Asthma	—	—	4	4
Chronic Bronchitis	—	—	2	5
Acute bronchitis	—	—	3	2

(a) Special investigations on advice by consultant panel.

(b) Initial X-ray, sputum & clinical exam. followed up by repeat of these investigation after 6-8 weeks.

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A STUDY OF THE SPONTANEOUS ABORTIONS IN RURAL COMMUNITY

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Abstract

The present paper deals with the application of a probability distribution model to the data on the number of spontaneous abortions occuring to females in rural community.

Introduction

An abortion is usually described as the interruption of pregnancy before the foetus has attained viability i.e. before it has become capable of independent existence which is usually before 28 weeks of pregnancy (Potts, 1975). The abortion may be spontaneous or induced. Occurence of spontaneous abortion in a community is a problem for health, haemorrhage, psychological disturbances, attendant hazards etc. In the community, certain families are bound to have abortion any time during their fertile period. Since the occurence of spontaneous abortions to a female may be thought to be a rare event and the risk of abortion may vary from female to female, it is supposed that a negative binomial distribution may describe this situation. It is applied to the observed distribution on number of spontaneous abortions obtained from the General Health Survey of Chiraigaon Block (Rural) Varanasi, 1968-69.

Material and Methods

A systematic random sample of ten villages was selected from the 1961 Census lists of the Chiraigaon Block of the Varanasi district. The sample consisted of 1553 households. Information pertaining to only those females whose husbands were still living at the time of survey was recorded as the age at widowhood was not elicited. Adopting the questionnaire method, information on age, marital status, total number of children born and alive, total number of abortions and still births were recorded upto the date of survey. The sample consisted of 1880 females (whether they were within or beyond their reproductive age periods) with the history of at least one pregnancy. The distribution of the number of spontaneous abortions to females obtained in this survey is also given in table 3 of Rao *et al* (1972), where it is not mentioned that the distribution is on spontaneous or on induced or on both types of abortions. In fact distribution is on spontaneous abortions.

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A detailed report regarding this survey is in progress and would be published elsewhere.

Results and Discussions

The analysis is based on the information from 1880 females. For completeness, the assumptions and the other details of the distribution are given below :

(i) The number of spontaneous abortions to a female is a random variable and follows the poisson distribution i.e.

$$P[Y=y]=Py\,(t)=\frac{e^{-t}\,t^{y}}{y} \qquad (1)$$

for $y=0,1,2,\ldots\ldots$ and $t>0$

where Y denotes the number of spontaneous abortions, t the risk parameter and P stands for probability.

(ii) The risk parameter varies from female to female and follows the type III distribution, i.e.

$$f(t)=\begin{cases}\frac{a^{n}}{\sqrt{n}}\,e^{-at}\,t^{n-1}\,;\ a>0, n>0 & (2)\\ 0\,;\ t<0\,;\ t\leqslant o\end{cases}$$

Under the above two assumptions, the marginal probability distribution function of Y is given by

$$P[Y=y]=\frac{a^{n}}{\sqrt{n}\ y}\int a^{-(1+a)t}\,t^{y+n-1}\,dt$$

$$=\binom{-n}{y}\,p^{n}(-q)^{y} \qquad (3)$$

where $p=\frac{a}{1+a}$ is the probability success and

$$q=1-p=\frac{1}{1+a}.$$

The distribution (3) is the negative binomial distribution with parameter (n,p) where the probability generating function of this distribution is given by

$$Py\,(s)=(Q-Ps)^{-n}\ ;\ s=0,1,2\ldots\ldots\ldots(4)$$

Where $P=\frac{q}{p}$ and $Q=\frac{1}{p}$

so that $Q-P=1$.

Thus from equation (4), we can compute the probabilities corresponding to 0, 1, 2..... spontaneous abortions occuring to a female. The estimates of the parameters are obtained by the moment estimate method and hence the expected number of females corresponding 0, 1, 2..... spontaneous abortions are worked out and are presented in Table 1.

Table—1

The observed and the expected number of spontaneous abortions in rural females with the history of at least one pregnancy

Number of abortions	Number of Females	
	Observed	Expected
0	1771	1763.3
1	68	78.3
2	21	22.7
3	10	8.5
4	4	
5	2	7.2
6	1	
Total	1880	1880.0

$X^2=3.949$; d. f. $=2$; $P<.05$

To see the goodness of fit, the X^2- test is applied for this situation. For applying this test, some last cells are grouped. The computed value of X^2 is not significant at the five present level ($X^2=3.949$, d.f. $=2$ and $P<.05$). If similiarity between observed and expected

frequencies is a criterian for the suitability of a model, the fitted probability distribution is a reasonable approximation. That is, the negative binomial distribution is a good fit for such data. It is, however, important to note that the negative binomial distribution is obtained on other sets of assumptions also. One way to obtain it is the compound pession process as obtained here; and the second way to find it is the Polya Process (see Chiang, 1968) where risk parameter depends on the past history of the process and follows the type III distribution. In this way, we have two very different mechanisms on the micro level which give rise to the same behaviour at the macro level.

However it is clear from the findings that the pattern of spontaneous abortions to the females is described well by the negative binomial distribution at least for such situations. If the existing characteristics of a community is changed, it may not be claimed the 'good fit' of such a distribution. Because the parameters involved in a model vary from community to community, region to region and individual to individual.

Conclusion

In the present study the number of spontaneous abortions to females in a particular rural community and the expected number of spontaneous abortions obtained from the negative binomial distribution are more or less similar. The difference is not statistically significant. Thus the distribution may help in checking the validity of the observations obtained in other surveys that are made in a similar communities as under this study. If the observed incidence of abortions happens to be more than expected, perhaps some disease process prevalent in the community (where the distribution holds goods) is responsible for it.

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ANALYSIS OF TETANUS NEONATORUM CASES ADMITTED IN A HOSPITAL DUING 1976-77

P. Jagetiya[1] and B. Bhandari[2]

Introduction

Tetanus neonatorum is one of the major health problems in developing countries. It is a common cause of neonatal death, second only to prematurity/low birth weight (Shah and Udani, 1969). Health education about the disease can be useful measure to prevent this disease in the community, contents of which can only be correctly formulated after an appraisal or the epidemiological factors prevailing in that locality. The present study was undertaken to find out the various epidemiological factors responsible for the disease.

Material and Methods

The study was carried out in the department of Pediatrics, R.N.T. Medical College Udaipur from July, 1976 to Aug., 1977. Sixty-two cases were observed.

A detailed fully structured proforma was developed and pretested. All questions were posed to the attendant with the patient, who in majority of cases was the female relative of the mother looking after her during puerperal period.

Observations

Age and Sex Incidence

The maximum number of the cases (41 cases or 66.1%) were 4 to 9 days old ; 20 cases (32.1%) of 10 to 15 days old and there was only one case who's age was 18 days at the time of admission. Males predominated in the present series with a sex ratio of male to female as 2 : 1.

Seasonal Variation

The maximum number of cases were seen during the humid weather (Table No. 1) i.e. during July to August. Sporadic cases were seen throughout the year.

Table—I

Seasonal Incidence of Tetanus neonatorum

Months	No. of cases	Percentage
July to Oct.	40	64.4
Nov to Feb.	16	25.8
March to June	6	9.6
Total :	62	

1. Senior Registrar,
2. Professor and Head, Department of Pediatrics, R.N.T. Medical College, Udaipur.

Socioeconomical and Cultural Factors

Education of the Father

Fathers of the 29 cases (46.1%) were illiterate, 17 (27.4%) had secondary and 14 (22.5%) primary education, while in 2 cases they were graduates.

Occupation of the Father

As shown in Table No. 2 maximum cases occurred in the families whose fathers were either farmers (29.0%) or labourers (19.9%). Others were professional workers (Teachers and Clerks) salesman and transport workers. In 10 cases fathers were belonging to unrelated or unidentifiable occupations according to international standard classification by International Labour Organisation and U.N.O.

Table—2

Incidence in Relation to the Occupation of Fathers

Occupation of the Father	No. of cases	Percentage
Labourers	12	19.4
Farmers	18	29.0
Professional (Teacher & Clerk) Unrelated and unidentifiable Occupation	10	16.1
	10	16.1
Transport worker	3	4.8
Salesman	9	14.5
Total :	62	100

Income of the Father

In the present study 54.8% of fathers belonged to the income group Rs. 200-400/ month, 25.8% to income group below Rs. 200/ month and 19.3% to income group 400 and above per month.

Incidence in relation to locality and place of delivery

Maximum number of cases (44 cases) were brought from the rural area in vicinity of the Udaipur. The rest of the cases belonged to urban locality. In this series all cases were delivered at their home under the supervision of untrained traditional birth attendants except in one case where delivery was conducted by midwife.

Instruments used for cutting of the cord

Various house-hold instruments were used for cutting of the cord (Table No. 3) Razor blade was used in 56.4% cases, other instruments used were kitchen knives, sickle and scissors without any sterilization.

Table—3

Various Instruments used for cutting of the Cord

Instruments	No. of cases	Percentage
Blade	35	56.4
Kitchen Knives	18	29.0
Sickle	7	11.2
Scissors	2	3.2

Substance used for cord dressing

It was observed that use of boiled ghee or oil was used most commonly for the cord dressing (Table No. 4). No cord dressing was done in 27 cases and talcum powder was utilized in 3 cases.

Table--4

Distribution of cases according to the various substances used for cord dressing

Cord dressing done by	No. of cases	Percentage
Boiled ghee or oil	32	51.1
Talcum Powder	3	4.8
No dressing	27	43.5

Discussion

Tetanus neonatorum is one of the common causes of mortality and morbidity in developing countries. This is attributed to environmental as well as socioeconomic and cultural factors (Marshall, 1968, Gupta et al. 1977).

The highest incidence was during July to Oct. Similar observations were made by Jaffari (1966), Nigam et at (1974), Suri et al. (1976) and Gupta et al. (1977). Increased incidence during these months could be because of increased number of births taking place during these months. Most of the cases in present study were belonging to the families where fathers were uneducated, and manual workers, having very low income. These factors bear indirect relation to the high incidence of the disease in these families. Bhakoo et al. 1976, Suri et al. 1976 and Urmila Lakhanpal (1974) also made similar observations.

Marshall (1968), Athavale and Pai (1968) and Majumdar (1971) observed that cord is cut with various house-hold instruments without any sterlization and many odd things are used for cord dressing all these play a vital role in the increased chances of the infection. We are also in close agreement of these workers.

Summary

In this study an attempt has been made to elicit the various socioepidemiological factors related to the high incidence of tetanus neonatorum. It is observed that various well established practices like cutting of the cord with unsterlised instruments, use of harmful materials for cord dressing and poor utilization of existing M.C.H. services need modification. It is essential for health workers to have some knowledge of these practices to carry out their activities satisfactorily in their areas.

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INDIAN JOURNAL OF PUBLIC HEALTH
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GENERALISED VACCINIA—A CASE REPORT

K. K. Datta[1], R. S. Sharma[2], V. K. Kaushik[3] and R. S. Misra[4]

Generalised vaccinia is a rare complication following smallpox vaccination.[1,2]. But in view of the eradication of smallpox from India and from the rest of the world, generalised vaccinia as a complication following smallpox vaccination has assumed a great importance.

Generalised vaccinia occurs in two forms. Much the rarer condition is seen in persons with previous healthy skin and is probably associated with a delayed antibody response to vaccination. The other form of generalised vaccinia occurs in patients with active or quiescent skin diseases, especially atopic dermatitis, and is known as eczema vaccinatum, the condition which is often called Kaposi's varicelliform eruption.

On receipt of the information from the district health authority Alwar to investigate a suspected case of small-pox, a boy aged 2½ months admitted in General Hospital Alwar, the authors visited the hospital on 19th April 78.

As per the history, the boy named Kaka aged 2½ months Hindu Male from village Ghari-Dhaneta, was admitted to General Hospital, Alwar on 15th April 1978, with huge swelling of the left arm and eruptions all over the body. The boy was given smallpox primary vaccination on 22nd March, 1978. On 1st of April, 78 eruptions all over the body appeared and there was enormous swelling and inflammation at the site of the vaccination.

On examination, the patient was running slight fever and had distribution of eruptions, more or less akin to the ordinary type of smallpox. Lesions were at the same stage of development and were like umbilicated pustules. The left arm where vaccination was given, was highly oedematous with confluent eruptions all over the left arm (Figure 1).

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2. Research Officer, National Institute of Communicable Diseases, Alwar, Rajasthan.
3. Deputy Chief Medical and Health Officer, Alwar, Rajasthan.
4. Dermatologist. Ram Manohar Lohia Hospital, New Delhi.

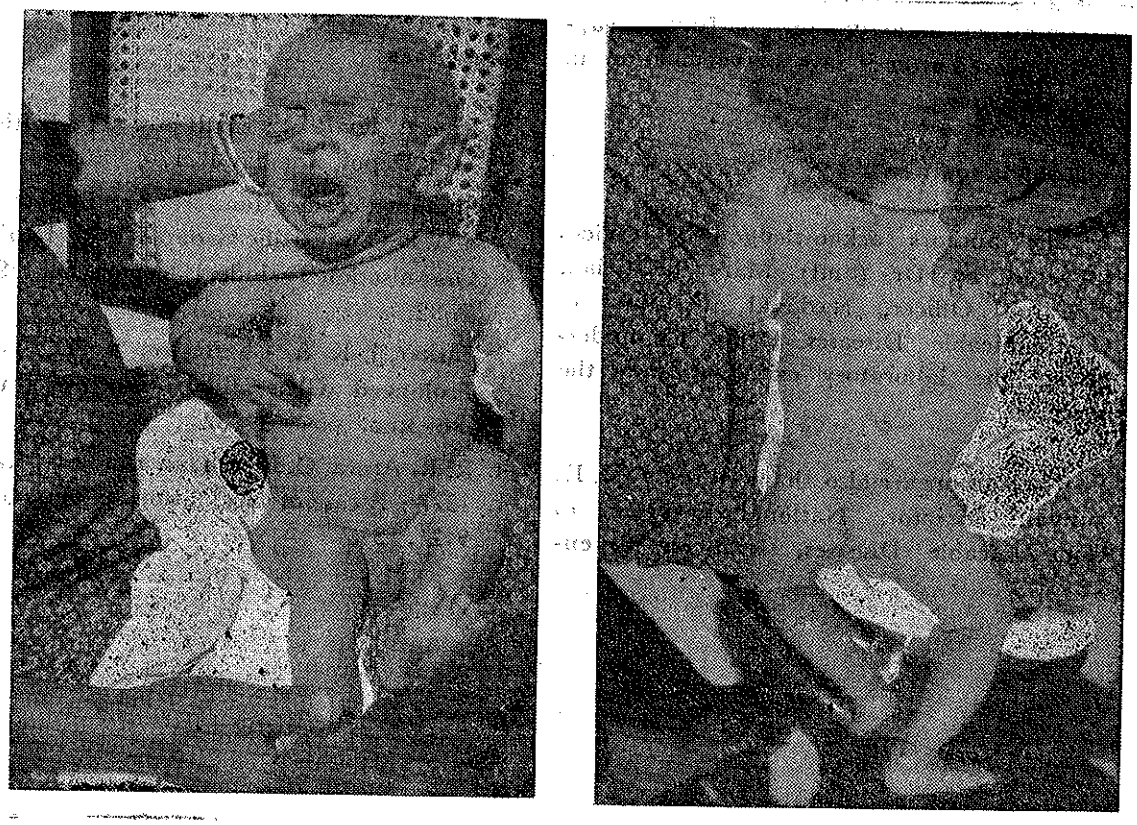

Fig.—I

The child was restless and was having signs of mild broncho-pneumonia. The vesicular fluid was sent for virus isolation to National Institute of Communicable Diseases, Delhi and it confirmed the presence of vaccinia virus. The case died on 22nd April 1978. The boy belonged to a family of farmer having six members (father 52, mother 42, four brothers aged 14, 12, 8 and 6 years). On the same day of vaccination i. e. on 22nd March another five children were also vaccinated in the same village with the same batch of vaccine, but they were all successfully vaccinated. The village belongs to the Primary Health Centre Nowgong, which reported last case of smallpox on 11.5.72. One interesting feature was that one of the relations of the child (grand daughter of the uncle of the child), also died of similar illness following smallpox vaccination at the age of 3 months in 1972.

The first case of vaccinia in India was reported by Sarkar & Chatterjee[3].

Recently Arora[4] et al reported a case of vaccinia from Delhi. The child was vaccinated on 11th July 1974, in England prior to their departure for India and the child developed eruptions all over the body on

20th July and the child was detained at the palam airport on arrival on 21st July. Eruption appeared after 9 days of vaccination in both the cases.

Acknowledgement

The authors acknowledge the services rendered by Dr. (Smt) Mary Sebastian, Research Officer, National Institute of Communicable Diseases, Delhi, for undertaking the laboratory examination of the material.

The authors are also thankful to Dr. R. K. Sanyal, Director, National Institute of Communicable Diseases, Delhi for his encouragement.

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INDIAN JOURNAL OF PUBLIC HEALTH
Vol. XXIII, No. 2,
April—June 1979

BOOK REVIEW

VIth Annual Report (1977-78) of the Gujrat Cancer & Research Institute, Ahmedabad.

T. B. Patel

This is the sixth annual report of the Institute at Ahmedabad doing very useful national work on the diagnosis and treatment of cancer. The Institute has at present 350 beds of which 60 are earmarked for research. During the last 5 years the number of cancer cases treated was 23,540 (male 67.7% and famale 32.3%). Oropharyngeal cancer had the highest proportions—42 5% followed by that of cervix 10.4%, lung 8.05%, oesophagus 7.64%, breast 5.93% and miscellaneous 25.5% in that order. In 1977 alone out of 8891 cases registered 5180 were diagnosed as cancer with 7.0% mortality. It has a well equipped laboratory and arrangement for X-ray, MMR, and Mammography, Radio-therapy (deep X-ray, Caesium 137, and Co—60 + theration 730). In brief, the report gives a good analysis of the activities of the Institute and of the very useful work done in India.

S. C. Seal

Problems of the Aged

By Col. Barkat Narain, published by the Skin Institute and Public Services Charitable Trust, N Block Greater Kailash—I, New Delhi, 110 048, Price—Rs. 10/-.

With reduction of death rates and improvement of health, there has been a major increase of life expectancy in India. This along with population explosion had led to the increase in the number of aged people with consequent rise of the problem of geriatrics. The problem has been further augmented by the change in the social structure and family life in the country following the breakup of joint family system with their attendent socio-economic and psycho-social repercussions.

Col. Barkat Narain's efforts to deal with the problem by bringing out this handbook has been both timely and helpful to those who are now badly in need of remedies for their troubles. He has given an insight into the varied ranges of the problem namely physical, biological, physiological and social aspects in 25 small chapters and suggested methods of rehabilitation and correct management for nutrition and other remedies. In fact, his wealth of knowledge and experience as a Health Administrator for the past half a century has been best utilized to handle the problems in a rational manner. It is also highly desirable that health services should include Gerontology as a specialised discipline and should necessarily be included in the curriculum of the training of doctors. This book will be undoubtedly found handy and helpful to all concerned and particularly to this ageing population.

S. C. Seal

INDIAN JOURNAL OF
PUBLIC HEALTH
Vol. XXIII, No. 2,
April–June 1979

NOTES & NEWS

10th International Conference on Health Education

Experts from over 40 countries will meet for the 10th in a series of conferences held under the auspices of the International Union of Health Education to be held in London from September 2nd to 7th, 1979. The theme of the conference, expected to be the largest ever global gathering of its kind, will be Health Education in Action—Achievements and Priorities. There will be three themes—PUBLIC POLICY—the integration of health education in national planning; HEALTH EDUCATION IN YOUTH—preparation for parenthood, pre-school training, primary and adolescent education and HEALTH EDUCATION METHODS, both in terms of general methodology issues and specific problems. Speakers will be drawn from all five continents and will include the Director-General of the World Health Organisation. Full detai's of registration are obtainable from :—The Conference Centre, 43 Charles Street, London W1X 7PB.

ASSOCIATION'S NEWS

It is a great pleasure to inform our members and readers that the Indian Public Health Association has been selected to host the 3rd International Congress of the World Federation of Public Health Associations, Geneva. This selection has come through a secrete ballot election where India got the highest number of votes.

It is most likely that the International Congress will be held in February/March, 1981 at Calcutta. Incidentally, 1981 also happens to be the Silver Jubilee Year of the Indian Public Health Association. Active cooporation and help from all members of the Associated are solicited.

P. N. Khanna
General Secretary

OBITUARY

Dr. S. L. Verma M.B.B S , M.S., D.P.H., F.C.C.P., F.I.C.A., F.I.P.H.A.
(Past President, Indian Public Health Association)

Dr. S. L. Verma, Director General, Railway Health Services (the last post he was holding at the time of his death) and lately President of the Indian Public Health Association, passed away suddenly on January 10, 1979 prematurely at the prime age of only 56 years. By his death the Railway has lost one of the most active, efficient, progressive and popular medical Director General ever engaged in the Railway Health Services, and also to the profession of Health Services in General. He contributed immensely to the development of the Indian Railway Medical and Health Services and he has to his credit a long list of improvements initiated by him. He framed the syllabus for Refresher courses for medical officers of the Indian Railways, reviewed and revised the contents of the accident relief medical equipment, introduced Operations Research Techniques on the delivery of health services in the Railway hospitals and health units. As a CMO of the Eastern Railway he built the Orthopaedic unit at Howrah and its extension to the field of prosthesis manufacture. Perambur and the best surgical units of the railways received his personal attention. According to Dr. A. L. Goswami his success to build up the medical services of the Eastern Railway was a matter of envy for all other railways, His tackling of the sanitation of "*Kumbh mela*" leading to no fly breeding was a great achievement. Though originally a veteran Surgeon, his whole philosophy had undergone a complete metamorphosis after his training in D P H at the All India Institute of Hygiene and Public Health, Calcutta and he devoted a large part of his energy in developing preventive aspects

and "*Community Health*" in railways. He was in fact, considered as a professional wizard in the Railway Health service as, it was through his relentless efforts and necessary work that other services were brought to the level of desired recognition. While posted at Lumding in 1948 where the professional facilities was only primitive, his zeal and initiative enforced by the efforts of his colleagues and subordinates turned this "penal station" into a pilgrimage for health services.

He took up public health work with so much enthusiasm and sincerety that he was unanimously elected to presidentship of the Indian Public Health Association and Indian Railway Officers' Federation. He was largly instrumental in the suggestion to build a federation of all associations concerning the different aspects of public health. As Surgeon-in-Chief of St. John's Ambulance Association he revised the dress regulation. Among his unfinished work is the problem of Railway Track Sanitation under the aegis of W H O and the National Environmental Engineering Research Institute, Nagpur.

Dr. Shantapharan Lal Verma, son of an officer of the Traffic Department of the old G.I.P. Railway, was born on July 27, 1923 at Satna, Madhya Pradesh where he had his school education. He passed his Intermediate from the Ewing-Christian College Allahabad and M.B.B.S. from the King George's Medical College, Lucknow and also M.S. from the same college in 1947 ; he obtained his D.P.H. from the All India Institute of Hygiene and Public Health, Calcutta in 1959 being declared as the best student of the year with award of a gold medal. He had also undegone a postgraduate training in Plastic Surgery. He started his professional career in August, 1948 as a direct recruit to the Divisional Medical Officer of the Indian Railways at the age of 25 years and was posted to Assam Railway at Lumding. In 1953 he was transferred to the N.E. Railway and was promoted as CMO in July 1961. After a period of 10 years he was appointed as the Director of Health Services in the Railway Board and was elected to the post of Additional Member Health and ex-officio Additional Secretary to the Government of India in March 1975. His post was redesignated as Director General, Railway Health services which he was holding till his day of demise, January 10, 1979. In his early career he was known as "angry young man" uncomferable, firebrond hardly compromising with what he considered the correct step." He was a hard worker and never spared himself at any time till death.

He was a great success in his professionel career and his merit was widely recognized. He was elected to the fellowship of Indian Public Health Association (FIPHA), International College of Angiology, USA (FICA) and the College of Chest Physician, (FCCP). In the St. John's Ambulance Association he was holding the top-most assignment of Surgeo-in Chief from 1974 till death. He was also associated with the following Associations or Societies : National Council of Bharat Scouts and Guides. Association of Plastic Surgeons of India and Indian Association of Occupational Diseases. He also served in various Committees namely, Surgical Instrument Development Committee, Central Committee of

Food Standards, National Malaria Eradication Committee, Smallpox Eradication Advisory committee, Family-Planning Education Consultative Committee, Project Committee on Infective Hepatitis, Advisory Committee of Trachoma Control Project. He was also the titular representative of the Indian Railways to the International Organisation of Railway Medical Union (UIMC).

He wrote several scientific papers on public health and wanted to bring out a book on First Aid and another on Importance of Home Nursing and Primary Wound care under the cegis of the St. John's Ambulance Association. He was a likeable and loveable person with capacity to win friends of all he came in contact with either in the Railway Services or outside. His death has been mourned by all His loss is hardly reparable. His ideals and life's mission are worthy of emulation by others. May his Soul rest if peace !

Editor

N. B. This obituary is a summary of the notes sent by Dr. N. K. Sinha, Deputy Adviser (Health) of the Planning Commission, Yojana Bhavan, New Delhi and Dr. A. L. Goswami, C. M. O. South Eastern Railway, to both of whom the Editor wishes to offer his grateful thanks.

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Sd/- A. K. Chakraborty

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SPECIAL ISSUE ON
INTERNATIONAL YEAR OF CHILD

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CONTENTS

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July — September, 1979

NATIONAL PLAN OF ACTION FOR INTERNATIONAL YEAR OF THE CHILD 1979*

1. Declaring 1979 to be the International Year of the Child, the U. N. General Assembly has set out its general objectives as follows :

a. "To provide a framework for advocacy on behalf of children and for enhancing the awareness of the special needs of children on the part of decision-makers and the public ;

b. To promote recognition of the fact that the programmes for children should be an integral part of economic and social development plans, with a view to achieving in both the long-term and short-term, sustained activities for the benefit of children at the national and international levels".

2. India has always been a strong advocate of the cause of the child and played a notable role in getting the United Nations General Assembly to pass a Resolution declaring the Universal Children's Day which is observed in India on 14 November every year. India has also been staunch supporter for declaring 1979 as the International Year of the Child and was the first country to announce its contribution of Rs. 900,000/- to UNICEF for the purpose.

3. The needs of children and our duties towards them are enshrined in our Constitution. Article 39 of the Constitution proclaims that the State shall, in particular, direct its policy towards securing that the health and strength of workers, men and women and the tender age of children are not abused and that children are not forced by economic necessity to enter a vocation unsuited to their age or strength. It further declares that childhood and youth are to be protected against exploitation and against moral and material abandonment. Constitution also enjoins upon the State to provide free and compulsory education for all children until they complete the age of fourteen years.

4. Keeping in view the constitutional provisions and the United Nations Declaration of the Rights of the Child, Government of India adopted a National Policy for Children in 1974. The policy recognises children as the nation's supremely important asset and declares that the nation is responsible for their 'nature and solicitude'. It further spells out various measures to be adopted and priorities to be assigned to children's programmes with a focus on areas like child health, child nutrition and welfare of handicapped and

* From the booklet on the subject by Government of India, Ministry of Education and Social Welfare, Department of Social Welfare, New Delhi, September, 1978.

destitute children. The Policy also provides for setting up of a high-level National Children's Board to focus attention on child welfare and child development and to ensure at different levels, continuous planning, review and coordination of all essential services directed towards children.

5. In accordance with the above general objectives, 1978, the year preceding IYC, is to be devoted to advocacy and preparatory work in connection with programmes of Child Welfare/Development, consolidation and strengthening of ongoing programmes for children and introduction of new ones where needed, so that a series of action programmes could be launched to realise concrete objectives laid down for the observance of the Year.

6. **Objectives** : The specific objectives of the observance of the International Year of the Child in India shall be as under :—

a) To make concerted efforts to significantly reduce the incidence of maternal and child mortality and morbidity by providing effective programmes and services for their health and nutritional needs.

b) To promote community awareness and education about the crucial importance of the healthy development of the child and a happy family life as the foundation for the child's security and well-being.

c) To facilitate optimum psycho-social development of pre-school children so as to prepare them for schooling by providing a network of Balwadis/Anganwadis/Creches/ day-care centres/nursery schools.

d) To strive for the speedy realisation of the goal of universal elementary education and to substantially reduce the rates of school drop-out.

e) To secure the basic rights of children and to protect them against neglect, cruelty, hazards and exploitation by promoting effective implementation of existing legislation and enacting new ones where necessary.

f) To secure entitlement of all children in the poverty groups born on/after 1 January 1979 to public assistance for their survival, growth and development.

7. **The Approach Strategy** : The objectives of the IYC are of a global nature encompassing all children in the age group of 0-14 years and call for massive inputs and viable infrastructures. However, in view of our resource constraints and differential degrees of ecological deprivation, our approach must be endowed with a certain focus and realism. The following guidelines may be kept in view while formulating action programmes for the observance of the International Year of the Child in this country :—

a) The general theme of IYC in India shall be "Reaching the Deprived Child"

b) The IYC should not be construed as a one-year programme. It should be viewed as a spring-board for vigorous continued action during the residual part of the Century. The goals and objectives as spelled out should positively be achieved by the end of the Century and to this end, a perspective plan for the next two decades (1979-99) should be evolved.

c) The empahsis during the period shall be on children of weaker sections of society, namely Scheduled Castes, Scheduled Tribes and other poverty groups located in rural areas and urban slums. Within this target group, greater attention should be bestowed on children in the age group of 0-6 years, primary school children as also pregnant and nursing mothers. It has been estimated that out of 115 million children (1971 census) between the ages of 0 and 6 years in India, at least 46 million are below the poverty line. Of these, 9.2 million live in the teeming urban slums, 2.8 million in tribal areas, and 34 million in rural areas, often inaccessible and beset by drought, flood and other hazards of marginal existence.

d) Since it will be difficult to cover, during IYC, all children under health and nutrition programmes, priority should be given to cater to the needs of children below the age of 6 years, pregnant and nursing mothers.

e) During the IYC, an attempt should be made to reduce maternal and infant mortality rate by about 5 percent.

8. In the light of the objectives and approach strategy as outlined above, the action plan has been divided into the following six broad heads, each spelling out concrete measures to be undertaken in respective fields followed by guidelines for their implementation :

a. Health and Nutrition including environmental sanitation and supply of safe drinking water.

b. Education including pre-school elementary and community education.

c. Social Welfare.

d. Legislation.

e. Publicity.

f. Fund raising.

INDIAN JOURNAL OF
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Vol. XXIII, No. 3
July—September, 1979

INTEGRATED CHILD DEVELOPMENT SERVICES SCHEME— OBJECTIVES, ORGANISATION AND IMPLEMENTATION

B. N. Tandon[1] and Shakuntala Bhatnagar[2]

There have been significant achievements in India in all spheres of development in last 3 decades. Nevertheless, various problems concerning child welfare are still of fairly large dimension. The incidence of morbidity, mortality and malnutrition among children continues to be high. Various surveys in our country have indicated that the incidence of severe malnutrition amongst preschool children is as high as 15-20%. The infant mortality rate varies in different parts of the country and is influenced among others, by social factors and level of socio-economic development of the community.

An integrated approach to early childhood services including nutrition supplement was adopted and in pursuance of National Policy for Children the scheme of ICDS was sanctioned in plan of social welfare sector. On 2nd of October, 1975, the Government of India lunched the scheme in 33 community development blocks with following objectives :—

1. to improve the nutritional and health status of children in the age group 0-6 years ;
2. to lay the foundations for proper psychological, physical and social development of the children ;
3. to reduce the incidence of mortality, morbidity, malnutrition and school drop-out ;
4. to achieve effectively coordination of policy and implementation amongst the various departments to promote child development ; and
5. to enhance the capability of the mother to look after the normal health and nutritional needs of the child through proper nutrition and health education.

It was decided to provide a package of following essential services to children 0-6 years, nursing and expectant women and women in 15-44 years age group.

i) Supplementary nutrition
ii) Immunization
iii) Health check-up
iv) Nutrition and health education
v) Referral services
vi) Non-formal education

On account of the key role of protected water supply efforts were also made to improve the rural drinking water supply through UNICEF and other Government Agencies.

One anganwadi has been established for a unit of 1,000 population, which is the focal

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point for delivery of the entire package of child development services. The anganwadi worker is a female worker recruited from the village. She is assigned the responsibilities of non-formal education to preschool children, supplementary nutrition and health education while 3 other services of the package are rendered by the Auxiliary Nurse Midwife (ANM). The surveillance of growth and development of children is inbuilt in the package. The treatment of common ailments during childhood was later introduced realising the availability of anganwadi worker in the village all the time.

Organisational structure and work load

The administrative unit for the location of ICDS project was chosen as a community development block in rural areas, tribal development block in tribal areas and slums in the urban areas. In selection of projects priority was given to areas backward in developmental services, nutritionally deficient and predominently inhabitated by the scheduled castes and tribes. Initially the 33 projects were placed in 11 tribal, 18 rural and 4 urban areas. In the years 1978-1980 the ICDS scheme has been expanded to 150 projects (56 tribal, 70 rural and 24 urban). Each project has approximately following number of beneficiaries per 1000 population.

Children 0-6 years	—	170
Pregnant women		30
Lactating women	—	70
All women of child bearing age (15-44 years)	—	200

To strengthen the health services, an additional doctor, 2 lady health visitors and 8 ANMs have been sanctioned in these projects, so as to make 1 ANM available for 5000 population at the periphery.

The entire package of services has been envisaged to be delivered by the social welfare and the health functionaries of the block through guidance from the respective authorities from district and state. The flow-chart at the end illustrates the administrative arrangements in an ICDS project.

Training of personnel : The anganwadi workers have been given basic training for 3 months at anganwadi training centres and a continued inservice training is given by the PHC physicians on all pay days with demonstrations at the maternal and child health and family welfare planning clinics and subcentres in groups of 8-10 anganwadi workers.

Monitoring and evaluation : The evaluation of organisation and implementation of the scheme has been entrusted to the PEO Cell of the Planning Commission, and periodic monitoring and evaluation of health and nutrition was undertaken by All India Institute of Medical Sciences through annual surveys which were conducted by the medical college consultants.

Role of medical colleges : To provide technical guidance, supportive supervision and training to various grades of functionaries of the programme, it was deemed necessary to appoint paediatricians as consultants to projects nearest to the medical colleges. To conduct periodic surveys for assessing the impact of services on health and nutrition, graduate interns were mobilised and in 15 projects it was possible to conduct 3 surveys within 2 years.

In the expanded programme, taking the distance of projects from the medical colleges and propagative nature of work, and also easy mobility of district staff, the paediatricians and the health officers of the respective district headquarters were appointed as consultants to the ICDS projects. Presently 54 consultants are the paediatricians or teachers of preventive and social medicine from medical colleges, while 35 consultants are officers from the districts.

Achievement of ICDS :

1. *Establishment of infrastructure :* Despite the difficulties in the system of appointments a very large proportion of health and non-health staff (87% and 99% respectively) is on the ground in projects of first phase, of which more than 88% of staff has undergone formal training.

2. *Training of functionaries and supportive supervision :* The basic training of anganwadi workers, mukhyasevikas and child development project officer was arranged by the National Institute of Public Co-operation and Child Development. All the physicians placed at the ICDS project and their supervisors at the district were trained regionally at the medical colleges by the consultants. The All India Institute of Medical Sciences introduced the in-service training of anganwadi workers and the ANMs within PHC with emphasis on primary health care and monitoring of maternal and child health and nutrition. The orientation is conducted by the physicians at the PHC or at sub-centres.

3. *Co-ordination :* The Child Development Project officers and the PHC physicians are the key persons in the implementation of the programme. The experience at the projects shows that medical college consultants have been successful in introducing environment of team approach by participating in various activities of anganwadi through co-ordinated supervision, re-organisation of the services of administration, referrals and establishing an information system through regular data collection. The services to high-risk-mothers and children were intensified, both at village and health centre level.

4. *Results of the surveys :* Three surveys were conducted in 28 projects at three different points at an interval of approximately one year on a sample of 10% anganwadis. Data from 15 projects has been compiled, which shows that there is a progressive increase in coverage of population of women and children regarding their enrolment, supplementary nutrition, antenatal and postnatal check up, immunisation and distribution of vitamin A and folifer tablets. Further, there is remarkable improvement in the nutritional status of children with almost 50% reduction in Grade III and Grade IV malnutrition.

Special benefits of the ICDS programme :

1. The blocks where an ICDS project is running h .ve also been selected for upgrading the PHC under the minimum needs programme. The ICDS programme has ensured the supply of refrigerators to these PHCs thereby helping in the immunisation programme. Sufficient amount of medicines including folifer tablets and vitamin A have been given to these projects with additional budget for medicine from ICDS. These projects were

given the transport at a priority basis. Rural electrification and water supply programmes have also been augmented in this project areas.

2. Anganwadi-worker as an agent of health care delivery to mothers and children :

The anganwadi worker has been envisaged as a caretaker for growth and development of young children and education of young mothers. Their selection from the local comm nity and ability to render the package of service at the anganwadi has proved to be an asset. The fact, that she is the only available and accessible health worker at the village level became a compelling need to train her in giving treatment for common ailments at first contact. Her training in primary health care and first aid has been found extremely beneficial to the community and complementary to work of ANMs. The health care has now been included in the syllabus of anganwadi workers' basic course and continued training at the PHC and the sub-centres aims at making them proficient in treatment of 'at risk' children and mothers.

3. Active involvement of paediatricians and teachers of community medicine has installed an academic impetus to the performance of health functionaries and management of severely malnourished children. Continuous training of various level workers has ensured better standards. The participation of graduate interns in the health surveys has proved to be an interesting field exercise which is hopefully expected to motivate them in the MCH work in their future practice. The consultants from the medical colleges have also been able to mobilise members of other disciplines in training and surveys. Most of the medical colleges are currently participating in this national programme.

4. The state directorates of health services have taken special interest in ICDS recognising the approach as an alternative strategy to delivery of health care.

What should be better achieved in ICDS

1. Children in age group 1-3, particularly the ones who are suffering with severe degree of malnutrition still remain inadequately covered. A system to establish nutrition therapy for such children at home or at sub-centre and PHC needs to be developed, though high calorie therapeutic food has been made available for treatment of those affected.

2. The referral system from anganwadi to the PHC and onwards needs support from the administration.

3. Inspite of renewed emphasis, the nutrition and health education activities remain low in service priority.

4. The improvement in water supply and sanitation has also not picked at a faster pace.

Conclusion

The comprehensive approach of child development is well conceived in ICDS projects and preliminary programme in 150 areas shows promising results. The ICDS programme is an example of unified efforts of Social Welfare and Health Departments leading to fulfilment of needs of those, who are deprived and neglected.

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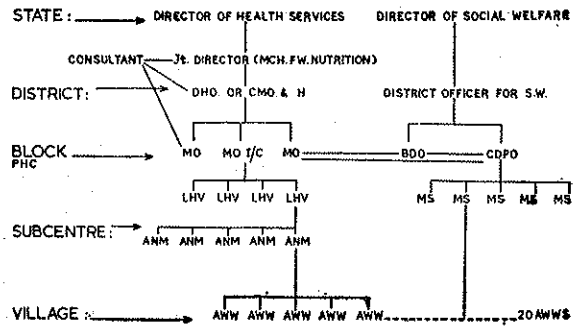
ADMINISTRATIVE FLOW DIAGRAM FOR A RURAL ICDS PROJECT



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SURVEILLANCE OF EPI TARGET DISEASES

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Introduction

Major causes of sickness and death of children in India are infectious diseases, many of which are preventable by immunization. The expanded programme on immunization (EPI) has been initiated in the country with the objectives of (i) integration of immunization services, (ii) expansion of immunization coverage of susceptibles, (iii) organization of reliable disease surveillance system (iv) production and quality control of vaccines (v) addition of antigens in existing programme (vi) development of cold chain for the storage and transport of vaccines (vii) orientation of health personnel (viii) ensuring community participation and (ix) periodic evaluation of the on-going programme. The traditional measures like the number of vaccinations and percentage of achievement of target of vaccination, do not ensure prevention of the disease. Success of the programme can only be indicated by the prevention of morbidity of the concerned diseases. There is need for setting clear objectives to quantified reduction in morbidity and mortality during certain period of time. EPI is a long term continuing programme and surveillance of the target diseases is one of its important components.

Need for disease Surveillance

Disease surveillance is systematic collection, compilation and analysis of morbidity and mortality within defined population for taking appropriate action. This registers and quantifies changes in disease patterns, that can be used to evaluate an immunization programme objectively, and to introduce needed modifications of the programme. In the context of EPI, surveillance has application for providing data to be used for :

a) Quantification of specific diseases preventable by immunization to measure the magnitude of the problem and indicate priorities. Thus surveillance identifies the need for an immunization programme.

b) Identification of population at particular risk of disease, death and disability by location and age ;

c) Study of the disease transmission pattern as means of formulation of strategy.

d) Monitoring of the effectiveness in achieving the programme objectives accurately and continuously by ensuring whether immunization programme is succeeding in preventing disease.

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Surveillance has five functional elements, namely (i) data collection (ii) preliminary data analysis (iii) epidemiological investigation (iv) action for control and (v) feed back. In this paper, data collection is discussed.

Currently Available Data

At present the information is being collected on 20 communicable diseases which include seven EPI target diseases (Diphtheria, Whooping Cough, Tetanus, Polio, Measles, Tuberculosis and Typhoid) on a monthly basis by the Central Bureau of Health Intelligence (CBHI). The data is related to patients treated in medical institutions (mainly hospitals) only. Even this data does not include information from many large hospitals. Sometimes the figures from a single hospital exceed the figures sent by the State authorities for the whole state. Moreover, all the states and Union Territories (UT) do not send their report to CBHI. Out of 31 States and U Ts, the number of units reported varied from 19 to 23 during 1972-1976.

Year	No of States/UTs reported
1972	19
1973	21
1974	23
1975	23
1976	19

In the States, there is no review of number of reporting units, and their regularity in submission. In Kerala, out of 879 reporting units, on an average, 575 reports at the state level were received each month. In Ropar district of Punjab, in 1978, out of 41 expected reports, 22 monthly reports were received on an average.

There is also discrepancy in data preserved at the State Bureau with that of CBHI as many of the delayed reports received from the periphery have not been incorporated subsequently.

Incidence of Tuberculosis as reported by State Programme Officer and CBHI during 1974 1977 in M.P.

Year	Cases of Tuberculosis	
	Reported by State Programme Officer	Recorded at CBHI
1974	363045	58556
1975	344343	57360
1976	355215	84274
1977	220652	81837

In many health institutions, cases of cough were reported as whooping cough and vice versa. Cases which do not visit medical institutions, are not included in the above reports. Many cases of measles and whooping cough get treatment within the community. Deaths from neonatal tetanus are not attended to. The epidemiological information available at present is fragmentary and do not represent the actual situation of the whole country, particularly in rural area. The infrastructure in different states is at various level of development and therefore the data cannot be compared objectively.

Appropriate Information System

An appropriate information system has to be established to provide the basis for programme development and evaluation. Some of the diseases with which the immunization programme is concerned, are easily recognized, such as measles. Others such as

diphtheria and pertussis, are much more difficult to diagnose. Residual paralysis is relatively easily recognised as compared to acute cases of polio. Because of these differences, no single method of surveillance can be used, with equal reliability for all of the diseases, The EPI target diseases deserve special attention, as national programme exists for the control of these diseases, The following steps need to be taken for improving the present situation.

i) Strengthening of current reporting from medical institutions.

ii) Supplementing the institutional information by reports from the health workers in the field.

iii) Additional data from selected centres.

iv) Special survey.

The first two will supply minimum data in terms of cases and deaths only. The last two sources will provide epidemiological data for detailed study.

Strengthening of current reporting system

The reporting units, flow of information, and proforma have to be examined and standardized. In some States, the reports from primary health centres come directly to State headquarters. Medical College hospitals or private hospitals have not been included as reporting units in certain areas. Supplementary reports should be encouraged and at the end of the year corrected reports have to be compiled at all levels. The diagnosis given in the medical institutions are expected to be rational. The physicians must understand the importance of disease reporting. They must record the diagnosis in out-patient registers clearly, so that compilation can be done monthly.

The number of cases and deaths from the target diseases, treated during the preceding month is all that is needed at this point. It is important to have all reporting units submit monthly return including 'Nil' reports. When reports are late, missing or improperly completed, the State/Central office should promptly attempt to obtain the correct information.

Reports from Health Workers

The health staff of primary health centres during their routine field visits, are coming across with different sickness including EPI target diseases. They should be encouraged to report those and Sanitary Inspector should make a monthly compilation of the information for despatch to district health office. Orientation of the health staff will provide the necessary skills to make correct diagnosis in most cases. During the fever with rash surveillance as part of smallpox eradication programme, the reporting of measles cases by health workers was found to be satisfactory in terms of adequacy and correctness. Preliminary analysis of data and investigation of unusual outbreaks will help in improving the quality of reporting Items of information related to EPI expected for monthly transmission from PHC to district, which in turn sends to State level after consolidation, can be seen in Appendix A. A simple wall chart as was maintained, during smallpox eradication campaign, showing all reporting centres and month, at district health office and State directorate, will provide a simple method of monitoring incoming reports. By entering the data of a report from each centre, under the appropriate month, it is possible to identity non and late reports.

Additional data from selected Centres

Teaching hospitals and primary health centres under supervision of Medical Colleges may supply additional epidemiological information in the form of age incidence, previous history of immunization, relationship with nutrition, investigation of large-sized outbreaks or unusual episodes. Infectious Diseases Hospitals and Rehabilitation Centres will be the source of detailed information of particular diseases. Information on prevalence of meningeal and military form of tuberculosis will be available from district tuberculosis centres and hospitals. These centres may be termed as sentineal centres.

Special Surveys

Systematic residual paralysis survey carried among samples of primary school children will provide an indication of the magnitude of polio problem. The actual incidence of polio has to be adjusted considering recovery, death, and non-attendance in school. As most of the neonatal deaths occur at home, enquiry of childhood deaths would give information on likely death due to tetanus. Experiences have shown that para-medical workers can be effectively used for these surveys after short orientation. Simple guidelines for these surveys for Polio, Tetanus and Whooping cough on the basis of WHO EPI manual are given in appendix B. Institutions have to be identified who will conduct these special surveys periodically.

Appendix 'A'

MONTHLY REPORT OF EXPANDED PROGRAMME ON IMMUNIZATION

State/Union Territory

Number of reporting units_____

Number of reports received_____

Month_____ Year_____

A. Surveillance

Disease	Cases	Deaths
Diphtheria		
Whooping Cough		
Tetanus		
Measles		
Tuberculosis		
Poliomyelitis		
Typhoid fever		

Vaccination Performance (number)

Smallpox	DT (1st dose)
B.C.G.	DT (2nd dose)
D.P.T. (1st)	TT (1st dose)
D.P.T. (2nd)	TT (2nd dose)
D.P.T. (3rd)	TT (3rd dose)
Booster	
Polio (1st)	
Polio (2nd)	Typhoid (1st dose)
Polio (3rd)	Typhoid (2nd dose)
Booster	

Signature

Appendix 'B'

SURVEY OUTLINE FOR NEONATAL TETANUS WHOOPING COUGH AND RESIDUAL POLIOPARALYSIS

The objective is to estimate the incidence of Tetanus neonatorum and Whooping Cough in randomly selected villages. One health worker covers a small village/ward population 500-1000) in one day. He visits every house and asks the following questions.

For Tetanus Neonatorum

1. Has there been a delivery in this house or family during last three months?
2. If yes, where is the child ?
3. If the child has not survived, when did the child die ? (age)
4. If the child died in the first month of life ;
   a) Did the child drink milk for several days and then stop ? (In case of cerebral birth trauma, the child is not able to drink milk from the beginning.)
   b) Were there any convulsion, any trismus, any opisthotonus ?
   c) Did the child die of tetanus (DHANUSTANKAR) ?
5. Do you know of any recent deliveries in neighbouring houses ? (for checking).
6. Record the result village by village.
   No. of live births.
   No. of suspected Tetanus Neonatorum cases.

For Whooping Cough

1. How many children in this family are under 1 year and 1-4 years.
2. Any children d ed during the last one year ?
3. What was the cause of death ? Elicit the possible cause of whooping cough by telling the mother symptoms of the disease.
4. What was the age of the child at the time of death ?
5. How/Where was the child treated ? If hospitalized, ask for record.
6. Did any child 1—4 years, suffer from whooping cough (use local name) during the last one year.
7. If so, how/where the child was treated ?
8. Is there any whooping cough case (1-4 years) at the time of visit ?
9. Record the result village by village.
   No. of children under 1 year
   No. of children under 4 years
   No. of deaths during last 1 year
   No. of children who suffered from whooping cough and survived.
   No. of children who died of whooping cough.

For Residual Polio Paralysis.

Health worker examines the children in randomly selected schools. Suspected cases of paralysis/paresis are re-examined by Medical-Officer.

1. Children aged 5-10 years are partly undressed with short trousers only.
2. Child stands before examiner and any asymmetry seen in muscles is noted.
3. Child turns around and the examiner sees him from the back
4. Child stretches arms sideways up : any non-function is noted.
5. The symmetry of muscles of extremeties and scapular region will be compared.
6. Child walks away and the examiner watches the child's gait and if there is any foot drop, he notes it.
7. If paralysis is detected, the examiner will have to determine whether it is flaccid, asymmetric, and whether there are any sensory changes.

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ECOLOGICAL APPROACH TO CHILD CARE IN INDIA

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Children in every country are the most precious possession of parents. The well-being of the child, its growth and development in a healthy atmosphere is and should be a universal aspiration of every family as well as a national concern as child is the future of manhood and asset of a nation. The various factors that govern the development of the child are ideology, political structure, economic standard, socialization pattern and value system. These factors in conjunction with the physical environment from the ecological womb in which the child is nurtured by the family both living in the same ecological space.

In the past, with much less population, sufficient land and high mortality rate, it was advantageous to parents and communities, particularly agriculturists to have large number of children. Today there is some realization that small families of healthy children with opportunities of education are to be preferred. At present in most of the countries in the world increasing attention is being given to health of mothers and young children and there is a feeling that if a country is to make rapid progress in economic and other developments it can be brought about within reasonable time after adequate services have been provided for the medical, nutritional and general care of small children, to become effective members of the adult society of the future. Furthermore demand for more children would naturally come down with assurance of survival of those born to reach the stage of useful adulthood.

Birth of a Healthy Child

The first essential need is the birth of healthy child with normal physical and mental components. In this respect, the most critical days in a child's life are those immediately before, during and after birth. The closer the time of delivery, the greater is the danger to the infant; the maximum rate of mortality of human being as a whole is the perinatal infant mortality. This largely depends upon three factors namely, mother's health, process of delivery and the initial environment to which it first opens its eyes.

Although every couple intuitively yearns for a child, but how many of them realize the responsibility involved in bringing up as a healthy and worthy inheriter? There appears to be an apathy to fulfil this responsibility as their behaviour pattern in relation

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to child birth is influenced by manifold factors namely (1) current belief and customs of delivery system ; 2) employment of untrained dais having no knowledge of contamination or infection for conducting delivery, particularly in the rural set up ; (3) without any attendant and proper shelter often costing the life of the mother or the child or of both ; (4) frequent pregnancies without spacing ; (5) many children to be cared for ; (6) want of common knowledge for proper rearing of the child ; (7) absence of adequate means to provide food and environment for normal development of the child.

Very long ago Manu *Samhita* described the laws and methods regulating child birth which were as scientific as of the present days, advocating a newly built hut (*Aturgriha*) for delivery and stay in isolation for one month with strict observance to save both mother and child from contact with others and possible infection (*Chhut*) on the plea of birth uncleanliness (*Janamasauch*). But in course of time the system deteriorated almost to the level of superstition. Not very long ago and even now in the rural setting the parturating mother was being placed in the worst environment such as an abandoned cowshed, husking room or some corner of the generally unused room for delivery with use of discarded linen, apparently polluted, often leading to infection, tetanus neonatorum and early death of the baby and sometimes of the mother as well. Use of bamboo strips for cutting the cord without caring for infection also caused high neonatal mortality due to tetanus and other infections.

Although lately the situation has changed for the better in certain communities with introduction of maternal and child care through establishment of primary and subsidiary health centres, effecting a reduction in infant mortality rate but this service being not adequate there has not been any significant decline in the still-birth and perinatal infant mortality rate even after the introduction of small family norm and birth control measures. At least three important measures need to be augmented for better success namely, (1) appropriate health education right into the rural families on responsibility of child birth, appropriate place of delivery and subsequent treatment of mother and child, child rearing, family planning and advantages of small family norm, (2) training of dais and (3) utilization of health centres for antenatal care and provision of facilities for hospital as well as home delivery system.

Importance of Environment

From the day of conception till the day of death the genetic constitution of a life is constantly subjected to influence of either internal or external environment perhaps causing certain modifications. When death results from environmental factors, e.g., from infection, physical accidents, lack of food and shelter, extremes of climate and so on it is called *ecological* death, as distinguished from *physiological* death such as by old age, failure of vital organs, mental and physical derangement or damage, etc. Too many children are still dying in India, the majority of deaths being environmental or ecological in origin, the need for control of environment is imperative.

Importance of health of mother and antenatal care

It is essential that mothers who have conceived shall have adequate health care, nutrition, rest and exercise to bear the brunt of pregnancy and to beget a healthy offspring There are certain diseases which have definite adverse effect on child bearing. Syphilis is one. The infant born to such mothers may be a still birth, or the child may be born with congenital syphilis with or without actual physical defect. Genetic anomaly arises out of the constitution of husband and/or wife and chromosomal disorders may lead to many kinds of physical defects such as of limbs, face, body, nervous system, cerebral diplegia, microcephaly, hydrocephaly low intelligence, psychosis, mental deficiency (idiocy, mongolism, etc.) and other hereditory traits such as, high blood pressure, diabetes, asthma, haemophilia, albinism, phenylketonuria and many others. To avoid these unwanted happenings the ancients made certain marriage laws for selection of partners. In USA every couple before marriage is compulsorily required to get a certificate of freedom from syphilis. Genetic counselling before marriage may be one of the measures to avoid such diseases as far as possible. Secondly couples with such defects are perhaps the fittest subjects for sterilization. They can however adopt a child if they like.

There are certain diseases from which if the mother suffers during pregnancy it becomes harmful to the offspring. These may cause still birth or the infant may be born with certain defects as in case of chickenpox, german measles and small pox. Mother should be vaccinated against smallpox and inoculated against tetanus to avoid smallpox for herself and to give passive immunity to her offspring against smallpox and tetanus. Again, the mother may suffer from mild or severe toxaemia of pregnancy. For all these proper antenatal care is the ready remedy for all mothers as well as the babies.

Child growth and development

India had the first manuscript on the management of children many years before the birth of Christ. *Kashyapa Tantra* had a chapter on *Kaumara Bhritya* i.e. service or aid to children. This was followed by Sushruta who wrote a chapter on *Kaumara Bhritya* in the second century A.D.

The growth impulse is inherent on the young of all animals and living creatures including human being and in obedience to natural impulse children grow even under hampering surroundings such as pavement dwelling, bustee or slum conditions, etc. But for perfect development of body and mind certain fundamental physical conditions are required. Among these are pure air, sunshine, food, water, warmth and protection, sleep and rest, freedom of movement and exercise. It is therefore plain wisdom to surround the child during early growth period as far as possible, with these conditions and environment which are conducive to healthy growth. Whatever qualities the child may have inherited from the parents, may be modified by his surroundings either to his advantage or disadvantage. Various studies made in this connection show that in rear and alley houses with low sanitary conditions, dark overcrowded badly ventilated rooms (as

in the bustee), many more babies die in the first year of life than in the better houses.

Children who play a large part of their time indoor, and specially those who live or work in close, hot, overcrowded huts, rooms or houses are apt to be dull, listless, pale and underdeveloped. A baby may thrive for the first year or two of life in such a surrounding but a child old enough to run about should have much more freedom than such quarters afford and should be able to spend a great part of his life out of doors. Even though the house or the living room itself is small and lacking conveniences and adequate sanitary requirement it does not matter much if the child can spend most of his life out of doors exposed to sunshine, fresh air and free exercise in company with his playmates. This problem does not generally arise in rural areas but it is a serious problem in cities and towns where bustee dwellings are extremely insanitary without any provision of open space nearby.

Child feeding and nutrition

For child feeding Indian mothers depend on tradition, local customs and sometimes on beliefs mingled with superstition, particularly in the rural setting. Nature has ordained that child should get all initial feeding from other's breasts but artificial living and condition of mother's health have gradually led to the disease and abuse of breast feeding. Flooding the market with artificial baby food, sophistication of womanhood and mothers taking to regular jobs in cities and towns are some of the additional reasons for abandoning breast feeding. In other words, motherhood, the highest sanctimonius function of human life is being allowed to be furnished at the alter of so called sophistication and civilisation. Strong emphasis on breastfeeding should therefore be advocated from all platforms, public or private, medical or nonmedical. On the other hand, many thousands of babies in India are nipped in the bud before or shortly after birth because of illness, overwork and underfeeding of their mothers during the nine months of prenatal life and a large contingent of them die of prematurity, underfeeding and malnutrition. Those babies require special care of feeding for their survival and growth.

It is estimated that more than half the babies born in India is suffering from some sort of *malnutrition*, and 10 to 20 percent from severe malnutrition with some leading upto the stage of Kwashiorkor mainly arising out of unbalanced dieting for want of the required amount of milk, vegetable or other animal proteins. Dissemination of knowledge and supplementation of feeding by social, voluntary or governmental organisations in a systematic programme all over the country and not merely by scrap, as is being done now-a-days on philanthropic basis, are necessary. The *Balwadis* and *Anganwadis* Schemes launched by the Government of India are the most desirable and welcome programmes but these should be integrated and devetailed with mothers' education on child rearing according to the prevailing local situation to have a permanent effect and benefit.

Another feature often noticed in our country among the well-to-do families is overfeeding but they should realize that the child's digestive system is not capable of dealing with all foods as the grownup people and that these

organs also require to be gradually trained. Hence in India a traditional weaning process by providing solid food starts from *Annaprasana* ceremony (cereal eating) at six months. At the same time prolongation of breast feeding (generally by the poor or country women) alone beyond six months without supplementation of solid foods is detrimental to the growth of the child as is the cause of anaemia in these children.

The question of school feeding will only come if the child survives upto 5 years.

Defective and Delinquent children :

As mentioned earlier quite a sizeable proportion of children are born in India with physical and mental defects and some acquire it during the stage of rearing. Those that are born with low intelligence can be taken care of by organising special institutions for the purpose of making them at least partially useful to the society. To help such children it is to be found which children are at risk most. Low intelligence (IQ) may arise from brain damage and cerebral palsy. Low economic factors and large families are often associated with low verbal IQ and reading retardation. These seem to be a result of both hereditary factor and persisting malnutrition and uncongenial environmental factors. There are methods now available for remedial teaching but institutions are very few in the country. Unless the government undertakes to establish such institutions the advantage of a few private institutions can be taken by the well to do only. The author once suggested that in every school irrespective of the standard should employ a social worker trained in psychiatry as one of the regular teachers compulsorily, just as it employs a physical instructor, to deal with the low IQ group. This can, however, be done without undertaking an additional financial burden as the social worker will normally act as a teacher of a general subject of her choice and in addition will deal with the low IQ with perhaps a small allowance.

Those that are born with physical defects can at least be partially restored to working condition by rehabilitation and surgical measures. In certain instances, genetic counselling and obligatory sterilisation may be adopted. For the blinds and deaf and dumb there are institutions, both voluntary and governmental, but these are inadequate for taking care of the large number that is born with these defects. Blindness due to diseases like smallpox and veneral diseases are definitely preventable by taking a good antenatal care, those that acquire the diseases due to *malnutrition* are also prevantable. For all these voluntary organisations have been mainly active to the field but the State and Central Government should undertake the task as a national policy.

A fairly large number of children are becoming *delinquent* due to adverse environmental and socio-economic conditions, particularly those who are born to poor families living in huts or bustees where child care is virtually unknown. Some of them become urchines and indulge in criminal or unsocial acts. For such children there are Juvenile Courts and rescue homes for correction and rehabilitation but these are inadequate in comparison with the extent and rising trend of the problem. The advantage of Borstal Institutions are generally enjoyed by families other than those coming from the poor strata.

Another group of children who are born to beggars, homeless families and pavement dwellers, also turn into beggars or street urchins and thus inflate the number of ordinary and criminal beggars. The author had made a study of these cases and was able to motivate 60-70 percent of the beggar women overburdened with children to accept voluntary sterilisation. In fact, many of them did not want to bear any more children but did not know how to achieve it. Sterilisation came handy to their rescue and they welcomed the measure.

Exploitation of Children

Child abuse and neglect are becoming common with increasing economic distress, unemployment and overcrowded living. The ecological stress factors associated with maltreatment of children are economical stresses, social stresses and intrafamilial and interactional patterns combined, to some measure, with psychological factors, to produce a general or usually a chronic condition of abuse, neglect or some other form of child maltreatment. Unmarried motherhood, parental discord, broken family, existence of co-wife, too many children, trouble with the neighbours, mental retardation, malnutrition dissatisfied or irritant child, frequent sickness in the child and various other social illnesses contribute towards maltreatment of the child and mere physical treatment is not right answer but it should be followed by social treatment by appropriate agencies.

There are two other kinds of child abuse in the society that need to be mentioned here: (1) Employment of children in odd jobs in factories, clubs, restaurants, tea shops, households, offices, etc. inspite of the existing legislation ; and (2) exploitation of children by designing beggars. Young children are lifted by the gang who maim their body through inhuman measure and present them in the street or suitable place to attract the sympathy of the passersby for donations or alms. Some of them are also trained for steeling, shoplifting, pickpocketting and other antisocial acts. The government in collaboration with the public should organise appropriate bodies to deal with these conditions and save the children from such humiliation and spoiling their lives for good.

Child Protection

Accidents claim the lives of more children each year than the next six leading causes of morbidity (pediatric diseases) combined. These produce injuries that require medical attention in one out of every three children. In the pre-schol age group 90 percent of these accidents and at least half of the fatalities occur in and around home. The commonest causes are fall (heading the list), fire, drugs and poisons, sharp instruments, coins and jwelleries, pins and needles, drowning, fruits and nuts, animals, vehicles, etc. Certain amount of protection can be given to the children by training and warning and by keeping the household materials (drug, poisons materials, coins and jwelleries, sharp instruments) not in use out of bounds for children as far as possible. Training in School should include accident prevention along with other school health programmes.

Prevention against childhood diseases is an essential programme. Vaccination against smallpox, polio, tetanus, whooping cough and

tuberculosis followed some months later by anticholera and antityphoid vaccines are to be started shortly after birth and should be completed within a year and a half with booster doses to be given during school carrier. First aid measures should be kept ready at every home and school. Health practices should start from the infant stage and gradually augmented during pre-school and school stage ending in regular health education course.

Problem of Working Mothers

Upto the age of 5 years the child is heavily dependent on mother and any situation that causes separation of the child from the mother even partially tells upon the health and psychological make up, and the child being deprived of mother's loving care develops individualistic trait instead of feeling for others. This situation arises in cities and towns in the families of working mothers. Industrial establishments partially manage this problem by maintaining 'creche' for suckling babies for feeding them at intervals. In other establishments the baby has to be left with relatives, ayahs, nurses, neighbours or foster homes (few) but this arrangement is not conducive to the normal development of the child. Even the hospital authorities having realized this problem are now allowing mothers to stay witp their hospitalized babies but working mothers cannot avail of this advantage.

The brief account of child care from ecological standpoint presented above is only to high light certain aspects which urgently require attention of the people and the government. Healthy growth of the child through proper and adequate child care prepares a strong foundation upon which a stable and strong superstructure of the child's adulthood can be built to ultimately strengthen the national edifice. Certain basic conclusions can be drawn from the above discourse namely,

1) Environment has a great influence on the family and the child.

2) Physical and mental make up with which the child is born can also be modified by these environmental factors.

3) Changes in the ecological parameters reflect in the variation in the growth and development of the child and also in the incidence, course, morbidity and mortality of childhood diseases.

4) Control of environment is easier and cheaper than all attempts to cure ill-health and disease. Hence preventive pediatrics is much more important than curative.

5) One must study and understand the social factors (which may differ from place to place) which contribute to the causes and continuance of the morbidity and mortality of children to enable the authorities to formulate the most useful method of control for which the following principles can be suggested—

a) An objective and imaginative approach to child health is necessary based on the knowledge of local customs and practices.

b) A maximum return in terms of child mortality and healthier children is to be obtained from the limited funds available.

c) Arrangements should be made for maternity service (antenatal, natal, and postnatal) extended upto the village level with necessary health education to mothers regarding child nutrition and child rearing.

d) Care for children should be extended to every section of the community services and need to be near the children's home by subsidized nutrition programme through health centres, mobile units and home visiting.

e) Minimum sanitary facilities are to be provided by improvement of bustee dwelling with some open spaces found for children's play and movement.

f) Accidents being the cause of high mortality measures to be taken to reduce the household hazards as much as possible through proper education of the children and inmates of the household regarding safety measures.

g) Child maltreatment and abuse should be tackled on social service model through protective care unit of a public Social Service agency in collaboration with the hospital pediatric departments on the one hand and legal steps in preventing the kidnapping of the children for begging and criminal purposes and for controlling child employment.

h) Sufficient number of institutions are to be provided to take care of the delinquent and physically and mentally defieient children including the blind and deaf and dumb.

i) Society should recognize the problem of the working mothers and evolve some remedy to deal with the situation locally.

j) Small family norm should be advocated from all platforms.

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ALTERNATIVE APPROACHES TO IMPROVE CHILD HEALTH IN INDIA

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Why alternatives ?

Because the existing health care strategies currently in vogue in India, have resulted in the all too familiar statistics, which child health workers are both sick of hearing and ashamed of. High birth rates (35.2), high mortality (122) and the increased incidence of diarrhoeal diseases are associated with poor nutritional state in pre-school children (upto 60%). Coupled with this poor health situation in children, are the seemingly insoluble administrative headaches of health planners such as, lack of doctors, nurses, equipment at the primary health facility which exists in the villages. Of course various combinations of these individual problems vitiate the situation further. There may be doctors, but no equipment. Equipments such as refrigerators and vehicles are in position, but not in a working condition nor there may adequate funds allocated for their functioning.

Community Participation

Doctors, nurses, keep struggling in most difficult and trying situations in the villages, often become frustrated and come to the conclusion that due to paucity of resources the above situation cannot be corrected. But we overlook the fact that human resources which this country is blessed with are not exploited fully for their own betterment. At the First International Conference on Primary Health Care held in Alma Ata, the most frequently stated theme was "People have the right and duty to participate individually and collectively in the planning and implementation of their health care."[1] The principle of community participation has been increasingly central in social and economic development thinking in recent years but it has never been more completely at the heart of the matter than at Alma Ata. Speaker after speaker emphasized the same points. Full community and individual participation at every stage in the development of primary health care services is essential. Self reliance and self determination must be allowed to flourish and must be supported by all levels and sectors of Government.

Primary Health Care

Primary health care is taken to mean a health approach which integrates at the community level all the elements necessary to make an impact upon the health status of the people. Such an approach should be an

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integral part of the national health care system. It is a response to the fundamental human need of a person to understand and be assisted in, the actions required to live a healthy life and to know where to go for relief from pain and suffering. A response to such needs must be a series of simple and effective measures in terms of cost, technique and organisation, which are easily accessible to the people in need and which assist in improving the living conditions of individuals, families and communities. These include preventive, promotive, curative and rehabilitative health measures and community development activities.[2]

What alternatives for the child in India ?

1. *Village/Slum Level Health Workers*

The community should select and sponsor mature female workers, may be a trained "dai" or a school leaver preferably married with grown up children of her own. They undergo a short course of training which covers simple topics on the preventive aspects of mother and child care. They do not replace doctors, but they may substitute them in a simple under six clinic in weighing children, immunising them and advising mothers on nutrition and health education. She may supervise the health and well being of 300-500 children under six years.[3]

This category of worker is known as "Anganwadi Workers" in the ICDS project of the Govt. of India being implemented in a few selected blocks. Recently they have been identified as "Shishu Kalyanis" in the nutrition supplementation programme undertaken by the Govt. of West Bengal, UNICEF and CARE for 30 of the worst flood affected blocks in West Bengal. Their training has now been entrusted to Child In Need Institute (CINI).[4]

2. *Nutrition Supplementation and Health Education Programme*

Nutrition supplementation with low cost locally available foods specially for "at risk" cases such as children under six years, pregnant and lactating mothers is now identified as a prime need in any rural or urban community in India. "Spot feeding" or "take home" food may be the two methods of delivery. The food should be used as a tool in delivering much needed nutrition and health education to the community. This supplementation is to be phased out gradually, once socio economic programmes to generate both food and income take root amongst the deprived sections of the community.

3. *Health by the people*

The village/slum health workers form part of a health care delivery system where the community themselves participate in the activity. A token contribution is levied for services rendered, simple medicines are disbursed whose costs are subsidised by the fee collected. The allowance of the health worker may also be met from the subsidy. A vigorous campaign is launched by the community to undertake immunisation programmes specially for children against preventable diseases and also against mothers for new born tetanus.

4. *Mahila Mondols, Youth Clubs etc.*

Such organisations have an invaluable role in strengthening and supporting community development activities. Through the block

administration and through the Panchayats women and youth groups can be mobilised. The women groups may be involved in the preparation of low cost nutritious foods for children, as well as be involved in kitchen garden and adult literacy classes. The youth groups may be involved in drama, puppet shows etc. to bring about social change through the use of conscientisation techniques. Another avenue may be the setting up of a village craft training centre, helping mothers to learn mat making, weaving, sewing etc.

Summary

Flaws and weaknesses in the existing health care system have resulted in high child morbidity and mortality This can possibly be corrected adequately by involving the community and allowing them to participate at all levels in improving their health state. Primary health care should be emphasised at all times to enable the community to receive preventive, promotive, curative and rehabilitative health measures in a simple and effective manner.

A few alternatives are presented where community sponsored mature women termed village/slum health workers are key personnel involved in delivering primary health care. The "at risk" population is covered by the nutrition supplementation and health education programmes and the people all contribute to a low cost health care.

Mahila Mondols and Youth Groups share in this responsibility to make health care a reality.

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INFANT MORTALITY IN AN URBAN LOCALITY OF CALCUTTA

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It is a universal truth that infant mortality is one of the most sensitive indices of the health and level of living of a community, state or nation. Demographers put great emphasis on the infant mortality because it is the largest single age-category of mortality, at this age causes of mortality are more specific than for the adults and also because the deaths can be controlled fairly easily by application of specific health programmmes

Infant mortality continues to be high in developing countries where the rate is as high as 200 or more per 1000 live births. In the developed countries it is much less where the rate may be as low as 10 per 1000 in Denmark and 11.7 per 1000 in 1972 in Japan. This remarkable achievement has been possible due to revolutionary advances in perinateology. The gradual decline in infant mortality throughout the world is due to improvement in the socio-economic condition, better standard of health care delivery system and advancement in the field of chemotherapy, antibiotics and insecticides.

In India, infant mor ality has shown a downward trend during last few years. Nearly half of the infant deaths occur during the first month of life of which more than 50 per cent occurs in the first week Of all the accountable causes of infant deaths, medical causes are the immediate causes and the rest are due to multiple factors like biological, social, economic and cultural which run together and threaten the survival of the infant.

Thus a multi-pronged attack is needed to reduce the infant deaths and conceivably it is not an impossible task. But the few, who are born with congenital abnormalities will probably die inspite of all efforts. Therefore the infant mortality is not likely to reach the zero level and the reduction to that level will depend on preventing one of its principal causes i.e., congenital abnormalities which is rather difficult to control for the community at large.

Material and methods

Information on infant deaths from 1957 to 1974, classified according to calendar month of occurrence of death, age at death and type of residence (slum or non-slum), were assembled from the records maintained in the vital statistics section of the Urban Health Centre, which is the practice field

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of the All India Institute of Hygiene and Public Health, Calcutta. These deaths pertain to the resident population of the service area of the Health Centre and are collected by the field staff (Field Investigators, Computors & para-medical staff) of the Health Centre for the purpose of providing the information on infant deaths to the M.C.H. section for their related services and for compiling the vital indices. These deaths were further classified by cause of death.

For the purpose of assessing the level of mortality among infants two types of rates were considered viz. the conventional infant mortality rate and adjusted infant mortality rate. Information on deaths by ages occurring in different months of any calendar year were referred back to identify the cohorts of births to which these deaths belonged. Then the infant deaths out of the births of any calendar year, thus ascertained, were divided by the births of the same year to get the adjusted I.M.R. for the year. It amounts to a cohort study on a restrospective basis and therefore the rates, had it been studied in a prospective way, are likely to be very near to the true I.M.R. These adjusted I.M.R. have further been studied with reference to the distribution of deaths by age in months during infancy in order to find out the behaviour of this distribution pattern over years.

Findings

Conventional infant mortality rates for the years from 1957 are shown in table 1, separately for slum and non-slum localities.

TABLE 1 : Conventional Infant mortality rate for the slum and non-slum areas in Chetla.

	Infant mortality rate per 1000 live births		
Year	Slum	Non-slum	Combined
1957	94.7	64.5	79.4
1958	87.0	66.4	77.4
1959	71.9	82.4	76.8
1960	89.3	75.2	82.9
1961	78.8	67.2	73.7
1962	79.4	60.4	70.9
1963	93.4	45.4	72.8
1964	75.2	56.0	67.5
1965	77.1	77.3	77.2
1966	77.5	64.5	73.0
1967	85.1	41.7	68.1
1968	82.9	47.8	69.8
1969	78.2	62.8	72.5
1970	87.8	65.7	79.5
1971	93.8	61.3	81.7
1972	91.0	62.9	81.2
1973	94.1	63.9	83.0
1974	103.0	65.5	89.2

From a perusal of the rates given in table I it appears that conventional I.M.R., both in slum and non-slum areas, had been rather insensitive to passage of time. An attempt was made to study the trend of the I.M.R. in relation to "adjustment factor" which is defined as the proportion of infant deaths in any calendar year out of the births of the same year.

It appears from the figures of adjustment factor in table 2 that the proportion of deaths of the infants born and died in the same calendar year did not appreciably change over the years in both slum and non-slum areas.

Table 2 : 'Adjustment factor' slum and non-slum areas.

Year	Adjustment factor in percentage	
	Slum	Non-slum
1957	67.0	73.5
1958	80.2	67.2
1959	66.7	74.3
1960	71.4	62.3
1961	71.8	82.4
1962	64.2	65.9
1963	77.4	67.6
1964	75.9	79.5
1965	72.7	79.6
1966	72.4	72.7
1967	77.2	88.0
1968	60.8	85.2
1969	80.3	75.0
1970	73.2	86.5
1971	75.0	75.9
1972	67.1	81.0
1973	67.0	88.9
1974	65.6	70.9

One of the disadvantages of the conventional I.M.R. is that the rate is influenced by the fluctuation in the number of births which forms the denominator of the rate. In order to alleviate this difficulty, adjusted I.M.R. as described earlier, was worked out and are furnished in table 3.

This exercise also was not of any avail, since the adjusted rates remained more or less unchanged over the years.

TABLE 3 : Adjusted infant mortality rate in slum and non-slum areas in Chetla.

Year	Adjusted infant mortality rate/1000 live births		
	Slum	Non-slum	Combined
1957	81.1	66.4	73.6
1958	92.7	66.3	80.0
1959	75.9	90.2	82.6
1960	85.7	64.9	73.0
1961	83.4	73.1	78.9
1962	71.6	54.9	64.6
1963	91.4	41.4	70.0
1964	77.1	58.2	69.8
1965	77.1	75.7	76.6
1966	74.4	52.7	67.0
1967	99.1	43.4	77.3
1968	66.1	56.6	62.6
1969	85.4	59.8	75.7
1970	85.9	70.3	80.1
1971	97.0	64.9	83.8
1972	97.0	57.6	81.8
1973	98.1	64.1	84.9

Analysis

This insensitive behaviour, of both the conventional and adjusted I.M.R. over the years was further examined through the level of mortality at various ages during infancy. In order to do this, the adjusted infant mortality rate of any year was classified according to the twelve ages at death in months. By doing so the variation in the number of deaths, caused by varying number of births in different years, was reduced to a comparable base. Further breakdown of the neonatal period, as is conventionally done, into different risk periods of the neonatorum was not attempted for avoiding any difficulty due to induced heterogenecity in the data.

The straight-forward technique of analysis of variance of proportions of adjusted infant mortality rates per 1000 live births at various monthly ages was carried out and the results

are shown in table 4. Through this analysis it was intended to investigate the effect of factors like time, place of residence, age at death during infancy, and their possible mutual interactions on the mortality level during infancy.

TABLE 4 : Analysis of variance table.

Source of variation	D.F	Sum of squares	Mean square	F
Between years	16	229.6936	14.3558	1.18
Between slum and non-slum	1	199.0250	199.0250	16.32**
Between Ages at death	11	32482.5088	2952.9553	242.10**
Interaction of age & place of residence	11	142.1749	12.9250	1.06
Interaction between place of residence and year	16	276.9194	17.3075	1.42
Interaction between age and year	176	2333.0666	13.2561	1.09
Error	176	2146 6989	12.1972	—
Total	407	37810.0872	92.8995	—

From the F value corresponding to "years" it is observed that the mortality among infants did not change significantly over the passage of time. This corroborates the findings in tables 1 and 3.

Further it is seen that the mortality among infants differs significantly among slum and non-slum dwellers. It is also found that the mortality force among the infants at different monthly ages of deaths differ significantly. This finding, when judged in the light of interaction between year and ages at deaths being not significant, could enable us to combine the experience of all the years (from 1957 to 1974) to provide the average mortality pattern according to age at death in months as shown in table 5, separately for the slum and non-slum areas.

TABLE 5 : Adjusted infant deaths per 1000 live births by age at death in slum and non-slum areas.

Age at death in month	Adjusted infant deaths per 1000 live births		
	Slum	Non-slum	Combined
—1	34.97	36.17	35.1
—2	8.87	4.94	7.6
—3	5.15	2.96	4.5
—4	4.76	3.46	4.4
—5	4.85	3.74	4.6
—6	4.30	1.60	3.3
—7	5.15	3.65	4 7
—8	3.63	2.04	3.0
—9	2.97	2.24	2.8
—10	3.08	2.33	2.9
—11	2.11	1.20	1.9
—12	3.88	2.59	3.5
	83.72	66.93	78.3

TABLE 6 : Survivorship table of infants born in slum and non-slum areas.

Age	Slum				Non-slum			
	l_x	d_x	1000_{qx}	l_x	l_x	d_x	1000_{qx}	l_x
at birth	16821	158	9.3930	1000	11894	89	7.4828	1000
3 days	16663	128	7.6817	991	11805	96	8.1321	993
6 days	16535	77	4.6568	983	11709	72	6.1491	985
0 month	16458	225	13.6712	978	11637	157	13.4914	979
1 month	16233	150	9.2404	965	11480	62	5.4007	966
2 months	16083	87	5.4094	956	11418	39	4.4530	961
3 months	15996	80	5.0013	951	11379	41	3.6031	957
4 months	15916	81	5.0892	946	11338	47	4.1454	954
5 months	15835	71	4.4837	941	11291	20	1.7713	950
6 months	15764	81	5.1383	937	11271	43	3.8151	948
7 months	15683	56	3.5707	932	11228	26	2.3156	944
8 months	15627	50	3.1996	929	11202	27	2.4103	942
9 months	15577	52	3.3383	926	11175	27	2.4161	940
10 months	15525	36	2.3188	923	11148	15	1.3455	938
11 months	15489	65	4.1965	921	11133	30	2.6947	937
12 months	15424	—	—	217	11103	—	—	934

It is evident from table 5 that the mortality of infants in the first month was highest both slum in and non-slum areas but the portion of death during first month to total infant deaths was higher in non-slum area (54%) than in slum area (42%) but the difference was not significant.

The pooled data of seventeen years was utilized for constructing the survivorship pattern of infants born in the slum and non-slum areas as given table 6.

It is observed from table 6 that mortality rate (qx) was highest among children of both slum and non-slum areas during 1st month of age and registered a decline thereafter except for a sudden upward jump at the 6th and 11th month. Increase in mortality at 6th month and after may possibly be attributed to weaning resulting in malnutrition. This phenomenon is common among the children in the developing country as observed in table 7 when the mortality tends to increase arround 6th and 8th month in countries like U.A.R., Phillippines, South Africa etc. But in the developed countries like Canada, U.S.A., U.K., Australia etc. there is continual decline in mortality after the 1st month without any intermediate increase. The public health implications of this difference is worth noting.

Findings in table 8 corroborate with the findings in table 7 and suggest that the main causes of death from 6th month onwards are the diseases of dysentery and gastroenteritis

TABLE 7 : Age specific mortality rate (qx) in selected developed and developing countries.

Country / Year	Canada 1966	U.S.A. 1966	Sweeden 1966	Australia 1966	Swiss 1965	U.K. 1966	Mexico 1966	Chile 1965	U.A.R. 1964	Guatemala 1966	Philippines 1965	S. Africa 1966
Under 1 day	9.432	8.546	4.039	6.787	8.145	5.679	2.927	11.490	7.520	7.167	9.542	6.318
1—3 days	4.072	4.772	4 061	3.997	8.756	3.250	8.323	9.485	4.300	6.687	6.318	12.289
4—6 days	9.255	8.763	8.418	1.012	.866	7.350	3.198	3.853	3.623	5.441	6.049	3.825
7—27 days	1.774	1,666	1.341	1.404	1.328	1.532	8.910	14.339	12.920	16.318	11.486	13.285
28days—2months	1.669	1.645	.614	.901	.720	1.109	6.262	14.063	9.417	9.624	5.892	10.278
2 months	1.357	1.222	.319	.747	.545	1.057	5.510	14.008	9.609	9.761	3.898	11.976
3 months	1.033	.940	.172	.747	.481	.790	5.510	11.901	10.319	6.534	3.418	13.267
4 months	.760	.697	.262	.597	.435	.549	4.277	8.920	10.181	4.642	2.981	11.565
5 months	.516	.510	.196	.451	.333	.457	3.371	6.850	9.565	4.181	2.946	10.855
6 months	.390	.399	.196	.392	.407	.371	3.721	5.430	12.214	5.103	3.231	9.866
7 months	.379	.323	.098	.255	.379	.310	2.942	4.310	9.626	4.520	3.303	7.901
8 months	.300	.284	.139	.324	.231	.216	3.053	3.384	10.912	5.255	3.897	7.298
9 months	.281	.211	.106	.210	.296	.183	2.737	3,092	8.616	5.056	3.548	6.188
10 months	.248	.214	.106	.210	.185	.182	2.142	2.297	7.948	4.978	3.012	5.634
11 months	.174	.232	.114	.260	.194	.166	1.889	2.114	5 020	4.572	2.940	5.320

TABLE 8 : Percentage Distribution of Infant deaths classified according to cause of death, age at death and locality.

I.C.D.	Cause	SLUM Age at death								NON-SLUM Age at death								
		—1 day	—4 day	—7 day	—1 mth	—3 mth	—6 mth	—1 year	infants	—1 day	—4 day	—7 day	—1 mth	—3 mth	—6 mth	—1 year	infants	2 X
773	Marasmus	—	—	—	12.2	4.3	7.9	3.2	4.7	—	—	—	26.7	8.1	3.9	6.0	8.0	2.27
776	Pre-maturity	69.5	73.9	64.2	22.4	3.7	1.4	1.6	22.9	66.7	61.3	66.0	24.8	4.1	1.3	1.5	25.0	1.29
772	Malnutrition	—	—	—	2.6	13.4	15.8	15.0	9.0	—	—	—	2.0	6.8	19.2	12.8	7.1	5.59*
762	Post Neonatal Asphyxia	25.7	11.4	1.9	1.3	—	—	—	4.2	29.8	27.4	4.3	2.0	—	—	—	6.9	1.64
764	Diarrhoea of Newborn	—	—	7.5	10.9	—	—	—	2.2	—	—	—	5.9	—	—	—	1.1	4.18*
491 493 501 761	Bronchitis and Broncho-pneumonia	—	—	11.3	29.6	36.6	21.6	21.7	20.6	—	—	17.0	24.8	27.0	18.0	21.8	17.4	9.52*
061	Tetanus	—	1.1	1.9	6.4	0.6	—	—	1.4	—	—	2.1	2.0	—	—	...	0.5	3.43
048 571	Dysentery and Gastroenteritis	—	—	—	0.6	26.2	28,8	24.9	15.3	—	—	—	2,0	32.4	33.3	27.8	16.1	1.48
085	Measles	—	—	—	—	0.6	—	4.7	1.5	—	—	—	—	1.4	—	2.3	0.7	2.79
	Other causes	4.8	13.6	13.2	14.0	14.6	24.5	28.9	18.2	3.5	11.3	10.6	9.8	20.2	24.3	27.8	17.2	5.44

and diseases of the respiratory tract infection. This table also suggests that the endogenous causes of death like Prematurity and post-natal asphyxia were equally prevalent in both the areas (slum and non-slum) and proportions did not differ significantly Whereas the proportion o death due to diarrhoeal diseases, pneumonia & bronchopnemonia and malnutrition was significantly higher among the slum children than among non-slum children.

Summary

For the purpose of assessing the level of mortality among infants in the service of the Urban Health Centre, Chetla, two types of rates viz. the conventional infant mortality rate and adjusted infant mortality rate were worked out separately for slum and non-slum areas based on data on infant deaths from 1957 to 1974.

Both these rates found to be insensitive to passage of time in slum as well as non-slum areas. Even the adjustment factor i.e proportions of death of the infants born and died in the same calender year did not appreciably change over the years, both in slum and non-slum areas.

Further analysis of the data showed that the adjusted infant mortality rate differs significantly among slum and non-slum dwellers. The endogenous causes like prematurity, postnatal asphyxia etc. were equally prevalent in both the areas and higher rate in the slum area was principally due to diarrhoeal diseases, pneumonia, bronchopneumonia and malnutrition etc. which may be regarded as the exogenous causes of infant mortality.

Mortality force among the infants at different monthly ages at death differed significantly and the mortality in the first month was highest both in slum and non-slum areas.

The pattern of survivorship of infants at different points of time during infancy revealed 3 peak points of higher mortality i.e. during 1st month, 6th month and 11 month. Increase in mortality at 6th month and after is possibly due to weaning and malnutrition subsequently. This patternt is different in the developing and developed countries of the world. In developed countries like USA, UK, Canada etc. there is continual decline in mortality rate after the first month whereas in the developing countries like U A.R,, South Africa etc. there are ups and down in the mortality rate during the period of infancy.

Acknowledgement

We are thankful to Dr. N. S. Deodhar, Director, All India Institute of Hygiene and Public Health, Calcutta for encouraging us to do this piece of work and kindly allowing us to publish the paper. Our thanks are also due to the field staff who have taken great pains in collecting this valuab e data since the insception of the Urban Health Centre at Chetla.

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A LONGITUDINAL STUDY ON PHYSICAL DEVELOPMENT OF THE CHILDREN FROM BIRTH TO ONE YEAR OF AGE IN AN URBAN COMMUNITY

A. Bhandari* and B.N. Ghosh**

Introduction

Physical development is one of the most important chapter in child development in its whole life. It differs from one country to other and in different parts of the country. This is particularly so in a country like India where the socio-economic conditions, ethnic groups and food habits vary from place to place.

For detecting any early deviation from normal physical development of a child in a particular community, a standard norm is pre-requisite. Several studies on physical development[1–6,10–13] of the children have been done in different parts of the country. Hence a longitudinal follow up study on physical development of the children from birth to one year of age was undertaken in an urban community in Calcutta.

Material and Methods

The present study was conducted at Chetla Urban Health Centre of All-India Institute of Hygiene and Public Health, Calcutta. All the 220 births that took place in the study area during the months of September, October and November, 1974 were initially selected for the present study. They were then subjected to the following selection criteria within 7 to 10 days of their births through home visits before they were finally included as study subjects :—

1) All full-term normally delivered babies having birth weights above 2.5 kg with no abnormal perinatal history and congenital anomalies were selected for the present study.

2) Babies with family history of heriditary diseases and mental retardation were excluded.

3) Babies who had abnormal conditions in neonatal period of life, icterus and asphyxia were also excluded.

Another cotingent of 10 children was excluded for illness, malnutrition and temporary loss of contact. The total number of infants actually followed was 123. Of them 67 were males and 56 females, 120 (97.6 percent) Hindu and 105 (85.4 percent) Bengali speaking. The literacy status of their mothers

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and occupation of their fathers and economic status of their families, family size and diet habits are given below in percentages :—

1. LITERACY STATUS OF MOTHERS :

Illiterate	23.6
Just literate	8.1
Under matric	50.4
Matric & above	17.9

2. FATHERS' OCCUPATION :

Skilled workers	27.6
Clerical job	26.0
Shop owners	21.9
Unskilled workers	17.9
Businessman	5.8
Unemployed	0.8

3. PERCAPITA MONTHLY INCOME (FAMILY) :

Rs. 20.00 to Rs. 49.00	24.4
Rs. 50.00 to Rs. 99.00	35.8
Rs. 100.00 to Rs. 149.00	24.4
Rs. 150 and above	15.4

4. FAMILY SIZE :

Less than 5	61.0
5 to 9	28.4
More than 9	10.6

5. DIET HABITS :

Non-vegetarian	96.8
Vegetarian	3.2
Consumers of fish or egg (daily)	52.9

Subsequent visits and examinations of the infants were done fortnightly upto the age of 2 months and thereafter at monthly intervals upto the age of one year.

Feeding habits of the children were as follows :—

Upto 3 months of age :

Only breast fed	18.7 percent
Both breast and artificially fed	59.3 ,,
Only artificially fed	22.0 ,,

By 6 months of age : 50.4 percent babies were discontinued breast feeding.

The physical development of the infants were assessed by the following anthropometric measurements :

1. *Weight :*—'Detecto-lever' type of beam balance was used for taking weights both at birth and for subsequent recording after checking it each time before use.

2. *Length (crown-heel) :*—Length was measured on a specially prepared wooden board with a fixed head piece and moveable wedge foot piece, The child was laid on this board fully stretched and the length measured in centimeters beginning from one month of age onward.

3. *Chest and head circumferences :*—The chest and head circumferences were measured by means of a tape at the maximum circumference beginning from one month of age.

All these measurements were taken regularly at monthly intervals till the 12th months (one year) for each child and the increase of weight, length, head and chest circumferences were determined for the 3rd, 6th, 9th and 12th month of age for each child seperately to calculate averages of the respective periods.

Results and Discussions

Weight :

The mean birth weights and on susequent months of the study children have been

TABLE 1 : Showing Range, Mean with standard deviation of weights in Kg from birth to one year of age of the study children.

Age	MALE			FEMALE		
	Range	Mean	S.D	Range	Mean	S.D.
At birth	2.56 to 3.40	2.81	0.20	2.52 to 3.24	2.78	0.24
1st month	3.25 to 4.50	3.70	0.50	3.40 to 4.01	3.45	0.30
3rd month	4.54 to 6.43	5.31	0.42	4 25 to 5.93	5.00	0.34
6th month	5 85 to 8.03	6.67	0.45	5.45 to 7.43	6.45	0.40
9th month	6.65 to 8.96	7.42	0.55	6.30 to 8.01	7.10	0.62
12th month	7.12 to 9.83	8.24	0.60	6.65 to 8.75	7.64	0.48

presented in table 1. It was observed that the mean birth weight for males was 2.81 kg. (SD=0.20) and for females was 2.78 kg (SD=0.21).

The weight increased steadily in both the sexes and at 6th month of their age their mean weight was more than double of their respective mean birth weights, thereafter the weight increase was less marked and at 12th month of their age the mean weights were not tripled of their mean birth weights.

By third month of their age the mean gain in weight (Table-2) was 88.9 percent and 80.0 percent respectively for males and females of their respective birth weights and the gain during this period (0-3 months) was maximum ; the observed gain in weight was minimum during the 6-9 months of age. This pattern of growth has also been observed from the graph (Fig-I A&B) of 50th percentile weight in both the sexes. The 50th percentile weight of the study group was very close to 50th percentile weight of I.C.M.R. Standard[2]

TABLE 2 : Showing average gain in Kg. from birth to one year of age and rate of increase from birth weight.

Sex	Average birth-weight in Kg	Average gain in weight in Kg. and rate of increase				Total increase (birth to 12 month)
		0—3 months	3—6 months	6—9 months	9—12 months	
Male	2.81	2.50	1.36	0.75	0.82	5.43
Rate of increase (in percentage)	—	88.9	48.0	26.6	29.02	192.7
Female	2.72	2.22	1.45	0.44	0.65	4.76
Rate of increase in percentage)	—	80.0	55.0	15.5	23.5	174.0

FIG:-I- GRAPHS SHOWING 50th PERCENTILE OF WEIGHT OF CHILDREN AS COMPARED WITH I.C.M.R.(1968) AND HARVARD STANDARD (NELSON, 1975)

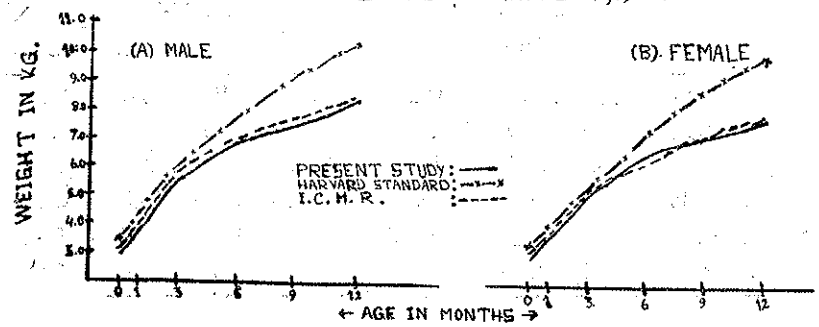
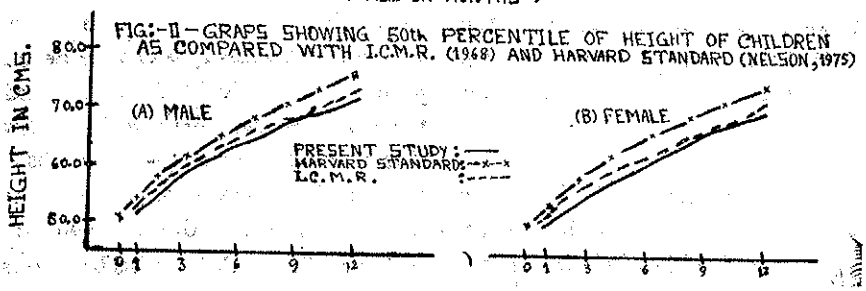


FIG:-II-GRAPS SHOWING 50th PERCENTILE OF HEIGHT OF CHILDREN AS COMPARED WITH I.C.M.R. (1968) AND HARVARD STANDARD (NELSON, 1975)



but much below the 50th percentile i.e. close to 10th percentile weight of Harvard Standard[9].

Higher birth weights in males than in females and difference in gain in weights between two sexes might be due to genetic predisposition and has also been observed by many workers in India[1-3] and in Western countries[7-9].

The steady gain in weight during early months and slower gain in weight during later months of their age were most probably due to the maintenance of adequate nutrition in the early life from mothers' milk (81.3 percent infants were breast fed upto 3rd month of their age) and lack of adequate nutrition during later life (50.4 percent of the children were only artificially fed at 6th month of their age). Similar observations were also made from the studies in low and lower-middle socio-economic group of communities in different parts of the country[1-3, 10-13].

Height (crown-heel length) :

Mean length of the children from one month to 12th month (one year) of age has been presented in Table-3. The mean length at one month for males and females were respectively 52.50 Cm (SD=0.95) and 51.01 (SD=0.45).

During one month to 3rd month of age the increase in length in both the sexes was more steady than during other months of infancy (table-4). The females gained more in length than males during their age period 3 to 6 months whereas the males gained more in length than females

TABLE 3 : Showing Range, Mean with Standard Deviation of lengths in Cm. from one month to one year of age of the study children.

Age	MALE			FEMALE		
	Range	Mean	S.D.	Range	Mean	S.D.
1st month	50.60 to 55.00	52.50	0.95	49.79 to 53.82	51.01	0.45
3rd month	56.15 to 61.15	58.24	1.00	54.63 to 59.46	56.80	0.81
6th month	61.12 to 66.03	63.40	1.10	59.71 to 64.77	62.58	1.61
9th month	64.63 to 70.40	67.49	1.58	63.91 to 69.22	66.54	1.60
12th month	63.20 to 75.00	71.03	1.54	67.67 to 73.59	69.32	1.72

during the age period 9 to 12th months. This difference in gain in length between two sexes might be due to the influence of nutrition as well as genetic predisposition which requires further study, however a similar observation to the present one has been made in a study at Varanasi[11].

TABLE 4 : Showing average increase in length in Cm. from one month to one year of age.

Sex	Length at one month in Cm.	Average increase in length in Cm.				Total increase (1-12 mths)
		1—3 mths	3—6 mths	6—9 mths	9—12 mths	
Male	52. 0	5.74	5.16	4.09	3.54	18.53
Female	51.01	5.79	5.78	3.96	2.48	18.31

The pattern of growth in length of the 50th percentile of the study children has been presented in graph (Fig-II A&B). Unlike weight curve the length curve was not so sharp in the earlier age period indicating more or less uniform gain in height. The 50th percentile height of the study group compared favourably with 50th percentile height of I. C. M. R. Standard[2] and falls below the 50th percentile (between 25th and 10th percentile) of Harvard Standard[9].

Head and chest circumferences :

The mean head circumference of the study children from one month to 12th month (one year) of age has been presented in table-5. The mean head circumference at one month of age in males and in females respectively was 36.02 Cm (SD=0.42) and 36.46 Cm (SD=0.62).

The mean head circumference increased rapidly in both sexes upto the age of 3rd month, less so during 3 to 6 months and thereafter very slowly upto the age of 12 months (table-6). At 12th month the head circumference of males was more than that of females. The slow rate of increase in head circumference was also observed in a study of

TABLE 5 : Showing Range, Mean with Standard Deviation of Head Circumference in Cm from one month to one year of age of the study children.

Age	Male			Female		
	Range	Mean	S.D.	Range	Mean	S.D.
1st month	34.30 to 37.54	36.02	0.42	34.11 to 37.02	39.46	0.62
3rd month	38.62 to 40.85	39.63	0.64	37.14 to 39.82	38.34	0.81
6th month	40.11 to 43.42	41.46	0.90	39.75 o 42.88	40.91	0.81
9th month	42.37 to 45.27	43.18	1.10	41.53 to 43.00	42.25	0.59
12th month	43.15 to 46.01	44.66	0.60	42.17 to 45.65	43.33	0.81

TABLE 6 : Showing average increase in head circumference in Cm from one month to one year of age.

Sex	Head circumference at one month in Cm.	Average increase in head circumference in Cm				Total increase (1-12 mths)
		1—3 mths	3—6 mths	6—9 mths	9—12 mths	
Male	36.02	3.61	1.86	1.72	1.48	8.64
Female	35.46	2.88	2.57	1.34	1.08	7.87

the children belonging to low socio-economic group at Delhi[5].

The mean chest circumferenec of the study children from one month to 12th month of age has been presented in table-7. The mean chest circumference at one month of age in males and in females respectively was 34.80 Cm (SD=0.77) and 33.62 Cm (SD=0.59). These measurements were 1.22 Cm shorter than head circumference in males and 2.84 Cm shorter than head circumference in females.

TABLE 7 : Showing Range, Mean with Standard Deviation of the Chest Circumference in Cm. from one month to one year of age of the study children.

Age	MALE			FEMALE		
	Range	Mean	S.D.	Range	Mean	S.D.
1st month	33.13 to 36 24	34.80	0.77	32.40 to 35.63	33.62	0.59
3rd month	36.93 to 40.73	37.95	1.10	35.10 to 38.99	36.63	1.19
6th month	39.44 to 43.65	40.57	1.27	37.59 to 42.65	39.50	1.49
9th month	40.87 to 44.98	41.00	1.50	40.38 to 43.83	40.92	1.31
12th month	42.29 to 47.06	43.30	1.22	41.43 to 45.76	42.10	1.75

TABLE 8 : Showing average increase in chest circumference in Cm. from one month to one year of age.

Sex	Chest circumference at one month in Cm.	Average increase in chest circumference in Cm.				Total increase (1-12 mths)
		1—3 mths	3—6 mths	6—9 mths	9—12 mths	
Male	34.80	3.15	2.62	1.43	1.30	8.50
Female	33.62	3.01	2.87	1.42	1.18	8.48

The mean chest circumference increased very rapidly upto the age of 3 months and also to less extend during 3 to 6 months but very slowly thereafter (table-8). The chest circumference did not equalise with the head circumference at the age of 12th month (one year). Rapid increase in chest circumference in earlier months and slower rate of its increase in the later months of age are related to the nutritional status of the children during their respective age periods in infancy which was also observed by other workers.[3,6,12-14]

If the nutrition of the children was good the birth weight became tripled and the chest circumference eqalised with the head circumference by one year of age (12th month), thereafter the chest circumference increased more than the head cir-cumference. Udani[13] in a study in the low socio-economic group at Bombay and Dean[14] amongst African children in Kampala observed that head circumference remained higher even upto the age of 2 to 3 years. Ghai and Sandhu[3] in a Delhi study amongst upper scioeconomic group of children observed that the chest circumference was higher than head circumference at 10 to 11 months in boys and at 12 months in girls As the present study conducted in the families belonging to low and lower-middle income group the pattern of growth of the children is similar to that observed by the former group of studies[13,14].

In a community whose socio-economic condition is poor the gain in weight upto the age of 3 to 4 months is maintained if the habit of breast feeding prevails but the nutrition suffers much as he grows, the reason being the nutritional requirements is not met up adequately from the supplementary feeding due to poverty and ignorance of the family concerned.

Therefore to plan a nutrition education programme in a community a study of physical development of the children is prerequisite.

Summary

Physical development of one hundred twenty three healthy new born babies (67 males and 56 females) were studied from birth to one year of age in an urban community in Calcutta. Anthopometric measurements were recorded at birth and thereafter at monthly intervals by home visits.

Mean birth weight of males was 2.81 Kg (SD=0.20) and that of females was 2.78 Kg (SD=0.21). In weight 50th percentile of

the study group was very close to 50th percentile of the I.C.M.R. Standard and little below the 10th percentile of Harvard Standard. In height the 50th percentile of the study group was similar to the 50th percentile of the I.C.M.R. Standard and below the 25th percentile of the Harvard Standard. The birth weights were doubled around 5th month of age but it did not triple at the age of one year. The chest circumference of the study children did not equalise with the head circumference at the age of one year.

Acknowledgemet

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PROPHYLAXIS OF VITAMIN A DEFICIENCY : A COLLABORATIVE FIELD TRIAL

B.N. Tandon[1], K. Ramachandran[2], L.M. Nath[3], N.N. Sood[4], D.K. Gahlot[5], M.C. Gupta[6], J.P. Wali[7], S.N. Sinha[8] and P.R Kutty[9]

Introduction

We have earlier reported high prevalence of occular signs of vitamin 'A' deficiency in a rural community of a relatively prosperous State of North India[1]. There was no evidence of any significant protein malnutrition in that population. Dietary survey had revealed deficient intake of vitamin 'A' and adequate consumption of protein[1].

There is no agreed approach to the prophylactic programme for vitamin 'A' undernutrition. Government of India has accepted the recommendation of the National Institute of Nutrition and accordingly, massive dose therapy with 200,000 I.U. every six months of vitamin 'A' palmitate in oil is being given to the preschool children[2]. However, studies from South India suggest that massive oral dose prophylaxis may have to be staggered at more frequent intervals than every six months period[3]. Dr. Macyor from Nutrition Unit of W.H.O. has recommended that more field studies be carried out with massive dose programme to prove its prophylactic value[4]. Present study was carried out in a rural community with a high prevalence of vitamin 'A' deficiency occular signs to compare the clinical effect of 200,000 I.U. biannual oral dose of vitamin 'A' acetate in oil with 100,000 I.U of quarterly dose.

Material and Methods

Population and Allocation of Regimens :

The clinical trial was conducted in three villages of Haryana State, Balwari, Bokha and Basdoda. The total population of these three villages, as listed by a complete population census prior to the start of the trial was 2269 persons. This population was allocated randomly, in equal proportions, to one of the following three treatment regimens :—

i) Vitamin 'A', 100,000 I.U. given orally, quarterly.

1. Professor of Medicine and Head, Deptt. of Gastroenterology and Human Nutrition Unit.
2. Associate Prof. of Biostatistics
3. Associate Prof. of Rural Health
4. Assistant Prof. of Ophthalmology
5. Lecturer, Ophthalamology
6. Lecturer. Human Nutrition Unit
7. „ „ „ „
8. Senior Research Officer
9. Post-graduate student

ii) Vitamin 'A', 200,000 I.U. given orally, biannually with a placebo given at 3 and 9 months after start of trial.

iii) Placebo given orally, quarterly.

Vitamin A dispensed as acetate in oil was used as the placebo. All the samples were distributed as coded specimens and neither the persons receiving them nor distributing them knew the contents. House to house visit was carried out for the administration of the sample. Since the individual person was the unit for random allocation, members of the same family often received different treatment regimens. Eight hours and 24 hours after the administration of the 'sample' toxic symptoms were recorded in an adequate number of persons.

Assessment

At the start of the trial a detailed clinical examination of the population for evidence of vitamin 'A' deficiency occular signs, was undertaken. The heads of households were carefully questioned for evidence of night blindness in the household. Of the 2269 persons enlisted for the trial only 1503 were available for this survey. Of these 1503, 475 had been allocated to Placebo, 510 to vitamin 'A' 100,000 I. U. and 518 to vitamin 'A' 200,000 I U.

At the end of the trial a resurvey of the population, on same lines as the earlier, was undertaken. This survey covered a total of 1363 persons of whom 427 had been allotted at the start of the trial to placebo, 460 to vitamin 'A' 100,000 I.U. quarterly, and the remaining 476 to vitamin 'A' 200,000 I.U. biannually. Of the latter two vitamin 'A' groups, only 208 and 295, respectively, had received all the scheduled doses of the regimen. Of these, 208 and 295 who had received all the scheduled doses of vitamin 'A' only 199 and 283, respectively, had been assessed in both the surveys.

The surveys were carried out by a team of medical personnel in cooperation with senior ophthalmic specialists. Particular care was taken in standardizing the diagnostic techniques used by the team in the survey. It has become apparent from pilot study that night blindness, Bitot's spots and corneal xerosis could be considered as dependable findings while conjuctival wrinkling and pigmentation carried a lot of uncertainty and observer bias. Complete eye examination, including fundus study was done in each case to exclude associated eye diseases which could produce night blindness or Bitot's spots. A special procedure was used to bring Bitot's spots to prominence by application of 'Kajal', a black carbon particle deposit obtained by burning cotton soaked in mustard oil.

Results

Prevalence of occular signs on admission to trial :

The comparison of the individuals allocated to the three regimens, placebo, vitamin 'A' 100,000 I.U. quarterly and vitamin 'A' 200,000 I. U. biannually, with respect to prevalence of night-blindness and Bitot's spots at the start of the trial are presented in Table 1.

The individuals in the Placebo and vitamin 'A' 200,000 I.U. group had closely similar

TABLE 1 : Comparison of prevalence of night blindness and bitot's spots on admission to trial in persons randomly allocated to the prophylactic regimens.

Age (Years) (At start of Trial)	Placebo Group					Vit.A : 100,000 (I.U) Quarterly					Vit.A : 200,000 (IU) Biannually				
	Number in Trial	Night Blindness		Bitot Spots		Number in Trial	Night Blindness		Bitot Spots		Number in Trial	Night Blindness		Bitot Spots	
		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%
1	7	0	(0)	1	(14.1)	5	0	(0)	0	(0)	5	0	(0)	0	(0)
1— 4	64	0	0	7	10.9	69	2	2.9	10	14.5	83	3	3.6	9	10.8
5— 9	102	4	3.9	15	14.7	105	7	6.7	13	12.4	94	5	5.3	17	18.1
10—19	133	12	9.0	18	13.5	128	5	3.9	20	15.6	125	6	4.8	19	15.2
20—29	54	0	0	9	16.7	41	2	4.9	5	12.2	45	1	2.2	4	8.9
30—39	32	1	3.1	3	9.4	56	1	1.8	4	7.1	46	2	4.3	4	8.7
40—49	21	1	(4.8)	1	(4.8)	30	3	10.0	2	6.7	34	4	11.8	4	11.8
50—59	26	0	0	2	7.7	33	1	3 3	5	15.2	41	0	0	8	19.8
60	36	2	5.6	1	2.8	43	2	4.7	8	18.6	45	2	4.4	3	6.7
All ages	475	20	4.2	57	12.0	510	23	5.8	67	13.6	518	23	4.4	68	12.2

Figures in parenthesis indicate percentages based on less than 25 observations.

prevalence figures at the start. The prevalence of night blindness was 4.2% and 4.4% respectively, while that of Bitot's spots was 12.0% and 12.2% respectively. The group allocated vitamin 'A' 100,000 I.U. showed a slightly higher prevalence of both night blindness and Bitot's spots, 5.8% and 13.6% respectively. However, these differences are not unusually large for a random allocation, and therefore, permit a valid contrast of the effect of administration of the two different regimens of vitamin 'A'.

Prevalence of occular signs at the end of trial :

Table 2 and 3 present the prevalence of night blindness and Bitot's spots at the end of the trial, as assessed by the repeat survey, in individuals who had taken all the doses of placebo and vitamin 'A' according to the schedule. 427 persons had received placebo at quarterly intervals, 208 vitamin 'A' 100,000 I.U. at quarterly intervals, and 295, vitamin A at the start and at 6 months and a placebo at 3 and 9 months.

TABLE 2 : Prevalence of night blindness at the end of the clinical trial in the three study groups.

Age (Yrs)	Placebo Group			Vit. A : 100,000 I.U. quarterly			Vit A : 200,000 IU Biannually		
(At start of trial)	Number examed.	Positive No.	%	Number examed	Positive No.	%	Number examed	Positive No.	%
1	9	0	(0)	1	0	(0)	4	0	(0)
1— 4	61	0	0	39	0	0	48	0	0
5— 9	96	6	6.2	46	1	2.2	52	0	0
10—19	103	4	3.9	40	1	2.5	64	0	0
20—29	41	0	0	10	1	(10.0)	25	0	0
30—39	39	1	2.6	25	3	12.0	29	0	0
40—49	24	0	(0)	13	0	(0)	21	1	(4.8)
50—59	25	0	0	15	0	(0)	27	0	0
60	29	1	3.4	19	0	(0)	25	0	0
All ages	427	12	2.8	208	6	2.9	295	1	0.3

TABLE 3 : Prevalence of Bitot's Spots at the end of the clinical trial in the three treatment groups.

Age (Yrs)	Placebo Group			Vit. A 100,00 Quarterly			Vit. A 200,000 Biannually		
(At start of trial)	Number examined	Positive No.	%	Number examined	Positive No.	%	Number examined	Positive No.	%
1	9	0	(0)	1	0	(0)	4	0	(0)
1— 4	61	2	3.3	39	2	5.1	48	1	2.1
5— 9	96	6	6.2	46	3	6.5	52	2	3.8
10—19	103	4	3.9	40	3	7.5	64	3	4.7
20—29	41	5	12,2	10	0	(0)	25	2	8.0
30—39	39	1	2.6	25	1	4.0	29	4	13.8
40—49	24	0	(0)	13	1	7.7	21	1	(4.8)
50—59	25	2	8.0	15	0	(0)	27	1	3.7
60	29	2	10.0	19	0	(0)	25	1	4.0
All ages	427	22	5.2	208	10	4.8	295	15	5.1

The prevalence of night blindness showed a decline in all the three groups at the end of the trial. In the placebo group it declined from 4.2% at the start of the trial to 2.8% at the end of the trial and in the vitamin 'A', 100,000 I.U. quarterly group from 5.8% to 2.9%. However, in the vitamin 'A', 200,000 I.U. biannually group it showed the maximum decline from 4.4% to 0.3%.

In the case of Bitot's spots, though there was a sharp decline in its prevalence at the end of the trial, from 12.0% to 5.2% in the placebo group, 13.6% to 4.8 in 100,000 I.U. and from 12.2% to 5.1% in 200,000 I.U. group, there was no difference in response between the placebo group and the two vitamin 'A groups.

Incidence of occular signs during the trial :

The data was further analysed to see if the three groups showed any significant differences in the fresh occurrence i.e. incidence of night blindness and Bitot's spots during the trial period of 12 months. For this, the results on the persons in the three groups who had been surveyed both at the start and at the completion of the trial were used. The results of the analysis are presented in Table 4 and 5.

TABLE 4 : Comparison of night blindness by regimen in persons included both in the initial and final surveys.

	Placebo			Vit. A : 100,000 I.U. Quarterly			Vit. A : 200,000 I.U. Biannually		
	Final Survey			Final Survey			Final Survey		
Initial Survey	Positive	Negative	Total	Positive	Negative	Total	Positive	Negative	Total
Positive	0	16	16	0	11	11	0	13	13
Negative	5	315	320	4	184	188	1	269	270
Total	5	331	336	4	195	199	1	282	283

TABLE 5 : Comparison of Bitot Spots by regimen in persons included both in the initial and final surveys.

	Placebo			Vit A : 100,000 I.U. Quarterly			Vit. A : 200,000 I.U. Biannually		
	Final Survey			Final Survey			Final Survey		
Initial Survey	Positive	Negative	Total	Positive	Negative	Total	Positive	Negative	Total
Positive	12	32	44	4	25	29	5	26	31
Negative	4	288	292	5	165	170	8	244	252
Total	16	320	336	9	190	199	13	270	283

336 persons in the placebo group, 199 in the vitamin 'A', 100,0000 I.U. given quarterly and 283 in the vitamin A, 200,000 I.U. given biannually were available for this analysis.

Considering night blindness, 320 of the 336 in the placebo group, 188 of the 199 in the vitamin A 100,000 I.U, group and 270 of 283 in the vitamin A 200,000 groups did not have this symptom at the start of the trial. 1.6 per cent in the placebo group, 2.1 per cent in the vitamin A 100,000 I.U. group, and 0.4 percent in the vitamin A 200,000 group developed night blindness during the trial. This strongly suggests that vitamin A 200,000 I.U. given at six monthly intervals is most effective in preventing the occurrence of night blindness.

4 of 292 (1.4%) in the placebo group, 5 of 170 (2.9%) in the vitamin A 100,000 I.U. group and 8 of 252 (3.2%) in the vitamin A 200,000 I.U. group had fresh occurrence of Bitot's spots during the 12 months of the trial. Differences are statistically not significant (Table 5).

Table 6 presents the frequency of side effects in the placebo and the vitamin A group. 3.2 per cent persons in the 200,000 IU biannual dose group, 2.0 percent in 100,000 I.U. quarterly group and 1.2 per cent of the placebo group. Nausea, vomiting and headache were equally seen in all the three groups, giddiness was more frequent in vitamin A group, diarrhoea and pain abdomen were exclusively recorded in the group receiving vitamin A.

TABLE 6 : Frequency of side effects in the placebo and Vitamin A Groups.

	Placebo			Vit. A 100,000 (I.U) Quarterly			Vit. A 200,000 (I.U) Biannually		
Age (Years)	Number inter-viewed	Persons with side effects No.	%	Number inter-viewed	Persons with side effects No.	%	Number inter-viewed	Persons with side effects No.	%
5—14	122	1		100	1		109	4	
15—24	35	0		36	0		45	1	
25—34	27	1		32	1		39	1	
35—44	19	0		27	2		22	0	
45—54	14	1		23	1		24	1	
55—64	15	0		16	0		18	1	
65 or over	10	0		15	0		17	1	
All ages	242	2	1.2	249	5	2.0	274	9	3.2

Discussion

The present study reveals that the prevalence of occular signs of vitamin A deficiency is significantly reduced by biannual administration of 200,000 I.U. or quarterly administraation of 100,000 I.U. of vitamin A acetate in oil. Further there is strong suggestion that biannual dose of 200,000 I.U. of vitamin A is superior to other regimens used in the present study to the decrease of the prevalence rate of night blindness in the population.

A few studies in the literature have suggested the value of biannual oral administration of 200,000 I.U. of vitamin A for the prophylaxis of occular signs in preschool children.[5,6,7] Government of India had introduced "Prophylaxis against blindness in children due to vitamin A deficiency" in Fourth Five Year Plan[2]. Under this scheme children in the age group of 1-5 years are given oral dose of 200,000 I.U. of vitamin A in oil at 6 monthly intervals. The six monthly administration of vitamin A is to continue till the children attain five years of age. Interim reports from two States—Kerala and Mysore are available. In Kerala, 4913 preschool children (1-3 years age group) were examined for occular signs of vitamin A deficiency (signs not specified). Vitamin A, 200,000 I.U. in oil was administered at 6 months interval. 4752 of these children were available for re-examination. The prevalence of occular signs during the base line survey was 6% and 1 year latter, after the two doses had been administered it fell to 1.3%. In Mysore State, of 1285 children, had base line data regarding the prevalence of occular signs of vitamin A deficiency. 600 children, most of whom had received two doses could be re-examined at the end of one year. The prevalence of conjuctival xerosis and Bitot's spots amongst these 600 children fell to 2.4% as against 6.5% found before the programme was initiated. In a similar study carried out in Indonesia, involving 473 preschool children, the incidence of occular manifestation was found to be 25% of the pretreatment prevalence at the end of 6 months following the administration of an oral dose of 200,000 I.U. of retinyl palmitate in emulsion form[7].

Field experience from India and Indonesia seem to support the prophylactic value of biannual administration of 200,0 0 I.U. of vitamin A in oil. Present study was different from earlier field trials in several important respects. People from all age groups instead of only the preschool children were included in the trial as prevalence of occular signs in the population older than 5 years of age was significantly higher and the evaluation of clinical signs in this group was relatively easier than preschool age children. Night blindness and Bitot's spots instead of xerosis and Bitot's spots, were selected as the occular signs for assessment of vitamin A deficiency. Associated systemic and eye diseases which could be responsible for these occular signs were carefully excluded by expert ophthalmologists and physicians involved in this study. Status of protein-nutrition of other studies from India has not been mentioned but from the general pattern of distribution of malnutrition in the country it is expected that about 30% of the preschool children could be suffering from protein-calorie malnutrition. In contrast, the population studied by us had adequate intake of protein and calorie and any significant protein calorie malnutrition was quite uncommon.

Studies from National Institute of Nutrition, India have indicated that massive dose of vitamin A was most effective when given to 1-2 year old group and was least effective when given initially to 4-5 years old children[8]. No explanation for the lack of responsiveness in older children have been given. Olson has suggested that this "may possibly be caused in part by greater resistance of older eye lesions to therapy, reduced dosage of vitamin A per kilogram given to older children and poorer absorption due to more extensive parasitic infestation in older children[9]." The present study however does not show any evidence of lack of responsiveness in older children or adult population. Vitamin A prophlaxis proved equally effective in all age groups.

Two studies from Vellore, South India reported the failure of massive oral dose therapy for prophylaxis of vitamin A deficiency.[3,10] It was observed that a single oral dose of 100,000 ugm of vitamin A in oil could maintain adequate blood levels for 15 weeks and by the end of 25th week 10 of the 14 children had serum value less than 15 ug per 100 ml.[3] In yet another study from same centre it has been shown that 50 000 ug vitamin A in oil failed to offer any clinical or biochemical advantage for children on a moderate carotene diet[10]. 2 of the 12 children showed conjunctival xerosis at 10 weeks and all but 3 serum levels were below 15 ugm/100 ml at 18 weeks. The investigators suggested ; "The effect of repeated massive doses given at short intervals on the maintenance of serum levels of vitamin A deserves study. By staggering the dose toxic symptoms may be avoided and liver stores may be replenished[3]". Clinical effectiveness of 100,000 I.U. of vitamin A in oil given every 3 months for 4 doses was compared to biannual dose of 200,000 I.U. in the present study. Staggering the massive dose to quarterly period failed to offer any advantage over the biannual dose. In fact, there is strong suggestion that biannual dose is more effective in prevention of the prevalence of night blindness compared to quarterly dose. Conclusions of the Vellore study are primarily based on serum vitamin A levels and such dubious occular signs as conjunctival wrinkling and xerosis. In fact none of the subjects in both these studies were reported to have developed Bitot's spots or night blindness. Lack of correlation between the serum levels and occular signs of vitamin A deficiency is well known[11].

Most unexpected finding of the present study is significant decrease of prevalence of occular signs in the group which received peanut oil as placebo. The design of the present study was such that nutrition education, particularly, in relation to vitamin A was given to the whole population by group meetings and face to face contacts. It was realised that unless people were explained all about the project and the benefits of vitamin A administration it may not be possible to get their good cooperation. Further, night blindness in this population was a repeated phenomenon and many people knew how to cure it by local remedial measures. It is possible that placebo group showed decline in the prevalence of occular signs of vitamin A deficiency because they knew how to take advantage of local remedial measures and nutrition education further helped them in this respect. Since educational factor was equally common to all the group it is likely that it also had an important effect in the other groups, receiving biannual and quar-

terly doses of vitamin A. This emphasises the value of control group in such field trials. Commenting on two successful studies of massive dose prophylaxis of vitamin A deficiency carried out at National Institute of Nutrition in India, Pereira and Begum noted, "In both these reports however, no controls were included, so that it is difficult to eliminate the influences of seasonal variation of dietary intake and the results cannot be attributed solely to the ingestion of large doses of vitamin A."

Prevalence study alone fails to unequivocally establish the prophylactic value of massive dose of oral vitamin A administration. Incidence study, further supports the clinical advantage of biannual dose compared to the placebo and quarterly vitamin 'A' dose. During the trial period from amongst the persons who had no night blindness at the beginning of the trial, 1.6 per cent of the placebo group, 2.1 per cent of the quarterly but only 0.4 per cent of the biannual dose group developed this symptom, which strongly suggests that 200,000 I.U. vitamin A given at six monthly interval is effective in preventing the occurrence of fresh cases of night blindness. Similar trend is however not seen in reference to the occurrence of Bitot spots.

W.H.O. has yet not accepted massive, biannual vitamin A administration as a policy for prophylaxis of vitamin A subnutrition. Present study confirms the value of 200,000 I.U. of vitamin 'A' acetate in oil in prophylaxis of prevalence and incidence of vitamin A deficiency in rural community. Since there was no significant evidence of protein malnutrition in the population, the results are more relevant in reference to the direct effect of the administered dose of vitamin A. Nutrition education component seems to have a significant effect on the results of the present study.

We feel that if vitamin A is made available at the subcentres of health delivery structures and appropriate nutrition education is given to the population, most of the persons on their own will like to demand it for prophylaxis of some apparent ocular features such as night blindness. Adequate emphasis on nutrition education and easy availability of vitamin A dose, till local dietary sources are well developed may be considered key factors for mass prophylaxis and treatment of vitamin A subnutrition. Side effects of either 200,000 I.U. or 100,000 I.U. vitamin A intake are insignificant, minor, transient and reported by less than 3 per cent of the population.

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A STUDY OF HEALTH STATUS OF PRIMARY SCHOOL CHILDREN IN HAZRATBAL AREA (KASHMIR)

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It is an accepted fact that the school age is a dynamic period of the physical growth and development : when the children undergo mental, emotional and social changes, the need of health guidance should therefore be maximum during this period. The school age children by and large constitute, what may be regarded as a disciplined population easily accessible for health appraisal and health restoration under an organised health service. An essential pre-requisite for such a programme of services is an authentic information on the existing health and disease status of the school going children, which can serve as a foundation on which the edifice of a comprehensive school health programme can be laid.

The present health survey was thus aimed to obtain the basic data about the health status of the primary school going children in in an area of Kashmir, which holds good for the valley of Kashmir only, situated at a height of about 5,500 ft. above sea level and having a distinct socio-cultural milieu.

Material and Method

The survey covered 845 primary school children attending all the primary schools or primary departments of middle and high schools in and around the Hazratbal area, falling within the field practice area of Hazratbal Centre of Government Medical College, Srinagar.

The children were interviewed and examined according to a predesigned proforn a covering information on the socio-economic status, the environmental background, the state of health and the nutrition of the children.

Anthropometric measurements of height weight and mid-arm circumference were taken as described by jelliffe, 1966. Estimation of haemoglobin was done in the school by the Sahli's acid haematin method.

In each case stool examination was done for ova of ascaris lumbricoides, and the gradation of the worm load was done after Beaver, 1950.

1. Professor of Medicine, Chest Diseases Hospital, Srinagar.
2. Associate Professor.
3. Associate Professor.
4. Assistant Professor.
5. Demonstrator.

Observations and Discussion

Out of the total 845 primary school children examined, 516 were boys and 329 were girls (Table 1). The age ranged from 4 to 14 years. Maximum number of children were between 6 to 11 years of age. The mean age for the boys was 7.9 (± 2.17) years and for the girls was 8.8 (± 2.42) years.

TABLE—1 : Distribution of children according to their age and sex.

Age in years	Boys		Girls		Total	
	No.	Percent	No.	Percent	No.	Percent
Below 4 years	19	3.68	4	1.2	23	2.72
4— 5 years	38	7.36	22	6.69	60	7.10
5 — 6 years	35	6.78	20	6.08	55	6.51
6— 7 ,,	82	15.89	40	12 16	122	14.44
7— 8 ,,	87	16.86	35	10.64	122	14.44
8— 9 ,,	96	18.66	57	17.32	153	18.11
9—10 ,,	58	11.24	40	12.16	98	11.60
10—11 ,,	58	11.24	48	14.59	106	12.54
11—12 ,,	31	6.01	34	10.33	65	7.69
12—13 ,,	11	2.13	16	4.86	27	3.19
13—14 ,,	1	0.19	13	3.95	14	1.66
Total	516	100.00	329	100.00	845	100.00

On the basis of their average monthly income, 17 (2.01 percent) children belonged to social class I (Rs. 800/- and above), 184 (21.78 percent) children to social class II (Rs. 401/- to 800/-), 580 (68.65 percent) children to social class III (Rs 151/- to 400/-) and 64 (7.57 percent) children to social class IV (Rs. 50/- to 150/-).

525 children had provision of piped water supply and only 37 children had sanitary latrines at home.

1. *Anthropometric measurements*

1.1 Height :

The average values of height in boys and girls covered in this study are presented in the Table 2.

The height for age of boys as compared with the corresponding values of Indian children (ICMR 1971), an urban locality Alambagh in Lucknow (Koshi etal 1970), and a rural locality in Lucknow, Sarojini Nagar (Malaviya et al 1969) indicates that the values in the present study exceed the All India averages upto the age of 8 years and thereafter there is little difference. The average values of Alambagh and Sarojini Nagar studies are comparable with the present study, there being negligible difference.

The height for age of girls, as compared

TABLE—2 : Age wise average values of height of Boys and girls in centimters

Age in years	Boys	Girls
4 years	103.40 ±8.43	102.38 ±12.25
5 ,,	111.83 ±9.50	104.34 ± 8.96
6 ,,	113.04 ±9.83	111.68 ± 7.96
7 ,,	116.19 ±9.52	113.93 ± 7.94
8 ,,	119.01 ±8.54	119.70 ± 8.73
9 ,,	122.05 ±8.07	121.82 ± 7.73
10 ,,	129.01 ±8.07	124.65 ± 7.75
11 ,,	129.46 ±6.31	127.88 ± 9.58
12 ,,	138.70 ±5.97	131.28 ±10.64

with the similar values of Indian children (ICMR 1971), Alambagh and Sarojini Nagar also shows similar trend upto the age of 8 years and thereafter lags behind to the average Indian values.

1.2 Weight :

The average values of weight in boys and girls covered in the study are shown in Table 3.

TABLE—3 : Age wise average values of weight of Boys and Girls in Kg.

Age in years	Boys	Girls
4 years	12.83±2.15	12.56±1.94
5 ,,	15.03±3.11	15.18±4.46
6 ,,	17.27±3.46	16.81±3.10
7 ,,	19.01±2 99	13.11±4.96
8 ,,	20.24±3.46	19.71±2.23
9 ,,	21.87±2.98	21.13±3.28
10 ,,	24 12±4.73	22.30±1.78
11 ,,	24.32±2.67	24.21±4.43
12 ,,	27.51±4.48	24.92±6.32

The average weight for age of boys as compared to the ICMR (1971), Koshi et al (1970) and Malaviya et al (1969) shows that the weight in the present study exceeds the All India averages upto the age of 10 years, while the Alambagh values are higher upto the age of 9 years as compared to the present study. The Sarojini Nagar values show little differences with us.

The weight for age in case of girls as compared with other values shows that the values in the present study exceed All India averages upto the age of 9 years and later All India averages exceeding the values in the present study. Again, Alambagh and Sarojini Nagar values being comparable with little difference.

1.3 Mid-arm circumference :

The average values of mid-arm circumference for boys and girls are presented in table 4.

TABLE—4 : Mid-arm circumference in boys and girls in centimeters.

Age in years	Boys	Girls
4 years	15.83±0.88	15.81±1.22
5 ,,	15.79±1.23	15.18±1.21
6 ,,	15.26±1.23	15.41±1.20
7 ,,	15.43± .27	15.70±2.40
8 ,,	15.45±1.20	15.82±1.08
9 ,,	15.96±1.15	16.37±1.21
10 ,,	16.14±1.00	16.24±1.28
11 ,,	16.13±1.20	16.11±1.43
12 ,,	16.55±1.39	16.96±1.65

The mid-arm circumference values of the present study, when compared with the corresponding values of Jellife (1966) and the study of Alambagh it reveals that the trend is similar in both the sexes, while the values of the present study stand at the lowest level, showing very little increase in the muscle mass over the years. The difference with respect to other values increases steadily with the advancing age, the value of W.H.O. remaining consistantly at the higher level. This may suggest the presence of protien gap in the dietery intake of these children under study.

2. *Defects detected*

The sexwise distribution of defects detected (tables 5 and 6) on clinical examination

TABLE—5 : Showing the sexwise distribution of No. of defects present in the children

No. of defects	Boys		Girls		Total	
	No.	Percent	No.	Percent	No.	Percent
Single Def.	187	36.24	74	22.49	216	33.88
Two def.	79	15.31	32	9.72	111	13.13
3 def.	42	8.12	24	7.29	66	7.81
4 def.	15	2.90	3	0.91	18	2.73
5 def.	6	1.16	1	0.30	17	0 83

TABLE—6 : Showing the prevalence of morbidity in primary school going children (boys and girls).

Morbidity	Male		Female		Total	
	No.	Percent	No.	Percent	No.	Percent
Conjunstivitis	—	—	1	0.30	1	0.19
Blepharitis	—	—	1	0.30	1	0.19
Ear Wax	37	7.17	17	5.17	54	6.39
Ear Discharge	22	4.26	12	3.65	34	4.02
Rhinitis	56	10.85	22	6.69	78	9.23
Congested throat	7	1.36	—	—	7	0.83
Enlarged tonsils	57	11.05	40	12.16	97	11.48
Sub-mandibular gland enlargement	43	8.33	26	7.90	69	8.16
Cervical gland enlargement	28	5.43	1	0.30	29	3.43
Dental caries	158	30.62	66	20 06	224	26.51
Ascariasis*	475	92.05	321	97.57	796	94.20

* cases that are positive for ascaris ova

revealed that the defect free children in our study were 44.97 percent, as compared to other studies, whose percentage of defective children were higher. Mukherji et al (1960) reported 32.80 percent childern with defects. Pal 1966) observed 33 percent children with one or more defects. Gill et al (1969) reported 4.3 defects per defective child. In the study of Koshi et al (1970), there were 96.8 percent children with one or more defects. The average number of defects per defective child in our study was 1.8. The commonest defect observed was dental caries (26.51%) being more in boys than girls (30.62% boys and 20.06 percent girls). The high rate of dental caries in our children could be explained by a generally poor orodental hygiene. It is possible that the girls are being cared more than boys by their mothers and the boys are free to move outside to use more edibles. Various figures from other authors are : Pal (1966) observed 48 percent children with dental caries, Malaviya et al (1970) reported 50.77 percent childern, Rao et al (1974) reported 40 percent childern, and Indira Bai et al (1976) reported 10 3. percent children with dental caries among school children. It is interesting to note that we did not find a single case of dental mottling in our children, indicating absence of fluorosis in Kashmir. The figures from other studies are : Gill et al (1969) found mottling in 16.4 percent children, Malaviya et al (1969) reported 20.7 percent mottling and Koshi et al (1970) found dental mottling in 13.7 percent school children. This also corroborates with the fact that no case of fluorosis has been reported from Kashmir so far. 8.16 percent children had submandibular lymphnode enlargement and 3.43 percent children had cervical gland enlargement. Enlargement of tonsils among 11.45 percent children was found in the study. Ray et al (1971) observed 7.95 percent tonsilitis and Dhingra et al (1977) found enlarged tonsils among 5.6 percent children.

3. *Haemoglobin level*

The mean haemoglobin values were lower in girls as compared to boys (12.17 $\pm$0.91 gm% and 11.80$\pm$1.01 gm% for boys and girls respectively). The average haemoglobin value for both the sexes was 12.05$\pm$ 0.96 gm%. Koshi et al (1970) found 11.8 gm. haemoglobin in primry school children and Prakash et al (1973) in a study of primary school children reported mean haemoglobin level of 10.8-12.6 gm percent, being relatively lower in girls.

4. *Personal hygiene*

The overall personal hygiene was unsatisfactory among 454 (53.7 percent) children out of 845 children examined. The percentage of unsatisfactory hygiene was more among boys than girls.

5. *Ascariasis*

The prevalence of ascariasis was almost universal, 94.20 percent (Table 7). All the age groups had infestation. Majority of children had mild to moderate ascaris infestation (33.50 percent mild and 48.64 percent moderate respectively) and 102 (12.10 percent) children had severe infestation (ova count more than 100 per smear of 2 mg stools). Boys and girls were equally affected. However Wani (1970 found 80.7 percent ascaris infestation in Kashmir and Gill et al (1969) in their study

TABLE—7 : Showing the degree of ascaris infestation in different sex groups (standard ova count).

	Degree of infestation								
			Light		Moderate		Heavy		Total
	NIL		Below 20		20—100		above 100		
Sex	No.	Percent	No.	Percent	No.	Percent	No.	Percent	
Boys	41	7.94	178	34.50	242	46.90	55	10.66	516
Girls	8	2.43	105	31.91	169	51.37	47	14.28	329
Total	49	5.80	283	33.50	411	48.64	10	12.10	845

have shown 0.8 percent prevalance. In Bombay hospitals the reported percentage is 10-25 percent (W.H.O. 1964).

Summary

A study of health status of primary school children aged 4-14 years (516 boys and 329 girls) attending all the Primary Schools and Primary departments of Middle and high school, falling within the field practice area of P.H.C. Hazratbal was conducted.

Average height values indicate that the gain in height exceeds All India averages upto 3 years in boys and 9 years in girls, and thereafter it lags behind. In respect of the weight values, the weight is fairly comparable to national averages, in fact showing tendency to lag after 10 years in boys and 9 years in girls. Mid-arm circumference in either sex is much behind the WHO standards.

55.03 percent of the children examined were suffering from one or more defects. Average number of defects per defective child was 1.8. Dental caries was the commonest defect (26.51 percent), next in order was enlarged tonsils (11.48 percent).

Average haemoglobin value was lower among girls as compared to boys.

Personal hygiene was unsatisfactory among 53.7 percent children, being more common among boys.

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OBSERVATIONS ON ECONOMIC IMPACT OF PARALYTIC POLIOMYELITIS IN CHILDREN

S. N. Basu* and A. L. Saha**

Introduction

Paralytic Poliomyelitis draws more attention than other communicable diseases because it often leads to disability, the effect of which on the nation, on the family and on the individual needs no emphasis. Thus the cost of treatment, cost of long term maintenance and Public Welfare Schemes, loss of projected income in future life have to be taken into consideration. In almost every country, the restoration of the Physically Handicapped to useful life is now accepted on principle. The physical handicap usually adversely affects educational opportunities which consequently may be an important factor for unemployment. Apart from physical and psychological impact of paralysis on the child, the economic and social consequences of paralytic poliomyelitis upon the child and its parents surely deserve a sympathetic approach and deep appreciation of the problem. Childhood itself represents the non-productive phase of life (Winslow, 1951). Sickness and disability will further add to the economic drain and adversely affect his future employment opportunities. In this study an attempt has been made to assess the cost of treatment in one hundred paralytic poliomyelitis patients along with the income and occupation of their parents.

Material and Methods

This study has been carried out at the B. C. Roy Polio Clinic and Hospital for Crippled Children, Calcutta in collaboration with the Department of Epidemiology, All India Institute of Hygiene and Public Health, Calcutta. The B. C. Roy Polio Clinic and Hospital for Crippled Children, Calcutta has been the only hospital of its kind dealing with paralytic poliomyelitis in the Eastern India and patients are usually referred to this hospital by different Institutions and private practitioners.

Only frank paralytic poliomyelitis patients were selected for this study and the diagnosis was based on clinical grounds as history, physical findings, follow up study, muscle power assessment, electrical reactions of muscles and CSF study when deemed necessary.

For studying the economic impact, it was decided as a preliminary step to restrict to one hundred paralytic poliomyelitis patients

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who attended the hospital for a fairly long period (duration of illness and treatment exceeding one year). The initial plan was to select equal number of patients from each of the years, so that the findings could be representative. Accordingly, it was arbitrarily decided to select 5 cases for each of the years from 1954 to 1973. But due to non-availabity of adequate number of patients of the years 1954 and 1958, the distribution could not be maintained uniformly. Many of the old cases of the previous years, either recovered or otherwise discontinued treatment, so that selection of the cases had to be restricted to those who continued attending the hospital in 1973. The parents and the guardians of the patients were initially explained the idea in details and then were asked to furnish an actual account of the cost incurred on their patients. The cost included the cost on medicines (including modern or scientific, homeopathic, indigenous etc.), fees of doctors, cost on extra-diet, transport and appliances. The cost on transport included that for attending hospital and that for attending school provided that the transport was essential on account of disability. The cost incurred on each patient by the hospital authority was subsequently computed. The cases were selected on a random basis to avoid an element of bias.

Observations and Analysis of Data

As stated earlier, this study was based on one hundred paralytic poliomyelitis patients attending the hospital in 1973. The distribution of these patients according to the year of their first attendance to the hospital is shown in Table 1.

TABLE—1 Distribution of one hundred paralytic poliomyelitis patients from whom the economic impact could be studied—according to the first attendance to the hospital.

Year (first attendance)	No. of patients	Year (first attendance)	No. of patients
1954	4	1964	6
1955	4	1965	3
1956	1	1966	4
1957	5	1967	8
1958	2	1968	4
1859	7	1969	7
1960	4	1970	3
1961	9	1971	5
1962	6	1972	6
1963	5	1273	7
Total 100 patients from 1954 to 1973			

The occupation of the parents of the patients studied in this series is presented in Table 2.

TABLE—2 Occupation of the parents of the patients in whom cost of treatment was studied

Occupation of parents.	Number of patients.
Nil	1
Service	59
Business	22
Cultivation	5
Teacher	2
Labourer (skilled)	4
Labourer (unskilled)	3
Professionals (Doctors, Engineers, etc)	4
	Total: 100

It was observed that service or salaried group comprised the largest number in this series.

Table 3 shows the family income per month of the families from which patients were brought to the hospital.

TABLE—3 Number of patients in different family income groups

Family income per month	Number of patients
Nil.	1
Rs. 100 or less	2
,, 101—200	26
,, 201—300	26
,, 301—400	17
,, 401—500	10
,, 501—1000	15
,, 1000 & above	3
	Total : 100

It was seen that family income of 55 per cent of patients was under Rs. 300 per month. The per capita income of the families is presented in table 4.

TABLE—4 Number of patients in different income groups.

Per capita income per month.		Number of patients.
Nil		1
Rs. 1—100		88
,, 1— 10	Nil	
,, 11— 20	3	
,, 21— 30	13	
,, 31— 40	15	
,, 41— 50	23	
,, 51— 60	6	
,, 61— 70	6	
,, 71— 80	9	
,, 81— 90	3	
,, 91—100	10	
,, 101—200		8
,, 201—300		2
,, 301 & above		1
		100

It was observed that 88 patients came from families whose per capita income varied between Rs. 11 to Rs. 100 per month.

The proportion of income spent due to paralytic poliomyelitis was studied and presented in Table 5.

TABLE—5 Percentage distribbution of expenditure due to paralytic poliomyelitis in relation to income

Percentage of income spent	Number of cases/families
0—10	56
11—20	29
21—30	9
31 & above	6
	Total : 100

Except in one case, who came from a family which had no income and was totally dependent on relatives, expenditures incurred on treatment varied between 1 and 82.2 per cent of income. In one case the family sold his landed property to meet the cost of treatment. However, in the majority (84 per cent) the proportion of income spent on treatment varied between 1 and 20 percent Most of the parents/guardians repeatedly expressed their difficulty about the financial burden imposed due to the disease. Some were in debt for providing treatment. Many while submitting the return prayed reimbursement of the cost from the Government or for some form of help.

While computing the money spent by the

hospital authorities, the following facts were taken into consideration :

A)	Salaries of personnel	Rs. 162,848.80
	Diet, bedding, clothing	Rs. 17,302.57
	Medicine, Medical and surgical requisites	Rs. 10,782.35
	Rent, municipal taxes etc.	Rs. 254.04
	Other charges 'Liveries, electricity, office expenses etc.)	Rs. 8,424.73
	Travelling allowance to staff	Rs. 74.16
	Total money spent for running the hospital for the year 1973	Rs. 199,686.65
B)	Number of patients treated in 1973 New and old	26232
	Number of new patients	2617
	Total number of indoor admission	233
	Total patient-days	8791

It was observed that on an average the parents/guardians spent Rs. 503 per patient per year and the hospital authorities had to spend Rs. 576 per patient per yer in the out-patient department. For an indoor patient the hospital authorities had to spend Rs. 10 per patient per diem or Rs. 3650 per patient per year.

It was observed that the hospital authorities spent Rs. 4.20 for a patient in the out-patients department per day. It has been a custom in the hospital to direct the parents/guardians to bring their patients to the hospital about thrice a week. On that basis the yearly cost was calculated (Rs. $4 \times 3 \times 4 \times 12$) as Rs. 576 per year.

Thus the cost per patient in the out-patient department totalled Rs. 1079 or 1080 per year (Rs. 503 + 576) and indoor department Rs. 3650 + Rs. 503 or Rs. 4153 or Rs. 4150 per patient per year.

These costs were computed on actual money spent and yearly change in money values has not been taken into consideration

Discussion

In the recent past, there has been a growing interest in medical economics all over the world. However, the information published in one country is usually not comparable to another as the conditions might be so different (Abel-Smith, 1963). In this study, only the actual money spent on some patients could be considered and the loss of income in future life, which could otherwise be earned if there was no disability, was left out of the purview. Even while reviewing the cost by the hospital authorities, it must be admitted that the standard of hospital care, especially rehabilitaion services, has been far from ideal. Thus the cost of medical care would have gone up if the hospital services were of better quality.

In developing countries like India, where unemployment poses to be a great problem, physically handicapped persons have rather more gloomy future. However, rehabilitation of these physically handicapped persons may have to be accepted as a socio-medical activity. (World Health Organisation, 1973).

The time-honoured axiom, 'Prevention is better than cure', has to be accepted by all. Apart from avoiding personal suffering, it

has been observed to be economical. In the U.S.S.R., it has been calculated that 66 roubles were saved for every rouble spent during the 11-year national poliomyelitis vaccination programme (World Health Organisation, 1973). In Germany, it has been observed that every dentschmark spent for polio vaccination purposes saved 90 dentschmark (Schumacher, 1973). In Bombay, India, the cost per case of paralytic poliomyelitis has been calculated to be about Rs. 450 and the loss by unemployment and disability to be Rs. 4000 a year per patient (Jhala, 1962 as quoted by Gharpure, 1962). In this study, the cost per patient in the out-patient department was approximately Rs. 1080 per year and in the indoor department Rs. 4150 per year. Proper preventive measures would save this exorbitant expenditure on a rather easily preventable disease.

Summary and Conclusion

Approximately Rs. 500 per year per patient on an average have been spent by the parents/guardians, who came mostly from the economically hard pressed section of the people. This was a great burden compared to their income. It has been calculated that the hospital authority had to spend Rs. 576 per year per patient attending the out-patients department and Rs. 3,650 per year per patient admitted to the indoor department. Thus, a total of about Rs. 1,080 was spent per year per patient attending the out-patients department and Rs. 4,150 per year per patient admitted to the indoor department. The cost would be greatly multiplied if the loss by future unemployment and disability is taken into consideration. This great monetary loss can be averted by preventing the disease by polio vaccination as has been done in most countries of the World. In addition, this will save the lives of many children and avoid suffering of innumerable children and their parents.

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BOOK REVIEW

New WHO Publication

Environmental Health Criteria 8 : Sulfur oxides and suspended particulate matter.

Published under the joint sponsorship of the United Nations Environment Programme and the World Health Organization, Geneva, World Health Organisation, 1978 (ISBN 92 4 154068 0). 108 pages. Price : Sw. fr. 10. French edition in preparation.

The publication, the eighth in the series on Environmental Health Criteria, reviews and evaluates available information on the biological effects of sulfur oxides and suspended particulate matter, including suspended sulfates and sulfuric acid aerosols, and provides a scientific basis for decisions aimed at the protection of human health from the adverse consequences of exposure to these substances.

On a global scale, the emissions of sulfur compounds into the atmosphere from natural sources are about equal to those from man-made sources. The former occur from volcanoes, forest fires, soil marshes and tidal flats, and the latter principally from coal burning and to a lesser extent, from such sources as the combustion of petroleum products, petroleum refining and nonferrous smelting. Domestic and motor vehicle sources have a disproportionate effect on concentrations in the immediate vicinity because the pollution is emitted close to ground level.

In this book, attention has been concentrated on the effects of inhalation, the most important route of exposure and consideration has been limited to sulfur dioxide, sulfur trioxide, sulfate ions, and particulate matter primarily resulting from the combustion of fossil fuels.

The vast literature on these pollutants has been carefully evaluated and selected according to its validity and relevance for assessing human exposure, for understanding the mechanisms of the biological actions of pollutants and for establishing environmental health criteria, providing over 300 references.

Following a summary of the major issues and recommendations for further studies, the book reviews the chemical properties of the substances and the analytical methods involved ; their sources in nature and elsewhere ; their dispersion, environmental transformation, concentration and exposure ; and their metabolism. The effects of sulfur oxides and suspended particulate matter are considered in both animals and man and the work concludes with an evaluation of the health risks to man from exposure to these substances.

The volume takes into consideration the views expressed by national institutions collaborating with the WHO Environmental Health Criteria Programme and the comments obtained from the Food and Agriculture Organization of the United Nations Industrial Development Organization, the World Meteorological Organization, the International Atomic Energy Agency, the Commission of European Communities, and some nongovernmental and Industrial organizations.

The publication will be of interest to departments of the environment and of health protection, to national regulatory agencies, occupational and public health workers and to plant engineers involved in energy production and other technological processes in which these pollutants may be involved.

Addendum

Family Welfare, History, Method and Practice

by Dr. Ranjit Dutta

Published by and available at—Mrs. Arati Dutta

BE 31, Salt Lake City, Calcutta, 700 064

175, pages, date of publication 2.10.1977

Price—Rs. 20/-

(A review of the above book has already been published in Volume 23, No. 1, January—March, 1979 issue of this Journal).

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NOTES & NEWS

Unique O-T-C sleep aid to be marketed by pfizer division

A new non-prescription sleep aid, recently cleared for marketing by the U.S. Food&Drug Administration, will be made available within the next few weeks by Pfizer Inc., New York, the company announced on June 29, 1979.

The active compound, doxylamine succinate, differs chemically from all such products previously available. The product, effective in single-tablet dose, will be marketed as Unisom. It is only over-the-counter sleep aid which has a New Drug Application approved by the FDA.

Clinical studies with doxylamine, begun in May, 1976, showed the compound to be highly effective, Pfizer said. Controlled double-blind studies, analyzed statistically demonstrated that patients were asleep in significantly less time after being given doxylamine than after receiving an identical-looking placebo tablet.

Pfizer's New Drug Application to the U.S. F.D.A. was submitted on August 12, 1977, and was approved as an original application pioneering the use of doxylamine as a night-time sleep aid.

ASSOCIATION'S NEWS

It is a great pleasure to inform our members and readers that the Indian Public Health Association has been selected to host the 3rd International Congress of the World Federation of Public Health Associations, Geneva. This selection has come through a secrete ballot election where India got the highest number of votes.

It is most likely that the International Congress will be held in February/March, 1981 at Calcutta. Incidentally, 1981 also happens to be the SilverJubilee Year of the Indian Public Health Association. Active cooporation and help from all members of the Assoc ation are solicited.

P. N. Khanna
General Secretary

INDIAN PUBLIC HEALTH ASSOCIATION

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Write to the General Secretary, IPHA, 110 Chittaranjan Avenue, Calcutta-700073 for application form and further information.

EPI

SCHEDULE OF VACCINATIONS

Age	Vaccination	
Pre-natal		
16—20 weeks	Tetanus toxoid	1st dose
20—24 weeks	Tetanus toxoid	2nd dose
36—38 weeks	Tetanus toxoid	3rd dose
Children		
3—9 months	Smallpox Vaccine BCG Vaccine Diphtheria-pertusis-tetanus (Triple vaccine)—3 doses at an interval of 1—2 months ; Polio (Trivalent oral vaccine)—3 doses at an interval of 1—2 months.	
9—12 months	Measles vaccine—one dose	
18—24 months	Diphtheria-pertussis tetanus (Triple vaccine)—booster dose. Polio (Trivalent oral vaccine)– booster dose.	
5—6 years (school entry)	Diphtheria-tetanus (Bivalent vaccine)—booster dose Typhoid (Monovalent or Bivalent vaccine)—one dose. After an interval of 1—2 months the typhoid vaccine—one dose	
10 years	Tetanus toxoid—booster dose. Typhoid (monovalent or bivalent vaccine)—booster dose	
16 years	Tetanus toxoid—booster dose Typhoid (monovalent or bivalent vaccine)—booster dose.	

Pre-natal : When mothers are registered late in pregnancy, at least two doses of tetanus toxoid should be given. For a mother who has been immunized one booster dose of tetanus toxoid should be given in subsequent pregnancies preferably four weeks before the expected date of delivery.

Children : Ages indicated are considered to be the best times. However, if there is any delay in starting the first dose of triple vaccine the ages may be adjusted accordingly. It should be the aim to ensure that a child receives smallpox, BCG, DPT and polio vaccination, where available before it reaches one year of age. The different vaccines indicated against the various age groups can be given simultaneously ; for example, BCG, triple vaccine and polio vaccine ; smallpox, triple vaccine and polio, etc.

When typhoid vaccine is being given for the first time two doses at an interval of 1—2 months require to be given.

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CONTENTS

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SESSION—I

WELCOME ADDRESS

G. A. Panse*

I am indeed very happy to welcome you all here to-day to this 23rd Conference of the Indian Public Health Association.

Our State of Maharashtra is singularly fortunate in having a medical graduate as our Cabinet Minister for Public Health and Family welfare and another medical graduate as our Minister of State for Public Health & Family Welfare. Both have a vast experience of the medical and health needs and under their stewardship we hope to achieve better results in all our Health Programme.

We are very happy to welcome you Madam, here to-day, especially because you could squeeze some time for this conference from heavy schedule of multifarious programmes you have on hand to-day. We know that to-day morning only you reached Aurangabad from Akola by travelling a distance of 180 miles and then attended two conferences and then after inaugurating this 23rd Conference of the Indian Public Health Association, you are again to leave for Nanded, a city about 165 miles away from here.

So also our Hon. Minister of State for Public Health & Family Welfare, Dr. Gadekar, has also squeezed out some time for our Conference from his busy schedule. Dr. Gadekar is not only our professional colleague but also a person who has actively participated in the health work while previously working as Medical Officer in the Department. He accepted our invitation to preside over the function at a very short time, thus indicating that the cause of Public Health is uppermost in his mind.

I am sure that the presence of both these Ministers who belong to our divine medical profession will give proper direction to our deliberations.

We are also very happy to have midst us over 150 participants coming from different parts of the country. Amongst them we have distinguished scholars, delegates and Public Health Workers. We look forward for their valuable guidance which would go a long way in making the deliberations of the conference meaningful and realistic.

This is the 2nd Indian Public Health Conference that is being held in this State. Way back in 1967 it was held in Poona which

*President, Indian Public Health Association, Maharashtra State Branch.

is considered to be the Cultural and Educational Centre of this State. It is now being held in Aurangabad which has a rich cultural heritage. The city has grown up in all respects in the last about two decades. Its historical heritage has acquired new dimensions in the shape of additional and better educational facilities, industries and what not. This city is known for its hospitability and I am sure that our guests and delegates would feel quite at home while they are here.

We all know that the City of Aurangabad is surrounded by historically and culturally rich places like Ajanta, internationally known for its paintings, Ellora for its ancient beautiful archives, Daulatabad Fort and Khuldabad for the tomb of Aurangzeb, the Moghul Emperor. In Aurangabad city itself, we have the Bibika Makabara designed on the pattern of Taj Mahal. All this rich heritage is indicative of one thing that our ancestors have possessed really a good health without which they would have never been able to leave for us such immortal and precious treasure. It is only the robust and healthy mind in a healthy body that can leave behind such a rich treasure.

Turning to the Topic of our main deliberation, we are going to discuss among other public health problems, the role of Para Medical Personnel in the Medical and Health Programmes. We are going through a peculiar phase of development of the health programme which has an unique importance in the individual as well as national life. The challenges of the past are more or less met but new challenges are appearing on the horizon. We have to consider how best we can withstand these pressures and meet the challenges with vigour and success.

I am sure that the conference would consider the problems we are facing and the right type of remedies it could suggest.

Through out our deliberations we must be wide awake to the problem that public health is both a social and technical job. We have all to do the technical job as perfectly as possible and also we should know how to sell it to bring about behavioural change in the community. The change has to be brought about by visualising programmes that are not too expensive and those that suggest a co-ordinated nationwide attack on the poor hygienic conditions, superstition, ignorance etc.

We are on a threshhold of industrial revolution in our country. The gap between the rural and urban life is widening, posing their own problems and we have to meet them squarely. Our own medical profession is undergoing vast change. A Medical generalist, though still forms a back bone of the medical system, there is a crave for specialized treatment on the other hand. With the rapid industrialization, problems of industrial health also are raising their head. With an unprecedented advance in Medical Science, newer and newer technologies are being employed. All these challenges cannot be undoubtedly solved by the Practitioners of Medicine alone. They need help of the Para Medical personnel in their fight against the disease. The role of Para Medical Personnel has thus assumed wider importance. I may not be wrong if I say that para medical personnel form not only an integral part but forms an indivisible part of the total health care system.

I am sure that the gallaxy of delegates who have assembled here have rich experience and a far reaching foresight and their cumulative wisedom, experience, knowledge and foresight would lead up to the ultimate goal of creating a society free from disease and ignorance. "Sarve Janah Sukhinah Santu, Sarve Santu Niramayah" is our cherished goal and let us all, Medical, Paramedical, Social & Political men march hand in hand to attain it.

With these introductory words I once again welcome you to this city and conference.

INDIAN JOURNAL OF
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October—December 1979

INAUGURAL ADDRESS

Smt. Pramilatai Tople*

I am indeed very happy to be with you this afternoon to inaugurate the 23rd Annual Conference of the Indian Public Health Association.

I understand that the Indian Public Health Association is publishing a quarterly journal to focus attention of those engaged in this field on the important issues of Public Health Importance. Similarly, the Maharashtra Branch of the Association is establishing a Health Museum in Pune and also is running an immunization centre, apart from having discussions on various scientific aspects at regular intervals.

However, when the concepts of delivery of health care are undergoing, a revolutionary change, the activities of the Association may have to be suitably modified, and I am sure that this 23rd conference must be addressing itself to the changing role of the association.

There has been a growing realisation that despite the best efforts by official and non-official agencies, the basic health needs of the vast multitude of our rural population have still remained largely unfulfilled. The gap between the health facilities available to urban population and those available to rural population has continued to remain wide inspite of our five, Five Year Plans. The present Government has therefore, rightly decided to bridge this gap by providing more health facilities to our rural and tribal people and to those who are economically backward. This objective obviously cannot be achieved by medical men alone because of their small number and the large population, which they have to serve. The need to involve para medical in health care is thus obvious if we want to fulfil our cherished goal of improving the health standards of our rural and tribal people and hence I am happy to learn that this 23rd Conference of the Indian Public Health Association has rightly selected the topic, "Paramedicals in Health Care", for their scientific session.

Role of Para-Medical Personnel in the management of Health Care is as old as role of the Medical Personnel. The first Dai who conducted the delivery of her neighbour was the first para-medical person. The person who helped the Physician in dispensing medicine first happens to be the ancestor of the system of Pharmacists. The roles of para-medical personnel got widened with the progress of Medical Science and the discoveries of the causative organisms.

Health is man's precious possession as it

*Hon. Minister for Public Health and Family Welfare, Maharashtra.

influences all his activities and shapes his destiny.

Man has been striving to keep good health but it took centuries before he could know why and how the diseases occur. The primitive man attributed diseases to the causes of deities and drove away the spirits that caused the diseases by noise. It was intermingled with religion, superstition, magic and witch craft.

In the Egyptian Civilization mankind came to know of some scientific reasons that caused diseases.

Similarly, the Greeks, the Romans and the Indians have their own system of medicines.

Medicine which was long in the bondage of superstition and speculation began to emerge as a science, as new discoveries were made and human knowledge advanced.

The delivery of medical care also underwent changes with the passage of time and aspecially after the industrial revolution. A family doctor who happened to be a generalist could not cater to the comlexities of the diseases. Hospitals grew in numbers. Specialities with manyfold instruments and their operators increased in number. To cope with all these needs was beyond the capacity of a doctor or a physician. He needed assistance. The concept of Social and Preventive Medicine also acquired deep roots. The new thinking was how to prevent disease. Civilised communities came to two conclusions. The first was that the health of every individual was a social concern and responsibility and the second was that the medical care in its widest sense for every individual is an essential condition of maximum efficiency and happiness.

When medicine was an empirical art, when the possibilities of surgery were very restricted and when the hospitals were in the main, merely lodging houses for the sick, the medical part of the problem of care of the sick was relatively unimportant. But the picture has undergone a radical change. Surgery has achieved spectacular progress. Specialist medical help is increasingly being demanded and as such the profession has ceased to be possible for a single practitioner.

Health has become a national responsibility. It is closely linked with the production of a nation and it has a vital role in promoting national wealth. Health has been defined as a State of complete physical, mental and social well being and not merely an absence of disease. Now has the time come to add the 4th dimension that is spiritual health which we are trying to attain by going back to Yogasanas.

With the new concept of Public and Social Health giving emphasis on prevention, it has become necessary to divide the Health Care into 4 classes :

1) Know and learn about health hazards.
2) Take Preventive medicines wherever necessary and try to see that the diseases do not occur at all.
3) If at all you become ill get the treatment from your doctor who may be a generalist, or if it is beyond his capacity approach the specialist.
4) Get Hospitalised treatment by being

under constant supervision and make yourself available for pathological and other examinations.

For all these things, doctors alone are not required. Neither they can carry out all the work which para medicals can do.

Patent drugs for cure of diseases like Tuberculosis, Leprosy, etc. which can be administered through specially trained personnel have become available.

The motto of any welfare State is to provide health care from womb to tomb. This care cannot be provided by a handful of doctors especially when it can be provided with little knowledge that can be imparted to nonmedicals. The Nurses, Ionculators, Laboratory Technicians, X-Ray Technicians, B.C.G. Technicians, Ophthalmic Assistants, Physiotherapists, Medico-Social Workers, Compounders and all other such para medical personnel can reduce the burden of work on the doctors and yet help the community to acquire good health.

The recent addition to this category of para-medicals is the multipurpose worker He will replace all unipurpose workers such as vaccinators, B. C. G. Technicians, malaria workers, Cholera Workers, etc. and will provide majority of the promotive and preventive services and to a certain extent primary medical care to the people at their doorsteps or in their villages.

The ALMA-ATA-International Conference on Primary Health Care has fixed a goal of acceptable level of Health for all the people of the World by the year 2000 and has made numerous recommendation to achieve this.

The role of para-medicals in providing Primary Health Care has been given its due importance even in this Conference.

The International Year of the Child has just begun. According to 1971 census, the child population (0-14 years) in India was 230 million, constituting about 42 per cent of the total population. The importance of the first six years of life of a child, for its growth and development is very well known. We have about 115 million children in this valuable age group. The infant mortality rate is as high as 122 per thousand live births suggesting that a lot effort is still needed to promote the cause of child health. The prevailing Indian situation in relation to maternal and child health reflects a woeful inadequacy of achievements and leaves out immense ground yet to be covered. Women in the age group 15-44 constitute nearly 22 per cent of the total population, and children in the age group 0-6 constitute another 21 per cent. The health and nutrition needs of nearly 43 per cent of the total population have to be met. Of these, only a small percentage is being reached at present through existing child and maternity health services. Lot of help from para-medicals and voluntary organisation will be required in providing supplementary nutrition, immunization, health check up, referral services, health and nutrition education, etc.

It is thus clear that :

1. Even though we have made some progress in the field of public health, a lot more has yet remained to be achieved.
2. Medical persons alone will not be able to deliver all the health services, needed for our people.

3. Para-medicals have to be involved in large numbers to provide health care.

After having agreed to utilise the services of the para-medicals, the two major questions, viz. the areas in which they should be involved and their training may have to be seriously considered, as the entire success of our health programmes will depend on these two important aspects. I have every hope that this conference will help the Health Administrators in streamlining the entire issue of use of para-medicals in Health Care.

Government machinery alone will not be able to deliver the goods. It is necessary that voluntary organ sations, private institutions, private medical practitioners, Association like yours, the Indian Medical Association, etc. should actively engage themselves in health promotional drive and in programmes like Family Welfare which have received a set back in the recent past.

With your co-operation and with the co-operation of all such organisations only, it would be possible to achieve our goal.

I wish the conference a success and declare that the conference is inaugurated.

INDIAN JOURNAL OF PUBLIC HEALTH
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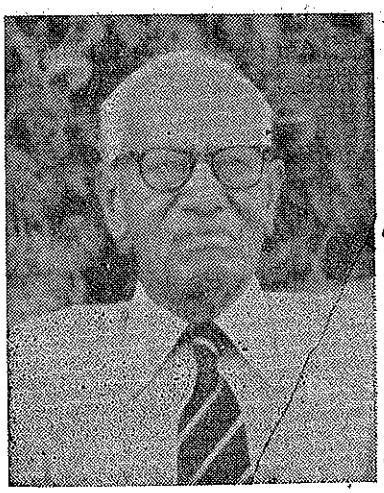
ADDRESS BY THE PRESIDENT OF INDIAN PUBLIC HEALTH ASSOCIATION

Dr. W. Mathur

Friends,

I am exceedingly grateful to you all for having elected me President of the Indian Public Health Association, unanimously for 19/8-79. I must admit that I do not find myself equal to the great honour you have bestowed on me. My only qualification is, perhaps, that I am one of the oldest devotees of the Goddess of Public Health. I, therefore, crave your indulgence and your unstinted and willing support in making this Session an unqualified success. We have very serious problems facing us, which can only be solved by the combined goodwill and wisdom of you all.



Our aim, as you all know, is to introduce and help extending the concept of total and positive health in the country. This would mean a programme not only for the control of epidemics, and treating the sick, but also to introduce measures which will bestow on every individual a state of fullest enjoyment of his or her physical and mental capacities in a harmonious social and ecological environment.

When we look at this, we know we have yet far to go, but it is always proper to keep the aim in view.

The biggest cause of deaths in this country —as shown by hospital statistics—are from communicable diseases and must, therefore, form the biggest chunk of morbidity. It would be worthwhile to assess the impact of a few important diseases on the health conditions of the country, and of the measures taken to combat them.

Malaria

Malaria continues as a major health problem even after the control programme of last 25 years. The incidence of malaria cases had come down to one lakh in 1965, but it again started going up with the peak of the present

trend in 1976 with 65 lakh cases. Since then, it is gradually coming down with 37.6 lakh cases in 1977-78, about 29.5 lakhs till September 1978 during 1978-79.

As you are aware, control measures are being taken according to the modified plan particularly in the districts affected by a severe type of illness due to P. falciparum. Coorperation is also now sought of panchayats and school teachers for establishing drug distribution and treatment centres. Anti-malaria measures, however, are of a socio-medical nature, and need involvement and active participation of the whole communities. This makes intensive and extensive health education among the masses as an essential prerequisite at the grassroot levels to make anti-malaria campaign as a people's programme, intead of working it merely as an official scheme.

It is rather discouraging to know that the "health education" component is only two lakhs in a total outlay of 75 crores for antimalaria work in 1978-79 which comes to 0.027% of the total scheme provision for this will be radically liberalised to win over mass report.

We almost reached the eradication point in the sixties, and we cannot afford to miss the bus again. Our motto must be continued vigilance, efficiency and mass participation.

Filaria

Bancroftian filariasis continues as a major public health problem. No less than 236 million population live in endemic urban and rural areas. The filaria control units are yet confined mostly to the urban areas protecting a population of 23 million through 153 filaria control units. We have yet to go far to make a dent in the endemicity of this infection. It is time that the control units should be extended to cover the whole of the area at risk. It is necessary to keep these as a separate staff as the multiplicity of functions is bound to tell on the efficiency of work especially in areas which are under the attack phase.

Smallpox

It is a matter of greatest satisfaction for the country to attain the target of Smallpox Zero on 5-7-1975 and to maintain the free status since then. It speaks volumes of the organisation and the efficiency of all those who participated in these operations. It is, however, necessary to maintain utmost vigilance. It is recommended that Primary Vaccination should continue till smalipox zero status has been certified everywhere.

Cholera

This disease which was at one point of time one of the biggest killers is now well contained and the cholera combat teams which are 40-45 in number have been found to be quick and serviceable.

Dysentery, Gastro-enteritis and Enteric group of fevers

These diseases are still very highly rampant in the conntry. The number of cases of this group treated in hospitals and dispensaries during 1972 to 1976 come to 49,10,417 or 41% of the total cases from communicable diseases. The W.H.O. in its

recent session of the regional conference for South East Asia held at Ulan Bator has also brought out that almost 80% of children in the rural areas suffer from intestinal parasitic or bacterial infections.

The above diseases are directly related to the problem of rural water supply and sanitation.

Water supply and Drainage

So far as the position of water supply is concerned, it may be relevant to mention that the budget of the Ministry of Health for 1978-79 shows only an allocation of Rs. 6,036.47 lakhs for schemes pertaining to sanitation and Public Health. Out of a total of 5,75,936 villages in the country barely 10% have been reported to be provided with safe drinking water facilities either through piped water supply or by hand operated tube well. Even in urban areas the conditions are not much happier, as in most places the supply is intermittent and far below the daily average requirements to cope with the rising population.

The position of the sewerage is still worse. Even in metropolitan towns, there are large areas with open sewers. Hardly 6% of the country's population is served by sewers.

Water supply and drainage scheme are executed by the public health section of the Ministry of Works. As such schemes have a direct bearing on public health, the priorities and allotments need be fixed in consultation with the Ministry of Health and as such the Department of Sanitary Engineering should function under the Director General of Health Services. This is now all the more necessary, as the Central Cabinet has decided to provide safe drinking water in 10,00,000 villages under the sixth plan.

Sanitation

As regards the rural sanitation, the conditions are too well known to need description. What is still worse, such abominable conditions exist also in Nai Bustees and slums which are springing up without any planning or sanitary facilities in the periphery of large urban areas. The overcrowding makes conditions still worse in such localities. The infant mortality rate, which is a sensitive index of the state of community health, is 131 per 1000 live births for the rural areas for 1970. This is the highest figure when compared even with other developing countries such as Malaysia, Singapore, Sri Lanka, etc.

Improvement of rural sanitation under the Primary Health Care Scheme now falls directly on the shoulders of the Community Health and Multipurpose Workers, under the guidance of the Health Assistants and Medical Officers. Will these cadres of Health workers develop sufficient drive and initiative to deliver the goods? These are the problems you have to consider on the basis of your observations. It is after all the mass health education which can arouse the health conscience of the people. This may be a long process before any change is discernible in the age old habits of the inhabitants. Can we wait so long? Time can be shortened if there is a large scale peoples' movement by the voluntary health workers, dedicated to the task, and fully supported by the political will of the authorities. Merely official agencies are not likely

to take us very far. The basic needs of potable water supply and sanitation are keenly felt by all and any tangible schemes for these would be acceptable to all.

Tuberculosis

It is estimated that there are about 2 million infectious cases of tuberculosis in the country against 42,500 beds for such patients, 308 district Tub. centres and 400 Tub. clinics. The need for providing each district with a Tub. centre need hardly be over-emphasised. These are imperative for organising and directing Tub. control measures to ensure efficient and early case-finding, effective treatment and organising health education in every district. There is hardly any difference in the prevalenee of Tub between the cities and the villages. Extension of Tub. control in the rural areas, therefore, assumes great importance on account of the large populations at risk. Under the Primary Health Care programme, tuberculosis conrol is naturally integrated with general health services specially at the periphery. If the community health workers and multipurpose workers are trained to make slides of the sputum from cough of three or four weeks' duration and send the same to the P.H.C., it would be very helpful in detecting fresh cases even from far flung villages. Patients with slides positive for tubercli bacilli should at once be put under treatment. It would be epidemiologically a sound, practical and cheap procedure and will set in motion necessary domiciliary treatment under the supervision of District Tuberculosis and the Primary Health Centre. I am mentioning this, as the manual of Community Health Worker does not make mention of this in the list of duties. I feel sanguine that if the peripheral health organisations are properly developed, we can effectively meet the challenge (now that the health services are being provided at the very door step of the people) by searching out tuberculosis cases from every village.

In a vast country like ours, it is not only the care of the patient but also the protection of the community, which is very important. In this the public health practitioners have a full role to pay in carrying out health education programme, helping and organising B. C. C. programme and to ensure working of domiciliary treatment.

Sexually Transmissible Diseases

It is estimated that no less than 4 to 10% persons are infected with such diseases at any one time involving 20 to 40 millions. These should, therefore, be deemed to pose a major public health problem. It is estimated that such diseases are spreading at a jet speed and are likely to get out of control. It is, therefore, essential to devise immediate and adequate measures commensurate with the problem. The old time concept that the disease is only confined to large cities and sea-ports and in Sub-Himalayan tract is a thing of the past, as with the present day means of communication and adverse economic conditions no place can be considered free. The increasing permissiveness of the society further facilitates the spreading of infection.

The present policy of confining the control by treating through 237 S. T. D. clinic cannot be considered adequate. It does not provide a clinic, even in each district.

The control measures can not be considered in isolation from the social, economic and family background of the patients. Lack of proper inter-personal family relationship and want of knowledge of these diseases generally drives one to promiscuity and to contracting these diseases. Large majority of victims get infected from prostitutes. The latter also adopt this profession as a result of grinding poverty at home. Any control programme to be effective should include all the three components viz. curative, educative and rehabilitative. Support of voluntary social organisations should also be invoked for this purpose.

About 20% patients in S. T. D. clinics belong to the teen-aged group, which comprises 35% of the population. This emphasises the urgent need of introducing Sex Education programmes in schools and colleges. This should form an essential part of the school curriculum, suitable for different age groups.

The Suppression of Immoral Traffic Act, 1956, enforced to restrain trafficking in women has been found to be ineffective and and needs to be amended so as to bring in its purview both the patrons and the prostitutes.

In view of the inadequacy of the S.T.D. clinics it is suggested that there should be arrangements for treatment of S.T.D. in all Primary Health Centres, where there would now be adequate staff to follow up contacts of the cases, and to effectively carry out mopping up of these infections in the countryside.

Nutrition and small family

Despite the green revolutions, the general state of nutrition does not appear to have made any difference. This is indicated by the net availability per capita of foodgrains per day during the preceding few years, shown in the Health Statistics issued by the D.G.H.S. as indicated below :

Year	Population	Per capita availability of cereals and pulses per day
1971	5,47,137	460.1 grams
1972	5.58,913	467.3 grams
1973	5,70,849	423.7 grams
1974	5,82,717	452.5 grams
1975	5,94,540	409·6 grams
1976	6,06,203	456.8 grams

The above shows that in spite of all efforts in augmenting agricultural production, the annual increase of population does not permit any optimism regarding an increase in availability of food per head. The average daily caloric value in India during 1972-74 came to 1970 per capita against a minimum requirement of 2210 calories. This figure also compares less favourably with some other developing countries of the neighbourhood. In Pakistan, it was 2132, in Singapore 2835, and Malaysia 2534. The caloric value of cereals and pulses in 1976 was only 1632 as per figures of Ministry of Agriculture.

The poor state of nutrition of an average Indian is further corroborated by per capita income which is Rs. 87.4 per month at current prices and Rs. 54.6 per month at constant (1970-71) prices.

Family Welfare

These are most revealing figures illustrating

stark poverty of the teeming masses. There is no doubt that a large number of schemes are being implemented to improve the socio-economic conditions of the country. These certainly have their relevance in the long run. But I am sure the key for the immediate solution lies in stabilising the population here and now for improving the quality of life of the people.

We have seen the adverse effects of introducing compulsion in the family planning programme. The percentage of protected couples went down from 23% to 22.5% in six months. What is now required is hard, strenuous, sustained and village oriented work of health education with a missionary zeal throughout the country. If carried out in the right spirit, there is no doubt that it will be taken up as peoples' own programme. Fortunately our Prime Minister and the Government are also very much alive to the problem and are providing large funds to popularise the movement. It is now for us, the Public Health Workers, to deliver the goods. Let the Family Welfare be our creed for several years till the birth rate comes down to 25.

Zoonosis

The Zoonosis constitutes another significant problem in relation to public health. Good deal of light was thrown on the subject at the last year's conference at Hissar. The problem divides itself into :

(1) diseases through infected eggs, milk and other foods. and (2) zoonotic disease due to direct contact or through a vector.

Action in regard to quality, manufacture and sale of articles of food is generally implemented by the local bodies, who have their own limitations. Only the Governments of Maharashtra and Pondichery maintain separate departments for food control. There is a provision of 13 lakhs under Plan and 11.74 lakhs under non-plan allocation in the Central budget for prevention of food adulteration. This can scarcely touch the fringe of the problem. Prevention of food adulteration laws have not been very effective for reasons well known.

Slaughter houses

Most of the slaughter houses are in deplorable conditions and provide excellent media for the propagation of meat-borne infections.

As regarding No (2), no serious effort has so far been organised to contain zoonotic diseases, except rabies. Spasmodic campaigns against rats are launched in special areas theatened with plague. In a country like ours, most of the rural population lives in closest proximity with bovines and other animals. It is estimated that four-fifths of the human infections are zoonosis, i.e. shared by man and animal. It is necessary to provide for further research about communication of Zoonotic diseases between human and animals and educate the public about the same throughout the country.

In our previous conferences also, we resolved that Veterinary Public Health Activities must be integrated with the health services. We should forcefully again endorse the same, as the two are intimately interlinked.

Environmental and Ecological Pollution :

There has been recently a rapid rise in the atmospheric and ecological pollution in the country both at the macro and micro levels. This is largely due to the advance of industry, and increasing urbanisation, which takes shape either in the form of multi-storeyed buildings or in vast expanding overcrowded insanitary slums, on the outskirts of large metropolitan cities. The gaseous effluvia emitted by the chimneys has a deleterious effect on the respiratory apparatus of those working and residing in the vicinity, particularly on the children. It is recognised that althouh there is an increasing danger of air pollution, yet the problem has not yet reached alarming proportions. I think there is no scope for any complacence in this matter, as there is plenty of evidence of the ills caused by such pollutants and also by overcrowding in the slums.

The National Committee on environmental planning which had put up some monitoring stations in the country has not yet fixed any realistic standards of permissible levels of air pollution. Any standards so fixed by the Committee should be incorporated in law so as to make their application imperative.

There are also very favourable malariogenic condition in the slums. The state of health among residents living in the flats on the fourth or higher flats needs to be surveyed on account of their special ecological conditions and health and accident hazards.

There is at present fast growth of urban, suburban and bustees on the outskirts of the towns. In addition, there is also need for rual planning. The past experience has amply shown that even minor deviations from principles of public health would result subsequently in major catastrophies in terms of human health and public exchequer. It is my firm belief that a public health representative must be invariably associated at the time of formulation of all schemes of urban, suburban or rural housing plans. This is necessary to take care from the public health point of view of every detail to avoid serious problems at a later date.

Primary Health Care

Friends, you are well aware of the Health Care launched in the rural areas by the Government of India on the 2nd Oct. 1977.

As the key-note address is to be on this subject, I do not propose to go into the details of the scheme.

The scheme has already started functioning in 726 centres, and it is expected that 90,000 community health workers will be trained till the end of 1979 who will cover 9 crores of population in about 80,000 villages.

The scheme will cover the whole country during the 6th Plan period.

The distinctive features of the scheme is not only its vast magnitude, but also the important and basic role which is assigned to the para-medical staff.

Many of you would have first hand knowledge of the actual working of the plan.

I would request you to express your views on the same, based on your actual experience

and observations regarding its various aspects such as training, administration and technical efficiency of the staff etc. The scheme is till in its formative stage and I feel sure any concrete suggestions from the body of health experts, such as yours, will receive due consideration of the authorities. As the theme of the conference is also "Para-medicals in Health Care", I trust there will be plenty of opportunity in the conference to discuss the scheme from every angle.

We as public health workers fully appreciate the basic philosophy of the scheme, as we feel that if it is properly guided and carefully nourished, it has in it the potential of blossoming out into a fully integrated health cover for the entire population.

Ladies and Gentlemen, I have tried to place before you some of the most urgent problems relating to health in the country. We must always bear in mind that Public Health is purchasable and it is for the votaries of this Goddess to find the means. Our recent experience in the eradication of smallpox amply proves that if the means are provided, there is no dearth of expertise in the country to deliver the goods. Fortunately, the Government of India is very much interested to improve the health conditions and I consider this the most opportune time for presenting our views.

Allocations of funds under different plan periods indicate that there has been a continual decrease in outlay allotted to "health" when considered as percentages of the total, in each successive plan, as shown below :—

Plan Period	Investment in Health Rupees in crores	Total Plan Outlay Rupees in crores
1st Plan (1951-56)	65.20 (3.3)	1960
2nd Plan (1956-61)	140.80 (3.0)	4672
3rd Plan (1961-66)	225.9 (2.6)	8576.5
Annual Plan (1966-67)	140.2 (2.1)	6625.4
4th Plan (1969-74)	335.5 (2.1)	15778.8
5th Plan (1974-79) Outlay	681.66 (1.7)	39303.2

(Figures in bracket indicate the percentage to total plan outlay)

Even though allocation in the 5th plan looks big, its value on the basis of 1960-61 prices is about 249 crores, which shows that it is approximately the same as provided in the 3rd plan. In fact the percentage of allotment to the total outlay has gone down from 2.6 to 1.7.

Considering that the demands on health have been naturally expanding, the above phenomenon cannot be looked upon with complacence, and we must raise our voice against this incongruity specially when the health conditions in the country are far below the standard and the above allocation also includes expenditure on hospitals and medical insititutions.

Multiple Associations

Many of us specialising in different aspects of community medicine have no doubt achieved considerable success in their own respective fields. Our aim is, however, attaining a high standard of total health for the population so as to raise their quality of life as

a whole. This requires a collective functionning of all the services pertaining to community medicine such communicable diseases control, M. C. H., veterinary public health, water supply and drainage, urban and rural town planning, control of atmospheric and ecological pollution, statistical services and other services having a bearing on public health. No organisation relating to any single speciality can aspire to achieve this objective.

My illustrious predecessors, the late lamented Dr. S. S. Verma and Dr. J. B. Srivastava, recognised this and worked for organising a common platform for chalking out a concerted action and joint endeavour for the purpose. Some of the like-minded Associations, during this year, also reacted favourably, and at one time we expected to hold a joint meeting in October, 1978, to discuss a few common problems. A set of modalities were also worked out and it was made abundantly clear that each Association will maintain its individual character and objectives as heretofore. The joint session will, however, provide opportunities for cross-fertilisation of ideas to evolve balanced and well integrated health schemes from all aspects. I hope and pray we shall soon succeed in this project.

Administration

Friends, as we know, our representations and resolutions often are overlooked by the authorities. Our very reasonable and modest request that one of the D. G. H. S. and Additional D. G. H. S. should be with a public health background, has not been seriously considered. At the present time, when gigantic health schemes are being initiated, this suggestion assumes still greater relevance. No less than 84% of the total allocations under the centrally sponsored and Central Plan Schemes of the Ministry of Health for the year 1978-79 relate to prevention of disease and promotion of health. I, therefore, wish to re-iterate the previous resolution on the subject to ensure a sound public health perspective in the entire project. We also place the special expertise of this Association at the disposal of the authorities and would request that we may be associated with all the health schemes during their formative stages, so as to enable us to present our views from public health point of view. I trust with your blessings and active support, we shall succeed in our legitimate representations.

Conclusions :

Ladies and Gentlemen, I must apologise for taking so much of your precious time and am very grateful to you for your kind indulgence.

I trust and hope you will have very useful discussions on the various health problems as scheduled in the programme and will find the sessions stimulating and fruitful.

INDIAN JOURNAL OF
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ENVIRONMENTAL CHANGE AND HUMAN HEALTH

(Late Dr. B. C. Dasgupta Memorial Oration—1978)

M. C. Mittal*

Chairman Sir, Colleagues—Ladies and Gentlemen :

To start with, I express my sincere thanks to the Generalbody of the Association for the great honour done to me by asking me this year to deliver the Oration which has been instituted to commemorate the memory of late Dr. B.C. Dasgupta, an outstanding personality in the field of Public Health in our country.

When I was informed by our Secretary, Dr. Khanna, of my election to this honour, I started thinking as to on which subject should I speak before a learned audience like this. Acknowledging his communication, I requested him if he could suggest to me a subject, which will be apt for this occasion. As expected he wrote me back, that I had to choose the topic. I could smell at this time of growing interest amongst our people in problem of Environment from some reports in Press, and so started pondering over the feasibility of writing on this topic. Just then a very revered peer of mine also suggested about the same sort of topic and this solved the dilemma, and here I am before you with a brief resume on "Environmental Change and Human Health."

The concept of environment is complex and all embracing. It is not merely the air water and soil that forms our environment but also the social and economic conditions under which we live. The internal and external environments comprise total environment.

Our environments, are influenced both

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by major events (war, famine and pestilence) and by minors. Strikes and related disputes that disrupt communication sanitary services can also affect our environment.

Health workers were long preoccupied with main vulnerability to obviously harmful contaminants. Though Vector Control, Waste disposal and water and food questions are still major concerns in some areas of the world, in affluent countries attention now centres on more sophisticated contaminants and the quality of air and topics like recreational facilities, working conditions etc. The rear of outboard engines scaring the last birds from a formerly tranquil lake, the reek of exhausts during a traffic jam and the disfiguring presence of crude on a favourite beach are important gradients in health related environmental change.

Through such things 'change' has become an emotionally charged word. But change may be for better as well as for the worse. Adverse environmental change may range from violent to imperceptible and have short range to very long range effects.

Environmental change in the world since World War II, has been radical, rapid and comprehensive. The physicians have reached new heights in their endeavours to adapt man to the environment. The Engineers on a scale hitherto undreamed of, are busily adapting environment to the man. But these conscious efforts towards improvement continue to produce unlooked for side effects. Therefore, when plans are made, certain environmental values have to be critically weighed against others. Value judgements do not necessarily mean an all or nothing approach.

As in developing countries, and underdeveloped regions of developed ones, air pollution and noise are overshadowed by locally more urgent environmental problems, I have, therefore, planned to include in my talk all those facets of environment which are of important to us today.

Physical Environment

1. Air Pollution

Truly speaking there has never been pure air, foreign substances have been present in air at all times, and at all places. The term air pollution is applied when there is excessive concentration of foreign matter in atmosphere which is harmful to man in his environment. It is mostly a man made change that adversely affects his natural surroundings and is a menace to health throughout the world. Problem of air pollution was first brought to sharp notice or focus when air pollution epidemic took place in Los Angeles (1948) and London (1952) when many people became ill and 4000 men died in 12 hours. Epidemic of asthma in Tokyo Yokohama region has been also due to air pollution.

Air Pollution in India

With rapid growth of industrialisation and rapid urbanisation India has started experiencing air pollution in big cities. Chakrabarty and Rao (1962) carried out a three years survey of air pollution in Calcutta. The results have been shown in Table I.

In 1968-69 the National Environmental Engineering Research Institute, Nagpur carried out air quality surveys in Bombay, Delhi Calcutta and Kanpur. The survey revealed

TABLE 1 : Atmospheric pollutants in Calcutta.

Atmonspheric pollutants	Range
Soot Fall	39.38-90-98 tons/Sq. mile/month
SO_2	.021—.058 PPM
Oxides of Nitrogen	.043—.122 PPM
NH_3	.160—.205 PPM
Aldehydes	.04 —.12 PPM
Respirable dust	.71 —.600 gs/cu.mi. of air

existence of high pollution level in certain places in these cities even more than some of the big cities of the West. The dust concentration is shown in Table II.

TABLE II : Suspended Particulate matter

City	Suspended matter/ug/m
Bombay	238
Calcutta	527
Delhi*	700
Kanpur	488
London	221
New York	134

*Conservative estimate puts to fly ash deposited by the Thermal Plant in the vicinity of Inderprastha Estate 3 tons a day.

Sources

(i) Industrial process—Chemical Industries metallurgical industries, oil refineries, fertilizer factories, textile industries etc.

(ii) Combustion—Industrial and domestic combustion of coal, oil and fuel is source of smoke, dust and sulphurdioxide.

(iii) Vehicles—In urban areas trucks, trains, aircrafts, cause air pollution by emitting hydrocarbons, carbonmonoxide, lead nitrogen oxide and particulate matters. In strong sunlight they get converted into a 'photochemical' pollutant of oxidising nature. Diesel engines emit black smoke and maladorous fuels.

(iv) Miscellaneous — Burning of refuse, agricultural activities e.g. crop spraying, pest control, and nuclear energy programmes also contribute to air pollution.

(v) Effluents from Brick fields when burnt in open i. e. Klins yield pyroligenous matter which are injurious to health.

(vi) Effluents from offensive trades like paper making, oil mills, rice mills etc. also pollute the environment.

(vii) Various dusty trades—give rise to silicosis, anthracosis, bagasosis, siderosis etc.

(viii) Industrial gases and fumes from chemical and mettallurgical industries cause respiratory hazards.

(ix) The dispersal of radio active contaminants through war time use and subsequent peacetime testing of nuclear bombs introduced the threats of genetic lesions affecting future generations.

Generalised health affects of air pollution

(i) Immediate effects — Sudden increase, though small, in air pollution, is associated

with immediate increase in mortality and morbidity referable to respiratory system.

(Ii) Delayed effects—are chronic bronchitis, and primary lung cancer.

(iii) Other effects—(a) On plants and animals—Plants are sensitive to SO_2, flourine compounds and smog. Spotting and burning of leaves, destruction of crops, retarted growth of plants have been observed. Flourides are toxic to amimals as to men.

(b) Soeial and economic effects are due to impairment of human, plant and animal health, erosion of metals, building material which in turn affects cost of cleaning, repairing removal of unpleasant odours etc.

(iv) Specific effects—or health hazards are found in specific occupation with involvement of toxic chemicals e.g. (i) inhalation of Arsine produces toxic jaundice, haemolysis, haematuria, suppression of urine, (ii) Co-prolonged inhalation leads to carboxy-haemoglobin, weakness of limbs, heaviness in head, giddiness, palpitations etc. (iii) H_2S—Prolonged inhalation leads to convulsions, paralysis, coma and death, (iv) Cl—leads to lacrymation, cough, dyspnoea, anaemia, decay in health and emaciation, (v) NH_2 Irritation of URT and conjunctivitis (vi) CS_2 —leads to headache, nausea, cramps, haemolysis and numbness.

2. Noise Hazards

Todays jets have subjected many people living near busy air ports to severe noise. Tomorrow's Supersonic Aircrafts will aggravate this issue, particularly for the people living along flight paths, in Island or Coastal areas remote from major Air ports. The elatter and hum of office machinery may impair working efficiency. Industrial noises are more serious. The level of 90 db is not too far for the level which has to be regarded as a threat to hearing (Broadhent 1964). This level is not at all unusual in industry and impaired efficiency of hearing may also result from certain types of low level sounds that do not annoy the hearer. The whole question of street noise is one clearly demanding critical monitoring and evaluation by environmental health scientists.

3. Water Pollution

Sources of water pollution are many e.g.

(i) Municipal waste water if not properly chanalised.

(ii) Industrial waste water.

(iii) Agricultural waste water.

(iv) Unguarded sources and reservoirs of water.

(v) Underground water and drainage pipe line if gets broken and there is leakage.

(vi) Insanitary wells.

(vii) Physical pollutants—Pollution of water supplies by radio active material represents an increasing hazard with regard to water quality. In radiological examinations, radio-activity is expressed in piocuries per litre (pci/l.). International standard proposed the following limits of radio-activity as acceptable.

Gross alphactivity 3 pci/litre.

Gross betaactivity 3 pci/litre. Below these limits water is potable.

(viii) Miscellaneous : Petroleum products and refinery wastes are generally listed

among possible mutagenic and carcinogenic substances. There has been recovery of various polycylic aromatic hydrocarbons including the known carcinogens, 3-4 benzpyrene and 1-2 benazathralene from sewage sludge. Effluents from gas work, atmospheric soot, washed from air by rain are suspected of introducing these chemicals into sewage, as azodyes. Similarly, we get dissolved and suspended inpurities in ground water.

The obliging Yamuna according to published reports carries from Delhi everyday 200 millions and odd litres of human wastes and 20 millions and odd litres of industrial effluents.

Solid Wastes

Health issues are linked with men's total environment. The accumulation of solid wastes in man's environment constitutes a positive health hazards because of (a) The organic pollution of solid states ferments and favours fly breeding. (b) The garbage in refuse attracts rats. (c) Pathogens are conveyed to man through flies and dust. (d) Leads to water pollution if rain water passes through deposits of fermenting refuse (e) There is risk of air pollution if there is accidental or spontaneous combustion of refuse. (f) Files of refuse are also a nuisance from an aesthetic point of view. Social development of community is reflected in collection and disposal of its refuse.

Excreta Disposal

Improper excreta disposal is an important cause of environmental pollution. The various health hazards are —

(i) Soil pollution.

(ii) Water pollution.

(iii) Food contamination.

(iv) Propagation of flies.

The resulting diseases are typhoid, paratyphoid fever, dysenteries, diarrhoeas, cholera, hookworm infection and parasitic infestations. These diseases are basically detriment to social and economic progress. Statistics indicate that about 50 million people suffer from intestinal infections, out of that 5 million die every year. In rural India, 45 million are infested with hookworm and about 2114 per 1 lac population suffer from enteric group of fever.

Biological Environment

Insects, animals and plants are constantly working for their survival and in this process some of them may act as disease producing agents, reserviour of infection, intermediary hosts and vectors of diseases for man. Between the members of ecological system which includes man, there is constant adjustment and readjustment. For the most part, the parties managed to effect a harmoneous interrelationship to achieve a state of peaceful co-existence. This has however not been enduring and disturbed environmental change has resulted which is not to the advantage of man in the long run.

Social Environment

It includes a complex interplay of factors and conditions viz. cultural values, customs,

habits, beliefs, attitudes, morals, religion, education, occupation, standard of living, community life, availability of health services social and political organisation. Man is a member of a social group, the member of a family, a caste, a community and a nation. Between groups there can be harmony or disharmony depending on interests and points of view that are shared or that are in conflict. The behaviour of one individual can affect others more or less directly. Conflicts and tensions between the individual and the group as a whole or between the individual and other members can lead to various social problems and increase in crimes of various sorts.

One of the great evils is the irregularity with which huts are built around a coming up industrial complex without any provision of basic sanitation facilities. This way slums are being created in almost all cities and industrial estates, and as is known slums are responsible for 35% of city fine, 45% of major crimes, 55% of Juvenile delinquency, 50% of arrests and 50% of diseases (60% of tuberculosis cases originate here). Food is made unsafe in various ways, which again is a social problem.

Thus man today is rightly viewed as the 'agent' of his own diseases. His state of health is determined more by what he does to him that from what some outside germ agent does to him. By poisoning with toxic chemicals, the air he breathes, the water he drinks, and the food he eats, man has been reducing the chances of his own survival.

In a Seminar recently, the Archbishop of Trivandrum rightly observed that modernisation, urbanisation and industrialisation have created crisis in our values, destroyed our ideal traditions and thrown our lives out of joint. This social disorganisation is mainly responsible for all sorts of corruption and ills.

What is the Remedy ?

The central task of environmental health planning is to formulate a strategy that will assure the maintenance of that combination of environmental qualities that allow all free living organisms to give their potentials the fullest development and most harmonious expression. This strategy cannot focus on environment alone for environment per se is not the real issue—The real issue is organism in environment.

Man emerged into terrestial habitat some two to five million years ago. For most of that long span of time, his impact on his habitat was relatively inconsequential. His capacity to effect change was limited to living in caves, erecting simple huts and establishing rudimentary social organisation. After the stages of gathering, hunting and fishing, the stage of herding started. This stage was signified by domestication of cattles harnessing of fire (50 000 years ago). The next stage was domestication of plants and start of agriculture. To start with there was an active and symbiotic partnership between man, animal and plants. But with the advent of potters wheel, which led to wheel of industry —industrialisation and latter to urbanization, the disturbance in ecosystem started.

At first man adapted his methods of managing wastes to natural processes. As the scale and tempo of waste production increased,

it soon exceeded the capacity of natural feed back and the toxic nature of human detritus began to disturb the orderly functioning of natural systems. So man has to now devise innovating processes to manage the rapidly accumulating detritus in the emerging human eco-system. It is certain that man by some control over physical environment controlled major communicable diseases. This in turn along with staving of major wars had led to increased populations, leading to crowding—over crowding and its deleterious effects—food shortage again, air and water pollution and various types of diseases. So it is a vicious cycle and until and unless broken and at a proper stage, there will be no permanent solution.

Some of the countries that were late to industrialize have largely bridged the technological gap and now also boast of efficient educational social health services—Japan has demonstrated how rapidly and effectively human populations can be scientifically managed. But what about the poverty smitten majority ? These show no more than the small beginning of technological advancement. They are racked by internal dissentions, lack of sound educational infrastructure and have Public Health Services that can do little more than furnish the bare necessities of medical care. Where these conditions prevail, meaningful limitation of population will not be achieved by handing out bead frames, condoms or intra uterine contraceptive devices.

Vast population in many countries exist in the most rudimentary and temporary shelters with less than elementary facilities for healthful living. Problems of sanitation, therefore must be considered against the background of social structure of the community in relation to urban, village, scattered rural specified industrial new colonies of migrants, refugees and labour forces engaged in public work.

In many village communities, where the basic elements of sanitation are missing, priority will have to be for water and soil sanitation, while in industrial communities, in addition to these, and taking care of slums, control and monitoring of air pollution will be as important.

Till now the progress obtained in environmental sanitation has been confined to a few advanced countries and only a small part of world population. Causes for slow and unsatisfactory development in environmental sanitation in other regions are lack of public conciousness and knowledge, lack of adequate sanitary organisation, lack of adequate trained staff, lack of finances and inadequate distribution of technical information.

Before any programme is taken in hand, man environment relationship must be thoroughly understood. Growing waste loads have already begun to have an obvious impact upon economic development of even some of the highly developed countries.

Options for improving environmental management are to improve technological process by increasing efficiency, using cleaner inputs and reducing wastes. Another set of options includes the recycling of residual such as municipal trash. Other options include, treating wastes which are currently untreated and to improve pattern of waste

disposal through time and space—Examples are restricting emissions during period of temperature inversion and other adverse meteriological condition and avoiding excessive concentration of waste geographically.

An increased sense of public urgency concerning the pollution problem is essential. It is also imperative that governmental agencies should be well equipped and staffed to take care of the same. Public is generally ignorant of the various acts the government has made to protect air and water from pollution. Then the laws against causing pollution have proved ineffective in some countries so far, possibly because the responsible official machinery is inefficient. The industries large, medium and small have no incentive to develop and operate pollution, control. The defaulting companies causing pollution are able to present a variety of expert witnesses to support their point of view while the poorly financed citizens' organisations generally lack expertise and sometimes are even made to work at cross roads.

Then to quantify the effect of actions on the environment and achieve agreement among many parties involved, is difficult if not impossible. To recognise the potential effects upon the environment and attempt to quantify them is, essential if we are to minimise ecological imbalances and the resulting health problems created.

Some of the general environmental impact questions to be considered before, we take up an industry or projeot could be as under. Similar questions could be designed for community water supply projects and sewerage and sewage treatment projects.

Environmental Impact Questions

1. What new public health problems will likely arise from the construction of the project ?
2. Which construction and plant operations are likely to open up new pathways for carriers of disease, affecting humans, plants or animals ?
3. What chemicals or toxic substances will be used during construction operation which may have a long term effect on the environment ?
4. What actions will be taken to avoid creating a more favourable environment for disease-bearing organisms ?
5. What is the extent and impact of the environmental degradation which could be expected in case of catastrophic failure or accidental spill of toxic material ?
6. What clean-up contingency plans exist for catastrophic failure or an accidental spill of toxic material ?
7. What will be the ecological consequences of change in land patterns and population distribution ?
8. What provisions have been made for resettlement of people and industries displaced by or attracted to the project area ?
9. Which alternate site and forms of action have been considered in an effort, to mitigate environmental degradation ?
10. To what extent is the environmental impact reversible ?. In what time period and at what cost ?
11. How does the design of the project allow for future expansion but still protect the environment ?

So it seems, the most important long run option for improvement of environment management will be changing, the size and composition of economic activity and shifting the nature of growth away from pollution intensive towards those activities which are less waste intensive, as well as optimisation of the world population if ecologic balance has to be maintained.

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PRESIDENTIAL ADDRESS

Namdeorao Gadekar*

Ladies and Gentlemen,

I am indeed thankful to you all, for inviting me to preside over the XXIII Annual Conference of Public Health Association at Aurangabad.

I really appreciate the foresight of organisers of this Conference in selecting a very appropriate theme for the scientific session "Para medicals in Health Care".

80% of population in India lives in villages. For a meaningfull progress, health of the people will have to be uplifted. A retrospective glance at the health facilities provided, will reveal that prior to independance, the infrastructure of health services was so meagre, that it could not make slightest dent on health conditions of people. On recommendation of Bhore Committee (in 1946), Primary Health Centres were establhlised in Rural areas, at the rate of one centre for each community development block. This was a new approach to meet the preventive, promotive and curative needs of the rural community, through a basic health team consisting of Medical Officer and Paramedical Workers and Nursing personnel.

In latter years, various National Programmes were under-taken for the control of important Communicable Diseases. Most of these programmes were vertical. With years of struggle, we are successful in taking some of the diseases, in other instances, we have eradicated some diseases.

It may be the scheme of opening Primary Health Centres, in Rural Areas. Eastablishment of a big Hospitals in Urban area or it may be an execution of National Programmes for control of Communicable Diseases, one thing is common in all and that is the participation by Para-medicals along with the Medical profession. In a poor developing country, like ours, where we don't have enough of medical personnel, many of the functions of Health Services, where much of the professional skill and expertise is not necessary can be undertaken by Para Medicals.

We have seen the eradication of Smallpox from our Country. In bringing this dream to reality, the role played by Vaccinators and other Para-medicals was as important as that of a Medical Officer of the Primary Health Centres. In many other programmes, also we have to attribute our successes to

*Hon. Minister of State, Public Health & Family Welfare, Maharashtra.

the hard working and untiring efforts of Para Medicals. Even in this decade, we experience the reluctance of Medical personnel to work in Leprosy, whatever, small achievements, we are able to make in this field are very much due to the dedicated work of Para Medicals.

It is a fact that Maharashtra has done a commandable work in Family Planning. For years, this State had done pioneering work in this field. I will not hesitate in stating that, role of Para medicals in the success of Family Planning work was not in any way less than the medical profession.

In rural and urban areas, backbone of our hospitals, and Primary Health Centres are nursing staff. In rural areas, specially, nursing staff has been the liasion between the community and medical officer. Achievements in Maternity Child Health Services are mostly due to the active participation of nursing staff. They played a great role in imparting health and nutrition education to mothers. They have performed these tasks againt many odds. Even now, there are no residential facilities to nursing staff, no security of female staff. There is difficulty of communications, even then nursing staff has helped medical profession in improving Maternity Child Health Services. Though there are some spectacular achievements in field of Health Services, if cirtical review is taken, some of the gaps, failures will become obvious. Our Para medicals have failed to penetrate in the community and also to work as re-inforcement to the medical officers. They have remained isolated from the community, resulting in lack of emotional rapport. I think to some extent, blame of this failure will have to be taken by administration. We have failed in training the Para medicals staff to the desired level and for the purpose for which, they are employed. Here I feel Indian Public Health Association, through its learned and scientifically skilled members can train the para-medical staff. Let the community get the benefit of your valued experience in the field. I would request the Indian Public Health Association to give a serious thought in the deliberation of next 2-3 days in finding out viable methods in what way Indian Public Health Association, can help Government in training the Para Medicals. I would also request that each Branch should adopt one primary Health Centre, initially and show the light to others.

I am happy to be with you, on this occassion. Ladies and gentelmen, I am keely interested in the deliberation of this Conference. I am confident, some important and useful resolutious will be passed in this Conference.

I wish you a very happy stay in this ancient and beautiful city of Aurangabad, and wish all the success to the Conference.

Thank you very much.

SESSION—II

PARAMEDICALS IN HEALTH CARE

KEY-NOTE ADDRESS

Role of Multipurpose Health Workers and Medical and Health Assistants in the Delivery of Health Care in Rural areas

B. C. Ghosal*

Mr Chairman Sir, dear Colleagues—Ladies and Gentlemen ;

I am extremely grateful to the General Body of the Association for the great honour done to me by asking me to deliver the key-note address for the Scientific Session "Paramedicals in Health Care". My only qualification is, perhaps that I am handling the Rural Health Scheme from the Government of India side. I see before me, senior health administrators, learned educationists, experienced public health workers and young scientists. I trust and hope that they will pardon me for making any observation which may not be acceptable to them. I will be glad to try to answer any question or accept any suggestion, if they are made after completion of presentation.

As you all know that our aim is to introduce and help in extending the concept of integrated health care in the country with preference to the rural masses, which form 80 p.c. of India's population. We need health organisation to develop a comprehensive health care programme to try and improve the health condition of the people. The present day medicine is not for individual only but for whole community. It is not enough to be free from disease, but be healthy and enjoy life through work, creation as well as recreation. This is why handicapped, is taken care of in rehabilitation and gainful employment is also the responsibility of the society in which he lives. Fortunately the trend of health care in the developing countries like India is towards integration. It is now increasingly appreciated that prevention is not only better than cure but also economical. Remarkable advances are taking place in various fields of medical science and procedures of treatment which can in the early stages bring about early cure and prevents spread of the disease in the community. It is rather difficult to draw a line between curative and preventive medicine.

In India, the problem of providing medical and health care to its vast population has always been a matter of serious consideration of planners and policy makers in the formulation of health and medical development programmes during the five year plans. As a result much has been achieved during the past 30 years. There are now 1,54,000 doctors in the conntry as compared to 60,000 in 1951. The number has risen mainly due to rapid expansion of training facilities during the different plan periods. As against 30 medical colleges with an admission capacity of about 2,600 per year in 1951, we have now 106 medical colleges with an admission capacity of about 13,000. The facilities for training of

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paramedical personnel have also increased substantially. Now we are not far from the norms recommended by the Bhore Committee (1946). A huge infrastructure of hospitals, primary health centres and their subcentres and dispensaries has also been built up. There has also been a remarkable progress in the control of communicable diseases, water supply, sanitation and research activities. Health status of the people has also been considerably improved as indicated by a steady decline in infant mortality and the increase in life expectancy over the last three decades.

Despite impressive progress during the past three decades, the position in rural areas is still far from satisfactory. Vast segments of rural population have little or no access to to Government Health Services. The health centre in the rural areas is a basic health organisation for providing integrated health services both curative and preventive to the people with family as a unit of care. The health centre concept is a positive step towards comprehensive health care. We have today 5400 Primary Health Centres and about 39,000 subcentres. These, however, have not made significant impact on the health status of the rural population. P.H.C. on an average covers 1,00,000 population. Out of this population the P. H. C. can conveniently provide medical care to the 20 p.c. of the population over a radius of 5 kms. In the rest of the areas, there is hardly any coverage by the P.H.C. Thus, a large unmet felt needs for health service exist in the rural areas. It is now being increasingly realised that the health needs of the rural people are unlikely to be met by our present health care system which is hospital based and relies on a large number of doctors, with emphasis on curative rather than preventive care, and depending upon sophisticated facilitics and equipments. The health services on this pattern were developed with the hope of expanding them progressively, as resources increase until the entire population is covered. The outcome has been quite different, unfortunately, the major outputs have been mostly directly towards urban areas to the relative disadvantage of rural population. The magnitude of the task for providing basic minimum health care to the entire rural population is so great and the financial resources so limited that one loses almost all hopes for meeting health needs on the basis of existing pattern. This makes one start thinking as what strategy to be adopted to meet the challenge.

In recent years there has been a considerable thinking in India in search of new approaches. Various experiments have been conducted by various individuls and agencies in different countries including international organisations. It has been realized that an adequate approach to meeting basic health needs must begin with the community itself and then link of these basic services with the infrastructure of dispensaries and hospitals through a sound and well organized referral system.

The Kartar Singh Committee which has examined the problem in detail, and after reviewing the entire health care delivery system, has provided some broad guidelines for the development of a comprehensive nationwide network of health services, to provide a basis for the immediate action programmes. The most important recommendation of the Commitee was that "the multipurpose worker would be entrusted with the

carrying out integrated functions, and would have greater rapport with the people in rural areas." It observed that the integration of Health with family planning and nutrition programmes is highly desirable as it would be more economical and effective. The recommendations for the committee of introducing the multipurpose workers in the rural areas in place of unipurpose workers were accepted by the Government. Under this scheme health workers both male and female are responsible for carrying out basic medical care, M. C. H. and Family Planning, nutrition education, health education besides preventive and promotive health services. Thus the present strategy of providing health services to the rural community is distinct from that of unipurpose workers scheme in which different health workers are responsible for different programmes.

The health assistant, as he is called in India is also a supervisor of the various health workers working in the area. The health assistant can get very little guidance and for practical purposes, he is to make decisions and organise activities, which normally would be taken care of by a doctor. A health assistant in the rural community combines the duties of a health administrator, clinician, nurse and a sanitarian, furthermore he has been trained to undertake the responsibility of supervisor.

In India the health assistant i.e. initially drawn from the existing cadre of malaria inspectors, sanitary inspectors, smallpox supervisors, pub ic health nurses, lady health visitors, etc. The new entrants will be required to have ten years of schooling and will then he made to undergo a programme of training which will extend over two or three years to qualify them for the job.

The health assistant will continue to exist and play a vital role in rural community for several years to come, particularly as the speed of development in rural areas lag behind. Even in those countries where doctors abound e. g. the U. S. S. R., the feldscher cadre is not being abolished but is being reshaped to meet the current needs of health services.

While the health assistants do have supervisory role, they should also function as health workers in their own area, carrying out the same duties and responsibilities, but at higher level of a technical competence. They will be specially responsible for the promotive and preventive health measures and all the national health programmes. The female health assistant should take particular care of children and expectant and lactatiug mothers.

Health assistants really fall in two phases. The first phase is qualitative in the sense that it is not proposed to increase the total number of persons at the supervisory level, but to replace the existing varieties of unifunctionaries by a broad based single cadre of multipurpose, middle level workers, comprising the subdoctorate and sub-professional groups. Persons in the existing categories of health supervisors, after suitable screening should be given intensive training for varying periods so as to fit them for the job expected of them as health assistants. The number of health assistants should also be increased gradually.

The cadre of health assistants is regarded

as an incentive to promotional cadre of health workers. In future the recruitment to the category of health assistants should ordinarily be restricted to health workers who are duly qualified to shoulder the higher responsibilities involved. However, where such qualified workers are not available for promotion, an alternative channel of lateral recruitment from the open market should be provided.

Both health workers and the health assistants will function as important llnks in the referral services. They will deal freely with cases within their sphere of competence; but their training would have to emphasise that they should refer cases beyond their competence to appropriate agency without delay or hesitation.

While attempts to induce doctors to settle down in rural areas should continue, and the services of all available doctors in rural areas should be fully utilized, there is no doubt that the category of health assistants will still be needed for years to come to supplement the available pool of medical manpower in rural areas. It is necessary to emphasise that the health assistant is not a functional substitute for a doctor, but he will be providing useful health services in the subcentres and thus will increase effectively the out-reach of the primary health centres themselves.

Though the multipurpose workers scheme has got a general acceptance by the people and is an important step in the direction of providing basic medical care to the rural population, yet there exists some deficiency and limitations in its implementation which are essentially attributable to lack of adequate preparation and the great speed with which it has been implemented. The deficiences have to be corrected for making the scheme a success.

As a person who has been working as a public health worker for more than 20 years in the field, I am convinced that with the introduction of multipurpose workers and health assistants, the rural community will be able to derive the benefits of total health care. The rural community and the medical profession alike still need the services of health assistants and health workers. I feel it is our duty, as a member of medical profession to help the Government to organise the huge training of health assistants and health workers so that they are able to serve the community not only as an efficient health workers but also as community worker who should contribute fully to the overall development of the people in rural areas.

ABSTRACTS OF PAPERS

Do We Really Need Paramedics in Health Care? A Demand—Function Analysis

Rathindra Nath Roy*

Since independence the government has pursued health policies which have given priority to the training of medical personnel, construction of hospitals, and extension of medical services to the countryside through PHCs. The number of physicians has increased. There has been a similar, though less pronounced, increase in the number of nurses, midwives and other medical personnel.

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The institutional network has expanded to more or less every block of the country. The community health workers scheme, started in 1977, hopes to involve the community through trained workers drawn from the villages to take health care to the very doorsteps of the population.

However, all this cannot counteract one inconvenient fact : *the people are growing more and more disease ridden*. Even if this is difficult to prove statistically, it is the only possible consequence of another trend that has been well documented : *the people are growing poorer*. More people eat less, have fewer clothes and less houses, and live in increasingly polluted environments. As a consequence their proclivity to disease increases.

This paper hopes to develop a rational planning methodology to improve the health of the people. It begins with the analysis of the health problem, studies its etiology, develops interventions to eliminate the causes of disease and finally synthesizes institutions, functions and work profiles to suit the intervention demands. In this it will be different from the solution-in-search-of-a-problem-approach that is popular.

The paper begins by analysing the existing mortality/morbidity profile in rural areas. Having classified the disease profile it looks into its etiology. The next stage is specifying the medical and non-medical interventions and lifestyles necessary to prevent preventable diseases and to cure the non-preventable. The intervention profiles are then used to derive the work profiles, functions and institutions needed in a truely responsive health system. The functional profile thus derived of the community health worker in particular is dramatically different from the so called barefoot doctor that has caused considerable confusion and dissent in health care circles.

The exercise emphasizes a rational planning approach wherein solutions are derived to suit the problem rather than the usual force-fitting of problems to suit existing "supposed" solutions.

Para Medicals in Health Care

K. K. Datta*

According to W. H. O. all those in the professions allied to medicine which together makeup the team of health personnel i.e., nursing and midwifery, dentistry, veterinary health, pharmacy, statistics, microbiology etc. should be called paramedicals. To achieve health for all particularly in the developing countries, we require to evolve a low cost health technology involving suitably the paramedicals. When we talk about health man power shortage we know that the shortage of paramedical man power is more acute than that of medical man power. Realisation of the importance of the paramedicals in health care delivery is of recent origin. In India we are still far short of achieving the recommended target of medical and paramedical ratio of 1 : 20. So it is meanningless to think of having more paramedicals at the moment. But with the increasing utilisation of health care by the people while planning health man power for the country we should keep adequate provision so that we may be able to have medical and para

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medical ratio of 1 : 25 in future. Almost all the committees appointed by the Govt. felt the importance of having increasing number of para medicals in health team to achieve our target. The role of paramedicals are to be clearly defined, their curriculum are to be modified and adequate number of paramedicals are to be deployed to achieve our health target. Functional efficacy of paramedicals in giving proper health care has been well demonstrated in USSR (Feldsher) and in China (Barefoot doctors). In the country like India where the task of health care delivery is gigantic, formidable and challenging, increasing deployment of paramedicals is imperative and a necessity.

Salient Characteristics of Community Health Workers

B. J. Goyaji* and M. P. Dandare**

K. E. M. Hospital, Pune, launched a Community Health Workers Project at Vadu Budruk and its surrounding areas in January, 1977. Its aim in the first phase is to provide comprehensive health care to the rural masses with maximum participation of the beneficiaries themselves, and in the second phase towards the total development of the area. The project covers a population of about 30,000 spread over in 19 villages around the K.E.M. Hospital Health Centre at Vadu Budruk, 30 Kms. from Pune.

Forty five persons, 23 men and 22 women were initially chosen. This was deliberately done as it was felt that if in spite of the careful selection some were found unsuitable or for any reason did not complete the course a minimum of 38 people would be available to start the scheme.

Age is not found an important factor. Nine Community Health Workers, 5 male and 4 female were between 20-24 years, and have shown good work. Their drive and enthusiasm more than compensated for their lack of maturity. Criteria of formal schooling need not be as important as was thought originally. Three women community health workers have done very well in spite of being illiterate. One needs to be cautious when selecting CHWs with higher qualifications. Though maximum constructive suggestions and work come from them with superior documentation they are not satisfied with the payment and facilities. Marital status and number of children did not have much bearing on the work. Absence of economic stress and strain in one's daily life in some cases has helped the individual to work with dedication. It is observed that those Community Health Workers who are not solely dependent upon the honorarium can mobilise the masses more easily than others.

Some of the good community health workers belong to the Malkari Sampradaya a popular spiritual group in Maharashtra. Members of this group are known for their detachment from normal worldly pleasures and interest, for their honesty, simplicity and freedom from addictions. These characteristics are appreciated and respected by all communities. Such workers are found to be working with dedication with encouraging results and have great respect of the villagers.

During the last two years four community health workers resigned from the job. One female Community Health Worker had to resign since her husband started doubting

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her fidelity because of absence from the home due to homevisits.

A young male Community Health Worker left the job for better prospects outside. Remaining two left on their own since they were unable to spare time for the work.

An Experience with Field & Multipur ose Work Distribution among Paramedical Personnel of RHTC Naila, Jaipur

I. U. Dudani* and Shiv Chandra**

The present study is an attempt to evaluate the work done by paramedical workers of the health team of Rural Health Training Centre, Naila when they were discharging duties of unipurpose work during the year 1971 and is compared with the work output in the years 1975 and 1976 after reassigning them area and multipurpose work in 1974.

After redistribution of area and population to be covered by the paramedical workers, changes were noticed in the output/outcome. Registration of antenatal, postnatal cases, infants and toddlers showed improvement during 1975 and 1976. Percentage output of domestic deliveries by ANM and LHV also improved varying from 14.51 (ANM) to 61.11 (LHV) during 1976. Vaccination against smallpox improved by all categories of workers and supervisors.

A ganwadi Workers of ICDS Projects as an Agent of Primary Health Care Delivery

S. Bhatnagar & Dharam Shakhiu*

The integrated child development services scheme has lunched a nutrition and health programme for children under 6 years, pregnant and lactating mothers with emphasis on supplementary nutrition and health education through non-formal education for pre-schools and functional literacy. The All India Institute of Medical Sciences has introduced primary health care to the role of Anganwadi worker, who is a young woman from the village with 1000 population to look after.

Present study is done on 150 Anganwadi workers in the urban ICDS project at Delhi, to assess the knowledge, attitude and practices of the Anganwadi workers in health care delivery by a questionaire method. The outcome of work is indicated by the coverage of the target population, for immunisation, Vit. A supplement and supplementary nutrition and reduction in severe degree of malnutri tion. This data has been collected through bi-monthly monitoring, and independent surveys conducted at yearly intervals.

The results indicate that Anganwadi workers are able to manage the common ailments adequately and are able to create a link between the peripheral health worker and the community. Further those workers prove to be extremely useful in collection of vital statistics.

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Para-Medicals in Health Care (Choice-Trained Dai)

M. L. Chugh*

Para-medicals in the form of Lady Health Visitors, Auxiliary Nurse Midwives, Family Planning Field Workers, Pharmacists, Health Inspectors, Nurses etc. have been always an essential part of the medical teams extending health services to the rural community. These workers had a compartmental approach earlier, but with better achievements in various National Health Programmes, multiplicity of work has been assigned to such workers and are designated as Multi-Purpose Health Workers.

Since October, 1977, the Central Government has put forward the scheme of employment of a Community Health Worker (CHWs) for each 1,000 rural population. The criteria for selection have been laid down by the Central and State Governments. These criteria in short are that workers should be local residents, middle aged, physically acceptable to the community and moderately literate. Male and female workers have been selected for these services by the Block Health Officers and the concerned Panchayets. These workers are given training for 3 months and employed on an honorarium of Rs. 50/- p.m. with expenses for daily use of medicines. It is well nigh impossible to have a worker from the local community at each place or area of work. This scheme of course has to cover about 6.5 lakhs of villages in India in the coming 5 yrs or so, and the number of workers needed will be about 4-5 lakhs, a very expensive proposition though but has to be undertaken in the best interest of the health of the nation and will prove economical in the long run by bringing down morbidity and mortality. Therefore, selection of such workers has to be carefully undertaken and in phases, learning from our initial mistakes through pilot projects in different parts of the country so that the scheme brings desired results.

The Department of Social and Preventive Medicine-cum-Community Health of Christian Medical College, Ludhiana after a good deal of deliberations has come to the belief that local trained dai is possibly the best suited individual for the said purpose. Her employment as Community Health Worker (CHW) would obviate problem of residence as well as acceptability by the community—being already an established person. The service to be derived of this individual, as is in practice in the area covered, by this department are :—

1. *Medical Services* :

Reporting of antenal cases for clinics attendance and immunization against tetanus; making domiciliary natal arrangements and attending to postnatal services; issue of iron and folic acid tablets under guidance of supervisors and advice on nutrition particularly in the third semester.

2. *Service to children* :

Motivating parents of all healthy children 0-5 yrs of age group for complete immunization against tetanus, diphtheria, whooping cough, polio, tuberculosis, enteric group of fevers, etc. Reporting all mal-nutrition cases

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for proper advice and treatment by the supervisors including medical officers ; health education on personal hygiene and prevention and control of communicable diseases.

3. *Family Planning* :

Motivating all target couples for adoption of small family norm and inducing cases for permanent and semi-permanent methods like sterilization, insertion of IUCD etc. She also helps in distribution of conventional contraceptives.

4. *Reporting morbidities* :

She is best fitted to know about various morbidities in the total community under coverage. Therefore, she can persuade all such cases for medical services through fully qualified hands i.e. our rural health centres, sub-centres and subsidiary health centres, acting as a watch dog for the community for all basic health problems, a liason between the community and the health institution.

She has not been given the concession of carrying any type of medicines or injections with her to avoid development of pseudo-doctor and quackery. Also it will avoid any clash with local registered medical practitioners.

She will also be helpful in extending desired health education in environmental sanitation in the form of installation of sanitary hand pumps, sanitary latrines, disposal of dry refuse, popularization of kitchen gardens etc.

She is employed on a monthly remuneration of Rs. 75/- p.m. which is acceptable by our such workers and is economical too. Being a female worker she can normally enter every house.

As trained dais are available in most of the villages of many States particularly in Punjab State, it is our strong view point and recommendation that this type of worker should be taken as Community Health Worker instead of imposing an unknown worker on a particular section of the community. Under our scheme through this institution, provisions have been made for in-service training as well as for new female entrants.

A high percentage of such workers will be drawn from under-privileged classes, who have taken the profession of trained dai in rural areas and thus it will act as a welfare step also.

Integration of Paramedical and Peripheral Health Care

S. M. Marwah & K. P. Shukla*

An exploratory study of the personal and professional aspects of healers without recognised/institutionalized training in allopathic or indigenous medicine in a ten percent random sample of the Chiraigaon Block (Varanasi) indicated the healer : population ratio of 71 : 1000, with a male : female ratio of 1000 : 250. The healers had higher general literacy i.e. 46.2% literate against block figure of 27.5% and rural U.P. figure of 18.1%. About 63.6% healers were farmers as compared to the block figure of 42.7%. About 82.8% of healers had their respective training

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as part of the family tradition on through fellow healers. About 52.8% healers had an experience of more than 10 years, 84.7% healers had practice only within respective villages. 78.8% healers used magico-religious and/or herbal therapies, 85.5% healers treating one to three diseases. The healers sought rewards in terms of cash even on credit, kind and/or merely social recognition/spiritual satisfaction. 43.4% healers expressed their willingness to undergo further training.

In the Varanasi slum areas we found that the untrained practitioners of a wide variety i.e. in terms of untrained dais (untrained midwives), bone setters, practitioners for piles, epilepsy, leprosy, marasmus, dysentery, mental diseases etc. etc. were nearly 1 per hundred population.

In the Varanasi Corporation studies, we found that the modern practitioners (i. e. university qualified medical graduates) population ratio in the corporation was 0.262 per thousand and indigenous practitioners (qualified in Indian systems) ratio was 0.576 per thousand population. The total population of the Varanasi at the time of study was 600 thousand (round figure).

In this paper an attempt has been made to illustrate through action models, how community health at the periphery can be cultivated beyond multipurpose on community level workers through intercultural interactions by incorporating the available resources in the sociological settings of any community.

Social Workers as Paramedicals for Primary Health care in Rural India

Vijay Kochar*

The paper starts by identifying a number of non-clinical skills that are involved in extending medical services and health care in rural areas. It is being recognized the world over that appropriate social technologies must be developed and applied for transferring medical technology to rural setting. The paper suggest three alternative solutions :

(i) train medical students more intensively in social and community oriented, and programme organization cum management oriented skills.

(ii) train paramedicals in rural health care infrastructure for such simple social techniques, organizational skills, and educational methods that they can use in their field activities.

(iii) include public health social workers in the health team to provide on the spot expertise and services at the various. levels. The paper elaborates the third alternative.

Use of social workers in rural field practice areas of the P.S.M. departments has become a well established practice in a number of leading institutions. The recent experience in three tier programme as well as the community orientation in different departments and specialities points out clearly that such programmes can be greatly facilitated by some one who can do the necessary leg work and initial spade work in the field. Both medicals as well as paramedicals perform much better if the stage has been set for them.

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The role of social workers in the field practice areas is undefined and unstructured. They are used as multi purpose field assistants. The functions and image of non-teaching social workers working in the field practice area is similar to that of paramedicals. In fact, in some departments they are referred by the faculty and post-gtaduates as paramedicals.

The paper lists the great variety of assignments, activities, and functions the social workers perform at the department of P.S.M., B. H. U. The paper emphasizes need for optimum utilization of social wokers in specific situations and for specific tasks for which neither medicals nor paramedicals are trained. It is pointed out that the social workers also need proper orientation before they can be effective.

An Estimate of Work Load for a Multipurpose Worker

N.S.N. Rao and S.M. Marwah*

The planning of primary health care to the rural masses is under continuous revision. Various committees have recommended different approaches. Kartar Singh Committee (1973) recommended that there should be a paid male and a female multipurpose worker for a population of 8,000 which should be gradually brought down to 5,000 for a male worker.

In the light of the above recommendation it is worth assessing what would be the total work load for a worker in terms of different activities suggested by the committee.

A longitudinal survey was conducted in a randomly selected population in a C.D. Block over a period of one year. A continuous surveillance was kept over the morbidities etc. in the community. Based on the data collected a statistical estimation of the total work load for a multipurpose worker is attempted. The results obtained will be presented.

Medical Social Workers As "Para Medicals in Health Care"

Bandana Roy*

Medical Social Work may be defined as the science of dealing with social components of human relation, which directly affects health of individual and community. To achieve health according to defination of W.H.O., world wide Medical Social Work has been established. England and America started to appoint Lady Almoners in the year 1895. Afterwards it became scientific profession. According to Bhore Committee recommendation India also appointed trained Medical Social Worker in the year 1946 though West Bengal appointed untrained 4 Social Workers in the year 1944. West Bengal now has got 610 Medical Social Workers upto P.H.C. level.

Principle of social work is to help to the to help himself. Techniques used are case work, group work, community organisation and research. Medical Social Worker is working on the following—

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i) Help in diagnosis and treatment planning by supplying the Social data to physician.

ii) Treatment supervision which means the arrangement of treatment available to the patient by tapping existing resources.

iii) In case of treatment refusal—Medical Social Worker to convince the patient or relations to accept the advised treatment.

iv) Contact check up should be arranged without harming the sentiment of the involved party.

v) Home visit may be done in case of necessity for demiciliary treatment, isolation and immunisation.

vi) Arrangement for recreational facilities as diversional therapy.

vii) Arrangement of financial help in need.

viii) Acting as liason between the family and patient, administration and community.

xi) After care i.e. case work after completion of treatment.

x) Rehabilitation—Social, Mental, Physical and Economical, the scope of economical rehabilitation being limited.

xi) Prevention of Diseases—Medical Social Worker acting as Health Educator.

xii) Promotion of Health Worker's work through the Clinics of Maternity and Child Welfare, Family Welfare, Nutritional Clinic, School Health Programmes etc.

Comparison of Efficacy in Rash with Fever Surveillance of Multipurpose Worker and Unipurpose Health Workers

Baride J. P. and Sathe P. V.*

In the final phase of National Smallpox Eradication Programme, rash with fever (RF) surveillance was the main activity. The efficiency of detection of RF cases of the multipurpose workers (MPW) and unipurpose workers (non MPW) like vaccinators at two primary health centres was compared. Some other data on chickenpox and measles collected during this activity are also presented in this paper.

Primary Health Centre (PHC) Fulambri with multipurpose worker pattern and an adjacent PHC, Sillod, with the previous unipurpose pattern were studied, for the period from February 1977 through April 1977 as State Surveillance Team Leader. The datewise onset, the day of detection and age distribution of chickenpox and measles have been studied.

Worker Population Ratio and RF Cases in the PHCs

PHC	Workers	Ratio	Chickenpox	Measles	Total Cases
MPW	31	1 : 2755	722	729	1451
Non MPW	29	1 : 9794	623	639	1262

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The MPW PHC had much better worker population ratio and it detected 1451 RF cases as compared to 1262 detected by non MPW PHC. These two PHCs geographically are adjacent to each other without any geographical or communication barriers. Hence, they were expected to have notified comparable incidence rates for RF cases. The cases expected to have occurred by assuming null hypotheses in MPW and non MPW PHC were 627 and 2086 but they had detected 1451 and 1262 RF cases respectively. The difference found was statistically highly significant ($X^2_1=1418$). It can therefore be said that taking the incidence rates as an indicator, MPW PHC had done better work than non MPW PHC.

A similar difference is found in the incidence of chickenpox and measles cases in this period, when analysed sepearately.

Incidence Rate of RF Cases per 1000 Population February—April 1977

PHC	Chickenpox	Measles	Total
MPW	8.45	8.54	16.99
Non MPW	2.19	2.25	4.44

In MPW and non MPW PHC 56% and 52% chickenpox cases respectively occurred in children below five years of age. Similarly 65% and 68% measles cases were in under-fives in MPW and non MPW PHCs. This shows that the epidemiological behaviour of both these diseases was similar in these adjacent PHCs, if age distribution of RF cases is considered. However the incidence rates notified differed a lot. Thus the difference in the incidence rate probably was due to varying efficacy of detection rather than difference in the epidemiological behaviour of the two diseases.

The average period between the onset of RF case and its detection was 6.64 days for chickenpox and 6.15 days for measles in MPW PHC. As compared to this the average period between onset of case and its detection in non MPW PHC was 10.34 days and 10.17 days respectively for chickenpox and measles, indicating better efficiency of MPW PHC.

Thus the better efficacy in the surveillance activity shown by PHC, Fulambri with MPW pattern can be attributed to a number of factors, inter alia, better worker population ratio, the training of MPWs in all aspects of their duties, the well trained supervisory staff, the better supervisor worker ratio of 1 : 4 as compared to supervisor worker ratio of 1 : 6 in non MPW PHC and the overall supervision by Health and Family Welfare Training Centre, Aurangabad.

Paramedical in Health Care

Santi Bose*

Health problem is a primary problem of mankind. In course of growth of the society World has become perplexed with many odd things, health is perhaps the major one.

Unhealthy dwelling house, filthy environment, growth of industry, contribute mainly to health hazards. It is difficult for a doctor to cover all aspects related to recovery of a patient.

An well planned, well organised team work is necessary for betterment of work.

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There is no denying that the role and contributions of Paramedical staff in various streams of total Health Care are indispensable. They are directly concerned with the people and community upto the grass rootlevel in the event of all practicalities and technicalities.

It is obvious that the nature of duties are categorically different in respect of the paramedical staff when they are engaged in the vast field of Health welfare. However if the arena of Health is deemed a triangle each side respectively consisting of a) Preventive aspect b) Curative Rehabilitation aspect c) Training aspect, the role of paramedical staff can be well assessed in each of the above fields.

a) Preventive aspect: Since this is concerned with Health Education, vaccination, sanitation, antenatal care etc. the role of certain category of Paramedical staff is highly important and effective. Actually their strict vigilence stops the disease to enter in a body or in a community. They make the people aware of it. The responsibility is entrusted in a net work comprising Health Educator, Sanitary Inspector, Public Health Nurse, Health Visitor, Health Worker. Vaccinator, field assistant, and such other paramedical staff. Each of them is equally involved in the entire process extended upto the remote corner.

b) Curative Rehabilitation: Curative aspect deals with acceptance and maintenance of treatment, Socio-economic components of illness, emotional factor and Psyco-somatic approach in the field of medicine. The Rehabilitation comes when restoration of a patient to his former social, economic or mental position is needed. Here the role of Medical Social Worker as a paramedical staff is indispensable. Also the role of Physiotherapists and occupational therapists are no less important.

In the process of treatment the contribution of other Paramedical staff like Dietician, Pharmacists and Laboratory Technicians are highly appreciated.

c) Training Aspect: The Paramedical staff are involved to impart training to the Health Staff and to conduct Research. Health Education, Medical Social Work, Physiotherapy, Family Welfare and so on may be the subjects in which qualified Paramedical staff may be the trainer and conduct Research Work.

In view of the above it is perhaps an established factor that the Paramedical staff are the keynote of success of the total Health care in a state. No fruitful achievements would have been possible without their cooperation and they are the Paramedical staff who carry every plans and schemes on Health care upto the Periphery of the society to make those a success.

An evaluation of training programme for community health workers

R. Chandra, S.L. Bagga, V.K. Srivastava, B.C. Srivastava*

When community health worker scheme was started there was doubt in minds of

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many that 3 months period of training of community health worker is inadequate. This study was undertaken to assess the impact of training on the knowledge of community health workers. One hundred and sixty eight community health workers were trained at Primary Health Centre, Sarojini Nagar, Lucknow during the period of one year extending October, 1977 to Septemer, 1979. Of these 153 (91.0%) could be evaluated both prior and after their training was completed through a written questionnaire in Hindi. Each question was assigned a score depending upon its importance for the working of community health workers. The post-training evaluation revealed that the gain in knowledge in a majority of them was satisfactory as far as subjects of communicable diseases, maternal and child health, family planning, immunization, health education, vital statistics, first aid during emergencies and treatment of ailments was concerned. But the scoring was not upto the mark in Nutrition and Environmental Sanitation ; which are important components of community health care. This was probably due to lack of proper orientation of those who were entrusted with the training of community health workers. For proper training of CHWs it is essential that trainers should first be given reorientation in community health work at Rural Health Training Centre of the department of Social and Preventive Medicine.

SESSION—III

Studies on Salmonella Enterotoxins

Y. K. Kaura and V. K. Sharma*

In the past, attempts to isolate enterotoxin from Salmonella cultures in order to understand role in pathogenesis of salmonellosis, have failed. Probably lack of suitable assay model has hampered many workers to demonstrate enterotoxin.

Very recently some investigators have succeeded in isolation of enterotoxin from **Salmonella** cultures. In our laboratory we have attempted to elucidate the mechanism of diarrhoea caused by common sero types of **Salmonella.**

The main findings of our study are as follows :

1. There is wide prevalence of enterotoxin producing Salmonella cultures. About 80% of 50 Salmonella cultures belonging to 10 serotypes gave ligated ileal loop response in rabbits and skin vascular permeability in rabbits.
2. Curde enterotoxin (sonicated preparation) containing 200—400/μg protein/ml gave ileal loop response.
3. The enterotoxin is heat labile.
4. The enterotoxigenic **Salomonella** strain were sereney test positive indicating epithelial penetration. Our preliminary findings tend to conclude that Salmonella produces diarrhoea both by epithelial penetration and elaboration of toxin.

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A Note on an Outbreak of Pseudomonas Gastro-Enteritis in Alwar, Rajasthan

R.S. Sharma*, K.K. Datta*, A. Sankaran*, S. Santhanam** and R.R. Arora**

An outbreak of Gastro-enteritis in Kasba Bansur and three other adjoining villages of Alwar District, was investigated in May-June, 1976. Pseudomonas aeruginosa was isolated from 6 out of 10 cases of Gastro-enteritis. Aeruginocin typing revealed "F" type in three and the other three were found unclassifiable.

The correlation between coagulase production and other biochemical characteristic of Staphylococci of bovine mammary origin

M.P. Kapur, O.P. Gautam and R. K. Kaushik***

Staphylococci are ubiquitous in distribution and makes the normal bacterial flora of the skin and mucous membranes of man and animals. They are frequently encountered as causative agents from suppurative lesions or toxic food poisoning in human beings. Variable percentage of coagulase positive Staphylococci (14.7 to 96.2%) from milk foods associated with food poisoning have been reported to be enterotoxigenic. In the field of dairy farming, the Staphylococci are well recognized as mastitis pathogens. The coagulase production by these organisms is generally accepted as a maker of their pathogenicity. Of late, attention has been paid to some other biochemical reactions closely related to coagulase production, such as DNase production, phosphatase production or tellurite reduction. The present study was designed to study the correlation between coagulase production and other biochemical properties of Staphylococci originating from mastitic/apparently healthy bovine mammary glands.

Organisms employed in this work were 304 strains of Staphylococci (103 coagulase-positive, *S. aureus* and 201 coagulase-negative, *S. epidermidis*), which were isolated from mastitic/apparently healthy bovine mammary glands.

Of the coagulase-positive strains examined, 73.5% (apparently healthy animals) and 56.25% (clinical cases) were found to be chromogenic. Whereas, these figures for coagulase-negative strains were 22.64 and 41.40%, respectively. There was good correlation between coagulase production and haemolytic activity. 86.20 and 73.75% of the coagulase-positive strains from apparently healthy animals and clinical cases of mastitis showed haemolytic activity. On the other hand many strains of coagulase-negative Staphylococci were non-haemolytic with the exception of 6.40 (apparently healthy animals) and 3.50% (clinical cases) of the strains.

It was found that all the coagulase-positive strains (16) from clinical cases were positive to DNase activity, phosphatase production, tellurite reduction and 93.75% were mannitol positive and that 65.50, 62.07, 96.56 and 58.60% of the coagulase-negative strains (29) also showed positive reaction to these tests.

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Amongst coagulase-positive strains (87) from apparently healthy animals 83.91, 91.95, 96,56 66.27 and 5.76% also showed positive reaction to these tests.

Rats and Common Bacterial Aerobic Food Poisoning Organisms

S.N. Saha and P.N. Khanna*

Due to rapid urbanization and industrialization our food habits have changed and a number of concerns are producing processed ready to eat food products. There is a fair amount of centralization of food production, distribution and consumption on mass scale. Foods, if not properly prepared or preserved, are likely to undergo spoilage due to contamination with aerobic (Staphyloccus, Salmonella, Shigella, *B. cereus*, *V. parahaemolyticus*) or anaerobic (Clostridial) organism and consumption of such foods may lead to bacterial food poisoning. Available information indicates that Salmonella and Staphylococcus are the most common organisms involved.

The problem of food hygiene has not received adequate attention in India and experience elsewhere indicates that food poisoning through processed food products forms bulk of the health problem. The food poisoning cases are neither reported nor investigated in our country. A study was undertaken to study the presence of common aerobic becterial infection in domiciliary rats which are so common in and around our food establishments.

Out of 220 specimens from 55 rats, 9 strains of Salmonella, 33 strains of *E. coli*, 25 strains of Staphylococci and 19 strains of Streptococci were isolated. The isolated Salmonella strains were *S. amsterdam* (4) *S. typhimurium* (3) *S paratyphi B.* (1 , *S paratypha B var Odense* (1). *S amsterdam* and *S paratyphi B var Odense* have been isolated for the first time from this continent.

The potential hazards of the above isolates in causing food borne infections will be discussed.

Control of Tuberculosis in Animals

D.S. Kalra**

The status of tuberculosis in cattle and buffaloes in India is discussed The control of tuberculosis in dairy herds on the 'Test and Segregation' policy, as adopted earlier at the Government Livestock Farm, Hissar, with minor modifications, is suggested. The need for vets participation in the programme of tuberculosis in India is emphasized. The problem of proper disposal of tuberculin reactors in animals needs to be resolved urgently.

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Isolation of Toxoplasma from sheep

S.L. Gupta, O.P. Gautam & R.M. Bhardwaj*

The positive role of meat animals as a source of *Toxoplasma* infection to human beings has been well established since Jacobs and Melton (1957) and Jacobs *et al.* (1960) developed a peptic digestion technique to recover the parasite from meat samples. In India, although serological evidence of *Toxoplasma* infection in different species of animals including sheep has been reported but there appears to be no published report of actual isolation of the parasite by mouse inoculation. Therefore, the present study was undertaken to isolate the *Toxoplasma gondii* from meat samples of apparently healthy sheep in order to evaluate its importance in the epidemiology of toxoplasmosis.

A total of 514 serum samples of apparently healthy sheep were screened for the presence of *Toxoplasma* antibodies by employing indirect haemagglutination (I H A) test. The *Toxoplasma* haemagglutinating antibodies were detected in 44 out of 514 sheep, thus giving prevalence of 8.56 per cent. A higher prevalence rate of 9.85 per cent (27 out of 274) was found in females a compared to males in which it was only 7.08 per cent (17 out of 240).

Diaphragm, heart and brain specimens of 44 serological positive sheep from Haryana Veterinary Vaccine Institute, Hissar and 23 apparently healty sheep (selected at random without serological testing) from local slaughter house were collected. The tissues were digested by peptic digestion technique and the digested material was inoculated intraperitoneally into 32 batches of cortisonised mice. The isolation of *Toxoplasma* could only be made from two batches of mice inoculated with tissues of seropositive animals. Thus, *Toxoplasma* was isolated from 4.56 per cent of 44 serological positive sheep but none from 23 apparently healthy sheep.

In one group of mice, *Toxoplasma* tachyxoites were isolated from peritoneal fluid of the inoculated mice by paracentesis. The virulence of the 'sheep isolate' was compared with standard RH strain of *Toxoplasma gondii*. The equal number of *Toxoplasma* organisms of each strain in graded doses (10, 100, 1000, 10000 per mouse) when inoculated into different groups of mice ; gave a mean survival time of 12.4, 11.0, 9.7 and 8.3 days respectively with 'sheep isolate' and 8.6, 7.9, 6.9 and 5.6 days respectively with RH strain. Thus, the sheep isolate was comparatively less virulent than RH strain although it could kill all the inoculated mice.

In another group of mice, the *Toxoplasma* cysts were demonstrated in the brain of mice only on histopathological examination. *Toxoplasma* antibodies were also detected in the sera of mice six weeks post inoculation.

The studies have confirmed the presence of *Toxoplasma* infection in sheep in our country.

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SESSION—IV

An Approch towards Cost-Benefit Evaluation of Health Education Programme

S. P. Mukhopadhyay*

In view of the present economic climate and far greater demand for medical and nursing treatment, perhaps it is now desirable to devote more time and money to educate people in the principles of healthy living and legitimate utilisation of health services. But to some people the value of health education is still controversial. It is for this reason of doubts and conflicting attitude towards the value of health education the present paper is written to envisage the justification of further and adequate resource allocation to encourage and extend its activities. So the primary objective here is to measure the effects as well as resources of Health Education Programme by a method which will be able to generate an outcome of such exercise in realistic terms e.g. monetory terms. The other objectives will be to assist to compare the value of different types as well as alternative forms of health education programme and also to identify the appropriate factor or factors for optimum result. In estimating such economic evaluation, two methods are applied ; one is to find cost-benefit ratio of a programme and the other is to find out cost-benefit Index of a programme. Method one is applied where the programme is new to the community and it is expected that at least 50% motivation change with result from such a programme. Based on this range of motivation cost-benefit analysis is made. On the other hand, method two is applied to those programmes of which the community is already familar. In such procedure motivation change due to a programme is determined by measuring the difference of level of positive motivation before the programme and after the programme. C B.I. indicates per capita value of the programme

Models of health education programmes are made and then their outcomes are projected through the help of these methods. These models were prepared in U. K. and U.S.A. and accordingly their outcomes were projected in dollars and sterlings. The models like "Anti-hypertensive", "Anti Smoking" "Genetic counselling", "Road accidents," have all projected the benefit against the money spent for such programmes. But "screening programme" indicated a loss in such a community programme.

From the results obtained from such cost-benefit exercise, it is reasonable to think that a case is made now for further and adequate resource allocation to preventive health programme. Nevertheless it must be emphasised that all programmes may not prove cost-beneficial as this not only depends on motivation change of a community but also the cost of the programme (vide screening programme). The issue this brings into consideration as a forerunner to future preventive programme is the need of a pilot trial before

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the Master Programme is launched. The Pilot trial would generate the net outcome of the programme through cost benefit analysis and depending on the nature of the outcome resources to the programme can be allocated accordingly.

Although these models were prepared and projected according to the estimates relevant to U.K. and U.S.A. standard, nevertheless it is principles and techniques of such evaluation which are considered to be important as they will guide the health professional to distribute the resources reasonably and optimally. It may be stressed here that whatever may be he outcome of a programme resulted through such cost-benefit exercises, the value of such approach is that it will generate some outcome in pure economic sense, so that one is justified of allocating or not allocating resources to a particular health education programme.

Role of Para-medicals in Leprosy Control

P. Kapoor and M. V. Yellapurkar*

The Leprosy Control Programme all over the world is mainly carried out by trained paramedicals because of paucity of doctors in this field. However experience gained so far shows that the paramedicals are quite good at suspecting and detecting leprosy cases in general. But they are not good at suspecting early leproma which is very difficult yet very essential for control of the disease.

The paramedicals can diagnose early leprosy patches with fairly good accuracy and can even initiate treatment with Dapsone, since the drug is simple and safe to administer. However the management of complications is very difficult in the hands of the paramedicals. The follow-up of patients is done by the paramedicals in such a mechanical and routine fashion that the leprosy patient who has to take treatment for years together loses faith in the treatment, resulting in a high drop-out rate.

The paramedicals can be utilised for screening old leprosy patients who have been registered for more than 3 to 5 years, with a view to find out whether they have become "inactive" but they cannot be relied upon for declaring patients as "Cured" or disease-arrested.

More often than not, the paramedicals are burdened with maintenance of too many records and that too in such great details, that very few can do any justice to it. Only such records need to be prescribed for maintenance, as would be essential for monitoring the programme.

Proper supervision is absolutely essential whenever paramedical workers are entrusted with responsible jobs. The category of paramedical supervisors is drawn from amongst senior paramedical workers themselves. Oftentimes such promotions are effected routinely on the basis of seniority as it is difficult to apply any yardstick for merit. Naturally such supervisors fail to fulfil expectations in terms of effective supervision which includes guidance.

Thanks to biomedical research, costly potent, yet toxic new drugs are now available

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for field usage. The distributing function for these drugs will perforce fall on the shoulders of the paramedicals who are still our sheet anchor in any programme. But there is every room for apprehension that if the distribution of such drugs is not handled properly with adequacy and regularity, not only will it be harmful to the patient, but it will also result in wastage of money, loss of potent drugs and above all an invitation to the bugbear of drug resistance. The paramedicals must therefore be trained properly regarding the correct way of administration of the drugs to identify the possible side-effects of the drugs and to learn when to refer to the doctor for expert advice.

The modern "Health Team concept envisages division of the responsibilities amongst different kind of paramedicals and training them to work together as a team so that their collective efforts meet the health needs of the community.

The Multipurpose workers scheme can be properly and easily developed if the above principles are followed and the uni-purpose workers become multipurpose workers in due course.

Training of Para-Medical Workers and Integration of Health Services

A. Dyal Chand and M. M. Karkaria*

This paper is based on the experience of implementing the Comprehensive Health & Development Project at Pachod, District Aurangabad. The Project was started with the object of developing a methodology which aimed at providing health care through village based semi-literate women trained as community health workers and maternal care through training of traditional dais, through professional staff re-oriented as multi-purpose workers to provide, support and supervisory services for these resource personnel from the villages.

Dai Programme

The training programme was designed so that only those practices which were harmful and needed change could be emphasised. A few examples of the beliefs and practices that existed prior to their training : 1. The concept of ante-natal care or post-natal care was something quite new, the Dais merely assisted in the actual delivery.

2. Deliveries were conducted in a dark room with the mothers squatting on bricks. The need to witness the actual progress of labour was considered unnecessary.

3. Implements such as sickles, knives, broken glass, stones and blades were used to cut the cord, and ash spplied to the stump.

4. The concept of fever of pueperal sepsis was never related to the entry of germs into the body. Its cause was attributed to the entry of air into the empty uterus. A few Dais had they practice to prevent this eventuality to insert their heel into the mother's vagina soon after delivery.

5. The child was put to the breast only three days after the delivery, for fear that the intestines would get adherent because of colostrum which was sticky, further the child was given castor oil to flush out any liqor or meconium the child might have ingested.

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The Dais are conducting 52% of the deliveries in their village after their formal training, as compared to 6% coverage that existed prior to their training. They are providing ante-natal care to 78% of the pregnant mothers. The average month of detection of pregnancies has come down from the 8th to the 5th month.

Community Health Workers

We very strongly feel that community health workers without exception be middle-aged women, because the larger section of the population consists of women and children who would prefer a female health worker.

The training of these women has to be completely task oriented as completely far removed from formal class-room teaching as possible.

Finally we come to the most important aspect of the programme : The Multi-purpose Workers Programme.

To avoid compartmentalisation of the three major aspects of this programme, i. e. the Dai programme, the Community health workers' programme and the Multi-purpose workers' programme, we have found it necessary to establish integration of these services during the training programme itself. The multi-purpose worker must be re-oriented not merely in performance of their own tasks, but to see their role in relation to the work being done by the Dais and the community health workers, in a supportive and supervisory capacity.

In a sub-centre area, with the population of 7500 the sub-centre is usually situated in a village with an average population of 2500, this is the intensive area of population for the female multi-purpose worker. She is fully responsible for rendering all services to this population and is expected to visit each house once a month. In spite of her limited mobility, this is feasible at the rate of 45 houses a day for 12 days of a month. The remaining 12 days she spends in visiting neighbouring villages around her sub-centre. Each village is visited fort-nightly. In these villages she provides maternal care services only through the trained Dais of that village. Her role is limited to providing support and supervision to the Dais of these villages. This brings us to the concept of a health post for each village. As Dais and community health workers become more and more established as regular parts of the health delivery system, it becomes apparant that regular house to house visiting by the female multi-purpose worker in the earlier pattern of planned and unplanned visits is quite unnecessary. Our experience has been, that if a female multi-purpose worker visits the health posts once every fort-night, the Dai will bring all the ante-natal cases to the health post. All normal deliveries are conducted by the Dais, and the female multi-purpose worker supervises the Dais services where necessary.

The male multi-purpose worker has a population of 5000 under his control with no responsibility in the sub-centre village where the female multi-purpose worker is located. On an average this amounts to 42 house visits per day with 23 working day a month. The male multipurpose worker provides all technical services in this area and provides

supportive and supervisory services to the community health workers of the villages under his area.

These three categories of peripheral staff now form an integrated infra-structure for delivering health, each service well co-ordinated with the other.

Integration of Functional Literacy and Development Services with the Health Services

A. Dyal Chand*

The comprehensive Health and Development Project, Pachod, proposes the use of health services as a vehicle for initiating a mass adult literacy programme and other economic development services.

By introducing the present health policy the government has placed in our hands suitable instructors or change agents and excellent catalysts who can be used for demonstrations, and the financial resources to bring about rapid advances in adult literacy and socio-economic development.

This project proposes to use Dais and Community Health Workers for developing a methodology which envisages integration of functional literacy and socio-economic development services with the existing pattern of health services.

Majority of the Dais are from the most economically backward strata of the rural society. They are all illiterate, apart from a few exceptions. They provide an excellent medium to propagate a desire in their community for these services.

Education with no purpose achieved is not attractive to these women who rejected the idea of learning how to read and write unless it was relevant to their needs. It was suggested to them to open bank accounts so that the nominal cash stipends received by them would accumulate in their account instead of being wasted away. This would permit them to request the bank for a loan for starting a cottage industry or dairy development or for any other immediate need they felt. After the necessary awareness the expected hesitation withdrew gradually and all the Dais who who have been trained by us agreed to open bank accounts. The Dais without exception are now undergoing adult literacy, a service that they are now demanding. What would the impact of this women be in her village when she is finally able to read the daily news to her neighbours and friends in the village.

The next requirement is suitable instructors who can take the responsibility of dissemination of knowledge in their villages. Community Health Workers are village based semi-literate women trained for providing basic health care and minor ailment treatment to her village community.

The aim of this Project is to train Community Health Workers as instructors in adult literacy. It is assumed that since they will be from the village community itself, their impact will be greater than instructors "planted in the village from outside".

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With the help of resource persons from Marathwa University at Aurangabad, the Project also aims to train 24 students of the University selected through the Employment Bureaus, to initiate mass literacy programmes by supervising Community Health Workers in their efforts to start non-formal education programmes.

Experience has indicated that attempts at functional literacy are not acceptable to rural illiterates unless it can be linked to socio-economic change. It is for this reason that the Project proposes to initiate dairy development with the intention of basing adult literacy and non-formal education on the various aspects of dairy farming.

The principal philosophy on which the methodology of this Project is based, is to function as a resource centre with the primary purpose of disseminating knowledge and information to the landless poor and the marginal farmers in the area. The knowledge disseminated will pertain to dairy farming, health and hygiene, and an overall better life style for those who are economically and socially down-trodden.

Having constituted an infra-structure to start the programme its implementation may look simple, but practically is wrought with problems.

The basic and more profound difficulty lies developing the right media for communicating with the rural population.

Planning, Monitoring and Evaluation of Community Health Programmes

M. Ibrahim Soni*

No society is so rich that it can consider its health facilities and services to be free goods. But still, in many developing countries the practice of decision making, with regard to the community health, is largely based upon conjecture and hit-or-miss notions. As a result of which planning of priorities and allocation of resources usually fail to achieve the desired objectives in the field of health and the society does not benefit in proportion to the amount of resources spent.

The experience of the developed and developing countries as well over the last two decades have made it clear that in the area of the community health an appropriate allocation of scarce resources calls for more rational planning. The most important prerequisite for the latter is an accurate, timely and relevant system for the collection, interpretation and maintenance of demographic data, medical statistics and health intelligence.

After efficient planning of the health programmes, continuous monitoring of them is of importance. It can be carried out with the help of specially designed some simple demographic and statistical tools.

Finally, if the two stages of a programme —planning and monitoring—are foolproof, the task of evaluation becomes easy.

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Interns, as Part of Health—Team in Rural Community, Health Work

S.W. Kulkarni, N.N. Shaikh, N. D. Jejurikar and M.R. Jape*

It is in the fitness of things that increasing stress is being given to rural orientation in medical education. A proper motivation on one hand and suitable training on the other will be the right approach to effective delivery of health care to the multitudes of our rural compatriots. Despite tens of thousands of medical graduates, coming out each year, our rural masses continue to be deprived in this aspect also.

In Maharashtra, in Government Medical Colleges interns are compulsorily posted in Primary Health Centres for a period of six months. The interns were interviewed in depth as regards their attitudes and reactions, expectations and realities, scope and effectiveness and complaints and suggestions in order to evaluate the worth of their posting as a part of Health Team. Many interesting varied and extremists' answers about village life, rural medical work, utility of training difficulties, and suggestions in the words of interns prompted us to present them as food for your thought and possibly to evolve a cogent policy for meaningful investment in terms of teaching, training and motivation in a medico for rural medicine.

Rural Health Survey : Report—I

P.G. Deotale, P.V. Sathe and N.E. Nimale**

The Rural Health Survey was undertaken with the aim of involving the Medical Students to learn and apply theoretical knowledge in the field and practice of public health.

The students were given the experience of Survey, collection of data and its analysis. The students themselves realised the need of better environmental sanitation. They did the chlorination of well, gave the health education and conducted the ante natal and post natal clinic. They were also involved in carrying out the school health examination and set upsmall laboratory for carrying out the investigation in required cases.

The students found out the rate of morbidity in the population and run the small dispensary.

The students appreciated this practical curriculum of teaching.

SESSION—V

Treatment Defaulters Among Tuberculosis Patients—A Study in an Urban Area

Vimala Charles***

This study was done to find out whether there was any difference in the number of defaulters among the Tuberculosis patients who came under the intensive care of Community Health Urban Unit and the rest of the urban populace. An attempt was also made to find out whether there was any significant difference in the reasons given. for defaulting among the two groups.

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Though there was no difference in the reasons given by the two groups of defaulters the intensive drive and the health team work seem to have its effect in motivating those who came under them for regular treatment.

A Study of Convalescent and Contact Carrier in the Spread of Cholera Epidemic of 1978 in Twin Cities of Hyderabad and Secunderabad

M. Subba Rao, V. Santa Kumari, K. Ratna, Shamshamuddin and R. Rajyalakshmi*

The role of carriers in the spread of cholera, seems to have been considered long before the discovery of the causitive organism of the disease. Griesinger in 1857 hinted at the possibility of persons recovering from an attack of cholera becoming convalescent carriers. Pacini in 1854 considered it possible that apparently healthy persons coming from an infected zone could transmit the disease to others.

The present study was carried out with a view to understand certain unexplored features of the maintenance of cholera epidemic in the twin cities of Secunderabad and Hyderabad. The following epidemiological observations were studied in detail to establish the nature of infection, carrier status and control measures by energetic antibiotic treatment.

1. To establish the existance of relative frequency of cholera carriers.
2. The relation between convalescent carriers, contact carriers and admissions made in the Fever hospital, Hyderabad with special reference to intrafamilial spread either through the medium of water or lapses in the personal hygenic measures.
3. The value of energetic and active antibiotic treatment by para clinical staff at the very first meeting of a cholera positive case.

The results are tabulated and observations are made for further guidance in the control measures adopted.

Guide Filmstrip for an Integrated Approach to Health and Family Planning

B. Swarajyalaxmi, M.V. Bapi Raju Sarma**

Health industry is essentially labour-intensive and so man power constitutes a critical component. This man power has to be managed in a way that would make it less costly but more fully capable of evolving an accessible and effective health care delivery system. The main failure of the health systems in many countries is their inability to provide the basic types of health services needed by the population as a whole. Thus, while a few segments of the population may be well-served, the majority are served poorly or not at all. While this situation is the result of operation of many factors, the major drawback so far has been in the system itself in many instances. The components of the system often function in isolation from each other resulting in fragmentary approach and activities overlapping each other wastefully. The quality and quantity of care can be much enhanced by an integrated approach wherein

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a single worker is able handle several allied functions in a smaller area. For example instead of a health assistant for immunisation of children, an auxiliary nurse midwife for maternal and child health, and a health inspector for family planning, say, covering a population of ten to fifteen thousand, an auxiliary nurse midwife can function as a Family Welfare Worker carrying out family planning, maternal and child health and immunisation activities for the mothers and children covering a population of five to eight thousand.

An effort was made to put this into practice in Visakhapatnam district long before the present multipurpose workers scheme was envisaged by the Government. In 1967-68, the first author of this filmstrip worked as District Family Planning Officer and was also in charge of the Regional Family Planning Training Centre at Visakhapatnam. The second author worked as Health Education Instructor in the Regional Family Planning Training Centre and later as Mass Education Officer in the District at about the same time. The integrated approach was planned and implemented successfully iu one of the Primary health centres of the district and the work done was the basis of the filmstrip.

A Study of Motivational Barriers in Drug Compliance in Anti Tubercular Therapy

Agarwal R.C., Singh G., Banerji S.C., Jain S.K. and Shukla R.*

A Cohort of 150 patients of Pulmonary tuberculosis was studied prospectively for one year to observe the treatment compliance pattern, specially the role of motivational efforts in ensuring proper compliance. The study revealed lack of knowledge about disease (38.00 percent), treatment (56.67 per cent), sputum as infective (65.33 percent) and the disease as infective to others (64.00 percent). Average compliance rate was 32 percent, which was dominated by them with extramotivational efforts (42.25 percent), as compared to ordinary motivation (23.28 percent). Other demographic and socioeconomic factors (caste System, family system, age, sex, income) showed no difference in compliance, but after considering motivational aspects, the extramotivated group showed significantly better compliance.

The study reveals that effect of personal, social characteristics on drug compliance were variable, but compliance was significantly better with extramotivational efforts, which should be emphasised through out the treatment schedule, to ensure regular compliance.

SESSION—VI

Problem of Cancer Control in India

T.B. Patel**

Inspite of the expenditure of large sum of money spent on many cancer campaigns, cancer research has been found to be disappointing when judged from the success in reducing mortality of cancer at various sites though it has increased our understanding of the nature of cancer and led to improved form of treatment. The overall death rate from cancer continus to remain very high. It has

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been the opinion of many cancer workers (John Pembertone, The Milroy Lecture, 1976) in the field that the results might have been better if more weight was given to cancer research in its epidemiological and environmental studies.

While the death rate from cancer has fallen in certain cancers like cervical cancer, it has not fallen more generally despite improvements in treatments, and the fact remains that cancer is now a major cause of ill health in the western countries. In this country, the highest prevalence of cancer is found in the age group of 46 to 50 years. Until recently and even now stress has been given in teaching people to recognise the first signs of the cancer disease in the people and that earlier treatment would lead to improved results. Too many cancers however are incurable by the time they draw attention to their presence for it to be possible to make any major impact by this means. The weight of the effort is therefore now being shifted to the development of programmes for examining the healthy persons in the hope that cancer can be detected before they have produced symptoms or better still that premalignant states can be detected and treated so that invasive cancer does not have a chance to appear. The examination of vaginal smears by 'pap' test, which costs very little, is one such method in controlling and treating cervical cancer in its earliest stage, i. e. at the premalignant stage. Intensive efforts are continued in this direction so that a similar programme could be taken up for other types of cancer. In addition, our aim should also be to prevent cancer by eliminating the factors that cause it.

In India, while the communicable diseases are still playing a major role in causing heavy morbidity and mortality, in recent iime cancer has been attracting increased attention among the public. It is also a fact that treatmeut of cancer is very costly requiring costly supportive treatment and anti-cancer drugs and sophisticated diagnostic equipment. At the same time it is pertinent to note that the commonest cancers prevailing in men in most parts of our country are those of oropharyngeal region and lung, and in women these are mainly cervical (uteri) cancer and next to that the cancer of the breast. It is also now a well recognised fact that the oropharyngeal cancer and cancer of the lung could be eliminated to a large extent by appropriate preventive measures. A large number of studies have proved that smoking of tobacco in the form of cigarettes is a principal cause of cancer of the lung. **This is true in our country also where country cigarette 'Biddi' is amoked in place of cigarettes by many people in the rural and urban areas. In addition, as our figures suggest smoking is also closely associated with the cancers of mouth, pharynx, oesophagus and larynx. There is also close association of oral cancer with the chewing of tobacco 'pan' quid which habit is common in many parts of our country. Thus, elimination of consumption of tobacco in any form can reduce the cancer incidence in our country to nearly half of the present figure. In women, cervical cancer which is highest among total cancers in women is the one which could be brought under control by early detection through taking cervical 'pap' smear in all women over the age of 30 years and particularly in the risk groups like those women who have started early sex life, or having many partners, have

many children as also those practising poor sex hygiene or having history of irregular intermenstrual bleeding. Similarly, breast cancer is the second highest in women in this country. Here by the habit of training women in regular monthly self-examination of the breast and consulting their physician in case of feeling local firmness of breast or a small nodule or discharge from the nipple, the breast cancer could be detected early and treated successfully with chances of cure in a majority of cases. It is, therefore, obvious that in a country like ours where there are difficulties of matching available resources to Society's needs in the cancer field the constrains of cost have to be seriously considered. Hence, the goal eliminating the cause of cancer in certain types of cancer and the early detection in other matched with effective treatment would result in considerable saving. Costs increase steeply for patients with advanced disease and are especially high when the course of the disease is prolonged and the disease proves fatal. It has been well observed that lung cancer and oropharyngeal cancer are mostly self inflicted disease. Better public education and serious acceptance of what we know about cancer prevention can be a potent factor in reducing overall cancer incidence and death rate.

Rural Health Through Mobile Hospitals

M.B. Fulare* and B.M. Basole**

India is a nation of villages, the 80% of Indian population is staying in the villages which are scattered through out, with all inadequate facilities in the form of health, transports, roads, drinking water. Ignorance about dieting articles and Healthy habits, sickness and its treatment. There are inadequate curative, Promotive and Preventive services.

The Government has started district Hospitals, Civil dispensaries and Primary Health Centres which provides curative promotive and preventive services which are static, but most of the population remain at enterior unattended and any sorts of specialists services are not at all provided to them.

The people of villages can not got to the Hospital due to various reasons. The Hospital should go to them on this basis the idea of mobile Hospitals originated and Govt. of India started 23 such Hospitals.

The Mobile Hospital provides medical facilities as well as a training institution to medical students Internees and Nursing students.

All facilities are provided in tents like X-ray Pathological laboratory room, Operation theatre, labour room etc, each camp remain for 3 months and cover 20,000 to 25,000 population follow up is done by Medical Officer of Primary Health Centre, nereby.

It is concluded that the scheme is extremely useful to the rural population.

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Growth & Nutrition Patterns in a Slum —An Anthropometric Survey

A. B. Chaudhuri[1], M. M. Kekre[2] and T. T. Patil[3]

An anthropometric survey of 60 children between the years 1-5 was carried out in Bombay. The study was cross—sectional. The children showed significantly affected physical growth due to environmental factors and a high degree of undernutrition affecting them at the most sensitive period of maximum brain— growth. The cross-over of chest to skull circumference, was at 30-36 months as compared to 24 months for poor Indian children. The weight and height of the children showed a high degree of correlation The skeletal parameters of growth i.e. skull circumference head circumference and height showed correlation However the growth curves when plotted against the Harvard and All India Standards ran parallel to them upto 2½ years after which they flattened out. Weight correlation to midarm was found but height showed no correlation to midarm. It is significant to note that a majority of the children were still being breast-fed upto 2½ years of age.

The slum chosen was Matunga Labour Camp—a part of the biggest urban slum in Asia—DHARAVI. The low values of all parameters of growth suggest that protein—calorie malnutrition was rampant in the community. Further the causative factors were active for sometime.

The purpose of the present study is to assess the extent of variations from the Harvard and All India Standards, and also to find out the age group where irreversible changes in growth parameters have not yet occurred and would therefore be receptive to nutritional additives.

A semilongitudinal study is also being carried out to find out if the introduction of a comprehensive low priced diet would bring about a rectification of protein—calorie status in the community.

It is a fact that unless urban slum infants are covered by better MCH services, the physical and physiological growth of these children are likely to be permanently retarded. The magnitude of the problem needs no stressing. The solution is not mere medical aid. The priority is to start nutritional services and free balanced meals on an emergency footing if a dent is to be made at all in combating rampant undernutrition, depressed immune response and subnormal mental growth.

Toxaemia and Seasonal Variation

S. X. Charles[4]

A study was done for a period of six years to find out whether there was any significant difference in the incidence of Texaemia in different seasons.

This was done because there is a lot of difference in opinion regarding the association between texamia and season all over the world.

This study reveals no significant variation in the incidence of Toxaemia in different seasons.

1. Demonstrator 2, Professor & Head of the Department 3. Biostatistician Preventive & Social Medicine Deppt. L.T.M. Medical College, Sion, Bombay 400 0.2.
4. Professor & Head, Department of Obst & Gynaecology, Christian Medical College & Hospital, Vellore.

SESSION—VII

Prevalence of Worm Infestation Among School Children in a Rural Field area

P.V. Chablani, S.D. Halde and C.G. Mali*

Undergraduate medical students of Swami Ramanand Teerth Rural Medical College, Ambajogai are posted at Chanai, a rural field practice area. Prevalence of worm infestation in school children of this village of 2000 population was studied. The school children belonged to Primary and Middle school in the age group of 7-16 years. Of 196 school children, 159 stools could be obtained for examination. Only 27 stools showed presence of worms giving prevalence of 17%. Prevalence of worm infestations at Chanai is much lower when compared with other studies. As this Community has been visited regularly by the students and symptomatic worm infestations treated, prevalence of worm infestation is lower. Asymptomatic worm infestation is not associated with subjective or objective morbidity in this group.

Health Needs of School Children

Kulkarni A.P., Sathe P.V. and Kamble S.A.**

To achieve better Co-ordinated and organized health services for school going children in Aurangabad city a pilot study was carried out at Urban Health Centre attached to Medical College, Aurangabad. Three hundred and seventy three primary school children of a municipal primary school were examined. Vaccination status against small pox prior to examination was found to be satisfactory (97% showed scar of primary smallpox immunization). However, poor immunization status against diphtheria, tetanus and tuberculosis was revealed.

Ophthalmic problems with a prevalance of 12.89% were among the most prevalent disorders followed by E.N.T., gastrointestinal (worm infestations), dental and skin disorder in that sequence. Frank signs of vitamin A defieiency were noted in 31 (8.57%) cases showing the need for prevention by administration of concentrated vitamin A solution, High myopia requiring correction by glasses was seen in 9 (2.68%) students. Contrary to expectations prevalence of trachoma was very low i. e. 6% only. Chronic suppurative otitis media and enlarged tonsils were the main ENT disorders. Prevalence of dental disorders was 4.52%, caries being the most prevalent. No case of leprosy was detected. Prevalence of worm infestations (round worm & thread worm) was 8.31% showing the need for periodic mass deworming.

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Prevalence of Parasitism in Children—Study at Raoli Hospital, A Static Health Centre

Suraja A. Prabhu*

We have selected this topic because parasitism is very common cause of morbidity in children.

This study was carried out to find out the prevalence of parasitic infestation in Raoli Child Welfare Centre, so that, the magnitude of problem is assessed. Since the study is still not complete we have not got enough of positive cases. It is still continued.

The community comprises of about 300 children, all below 5 years of age, with low socio-economic back-ground, staying in chawls or zopdas, using common community taps for their water supply. There is no sanitary latrine facility and most of them squat in open. Hygiene of these children was poor. We study these children coming to our child welfare centre, irrespective of any symptom.

Only 140 children were undergone these investigations, so dropout rate was 36/100 patients.

Haemoglobin determinations were carried out with Sahli equipment which had been calibrated against a photometric method.

For stool examination, fresh specimens were obtained and examined wiihin one-two hours of collection. Stools were examined in normal saline and by floatation method in supersaturated saline.

Upto 3 years most of the children were found anaemic, there was no marked difference between male & female children. Ascaris Lumbricoides was the most common infestation amongst positive cases more so in male children. In our static Health Centre there was practically no case down with parasitic infectation in 3-5 yrs. age group. All the possitive cases were in 0-3 yrs. To find out the correlation between positive parasite cases and underweight we found most of them not really underweight.

Results (1) Total parasitism was found to be 16% with the sex ratio of 1 : 1

(2) Rate of differentail parasitism was noted to be :—

Ascaris lumbricoids=45% Trichuris trichura=18%, E. hystolytica=27%
E. coli=10%

(3) Positive parasitic infestation in relation to haemoglobin shows the following rate :— Children with haemoglobin less than 8 gm% =5.25%, Children with haemoglobin between 8-10gm% =13.80%, Children with haemoglobin more than 10gm% =16.00%

Study of Helminthic Infestations Among Defence Personnel and Their Families

P.K. Mukherjee[1], S.C. Banerji[2], R. Shukla[3] and G. Singh[4]

An epidemiological study of helminthic infestations in a randomly selected cohort from army garrison of Allahabad cantonment was carried out. In the initial examination 201 (18.27 percent) individuals were found to be infested, by Ankylostoma Duodenale(42%), Ascaris Lumbricoides (35%), Enterobius

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Vermicularis (16%), H. Nana (13%) and others (3%) with single or multiple infestations. Maximum persons (67.71%) infested belonged to eastern region of the country. Nearly 88.0 per cent population exposed belonged to rural background and 95 percent of infestations were among them. Maximum infested persons (75%) gave history of having moved out of station to their homes in the last 3-6 months. The rate of infestation for various helminths ranged between 150-300 ova per gram. of stool. Average haemoglobin percentage was 14 gm percent with very few (7%) below 10 gm percent. In the second examination there were 57 fresh infestations detected and 14 among those dewormed on initial infestation, this giving an incidence rate of 55.45 per thousand population and overall prevalence rate for the year 147.20/10.0 of the freshly infested persons. 92.86 per cent had given the history of having moved out to their native places within six months of investigation. Most of such freshly infested individuals (62%) were from eastern regions of the country. The regression equations calculated for the duration of movement outside and quantum of infestation was found to be very highly significant ($P<.05$). This highlights the effect of movement outside on the infestation.

Filariasis and High Total Eosinophil Count

S. Russel and C. K. Rao*

There are various speculations regarding the etiology of tropical eosinophilia. Several workers have attributed it to filaria infection, some to human and others to animal. The National Institute of Communicable Diseases while undertaking human filaria surveys in the filarial endemic state of Kerala and in the non-endemic states of Jammu and Kashmir, Himachal Pradesh, Rajasthan, Punjab, Haryana and Manipur carried out total eosinophil counts by the standard Randolphs method on some of the people examined for filaria parasite. The results of the same are given :

Altogether 195 persons in Kerala and 600 persons in the non-endemic states were examined. Persons with high total eosinophil count were observed both in endemic and non-endemic areas. But the incidence was more in the endemic areas. The percentage of persons with eosinophil count of 2000 and above per cmm was 3.6 in endemic state whereas it was only 1.2 in non-endemic states. The next group of 1001 to 2000 and 450 to 1000 were also higher in the endemic state than in the nonendemic states.

In the endemic state two persons with a total eosinophil count of 5106 and 3907 per cmm harboured microfilariae whereas in the non-endemic states none of the persons showed microfilaraemia.

The higher rate of persons with high eosinophil count in the filarial endemic area in comparison with non-endemic states indicate association of the two conditions. However presence of high eosinophil count persons in non-endemic areas suggests that human filariasis is not the only causative factor. All persons with eosinophil count of over 2000 cmm could not be confirmed to have had tropical eosinophilia.

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GENERAL SECRETARY'S ANNUAL REPORT FOR—1978.

Mr. President and the members of the Association,

I have the honour to present before you the Annual Report on the activities of the Indian Public Health Association and its branches for the period January to December 1978.

The 22nd Annual Conference—Hissar (Haryana):

The 22nd annual conference of the Indian Public Health Association and Symposium on Veterinary Public Health and Zoonoses (under the auspices of ICAR) was held from February 24 to 26, 1978 in the College of Veterinary Science, Haryana Agricultural University, Hissar. A large number of members and delegates from all parts of India attended the conference. Dr. O.P. Gautam, President of the IPHA, Hissar Branch and Dean, College of Veterinary Science, Haryana Agricultural University, Hissar delivered Welcome Address. Welcoming the members and delegates, Dr. Gautam emphasised the important role of animals in Indian culture and society and the need of creating a nucleus of Veterinary Public Health Services in the Ministry of Health. He hoped that the conference would help in the exchange of scientific views between the two sister profession of Medical and Veterinary Services.

After the Address of welcome the Conference was inaugurated by Dr. M. Abdussalam, Director, International and Scientific Cooperation, FAO/WHO and was presided by Dr. Z. Matyas, Chief Veterinary Public Health, W H O, Geneva. Inaugurating the conference, Prof. Abdussalam said that more than 80 percent human beings particularly in developing countries lived in close contact with animals and they were more at risk to major diseases transmitted from animal to man. Every year more than a million people took Anti-rabies treatment in India, which caused heavy economic losses. He called upon the medical and veterinary Scientists for eradication of rabies which had been done by some countries of this region.

Dr. Z. Matyas in his presiding address discussed the new socio-economic changes coming in the society and to the appearance of new or earlier uncommon problems, most of which are animal related. He urged the Veterinarians along with other experts to be fully involved in the surveillance, prevention and control of Zoonoses including food borne infection.

Scientific Session :

The subject for the Scientific Session was—"Veterinary Public Health Zoonoses". The Session comprised of 8 (eight) Sub-Scientific

Sessions and a total of 52 papers were presented and discussed. The 8th Session was a Panel Discussion on Integration of Veterinary Public Health activities in Public Health Services. The Chairman and Moderator of the Panel were Dr. O. P. Gautam and Dr. C. Schwabe respectively. The Initiators were Prof. S C. Seal (Calcutta), Prof. P. N. Khanna (Calcutta) and Dr. G P. Sen (Calcutta). The scientists who took part in the discussion were Dr. S. S. Verma (New Delhi), Dr. C. W. Schwabe (California University, Davis USA), Col. Barkat Narain (New Delhi), Brig. S. L. Chadha (Simla), Dr. S.C. Adlakha (Delhi). A book-let on the Panel Discussion was published by the IPHA Hissar branch for circulation to members and delegates. The proceedings of the Scientific Sessions have been published in the IPHA Journal (Conference Number Issue), Volume 22, No. 4, October-December, 1978 issue, which had already been sent to all the members of the Association.

Recommendations of the 22nd Annual Conference

A Sub-Committee was formed consisting of Dr. O. P. Gautam (Hissar), Dr K. G. Narayan (Hissar), Prof. P. N. Khanna and Dr. G. P. Sen (Calcutta) for draft Recommendations of the 22nd annual conference. The draft Resolutions were prepared and were sent to the D.G.H.S., D.G.A.F.M.S., D.G. Indian Railways, all the Directors of Health and Veterinary Services—States & Union Teritorries, Agricultural and Medical Universities, Governmental and semi-Governmental Institutions etc. for their implementation.

Presidental Address

Dr. G. J. Ambwani, President of the Association could not attend the conference as he was indisposed. He also could not send his Presidential Address. Under the circumstances, Prof. S.C. Seal, the Past-President of the Association, was requested to deliver the Presidential Address on behalf of Dr. Ambwani. Dr. Seal dealt with the changed concept of medical practice laying more emphasis on preventive and social medicine. He urged that training of practitioners should therefore include different aspects particularly sociology, psychology and behavioural science with stress on preventive aspects. He also discussed the different aspects of medical and public health education and pleaded for democratic decentralization of rural health services.

Late Dr. B.C. Dasgupta Memorial Oration Address

The nominee for the Oration of 'late Dr. B.C. Dasgupta Memorial Oration Address' was Dr. P.R. Dutt, Consultant to the Gandhigram Institute of Rural Health and Family Planning, Madurai (Tamilnadu). The topic dealt was Rural Health Care in India at Cross Road. He discussed about the structure and function of Health Services in India, since independence.

Award of Fellowship of the Association for 1977

Nominations were invited from the existing Fellows, Life members and the Presidents of all the State and Local Branches of the Association for the Award of Fellowship of the Indian Public Health Association. A total of 13 (thirteen) nominations were received. The Credential Committee under Chairmanship of Lt. General D. N.Chakraborty, the

Past-President of the Association, held its meeting on 15 th November, 1978 and recommended 6(six) names for the Award of Fellowship. As per Rule 7-D, of the Rules & Regulations & Memorandum of the Association, the ballot was issued for approved 6 nominees by the Credential Committee, along with their brief Biodata, to all the existing Fellows of the Association for obtaining their votes for the final selection. The votes will be counted at the next (23rd) annual meeting of the Central Council. Those scoring more than fifty percent of the votes polled would be approved and then ratified by the General Body at its 23rd annual meeting scheduled to be held at the time of the 23rd annual conference during January last week of 1979 at Aurangabad. The names of the 6 (six) recommended members, according to the alphabetical order, are as follows :—

1. Dr. S. C. Banerjee, Prof. & Head. Dept. of Prev- & Social Medicine M.L.N. Medical College, Allahabad (UP).
2. Dr. R.N. Basu, Asstt. Director General of Health Services, Ministry of Health & Family Welfare, Govt. of India, New Delhi.
3. Dr. A. Contractor, Asstt. Director of Public Health, Govt. of Gujrat, New Civil Hospital, Ahmedabad.
4. Dr. B.C. Ghoshal, Asstt. Director General of Health Services, Ministry of Health & Family Welfare, Govt. of India, New Delhi.
5. Dr. V.L. Pandit, Asstt. Director of Health Services (Retd.), Govt. of Karnataka, Bangalore.
6. Dr. N. K. Sinha, Deputy Director of Health and Family Welfare, Ministry of Railways, Govt. of India, Rail Bhavan, New Delhi.

Association Award for the years 1976 and 1977

The Central Council at its 21st annual meeting held during February, 1978 at Hissar, constituted a Sub-committee consisting of the following judges for the scrutiny of the best Scientific paper for the Association Award for volume 20, 1976 and volume 21, 1977 issues of the Journal, to be given at the time of the next (23rd) annual conference scheduled to be held at Aurangabad. The Judges of the Panel were as follows :

1. Dr. S. S. Verma, Director General, (Health)—Railway Board, Ministry of Rlys. Govt. of India, New Delhi.
2. Dr. W. Mathur, President of the Indian Public Health Association New Delhi.
3. Prof. S. C. Seal, Editor of the IPHA Journal, Calcutta.

The sealed recommendations for the best Scientific papers have been received from the above Judges. These will be opened and finalised at the 23rd annual meeting of the Central Council schduled to be held during January, 1979 at Aurangabad.

World Federation of Public Health Associations, Geneva.

(a) In the light of the recommendations of the previous meetings of the Central Council, the Association approached the World Federation of Publich Health Associations, Geneva with a suggestion that the Indian Public Health Association would like

to host the 3rd International Congress of the World Federation in Calcutta to be held during 1981. No reply has been received, but from the proceedings of the World Federation—'Record of 1978, Annual Report' it appears that among the two requests received to host the next International Congress were Indian and Israeli Public Health Associations. The final decision will be made at the 1979 Annual meeting of the World Federation of Public Health Associations scheduled provisionally in Geneva, during the week beginning 7 May.

I may, however, inform the House that the formal invitation to host the 3rd International Congress to the World Federation was sent subject to the approval of the Govt. of India. The Central Council at its 22nd annual meeting constituated a Sub-Committee consisting of the following personnel with the power of coopting additional members for taking further action, if required :—

1. Director, School of Tropical Medicine, Calcutta
2. Director, All India Institute of Hygiene & Public Health, Calcutta
3. Director of Health Services, Govt. of West Bengal, Calcutta
4. Dr. J. M. Ghosh, Chief Medical Officer, Eastern Railway, Calcutta
5. Dr. S. S. Verma, Director General (Health), Indian Railways, Govt. of India New Delhi,
6. Col. Barkat Narain, Past-President of the IPHA, New Delhi.

(b) Dr. B. Sankaran, Director General of Health Services, Ministry of Health and Family Welfare, Govt. of India, New Delhi represented the Indian Public Health Association as an official delegate in the World Federation of Public Health Associations,' Annual meeting held at Geneva on May 11, 1978.

(c) A sum of Rs. 2270/- (approximate) is outstanding to the World Federation towards membership fee due for the years 1970, 1971 and 1975, 1976, The subscription for the year 1977 has already been paid, while the subscription for the years 1978 and 1979 are being processed for paymenat.

Editorial Board of the IPHA Journal & publication.

The office bearers of the Editorial Board were selected and ratified by the General Body at its 22nd annual meeting for a term of 3 (three) years i.e. 1978-80. During the years, three meetings of the Board were held on 4th February, 3rd June and 6th December, 1978 respectively, and discussed about the administration and procedure for finalisation of the manuscripts for publication in the Journal. All the four issues for the year 1978 (Volume 22) were brought out and sent to members and subscribers in India and Abroad as well. The 1st issue viz. Jauuary—March, 1978 was dedicated to the 'Eradication of Smallpox' as a Special issue, and the WHO, South-East Asia Region, New Delhi, had purchased 1000 (one thousand) copies of this special issue.

The Board at its meeting discussed the poor position of the advertisements in the Journal. Some advts. were procured through the efforts of Dr. N. K. Sinha and Dr. S. S. Verma of New Delhi, and Dr. K. K. Modak

of Calcutta. A strong drive is required to be made in procuring advts. for the Journal. The help from the members, in this regard, will be greatly appreciated.

Central Council Meetings

During the year, three ordinary meetings, i.e. 55th, 56th and 57th, were held on February 4, May 6 and December 30, 1978 respectively. The 56th Ordinary meeting was held at the residence of the President of the Assocn. Dr. W. Mathur at New Delhi. The 22nd annual meeting of the Council was held on 24th February, 1978 at the College of Veterinary Science, Haryana Agricultural University, Hissar, at the time of the 23rd annual conference of the Association. At the annual meeting, new Office bearers for the H/Q office were recomended and selected along with other office bearers for the Editorial Board, Credential Committee, Sub-Committee for the Association Award etc. The other official transactions were also carried out. The Annual Council meeting was presided over by Col. Barkat Narain, the Past President of the Association, in the absence of the President of the Association, Dr. G. J. Ambwani, since he was indisposed.

The Council at its meeting accepted the invitation offered by the Maharastra State Branch to play host for the 23rd annual conference to be held at Aurangabad during January, 1979. At the annual meeting, the Council also nominated Prof. M. C. Mittal Prof. & Dean, Medical College, Jabalpur (MP), for the 'late Dr. B. C. Dasgupta Memorial Oration Address'. The proceedings, after approval and ratification by the General Body, had been published in the Conference No. of the Journal, Vol. 22, No. 4 (October—December 1978) issue. The Central Council at its 56th and 57th Ordinary meetings, also discussed about formation of 'Building Fund' of the Association which was strongly desired by the members.

Financial position and Accounts

The audited Statement of Accounts of the Association for the year ending 31st December, 1978 is being placed along with the report, and also the Statements of (i) Liabilities and Assets and ii) Budget estimate for the period of January—December, 1979. The anticipated SURPLUS of Rs. 20,254.46 in the budget estimate takes into account the realisation of outstanding advts. bills for a sum of Rs. 2185/.

On the recommendation of the Central Council, the General Body approved and ratified to write off a sum of Rs. 541.50, which were outstanding with the State Bank of India, Park street Branch, Calcutta, since 1971-72. The amount includes a susbcription of Fellowship fee of Rs. 300/-.

The Association made with the Indian Bank, Central Avenue Branch, Calcutta, three Fixed Deposit Accounts—2 for Rs. 5000/-, each for one year and one Rs. 3000/- for a period of 6 (six) months. The F. D. R. for Rs. 3000/- matured in December, 1978 and fetched to the Assciation a sum of Rs .67.50 as interest. The Association also received a sum of Rs. 134.25 as interest on Savings Account with the above Bank. The other two F.D.R. each of Rs. 5000/- would mature in June, 1979.

Membership Position and Membership Drive

There are 788 members on roll, which includes 103 fellows (six honorary), 188 life members, 476 ordinary members and 21 Associate members. During the year 97 members have not renewed their membership. The individual reminders were sent to them with a request to renew their membership. After the 2nd reminder sent, the name of members not paying subscription for 1978, have been dropped from the membership list. A total of 197 new members (including life and ordinary) were enrolled during the year 1978. A membership drive was again launched with the help of Dr. S.S. Verma and Dr. N.K. Sinha of Indian Railways to enrol more members and to revitalize some State and Local Branches of the Association, which had ceased to function. Although the response was not very encourageous, Bihar, West Bengal and Madhya Pradesh State Branches intimated the H/Q office of the Association about revitalization of their Branches. I have great pleasure to inform you that with the efforts of Prof. S. C. Seal, Dr. J. Nath, Dr. G. C. Roy and Dr. B. C. Basak, the West Bengal State Br. organised its annual meeting during October, 1978 and new office bearers were selected. The Ex-secretary of M.P. State Branch, Prof. M. C. Mittal has also informed that he would look into the matter to re-organise the Madhya Pradesh State Branch. Attempts are also being made to start a Andhra Pradesh State Branch at Hyderabad.

Activities of State/Local Branches of the Association

There are 10 State and 5 Local Branches of the Association mentioned below :

State Branches : (1) Delhi, (2) Maharastra, (3) Tamilnadu, (4) Gujrat, (5) West Bengal, (6) Bihar, (7) Goa, Daman & Diu, (8) Karnataka, (9) Madhya Pradesh and (10) General Branch (members not residing within the jurisdiction of existing Branches).

Local Branches : (1) Allahabad, (2) Varanasi, (3) Hissar, (4) Jamshedpur and (5) Poona.

Out of 15 State/Local Branches, only 5 (five) Branches namely, (1) Delhi, (2) Hissar, (3) Gujrat, (4) Tamilnadu and (5) Allahabad have sent the information about their main activities during 1978 along with the list of Office bearers. No intimation has been received from other Branches till the time of preparation of this roport, although reminders have been sent to those branches.

During the year 1978, the West Bengal State Branch resumed its function and held its annual meeting in October, 1978. The report and the list of office bearers are still awaited. Four branches viz. (1) Bihar, (2) Madhya Pradesh, (3) Goa, Daman & Diu and (4) Karnataka appear to have ceased function. The Joint Secretary Dr. N.K. Sinha tried to contact and met in person with the Secretaries of Goa, Daman & Diu and Bihar State branches to revitalize and start functioning of the branches.

Activities of the Branches of the IPHA

(A) *Delhi State Branch* : This branch organised the World Health Day and the function was organised in collaboration with the Central Health Education Bureau and Delhi Municipal Corporation. The function was inaugurated by the Mayor of Delhi.

An exhibition was set up on the W H O theme of the year 'Down with High Blood Pressure'. Arrangement was made to check the blood pressure of the visitors coming to the exhibition.

A Scientific symposium was held on High Blood Pressure at the Lady Hardinge Medical College and a Seminar for Senior medical students and internees at the Maulana Azad Medical College along with a question hour by the Public at Lajpat Bhavan. Members of the Delhi branch of the Association participated in the programmes for rendering medical aid and carrying out mass immunization of flood victims and wholeome drinking water supply.

(B) *Hissar Local Branch :* The Hissar branch of the Association hosted the 22nd annual conference of the Indian Public Health Association and Symposium on 'Veterinary Public Health Zoonoses' from February 24 to 26, 1978. A new department of Veterinary Public Health and Epi. in the College of Veterinary Science, Hissar has started functioning including the study of food borne infections and intoxications. The attempts are being made by the Hissar branch to arrange a symposium/seminar on Public Health disease/diseases.

This branch held its annual general body meeting during November, 1978. The office bearers were elected at the meeting and other agenda were transacted.

(C) *Gujrat State Branch :* The Gujrat branch took an intensive enrolment drive and could make 194 members during the year. With active involvement of the members of the Association for the first time in the immunisation programme the state has achieved highest percentage of immunisation during 1979. With the active involvement of all members of the Association the State was able to secure first rank in the family planning programme in the whole country.

(D) *Allahabad Local Branch :* During the year, a General Body meeting, two special meetings and seven Scientific meetings were held by the Branch in the M.L.N. Medical College. During the meeting, Dr. S. C. Banerjee delivered a lively talk on the scope of community health workers scheme, its implementation for the benefit of rural community. The Branch also organised a weekloug activities to mark the WHO Day —the theme being 'Down with Blood Pressure'. Dr. G. Singh, the Secretary of this Branch have a series of Lecture at various organisations and institutions on Epidemiology of hypertension, including Rotary Club, Regional Health and Family Welfare Institute, Allahabad Medical Association and Rural areas. Other eminent speakers were Dr. S.P.S. Chauhan, Dr. S.B. Dixit, Dr. J.N. Harkauli, the Joint Health Services, summed up the meeting with an enlightening speech. In the Scientific meetings various current topics were covered such as, Medical Termination of Pregnancy, latest strategy in Malaria Control, return of Kalazar and viral encephalities. Besides this, the branch arranged for Seminars on Malaria and Kalazar at the U.P. State IMA Conference held at Allahabad. The membership position remained more or less stationary with a few new arrivals and some transfers. It was decided in the meeting to step up the membership drive and adopt village for model Community Health Work.

(E) *Tamilnadu Branch :* This branch has sent only the list of office bearers for the year 1979 and intimated that the report would be sent in due course.

Miscellaneous

(A) *Federation of Public Health Associations in India* : As per the recommendations of the Sub-committee of the Federation of Public Health, the different Associations viz. Indian Association for Communicable Diseases, Bombay Indian Society for Malaria and other Communicable Diseases, Delhi Association of Preventive and Social Medicine etc. were approached for merger under the Federation. A meeting of the Central Council was, therefore, called by the Presidentof the I P H A, Dr. W. Mathur on 6th May, 1978 at New Delhi. The Council, at meeting, felt that preliminary arrangements for holding such a conference in Delhi be made by December, 1978. Dr. S. K. Sengupta, Asstt. Director Gen. of Health Services had been requested to function as a Convenor. The proposed meeting for the formation of Federation to be held in Delhi during December 1978 did not materialise as some of the Associations had announced earlier about their annual conferences with date and venue. Since the venue was other than Delhi and due to the lack of timely communications, the offer of Maharastra State Branch of the IPHA for holding the 23rd annual conference at Aurangabad during January 1979 was agreed upon. It may be mentioned here that during the th National Annual Conference of the Communicable Diseases of Bombay held at Calcutta during December, 1978, the General Secretary, Prof. Khanna of the IPHA had a detailed discussions with the General Secretary, Dr. Kamath and the President, Dr. (Mrs.) Sushila Nair of Communicable Diseases Association regarding the formation of Federation of Public Health Associations. Prof. Khanna was informed by Dr. Sushila Nair that she is interested in the 1st instance to merge the two Communicable Diseases Associations of Delhi and Bombay. She further told that after effective merger of the above 2 Associations, we would think of formation of Federation. On the advice of Dr. Nair, the President Dr. W. Mathur was informed to be in touch with NICD officials and to attend the proposed merger meeting so that further action in formation of Federation is effected.

(B) *Organising Projects by the members of the IPHA :* As a follow up to the Central Council meeting for organising definite projects by the members of the IPHA to activate the Association, Dr. W. Mathur, President of the Association prepared a brief note in the form of a letter which was cyclostyled and sent to all the members was not encouraging as no comments were received.

C) *Association's Building Fund* : The Central Council at its 56th and 57th ordinary meeting discussed about raising a Building Fund of the Association's H/Q office at Calcutta. The ways and means for the fund should be worked out at the annual meetings of the Central Council and General Body scheduled to be held during January last week of 1979 at Aurangabad.

(D) *Award of special leave to the staff :* The Central Council at its 56th and 57th ordinary meeting considered the application of Sri K. K. Banerjee, the staff of the IPHA H/Q office regarding the special leave for 30 (thirty) days during the month of September and October, 1978, since he could not come and attend for duty as all the links from his residence (Kolaghat, Dist. Midnapur) to Calcutta were disrupted due to flood. The Council considered sympathetically his application and granted 30 days leave as a special case.

(E) *Next scale to Sri K. K. Banerjee* :

A petition was submitted by Sri K. K. Banerjee that he may be granted a scale since he was satisfactorily doing his duties as a peon or the last 15 years. The application was carefully considered but the Council regretted to meet the request.

(F) *Medical grant to Sri R. N. Thakur* :

A petition was received from Sri R. N. Thakur, Accounts-cum-Clerk, the staff of H/Q office, for a grant of Rs. 1000/- to meet a part of his expenses incurred by him in the treatment of his mother. The medical certificate and bills were put up to the Council members. After giving a careful thought, the Council regretted that there was no scope for such a grant.

The General Secretary informed she members of the Council that the staff of the Association were not being provided with medical allowance/medical reimbursment or free medical service facilities. Keeping in view of the low pay and limited allowances, the Central Council recommended Rs. 8/- per month each to both the staff members. This facility will come in force from January 1, 1979, subject to the ratification of the General Body.

Administration

The administration at the Headquarters Office met all the needs of the members of the Association satisfactorily. The office of the Association continues to function at the premises of the All India Institute of Hygiene and Public Health, Calcutta.

Concluding Remarks :

I shall be failing in my duties if I do not acknowledge my sincere and deep sense of gratitude to the President Dr. W. Mathur, all my colleagues of the Central Council for their constant cooperation, guidance and encouragement throughout the year in various matters concerning the welfare of the Association. My thanks are also due to Vice-Presidents, Joint Secretaries, Treasurer and members of the Editorial Board for their advice and valuable help in the management of the affairs of the Association.

Thanks are also due to all the Presidents, Secretaries of the State/Local Branches of the Association for their active cooperation. I also thank Dr. D. C. Badade, Secretary and Dr. G. A. Panse, President of the IPHA Maharastra State Branch and Prof. P. V. Sathe, the Organising Secretary of the 23rd Annual Conference of the Association for playing host for the conference.

My thanks are also due to Prof. S.C. Seal

Past-President, Col. Barkat Narain, Past President and President of the IPHA Delhi State Branch, Dr. S.S. Verma, Past-President, Dr. J. Nath, Vice-President of the Association for their active and untiring interest in the Association's affairs.

Sd/- P. N. Khanna
General Secretary
Indian Public Health Association
H/Q Office, Calcutta

COPY OF THE AUDITOR'S REPORT FOR 1978

We have audited the attached Statement of Receipts and Payments of INDIAN PUBLIC HEALTH ASSOCIATION for the year ended 31st December, 1978.

1. *Account*: An Income and Expenditure Account and a Balance Sheet should have been drawn up by the Association as provided under the Rules & Regulations of the Association.

2. A cheque for Rs. 300/- deposited with State Bank of India, 1972 and the same not being credited by the Bank till the date of Audit has been written off by the Association.

3. (a) *Postage*	Budgeted	Rs.	4,000.00
Expences	Spent	,,	5,270.05
(b) *Printing &*	Budgeted	,,	10,000.00
Stationary	Spent	,,	15,165.84

Subject to the foregoing observation, we report that we have found the attached Statement of Receipts and Payments to be correct and be in accordance with the books of account maintained by the Indian Public Health Association.

Calcutta,
22 January, 1978
Basu House
3 Chowranghee Approach
Calcutta-700 072

Sd/- G. Basu & Co.,
Chartered Accounts

INDIAN PUBLIC HEALTH ASSOCIATION, CALCUTTA-73

Receipts & Payments Account for the period ending 31st December 1977.

RECEIPTS	Rs. P.	Rs. P.
To, Opening Balances :		
(i) Cash in hand (including postage stamps for Rs. 14.32)	623.60	
ii) Bank balance with State Bank of India on Current A/c with		
a) Park Street branch	7434.61	
b) Netaji Subhas Road branch	2019.44	10,077.65
Fixed Deposit with State Bank of India Park Street branch, on account of :		
a) 'late Dr B.C Dasgupta Memorial Oration Award Fund	10000.00	
b) Association's Fund	4000 00	14,000.00
Suspense		241.50
Membership and Journal Subscription (including previous year and subsequent year)		17,184.09
Fellowship Award Subscription (1976)		303.50
Advertisements		510.00
Recoveries against puja advance from staff		160.00
Interest on Fixed Deposit on account of :—		
(i) 'late Dr. B.C. Dasgupta Memorial Oration Fund	900.00	
(ii) Association's Fund	346.45	1,246.45
Reprints of articles and sale of old issues of the IPHA Journal		279.10
	Total Rs.	44,002.29

PAYMENTS	Rs. P.	Rs. P.
By, Salaries		9,609.45
Advance to office staff (puja advance)		200.00
Printing of IPHA Journal (including paper, press printing, block etc. for the last two remaining issues for 1976, 3 issues for the current year, being paid in full settlement and 1st issue (special issue) of 1978 being paid in part		23,442.68
Printing of 'Rules and Regulations and Memorandum of the Association (2nd revised edition)		418.00
Audit Fee (1976)		200.00
Office printing and Stationery		907.94
Bank charges		208.95
Postage		2,914.70
Conveyance and Travelling		211.54
Late Dr. B C. Dasgupta Memorial Oration Award for 1976 (Prof. S.M. Marwah, Varanasi)		900.00
Association Award (Joint for 1975)		100.00
Annual subscription to the World Federation of Public Health Associations, Geneva, 1977		563.95
Miscellaneous		411.82
Advertisement Commission		90.00
Suspense		241.50
Closing Balances :—		
(i) Cash in hand (including postage stamps for Rs. 4.85)	95.60	
(ii) Bank balance with State Bank of India on Current A/c		
a) Park Street branch	1297.03	
b) Netaji Subhas Road branch	691.77	
(iii) Indian Bank on Saving Account at Central Avenue Branch	1497.36	3,581.76
	Total Rs.	44,002.29

Sd/- G. Basu & Co , Chartered Accountants
Basu House, Chowranghee Approach, Calcutta 700 072
Dated, 21st February, 1978

Sd/- P.N. Khanna
General Secretary

Sd/- A. Kiran Kumar
Treasurer

INDIAN PUBLIC HEALTH ASSOCIATION, CALCUTTA-73

Receipts and Payments Account for the year ending 31st December 1978.

RECEIPTS	Rs. P.	Rs. P.
To, Opening Balances :		
(i) Cash in hand (including postage stamps Rs. 4.85)	95.60	
Bank balance with State Bank of India on current A/c		
a) Park Street Branch	1297.03	
b) Netaji Subhas Road Branch	691.77	
With Indian Bank on Savings A/c at Central Ave. Branch	1497.36	3,581.76
Membership & Journal Subscription (including previous year and subsequent year)		54,382.18
Fellowship Award Subscription (1977)		400.00
Advertisements in the IPHA Journal		587.50
Recoveries against puja advance from staff		200.00
Interest on Savings Account with Indian Bank, Central Avenue Branch		134.25
Interest on Fixed Deposit Receipts on account of Association's Fund		67.50
Reprints of articles in the IPHA Journal and sale of old issue of the Journal		164.75
	Total Rs.	59,517.94

PAYMENTS	Rs. P.	Rs. P.
By, Salaries		9,799.25
Printing of the IPHA Journal (including paper, printing, block making charges etc. for all the last 3 issues of 1978 and printing charges for October, 1977 only ; and payment made in full settlement for 1st issue, 1978 printing)		14,045.74
Advance to office staff (puja advance)		200.00
Office printing and Stationery		1,220.10
Audit Fee (1977)		200.00
Bank Charges		373.95
Postage (Office and Journal)		5,270.05
Conveyance and Travelling (including paid in advance for 1979)		308.65
Contribution towards organising 22nd annual conference of the Association at Hissar		1,000.00
Service charges (monthly) for Typewriter Machine (including subsequent year)		72.00
Miscellaneous		814.48
Cheque deposited in 1972 but not yet realised, written off		300.00
Closing Balances :—		
(i) Cash in hand (including postage stamp Rs. 6.42)	2344.65	
(ii) Bank balance with		
a) State Bank of India, Netaji Subhas Rd Br. on Current A/c	505.97	
b) Indian Bank, Central Avenue Br. on Saving Account	3139.60	
(iii) Fixed Deposit with Indian Bk.		
a) On account of late Dr. B.C. Dasgupta Memorial Oration Fund	10000,00	
b) On account of Association's Fund	10000.00	25,990.22
Outstanding cheque with S.B.I., Park St. Br. pending clearance from February, 1977		23.50
	Total Rs.	59,517.94

Sd/- G. Basu & Co., Chartered Accountant, Chowranghee Approach, Calcutta 700 072, Basu House, Dt. January 22, 1979

Sd/- P. N. Khanna *General Secretary*

Sd/- A. Kiran Kumar *Treasurer*

INDIAN PUBLIC HEALTH ASSOCIATION, CALCUTTA-73

Statement of Assets & Liabilities of the Association for the year ending 31st December, 1978

LIABILITIES	Rs. P.	Rs. P.
Membership Fee due to the World Federation of Public Health Associations, Geneva :		
a) 1970, 1971 and 1975, 1976	2270.00	
b) for 1978	700.00	2970.00
State share in respect of membership fee		1500.00
Publication of the IPHA Journal :		
(i) M/s Eka Press, Calcutta (for April, 1973 issue)	1115.10	
(ii) M/s Asian Printers, Calcutta (for reprints in Jan '76 issue)	64.00	
(iii) M/s Tower Process, Calcutta (block making charges)	107.66	1286.76
Association Award for the best Scientific paper published in the IPHA Journal for 1976 and 1977		400.00
Contribution towards organising the 23rd annual conference to Maharastra State Branch of IPHA		1000.00
Excess of Assets over Liabilities		20504.46
	Total Rs.	27661.22

ASSETS	Rs. P.	Rs. P.
Advertisement in the IPHA Journal (including Rs. 657.50 for the year 1978)		2842.50
Advance to Staff (Puja Advance)		120.00
Subscription to Journal :		
a) D.H.S., Govt. of West Bengal	7750.00	
b) Inland and Overseas subscribers	435 00	8185.00
Membership fee (Life member paying in instalments)		350.00
Holding the Annual Meeting of the IPHA, West Bengal State Branch		150.00
Closing Balances :		
(i) Cash in hand	2344.65	
(ii) Bank Balance on current A/c with State Bank of India, Netaji Subhas Road Branch	505.97	
(iii) Bank Balance at S/account with Indian Bank, Central Avenue Br. (as per pass book Rs. 2294.84.35 plus outstanding cheques for Rs. 1163.00 plus being cheques dishonoured, returned to party Rs. 126/- minus cheques issued but not presented for Rs. 443.75)	3139.60	
(iv) Fixed Deposit on account of Association's Fund with Indian Bank, Central Avenue Branch	10000.00	15990.22
Outstanding cheque with S.B.I., Park Street Branch—being the A/c transferred to S.B.I., N.S Road Branch		23.50
	Total Rs.	27661.22

N.B. : Out of a sum of Rs. 900/- on account of late Dr. B. C. Dasgupta Memorial Oration Award to Dr. P. R. Dutt, New Delhi, he has been included as a Life member to the Association and Rs. 125/- was paid for printing his 'Dasgupta Oration' through IPHA Hissar Branch and the balance of Rs. 575/- he has donated to the Association.

Sd/- P. N. Khanna
General Secretary

Sd/- A. Kiran Kumar
Treasurer

INDIAN PUBLIC HEALTH ASSOCIATION, CALCUTTA-73

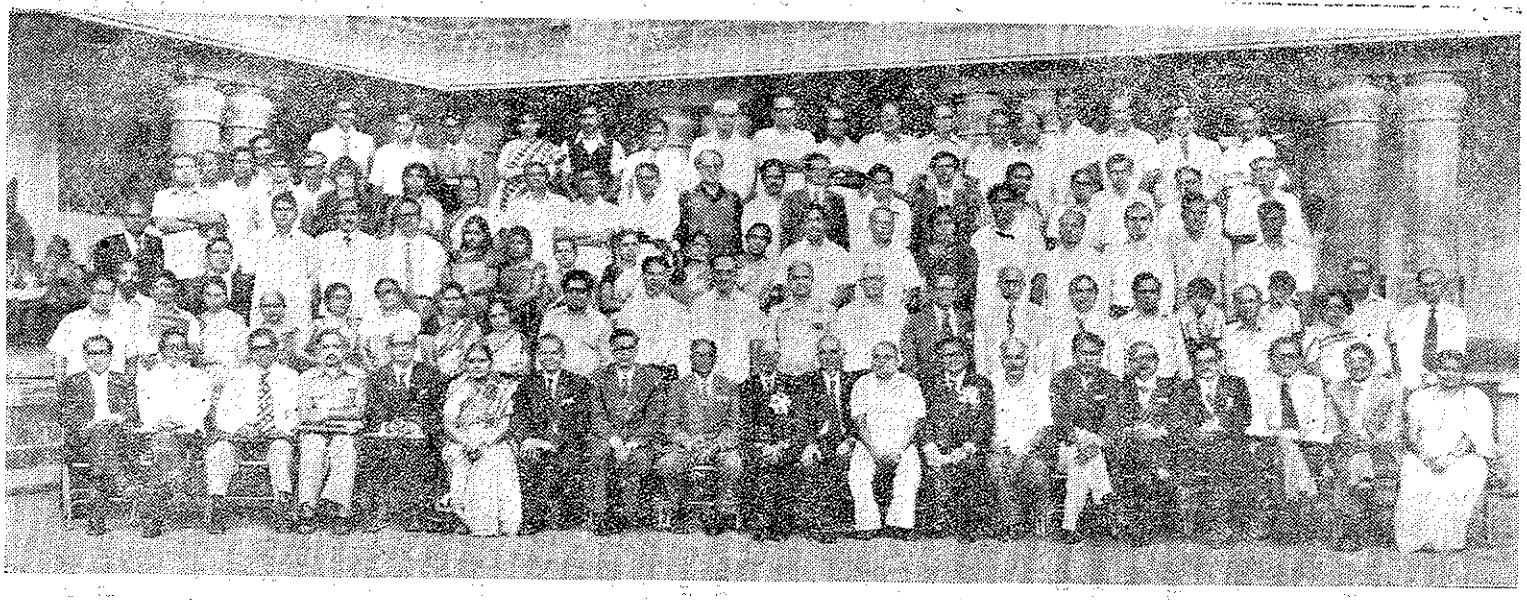
Budget Estimate for the period from January—December, 1979

INCOME		Rs. P.	Rs. P.
Membership Subscription (in form of Central Share) Existing Members			
(i) Ordinary members	414×14	5796.00	
(ii) Life (in instalment)	23×50	1150.00	
(iii) Ordinary Members (paying in full)	62×20	1240.00	
New Members			
(i) Ordinary Members	100×14	1400.00	
(ii) Life (in full)	10×200	2000.00	
(iii) Life (in full Central)	15×140	2100.00	
(iv) Life (in instalments)	30×50	1500.00	15,186.00
Subscription to the Journal :			
(i) D.H.S., Govt. of West Bengal		7750.00	
(ii) Subscribers in India		3000.00	
(iii) Subscribers from abroad		2500.00	13,250.00
Interest on Fixed Deposit Receipts			
(i) On account of Late Dr. B.C. Dasgupta Memorial Oration Fund		900.00	
(ii) Association's Fund		700.00	1,600.00
Interest on Savings A/c with Indian Bank			150.00
Advertisement in the IPHA Journal			2,000.00
Fellowship Award subscription			500.00
Sale of old issues and reprints in the Journal			500.00
Recoveries against puja advance from staff			200.00
Excess of Assets over Liabilities			20,504.46
		Total Rs	53,890.46

EXPENDITURE	Rs. P.	Rs. P.
Salaries to the staff		10000.00
Advance to staff (only puja advance)		200.00
Postage (office despatch and Journal		4500.00
Honorarium for Auditors (for 1971)		200.00
Printing of the Journal (including paper, press printing, block making charges etc.)		12,000.00
Office printing and Stationery		1,000.00
Advertisement Commission		500.00
Contribution towards organizing the 24th annual conference of the Association		1,000.00
Association's Award (for best Scientific paper published in the Journal for 1978)		200.00
Late Dr. B.C. Dasgupta Memorial Oration Award		900.00
Membership fee to the World Federation of Public Health Associations, Geneva (approximate)		800.00
Bank charges		400.00
State share in respect of membership fee		500.00
Conveyance and Travelling		400.00
Monthly service charges for Typewriter Machine		36.00
Miscellaneous		1000.00
Excess of INCOME over EXPENDITURE (Surplus)		20254.46
	Total Rs.	53890.46

Sd/- P.N. Khanna
General Secretary

Sd/- A. Kiran Kumar
Treasurer



Delegates in the 23rd Annual Conference of the Indian Public Health Association,
Medical Collage, Aurangabad Maharastra.

Proceedings of the 23rd Annual General Body Meeting of
INDIAN PUBLIC HEALTH ASSOCIATION

Proceedings of the 23rd annual General Body Meeting of the Indian Public Health Association held on Sunday, the 28th January, 1979 at the premises of Medical College, Aurangabad, Maharastra State.

In all 44 members attended the meeting.

Dr. W. Mathur, President of the Association, thanked all the members present and took the chair to conduct the business of the meeting.

At the outset, the members stood up and observed a two minutes silence to pay homage to late Dr. S. S. Verma, the Past-president of the Association and Director General, Health, Railway Board, Ministry of Railways, Govt. of India, New Delhi.

Agenda No. 1. Confirmation of the proceedings of the 22nd annual General Body meeting of the Association held on February 25, 1978 at the premises of the College of Veterinary Sciences, Haryana Agricultural University, Hissar.

The proceedings of the 22nd Annual General Body meeting were read by Prof. P. N. Khanna, General Secretary of the Association and were confirmed. These proceedings were printed in the Conference Number (October-December, 1978), Volume 22, No. 4 issue of the Association Journal — Indian Journal of Public Health, which had already been circulated to the members of the Association.

Agenda No. 2. To discuss matters arising out of Agenda No. 1. of the above.

No point was raised for discussion out of agenda No. 1 of the above.

Agenda No. 3. To approve and adopt the Annual Report of the General Secretary for 1978.

Prof. Khanna, General Secretary of the Association, read out the annual report on the activities of the Association and its branches during the year 1978-79. Since the report was placed to the members only at the time of the meeting, members had not got the opportunity to go through the report thoroughly. It was further decided that the annual report of the General Secretary along with the Statements of the Liabilities & Assets and Budget estimate and the Statement of Accounts, duly audited by the Chartered Accounts, should be circulated to them at least one day in advance at the venue of the conference. It was, therefore, decided that in future, the report should be given to all the members at the time of the registration.

The General Body recorded its appreciation of the services of the General Secretary and approved the annunal report.

Agenda No. 4. To approve and adopt the audited Statement of Accounts for the year ending 31st December 1978.

The audited Statement of Accounts for the year ending 31st December, 1978 was taken up for consideration. It was observed by the members that the postage expenditure as well as expenditure towards printing of the journal were in excess as provided in the budget

for the period January to December, 1978. The General Secretary explained to the members that the excess of expenditure for the above two heads of expenditure were due to increase in postal rate with effect from June, 1978 and use of higher postage for mailing the Special Issue on 'Smallpox Eradication' (January-March, 1978 issue) which was about three times more voluminous than the usual issues. The increased expenditure towards printing was also due to increased requirement of copies of the journal for the Special issue as 1,000 (one thousand) copies were to be supplied to the Regional Office of the World Health Organization, South-East Asia Region, New Delhi. The General Body approved and ratified the Statement of Accounts.

Agenda No. 5. To approve and adopt the (i) Assets & Liabilities as on 31st December, 1978 and (ii) budget estimate for January to December, 1979.

The Assets & Liabilities for the year ending 31st December, 1978 and budget estimate for the period January to December, 1979 were considered and approved by the General Body. The members noted with appreciation a donation of a part amount on account of late Dr. B. C. Dasgupta Memorial Oration Award' for a sum of Rs. 575/- to the Indian Public Health Association, by Dr. P. R. Dutt, New Delhi. The budget estimate reflected a surplus of Rs. 20,254.46, which takes into account the realisation of outstanding advertisement bills of Rs. 2185/- also.

Agenda No.6 To approve and ratify the results of electiou of (a) President-elect, and two Vice-Presidents and other office bearers of the H/Q office viz. (1) General Secretary (2) Two Joint Secretaries, (3) Treasurer for the year 1979-80.

As per Rule 19C (a) of the Rules & Regulations and Memorandum of the Association, the nominations were invited from the members of the Association for election of President Elect and two Vice-Presidents. One valid nomination each for the office of the President-elect and two for the offices of the Vice-Presidents, were received. Hence, no ballot contest was made.

The nomination for the President-elect was in favour of :

Dr. N. S. Deodhar, Director
All India Instt. of Hyg. & Pub. Hlth. Cal.

and two vice-presidents were in favour of :

(i) Dr. B. C. Ghosal, Asstt. Director General of Health Services, Ministry of Health & Family Welfare, Govt. of India, New Delhi.

(ii) Dr. P.C. Samantaray, Medical Manager, Indian Drugs and Pharma. Ltd., New Delhi.

The General Body on the recommendation of the Central Council, approved and ratified the above names for the offices of the President-elect and two vice-presidents.

The General Body also approved the nomination of election of the office bearers for the Headquarters Office at Calcutta for the year 1979-80, as follows :

General Secretary : Dr. P. N. Khanna (re-elected) Prof. of Veterinary Public Health, All India Instt. of Hyg. & Pub. Hlth., Calcutta.

Joint Secretaries : (I) Dr. I.C. Tiwari, Prof. & Head, Dept. of Prev. and Social Medicine, Institute of Medical Sciences, Banaras Hindu University, Varanasi.

(II) Dr. G. C. Roy (re-elected), Senior Epidemic Control Officer, Govt. of West Bengal, Calcutta.

Treasurer : Dr. A. Kiran Kumar (re-elected), Lecturer, Dept. of Epidemiology, All India Institute of Hygiene & Public Health, Calcutta.

Agenda No. 7 To approve and ratify the election of 10 (ten) members (vide Rule 15A, c) to represent in the Central Council of the Association for 1979-80.

On the recommendation of the Central Council, the General Body approved and ratified the election of the following members to represent in the Central Council as follows :

1. Prof. G. Anjaneyulu, Hyderabad.
2. Prof. M.M. Ganguly, Calcutta.
3. Prof. S.P. Mehta, New Delhi.
4. Prof. M.C. Mittal, Jabalpur.
5. Prof. (Mrs.) L. Philip, Calcutta.
6. Dr. C. K. Rao, New Delhi.
7. Prof. P.V. Sethi, Aurangabad.
8. Air Vice Marshal J.K. Sehgal, New Delhi.
9. Prof. Rameswar Sharma, Jodhpur.
10. Dr. N.K. Sinha, New Delhi.

Agenda No. 8. To approve and ratify the Award of Fellowship of the Association for 1978.

Nominations were invited from the Presidents of all State and Local Branches, existing Fellows and life members of the Association for the Award of Fellowship of the Indian Public Health Association. A total of 13 (thirteen) nominations were received. The Credential Committee under the chairmanship of Lt. General D. N. Chakraborty, Calcutta, considered the nominations and recommended 6 (six) candidates for election of the Award of Fellowship. The ballot for the six candidates along with their brief bio-data were sent to all the existing Fellows for obtaining their opinion and selection (vide Rule 7, D of the Constitution). In order of the votes polled, the following were declared for the Award of Fellowship of the Indian Public Health Association. The General Body approved and ratified the Awards of Fellowship for the following members :

1. Dr. R. N. Basu, Asstt. Director General of Health Services (small pox) Ministry of Health and Family Welfare, Govt. of India, New Delhi
2. Dr. S. C. Banerjee, Prof. and Head, Dept. of Prev. & Social Medicine M. L. N. Medical College, Allahabad, Up.
3. Dr. B.C. Ghoshal, Asstt. Director General of Health Services Ministry of Health & Family Welfare, Govt. of India, New Delhi.
4. Dr. N. K. Sinha, Dy. Director (Health) Railway Board Ministry of Railways, Board Ministry of Railways, Govt. of India, Rail Bhavan, New Delhi
5. Dr. A. A. Contractor, Asstt. Director of Health Services Govt. of Gujrat, New Civil Hospital, Ahmedabad.

Agenda No 9. Consideration and rati-

fication of the resolution put forward by the individual member.

A resolution was received from the President, IPHA West Bengal State Branch regarding the backlog payment of membership subscription from the defaulter members who could not pay their membership subscription as the Branch had virtually ceased to function. This point was discussed and it was desired that defaulter members may start paying their membership subscription from the current year i.e. from 1979, since there is no admission fee, so no extra charges are required to be paid by them. It was also made clear that such members would not get the IPHA Journal of the previous years for which they have not paid membership fee.

Agenda No. 10 To consider the progress about the formation of Federation of Public Health Associations in India.

The General Secretary informed the house that as per the recommendations of the Sub-committee of the Federation of Public Health Associations, the different Associations viz. Indian Society for Malaria and other Communicable Diseases, New Delhi ; Indian Association for Communicable Diseases, Bombay ; Indian Association of Preventive and Social Medicine, Varanasi ; Indian Association of Occupational Health etc were approached for merger under the Federation The following two Associations had expressed their willingness to join the Federation.

1. Indian Association for Communicable Diseases, Bombay.
2. Indian Soceity for Malaria and other Communicable Diseases, New Delhi.

The premises of the National Institute of Comm. Diseases, Delhi was offered for holding the conference. A meeting of the Central Council was, therefore, called by the President Dr. W. Mathur of the Indian Public Health Association on 6th May, 1978 at New Delhi. The Council at its meeting felt that preliminary arrangements for holding such a conference in Delhi be made in December, 1978. Dr. S. K. Sen Gupta, Asstt. Director General of Health Services, New Delhi was requested to function as a Convenor. The proposed meeting for the formation of a Federation to be held in Delhi during December, 1978 could not be materialised as some of the Associations had already announced the date and venue of their conferences. As the venue was other than Delhi and due to the lack of timely communications, the offer of the Maharastra State Branch of the IPHA for holding the 23rd annual conference at Aurangabad, during January, 1979 was agreed upon.

The General Secretary also informed that during the Conference Indian Association for Communicable Diseases (Bombay) held at Calcutta in the month of December, 1978, he had a detailed discussion with the General Secretary, Dr. S.A. Kamat and the President, Dr. Sushila Nayar of the above Association regarding the formation of the Federation. He was informed by Dr. Nayar that she was interested in the first instanceto merge the two Communicable Diseases Associations of Bombay and New Delhi. She further told that after effective merger of the above two Associations they would think of formation of Federation. On the advice of Dr. Nayar, the President of the IPHA, Dr. W. Mathur was informed to be in touch with the NICD officials and to

attend the proposed merger meeting so that further action in formation of the Federation is taken.

Agenda No. 11. To announce the office bearers and 2 members representing in the Central Council from various state/local Branches of the Association for 1979-80.

The General Secretary informed the house that out of 15 state/local branches, only five branches had forwarded the list of the office bearers and names of 2 members representing in the Central Council of the Headquarters office. They are as follows :—

1. DELHI STATE BRANCH

President—Col. Barkat Narain
Secretary—Dr. (Mrs.) Prabha Malhotra
Jt. Secretary—Dr. M. Dutta
Treasurer—Dr. R.N. Basu

Members representing in the Central Council

1. Dr. R. N. Basu
2. Dr. A. C. Basu

2. TAMILNADU STATE BRANCH

President—Dr. V. Kapali
Vice-president—Dr. (Mrs.) R. Visalakshi
Secretary—Dr. B. Padmanabhan
Jt. Secretary—Dr. K. Veera Raghvan
Treasurer—Dr. W.D. Chelladurai

Members representing in the Central Council

Dr. K.R. Jagganathan
Dr. B. R. Deshikachari

3. HISSAR LOCAL BRANCH

President—Dr. O. P. Gautam
Vice-president—Dr. D. S Kalra
Secretary—Dr. R. C. Kulshrestha
Treasurer—Dr. D. N. Bhargava

Members representing in the Central Council

1. Dr. D. S. Kalra
2. Dr. N. K. Chandiramani

4. ALLAHABAD LOCAL BRANCH

President—Dr. (Mrs) G. Thapa
Vice-president—Dr. S.K. Jain
Secretary—Dr. G. Singh
Treasurer—Dr. R.C. Pandey
Jt. Secretary—Dr. D.B. Ghosh

Members representing in the Central Council

1. Dr. D.B. Ghosh
2. Major A.K. Saxena

5. GUJRAT STATE BRANCH

President(Acting)—Dr. (Mrs) P. Varma
Vice-president—Dr. G.K. Trivedi
Secretary—Dr. R.D. Kachhia
Treasurer—Dr. P.C. Shah

Members representing in the Central Council

1. Dr. A.A. Contractor
2. Dr. P.C. Shah

Agenda No. 12. To approve and ratify the nomination for the Oration of 'late Dr. B. C. Dasgupta Memorial Oration Address' for 1979.

The General Body approved and ratified the recommendation of the Central Council for the following two names for the 'late Dr. B. C. Dasgupta Memorial Oration Address' for the year 1979. In case, the first nominee expresses her inability to give the Oration Address, the second nominee may be requested for the same. They are as follows :

1. Dr. (Mrs) Sushila Nayar, M.P.
   President, Kasturba Health Society, Sevagram, Wardha, Maharastra State.
2. Dr. S.C. Bagchi, Prof. of Preventive and Social Medicine, Magadh Medical College, Gaya, Bihar State.

Agenda No. 13. To approve and ratify the formation of Panel of Judges for scrutiny of the best paper (scientific) published in the IPHA Journal, Volume 22, 1978.

The General Body approved and ratified the recommendation of the Central Council for the panel consisting of the following judges for the scrutiny of the best Scientific paper for the Association Award, to be given at the time of the next i.e. 24th annual conference of the Association.

1. Dr. N. S. Deodhar, Director, All India Insti. of Hyg. & Public Health Calcutta.
2. Dr. S. M. Marwah, Prof. & Head, Dept. of Prov. & Social Medicine, Institute of Medical Sciences, Banaras Hindu University, Varanasi
3. Prof. S. C. Seal, 2 Fern Place, Calcutta.

Agenda No. 14. To approve and ratify the recommendations of the 23rd annual conference.

The General Body approved and ratified the recommendation of the Central Council for the formation of Sub-committee, consisting of the following two members, for preparation of draft recommendations of the 23rd annual conference of the Association. These recommendations after finalization, has to be circulated to all the Directors of Health Services State and Union Territories, Director General of i) Health Services, (ii) Armed Forces Medical Services, (iii) Health Railway Board, Govt. of India, New Delhi ; etc. for implementation. The members of the committee are as follows :—

1. Dr. G. A. Panse, Dy. Director of Health Services (Tuberculosis) Govt. of Maharastra, Bombay,
2. Dr. P. V. Sathe, Prof. & Head, Dept. of Prev. & Social Medicine Medical College, Aurangabad, Maharastra.

Agenda No. 15. To approve and ratify the appointment of Auditors for the year 1979.

The General Body approved and ratified the recommendations of the Central Council for the appointment of auditors, M/s. G. Basu & Co., Chartered Accountants, Calcutta, for auditing the Association's accounts for the year ending 31st December, 1979.

Agenda No. 16. To approve and ratify the date and venue, and subject for the scientific Session for the next (24th) annual conference of the Association.

The General Body approved and ratified the recommendation of the Central Council for the next annual conference (24th) to be hosted either one of the following three branches by of the Association :-

1. Allahabad Local Branch
2. Gujrat State Branch
3. Andhra Pradesh State Branch (this branch is under formation having its office at Hyderabad).

The General Body also approved and ratified the recommendation for the theme of the Scientific Session entitled — "Child Health Care—Through Sub-Centres".

Agenda No. 17. To consider any other item brought forth by the members with the permission of the chairman.

The General Secretary, with the permission of the chairman, put the following matters for approval and ratification, already recommended by the Central Council, regarding the membership fee in overseas countries and enhancement of annual subscription rate of IPHA journal. The General Secretary, Prof, Khanna informed the house that the member ship fee for overseas members is at par with the membership in India. Since the postage incurred in mailing the journal and other communication to them is more expensive and the cost of paper and printing charges have gone up considerably and with the increassed postal charges effective from June 1978, the General Body approved the following revised membership fee in overseas countries and rate of annual subcription of journal with effect from 1st January, 1980 respectively.

Membership fee in overseas countries—Ordinary from Rs. 20/- to 50/- per year Life membership fee from Rs. 200/- to 500/-. (effective from January, 1979)

Subscription to Journal (effective from January, 1980, Volume 24)

INDIA : from Rs. 25/- to Rs. 30/- per copy per year (single copy Rs. 7.50)

OVERSEAS : from Rs. 50/- to Rs. 60/- per copy per year (From US $ 7.00 to $ 10.00)

It was also decided that the enhanced rate would not be applicable to those subscribers who purchases a minimum of 100 copies and they would continue to be supplied at the existing rate i.e. at the rate of Rs. 25/- per copy per year.

The General Secretary also informed that the Central Council at its 57th ordinary meeting held on 30th December, 1978 at the Headquarters Office, Calcutta, had sanctioned a medical allowance of Rs. 8/- per month for Headquarters Office staff, Mr. R. N. Thakur, Accountant-cum-Clerk and Sri K.K. Banerjee, Peon to be given from the month of January, 1979 subject to he approval of the General Body. The General Body considered the recommendation of the Central Council regarding the medical allowance to the IPHA staff and approved the same.

The meeting, then, terminated with a vote of thanks to the chair.

Sd/- W. Mathur
Chairman
(President)

Sd/- P.N. Khanna
General Secretary

Indian Public Health Association
Headquarters Office, Calcutta.

INDIAN PUBLIC HEALTH ASSOCIATION

RESOLUTIONS PASSED

Recommendations of the 23rd Annual Conference of the Indian Public Health Association, held at Medical College, Aurangabad (Maharastra State) from January 27 to 29, 1979. The subject for the Scientific Sessions was — 'Para Medicals in Health Care'.

1. It has come to the notice of the Indian Public Health Association that a few State Governments have recently modified their rules regulating promotions of doctors already in service. Hitherto, a medical graduate or one with a Diploma in Public Health, after graduation, was considered eligible for higher posts, such as Joint Director, Director, with reference to his length of service and the cumulative experience gained by such Officer in the field. The modified proceedure adopted by a few State Governments demand that the Officer aspiring promotions as Deputy Director, Joint Director and Director should possess a Post-graduate degree. Post-graduate diploma is not considered as an adequate qualification. This entails a practical handicap in respect of those doctors possessing a Medical degree and a Diploma in Public Health. The Indian Public Health Association resolved that a uniform policy be adopted both by the Central and the State Governments and rules made flexible for regulating such promotions to higher Cadres in the hierarchy giving due weightage individual cases with reference to the total number of years in service without dogmatically insisting upon the acquisition of a Post-graduate degree.

2. The Indian Public Health Association endorses the efforts made during the year for setting up a common platform with other like minded Associations in the field of Community Health and recommends that the same be pursued in the interest attaining a high standard of health and quality of life for the entire population of the country.

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NOTES & NEWS

IMA College of General Practitioners is publishing a Journal under the title 'Continuing Education' which is nearing the completion of its second year of existence. This journal caters for the need of general practitioners in general and tries to cover as wide a field as possible and includes among its contents. Summaries, Comments, Quiz, Extracts, Problem solving, Views, News as well as specific problems.

The annual subscription of the continuing education bulletin is Rs. 15/- payable in advance and it includes the supply plus postage of 8 issues in every year. Six regular bi-monthly issues and two special issues, one in August as a mid year academic seminar number and one in December as the annual number.

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