Hepatitis outbreak highlights India's water infrastructure problem

by John Grauerholz, M.D.

An epidemic of hepatitis now raging through India's eastern Bihar state has claimed at least 210 lives, and another 11,000 persons are suffering from the disease. At least 205 villages in the districts of Singbhum, Ranchi, Palamu, and Chotanagar, have been hit with the disease because of contaminated water. The immediate cause, apparently, is a heat wave, which has dried up potable water supplies in the area.

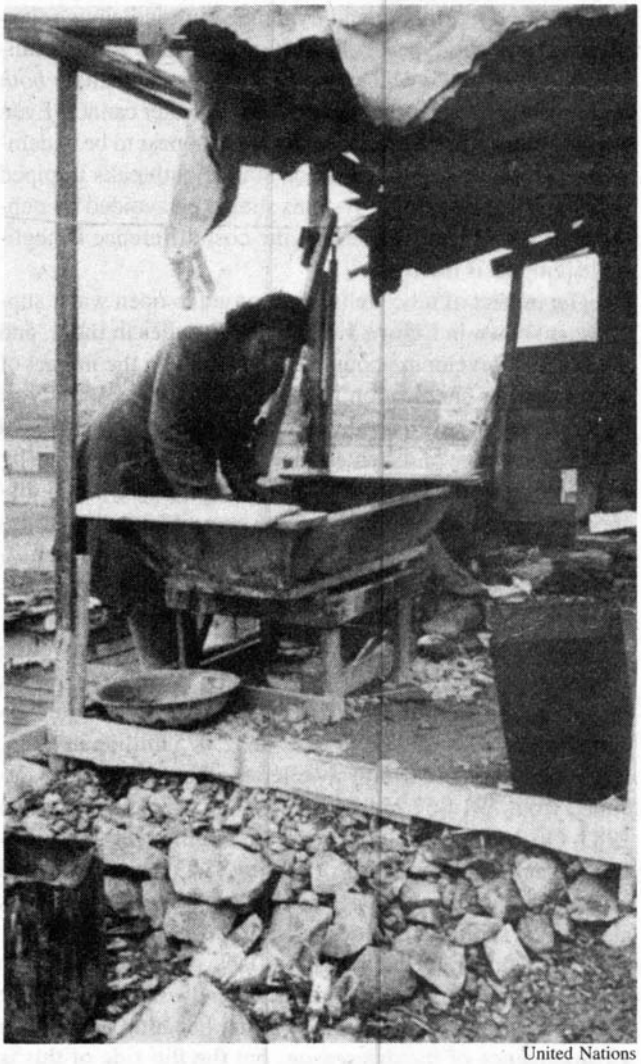
Bihar is no stranger to outbreaks of environmentally transmitted disease, having hosted outbreaks of Leishmaniasis in 1976, which subsequently grew into full-blown epidemics in 1977-78.

Rural villages are not the only places suffering from deficiencies in water supply and sanitation infrastructure. V. Ramalinpaswami, head of the Indian Council for Medical Research, told a science conference on Jan. 5, 1986 that up to half the people in big Indian cities are likely to be living in disease-ridden and unsanitary slums by the turn of the century. He said that millions of people were already prone to tuberculosis and worms because of overcrowding and open sewers. He noted that only one-third of India's 160 million urban dwellers have a drinking water supply or sanitary facilities. Forty percent of urban households live in one room. He said that India's estimated 13 million slum children are prone to lung infections, diarrhea, and malnutrition, and nearly one-third of all urban children under the age of nine do not attend school.

The common denominator: water

The common denominator in these situations is the lack of water. Ironically, by virtue of the majestic Himalayas, the highest mountain range in the world, the Indian subcontinent is blessed with some of the greatest water resources in the world, and older civilizations in India had highly developed water-management and irrigation systems. However, in the 19th century, under British colonial rule, the infrastructure and population of the subcontinent were depreciated to the point that the Ganges-Brahmaputra river delta served as the breeding ground for no fewer than seven cholera pandemics which swept around the world.

Water is essential to life. The human body is approximately 70% water, and while the average human can survive for weeks, and sometimes months, without food, total restriction of water will lead to death within one week. In addition to physiological requirements for consumption of water, water is essential for numerous hygienic functions,



United Nations

including washing of the body and its garments and assisting in the sanitary disposal of solid and liquid wastes. To a great extent, the growth and development of civilized societies has been predicated on the development of infrastructure and institutions designed to separate what we eat from what we excrete. When such institutions and infrastructure have deteriorated under cultural and economic collapse, the result has been epidemics of disease which accompanied the dénouement of that society.

Because of its role in both ingestion and excretion, as well as its importance to life processes of all sorts, water, while essential to life, may act as the vehicle for various disease agents which are inimical to life. According to a report prepared for the U.S. Agency for International Development entitled *Water and Human Health*:

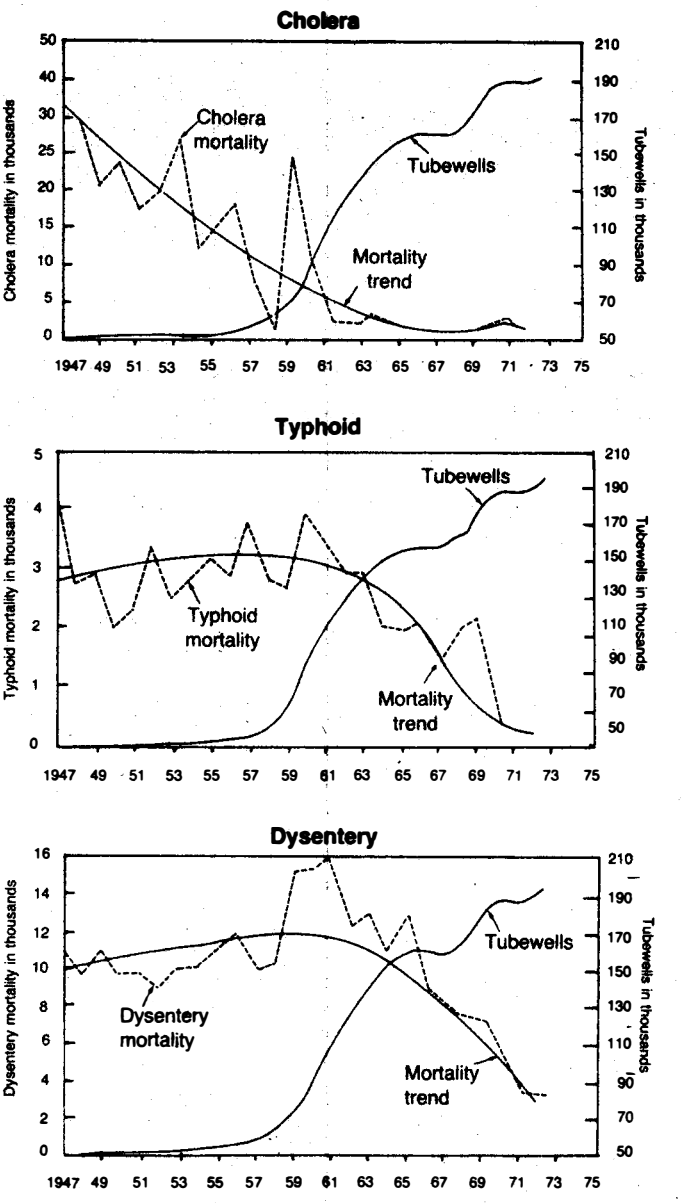
"Sufficient water must be available for hand washing, bathing, laundering, and cleaning of cooking and eating utensils. This quantity is needed in addition to that used for drinking. A fallacious argument is sometimes advanced that quantity of water is important, quality is not. Economically, only one water supply is often feasible; this must provide waters for *both* drinking and hygiene. With judicious selection and protection, particularly of groundwater sources, microbiologically safe water can often be found to satisfy *both* purposes: Even large quantities of unsafe water cannot. Even where waterborne transmission does not appear to be endemic, the epidemic risk of common source outbreaks in piped community water supply systems should be avoided by public agencies. In most instances, the cost difference is negligible [emphasis in original]."

The impact of tube wells, as opposed to open water supplies, is shown in **Figure 1.** Numerous studies in India, and many other developing countries, have shown the impact of sanitary water supplies on the level of disease. A study of water supply in seven rural villages in Uttar Pradesh showed that the incidence of dysentery declined by 76%, diarrhea by 77%, scabies by 98%, trachoma by 90%, and typhoid disappeared completely, when piped water was supplied to in-house taps. An earlier study in Uttar Pradesh found significant reductions in deaths from cholera, typhoid, dysenteries, and diarrhea, after the installation of water treatment plants.

The government of India has attempted to improve the supply of clean water to urban and rural populations. As a result, the number of urban dwellers without safe water declined from 44.24 million in 1970 to 32.075 million in 1983, while the number of rural dwellers without safe water declined from 391.667 million in 1970 to 287.553 million in 1983. On the other hand, whereas 16.5 million rural dwellers lacked sanitation facilities in 1970, by 1983 that number had increased to 114.3 million, and 425 million urban dwellers also lacked sanitary facilities in 1983.

The main problem in India is lack of infrastructure to manage the seasonal variations of water availabilty inherent in the monsoon rain pattern. The Bihar hepatitis outbreak is a consequence of the dry season, but the flip side of this is

FIGURE 1



outbreaks of cholera and other diarrheal diseases occasioned by flooding of water and waste-disposal systems during the rainy season. Thus, a combination of flood control, reservoirs, and irrigation is necessary to tap the agricultural potential of the water, while insuring a steady nonpolluted supply.

It is precisely in the ancestral home of the cholera pandemics that the potential for creating the necessary water-management infrastructure for the entire subcontinent exists. In 1972, Dr. K. L. Rao, once irrigation and power minister of India, drafted a comprehensive Ganges revitalization and Brahmaputra control plan. His plan looked forward to the production of an additional 1 billion tons of food grains

annually, eight times the present level, with 130 million hectares of land under cultivation. He foresaw at least 40 gigawatts of new hydroelectric capacity, compared to 5 gigawatts presently.

Drawing on Dr. Rao's plan, the Fusion Energy Foundation, in 1979, proposed modifications of the Ganges-Brahmaputra Canal proposal of Mitsubishi Industries Global Infrastructure Fund. The GIF proposal involves "damming the Sanpo river on the upper reaches of the Brahmaputra in the frontier area between China and the Indian province of Assam to make it flow into India through a tunnel across the Himalayas," and projects an annual hydroelectric generating capacity of 240 to 300 billion kilowatt hours.

It is only through this sort of comprehensive approach to water management, combined with the industrialization necessary to build such a project, that the required infrastructure to eliminate recurrent epidemics of infectious disease in the Indian subcontinent will exist.

In contrast, the United Nations inaugurated the International Water Supply and Sanitation Decade (1981-90) with the ostensible goal of providing available, readily accessible, safe, and reliable community sanitation and water supply by 1990. However, the provision of this water was to be made by low technology, clean-your-own-latrine sanitation, compatible with "primary health care," as defined by the 1978 WHO conference at Alma Ata in the U.S.S.R. Since water supply and sanitation are, by WHO and UNICEF definition, a component of "primary health care," this meant that no major capital investment in water or sanitary infrastructure would be made.

In a paper presented at a meeting on Health and Population in Developing Countries, Kenneth Warren, M.D. of the Rockefeller Foundation stated: "Proper sanitation and clean water make a substantial difference in the amount of disease in an area, *but the financial investment is enormous*. The success of such projects also depends on rigorous maintenance and alteration of engrained cultural habits." The ludicrousness of such a statement in regard to India, which was the home of highly developed industrial civilizations, prior to the depredations of the British, and which currently ranks behind only the United States and the Soviet Union in total number of Ph.D.s in science, needs little comment.

The basic premise underlying the WHO approach to the developing countries is that the populations of these countries are, in themselves, undesirable, and anything which would materially improve their existence, and thus increase their numbers, is anathema. There is little doubt that, historically, good water and sewer systems preserved and extended more lives than all the physicians who have populated this planet. Thus the emphasis on clean-your-own-latrine sanitation, in the guise of "primary health care," is a method of ensuring that the major water-management projects, such as the Ganges-Brahmaputra Canal proposal, necessary to actually deal with the disease and famine now rampant in the developing sector, will not come into existence.

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