

## Social determinants of health: past, present and future

Health is always a major concern in the society at local, national and global level. Social determinants of health include conditions under which people are born, grow, live, work and age. The fundamental drivers of these are education, income and wealth, with a wide range of health outcomes (Braveman, P. and Gottlieb, L., *Public Health Rep. (Suppl. 2)*, 2014, **129**).

The 19th century founders of social medicine observed a strong association between poverty and ill-health in terms of sanitation, housing, nutrition and working conditions of the poor. We need to focus on socio-cultural factors of all societies to provide good health.

In the *past*, communicable diseases were the major cause of illnesses like small pox, polio, tetanus, diphtheria, etc. Now, leprosy has been nearly eliminated and measles is on decrease. This achievement was possible with improvement in the healthcare system, hygiene, nutrition, potable water and societal education (McMichael, A. J., *N. Engl. J. Med.*, 2013, **368**, 14).

It is a fact that health and wealth are interrelated. A healthy population can undoubtedly contribute to economic growth and development of a country and with good wealth one can receive quality healthcare and mitigate the risk factors for diseases. No country will progress with illiteracy and ill-health.

India accounts for a relatively large share of the world's disease burden; the country is undergoing an epidemiological transition period from communicable diseases moving towards non-communicable disease burden. According to the Indian Council of Medical Research (ICMR), communicable maternal, neonatal and nutritional diseases have dropped from 61% to 33% between 1990 and 2016. In the same period, the disease burden from non-communicable diseases has increased from 30% to 55%. However, the epidemiological transition varies widely among various Indian states: 48% to 75% for non-communicable diseases, 14% to 43% to infectious diseases and 9% to 11% for injuries (Directorate General of Health Services, Ministry of Health and Family Welfare, WHO Collaborating Centre on Family of International Classifications (ICD-10, ICF and ICHI, National Health Profile 2018, 13th Issue).

For example, while considering social determinants of health in relation to mortality from acute respiratory

infections, we have achieved reduction by 47% between 2000 and 2015 according to a report by UNICEF. We have mainly tackled the risk factors for acute respiratory infections (pneumonia) like educating society, in particular, young mothers on child-care practices, poor sanitation, parental smoking, indoor air pollution, nutritional values, breast feeding for more than six months, vaccination for measles and pertussis, focusing on social groups like SC, ST and other backward classes of the society, and early clinical diagnosis by community health workers as well as use of simple, less expensive antibiotics with follow-up (Paramesh, H., *Indian J. Pract. Paediatr.*, 1994, **2**, 4954).

*Presently* we are facing health problems due to non-communicable diseases. Allergic rhinitis, asthma and skin allergy are the earliest onset non-communicable chronic lung diseases due to environment pollution, with tremendous global psycho-socio-economic health burden.

Asthma is a global epidemic. According to the WHO data of 2015, 1 billion people are suffering from asthma, and this number is predicted to go up to 4 billion by 2050.

Why are we suffering from more allergies now. There are two main reasons: (1) We are losing the threshold of protection – by moving away from the protective germs in our environment; due to changes in our traditional diet, and adopting the Western lifestyle. (2) Higher exposure to triggers – due to indoor and outdoor air pollution; increase in viral respiratory infections by rhinovirus, parainfluenza and respiratory syncytial virus; less access to healthcare facilities and other socio-economic problems (*Global Atlas of Allergy*, 2014; [www.eaaci.org](http://www.eaaci.org)).

Air pollution, global warming and climate change are interrelated, and are the major contributing factors for illness. There has been significant increase in carbon dioxide emission since mid-1800s after industrialization, deforestation, burning of fossil fuel, coal and petroleum, automobile emissions and intense animal agriculture to meet the needs of non-vegetarian diets, thus contributing significantly to global warming.

Currently our concern is on suspended particulate matter (SPM) of 2.5  $\mu\text{m}$ , tobacco smoke and ozone depletion from air pollution. SPM not only produces inflammation

of the respiratory tract by oxidative stress in the airways, but SPM of 2.5  $\mu\text{m}$  quickly crosses the lung interstitium into the blood stream, thus causing non-pulmonary diseases like coagulation, blood pressure, cardiovascular diseases, insulin resistance, diabetes, cancer, decrease in cognitive functions, attention deficit or hyperactivity, autism in children, dementia in adults, sudden infant death syndrome and Alzheimer's disease (Philip, J. L. *et al.*, *The Lancet Commission on Pollution and Health*, vol. 391, no. 10119).

According to global estimates, deaths by pollution risk factors between 2005 and 2015 included nearly 6.5 million people by air pollution, 2.5 million by water pollution, 1–1.5 million by occupational hazard and 1% death owing to soil, chemical and metal pollution.

Our aim is to stop the aggressive war on bacteria by avoiding strong soaps and detergents which weaken our immune system by killing the protective germs. We must encourage children to play outside, and follow traditional food habits. We must restrict the usage of fossil fuels and find alternative sources of energy, maintain green places and create satellite towns. This will help control asthma symptoms and improve the quality of life (Paramesh, H., *Indian J. Pediatr.*, 2018, **85**(4), 284–294).

One can anticipate the exacerbation of existing diseases. In *future* it will widen the gap regarding health quality within and between countries, if no measures are taken. Morbidity and mortality will increase due to: (a) The extreme weather-related health effects – heat stress, COPD, cardiovascular failure, injuries, fatalities; (b) Psychosocial impacts on displaced population: anxiety post-traumatic stress, depression from disposition; (c) Health impact from conflicts: forced migration, civil conflict, and chemical pollution, which would be a major global health burden from womb to tomb, because the effects of chemical pollution on human health are poorly understood.

More than 140,000 new chemicals and pesticides have been synthesized since 1950. About 5000 of these are produced in bulk and widely dispersed in the environment. Fewer than 50% of these bulk-produced chemicals has undergone any testing for safety or toxicity, and pre-market evaluation. The historical examples are lead, asbestos, DDT, PCBs and CFCs. Newer synthetic chemicals cause developmental neurotoxic effects, and promote endocrine disruptors.

The millennium development goals from social determinants have been replaced by sustainable development goals (SDGs) as the guidelines for coordinating global actions. We need to focus on teaching of indigenous

cultures and traditional knowledge with availability, acceptability and affordability. A variety of world views is necessary for mental, psychosocial, physical, spiritual and emotional health, and to understand that a relationship with the earth and our social environment is essential for achieving health at all levels.

The promotion of health continues to stimulate professionals to work together in order to change the policies and practices towards addressing the health inequities involving the following multiple strategies (Paramesh, H., *NIJP Index Carpernicus Int.*, 2016, **5**(4), 180–182): Create healthy public policies where health promoters work at all political levels; Create supportive environment which includes social, economic, physical, multinational environments and ecological determinants; Strengthen community action involving individuals and communities, both urban and rural areas at all levels; Develop personal skills: health education, communication and health literacy with evaluation of social media; Reorient health service – public, private participation in healthcare, and allocate funds in prevention of disease than only curing few diseases.

WHO has added a transformational approach to sustainable development of health – by making the public voice heard by policy makers; focus on prevention; target the sector for air pollution, polluting fuels, inefficient technologies; meet the target of the Paris agreement on climate change – energy, public transport, diet; focus on hygiene, sanitation, water; reduce radiation and radon; chemical safety; safety in workplaces; be prepared for any emergencies and good governance (WHO Health, Environment and Climate Change EB144/15, 5 December 2018).

WHO also focuses on triple billion targets to save 30 million lives, 100 million healthy life years and 2–4% economic growth in low and middle income countries (WHO EB144/5, 13 December 2018).

If all stakeholders follow the WHO guidelines with sincerity while thinking and acting locally and propagating good results globally, we can achieve our SDGs on health by 2030.

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