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Perspective

Communicable diseases viewed as collateral damage: Role of primary prevention in their prevention and control

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Communicable disease incidence may be seen as ‘collateral damage’ of our choices or compulsions, whether it is our behavior, religious or ethnic group we belong to, occupation we indulge in, geographical area we live in or the genetic constitution we possess. Disease extent and pattern is, thus, contingent on various combinations of these determinants. Hence, a setting-based health promotion approach is relevant for their control.¹ Historically, many of the currently prevalent communicable diseases have resulted from domestication of animals. Many zoonoses/vector-borne diseases can be linked to our uninvited forays in to the forests. Similarly, diarrhea and other gastrointestinal diseases are the price we pay for ‘eating out’ (which itself is a collateral damage of affluence and development linked to working couples culture). The issue here is also of error of omission, i.e., a lack of enforcement of the food safety–related laws because the eating establishments are allowed to violate the food hygiene norms (substandard raw material, dirty premises, unhygienic food handlers, and poor food storage).

Soldiers across the globe, because of the nature of their field duties, are exposed to diseases such as scrub typhus, meningococcal infections, Ebola, Q fever and so on.² The famous Indian Armed Forces’ ‘Red Book’ also refers to the loss

of Napoleon's army because of louse-borne typhus.³ This happens despite the fact that, everywhere, army cantonments diligently practice health promotion, e.g., clean environment, good housing, physical fitness, good nutrition, and optimal medical care besides strict enforcement of discipline.

Hospital-acquired infection is the ‘collateral damage,’ which acts as a double-edged sword. Health personnel themselves are at the risk of acquiring infections as an occupational hazard. Patients also get nosocomial infections. Standard precautions can decrease it through washing of hands by health personnel before and after all patient and specimen contact; considering all laboratory specimens, blood and body fluids, as potentially infectious; wearing gloves; safe disposal of used syringes, vaccination of health personnel, and use of personal protective equipment by them. Infection control committee has an important role in this regard. Although hospitals strive for adherence to hygiene standards, it is the most neglected part of their infection control practices.

Similarly, for commoners, communicable diseases can be described as a ‘collateral damage’ of living in unhygienic environment and squalor. Given the poor state of civic amenities in India, every year, media often flashes headlines of outbreaks of diarrhea, typhoid, and jaundice in various states. What is puzzling is the response of the stakeholders to the situation. There is a lot of public pressure on the authorities for taking suitable remedial measures when such outbreaks occur. Often, expert advice of public health specialists is taken. Their response is usually confined to a quick survey, counting of cases, and collection of samples for laboratory tests. Their reports often include phrases such as (i) ‘chlorination was inadequate’ (ii) ‘... water had xyz organisms/

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100 ml'. This inexplicable and almost exclusive focus of public health specialists on 'diagnosis' is puzzling.

There is no use of 'circular epidemiology' approach of doing such surveys repeatedly, while the basic flaws in the system (slipshod civil engineering work—poor sewerage system and unsafe water supply) persist unchanged to cause yet another outbreak next year. Still, in public health, there is a lopsided emphasis on epidemiology. We have to understand that the locus of action is in health promotion arena (lobbying/advocacy/creating civic amenities/formulating laws/health education). Epidemiology is subservient to health promotion as a diagnostic tool to quantify and analyze the problem.

Rather than being translated into actionable decisions to serve the cause of humanity, epidemiology is usually (mis)used by public health experts to do the bidding of state health services. Very often, it is just used as a political tool, whenever reports of outbreaks of water-borne disease are there in media. Quite frequently, epidemiology focuses on suppressing the data, which is counterproductive. This happened in case of 'underreporting' of malaria in India, as quoted in *The Lancet* in 2010.⁴

If, in 2019, we assert that research is needed to justify safe water supply by proving that it was fecal contamination which led to a particular outbreak of diarrhea/jaundice, this is misuse of epidemiology. Safe water supply and sanitary waste disposal are inherently and esthetically desirable for ensuring good quality of life for citizens. It is their right.

As discussed, epidemiology mainly focuses on data collection and so on, presumably to give a semblance of some action being taken to be fed to the media (and the public). Even the focus of newspapers/TV debates about such outbreaks often remains on data only, and action is not given much emphasis. It should be remembered that public health is not a tool to be exploited by authorities to divert the attention of public and media from real issues, i.e., the deplorable condition of civic amenities.

A lip service, of course, is performed by mentioning 'health education' in ensuing debate. Actually, over the last 50 years or so, an impression has been created that whenever we talk about 'preventive medicine', we always recommend 'health education' as the solution (to be provided by our specialty) for every problem! The discussions do not clearly mention the role of civic authorities, town planners, or the engineers. Blame is mainly targeted at health-care providers/public health discipline.

As per health field theory, communicable diseases result from the interplay of host factors such as our genetic constitution and lifestyle, environment (containing the disease agent and facilitating its growth and spread), and access to medical services.⁵ Accordingly, there are three major health promotional approaches to their control, viz., improving host resistance by immunization and proper nutrition, promoting physical/mental fitness, and controlling the agent by environmental hygiene measures (air, water, food, housing, wastewater treatment, and garbage disposal) through sanitary engineering and vector control.

Primary prevention is the key for controlling communicable diseases by ensuring vaccination (measles/polio), sanitation and safe water supply (diarrheal and parasitic diseases), and early diagnosis and treatment (tuberculosis and malaria).

Public health law also has a definite role here by improving access of people to vaccinations, screening, and treatment. Law authorizes health administrators to use their power in epidemic situation by isolation of exposed people, closure of buildings in public place, and facilitating education of those at risk of infection.

In context of communicable diseases control, improved nutrition, personal hygiene, and public sanitation have a major role to play, even though vaccines and antibiotics have brought down related morbidity and mortality.⁹

Historically also, it has been seen that reduction of communicable diseases in Western countries was ascribed to the improved socioeconomic status and standards of living, rather than to any specific disease control program. So, to achieve similar success in developing countries such as India, the government has to provide basic civic amenities to ensure the minimum level of health for the masses. All these are long-term measures, which require heavy resource investment. Solution clearly lies more in non-health sectors. Amartya Sen had also lamented that government should focus on basic issues such as education, roads, electricity, and water supply. Sadly, even in 2019, people in India have not been assured of good quality civic amenities.⁶

However, despite all this evidence and theoretical knowledge, whenever communicable disease control is discussed, focus is on quick technical solutions such as immunization which includes MR vaccine (see *The Times of India*. '100s of Madrassas reject vaccination'. 21st December, 2018) or a new drug regime (like multidrug therapy for TB) without a mention of underlying social pathology such as poverty, poor civics, or lack of intersectoral co-ordination.⁷ Ensuring an environment free from communicable disease also requires elimination of breeding grounds for disease vectors through environmental hygiene. Control of infectious agents and their animal reservoirs also requires collaboration with veterinarians, entomologists, and toxicologists.

Besides this, peaceful existence is essential for sustenance of any semblance of communicable disease control. War or civil strife in any part of the world compromises all gains of special health campaigns. Even routine health services such as immunization are seriously disrupted.

Our national health policy gives due priority to immunization coverage and newer vaccines through Mission *Indradhanush*. It recognizes the interrelationship between communicable disease control programs and public health system strengthening. The policy advocates the need for districts to respond to the communicable disease priorities of their locality through the network of well-equipped laboratories backed by tertiary care centers and enhanced public health capacity to collect, analyze surveillance data, and respond to the disease outbreaks.

All said and done, we need not be complacent with our 'successes' such as eradication of small pox/poliomyelitis (impending); elimination of dracunculiasis, neonatal tetanus, leprosy, and yaws; and reduction in incidence of AIDS, malaria, kala azar, and so on.⁸ These just represent temporary victories (*Dil ko behlaane ko Ghalib ye khyaal achhchha hai!*).

We need to remember that, as far as microbes/vectors are concerned, they are much smarter than humans! Similar to 'rakthabeej', these resurrect to attack us yet again. If it was

bacterial diseases, which were the major health risks earlier, now it is viral diseases such as Ebola, SARS, Zika, and so on. Even use of modern techniques may not completely eradicate communicable diseases, e.g., use of biomarkers for screening blood donors by army hospitals.⁹ We should not harp on the 'survival of the fittest' philosophy. We should realize that communicable diseases result whenever there is imbalance in the optimal harmony between people and their environment favoring microbial dominance.

Nature may have the last laugh! After all, microbes/vectors are more in tune with Nature, which besides human beings, happens to be their ecological niche also. For communicable disease control, therefore, there is a need to create pathways for peaceful coexistence between people and the problematic environmental microbes, of course, with effective barriers.

So, the lesson that had to be learnt, at least for now, is that ad hoc solutions will not put a permanent check on communicable diseases. Rather, long-term sustainable solutions are needed through enhanced commitment by individuals, communities, and nations viewing the world as a global village. Public health specialists have to play a leadership role here academically and through action!

Finally, although we have won battles through science, the war on communicable disease is still on (*Jung zaari hai*)!

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