

Public Health

Control of Environment by Engineering

By

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The concept of public health within the last two decades has undergone revolutionary changes, and it has been well-established that prevention of disease and promotion of positive health is not the responsibility of any one particular profession, but is the combined effort of Doctors, Scientists, Nurses, Engineers, Sanitarians and all workers in the field of Health Services.

It is true that modern advances in the method of medical immunisation have gone a long way toward increasing the resistance of man to a particular disease. One may use immunisation in an emergency to fight against an outbreak of cholera, typhoid, plague or dysentery, but the lasting protection against these diseases can be had only by protected water supply, hygienic disposal of human excreta, by ensuring that food is prepared and consumed under hygienic conditions without being contaminated by flies or human agencies; and by control of insects and rodents.

Similarly in the control of tuberculosis, lasting effects cannot be expected unless the housing condition is satisfactory.

A little over a hundred years ago, Sir Edwin Chadwick in 1842 in his Sanitary Report pointed out that prevention and control of communicable diseases depended on certain amenities like a continuous supply of water through pipes at a high pressure; disposal of liquid waste and human excreta by means of underground drainage system; disposal of garbage under sanitary conditions and drainage of storm water expeditiously.

The system which is generally known as the 'closed system' has been accepted internationally, and has been put to use in

urban areas to the extent of the financial ability of the countries concerned.

In the developed areas of the world, control and improvement of the environment with mass vaccination, draining of swamps, improvement in and control of insecticides, food sanitation, maternity and child health programmes, have resulted in dramatic decrease of morbidity and mortality.

But unfortunately nearly 2/3rd of the world's population still live under deplorable conditions of housing and sanitation, and India as a whole falls under this category.

The requirements of decent environment are many, but following are the basic elements.

1. The home and its surroundings should provide the family with shelter against sun, wind and rain. It should provide security of person and property. It should provide privacy, with protection against physical hazards and infection.

It should be so situated that chances of flooding either through precipitation or overflowing of rivers and streams, are unlikely.

The fulfilment of this objective is to be achieved by Town and Country Planning directives for houses to be constructed with materials suitable for the purpose and the region.

2. The next important element required for sustenance of human life, is water. People must have facilities for getting adequate supplies of safe water. This can be achieved through water supply controls.

3. Facilities for obtaining an adequate supply of nutritious food, milk and

beverages prepared and served under hygienic conditions. This is to be attained by food sanitation and by controlling markets, eating houses, dairies etc.

4. People should be able to work under comfortable conditions free from such hazards to health as dust, smoke, odours and germs. They should have adequate light and ventilation so that they can carry on their duties smoothly and efficiently.

We could achieve these through control of 'offensive' trades, and through engineering applied to Industrial Hygiene.

The waste products of the family, the community and the industry, would have to be collected and disposed of in a manner so as not to endanger the health of the public in any way. This can be achieved by collection and disposal of garbage by efficient removal agents e.g., the Municipality; by disposal of human excreta by means of sewerage and sewage treatment works.

The lakes, beaches, streams and water courses would have to be protected from pollution as these are generally used as sources of water supply for domestic purposes and recreational facilities.

People congregate in schools, at fairs and festivals; in railway stations and public vehicles. Chances of spreading of infection in these places are great. Vigilant control over the sanitation of the environment in these places is necessary.

The environment should be such as to be unfavourable for the growth of the seeds of diseases.

Rats, flies, fleas, sand flies and mosquitoes should find the environment unsuitable for them.

This object can be achieved through cleanliness, sunlight, drainage and chemicals; and through teaching the public.

When a person is ill he should be treated and nursed in an environment favourable to rapid recovery. This would be achieved through the establishment of high standards of hygiene and efficiency in hospitals, dispensaries, nursing homes.

These are some of the basic needs for

the control and improvement of environment. No country has yet succeeded in providing these facilities to every citizen to perfection; but progressive countries have achieved much—whereas underdeveloped countries like ours are striving to reach certain goals.

In urban areas such centralised facilities are possible, and in India, though progress has been slow, some attempt has been and is being made at present to improve and control community environment.

This however cannot be said of the rural areas where more than 80% of the total population of India live.

Though the basic principles of sanitary science apply, it must be recognised that under the present circumstances, centralised action is not feasible. What then is the answer to the problem? This is a challenge to the whole Health Service. The engineers and field workers will have to modify and adapt present health techniques and methods so as to make them cheaper and more acceptable. Measures, not merely to eliminate diseases, but to provide positive health for the people, together with concomitant recognition of the importance of social and mental, as well as physical well-being, will have to be found.

Public Health educators, doctors, nurses and sanitarians would have to obtain the people's participation in the Health Programme of the Country to break the chain of transmission of disease.

All people have the desire to live decently, with as little suffering as possible. I believe if we could approach the people in the right manner and see their point of view, it would not be so difficult to attain our objective.

One may question—these are primarily the functions of Engineers—Public Health Engineers. This is true as far as construction and maintenance of the works referred to above, are concerned. I can answer the question by quoting Mrs. U. Gupta, who in her talk to the Public Health Association of India stated,
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