



CLEANLINESS

Success in Water Borne Diseases

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Received September 3, 2018

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“We can no more gain God’s blessing with an unclean body than with an unclean mind. A clean body cannot reside in an unclean city.”

– Mahatma Gandhi

“So long as you do not take the broom and the bucket in your hands, you cannot make your towns and cities clean.”

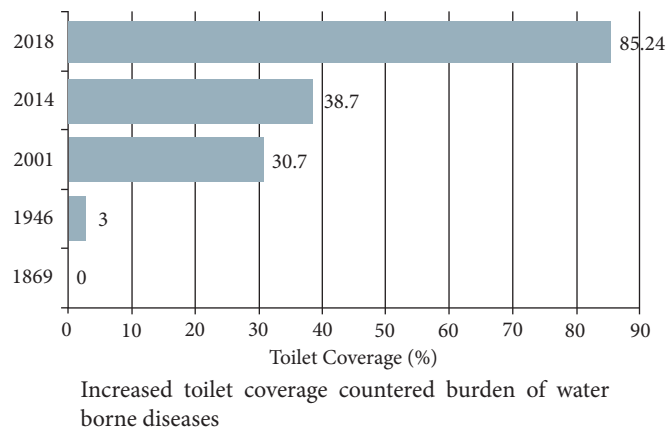
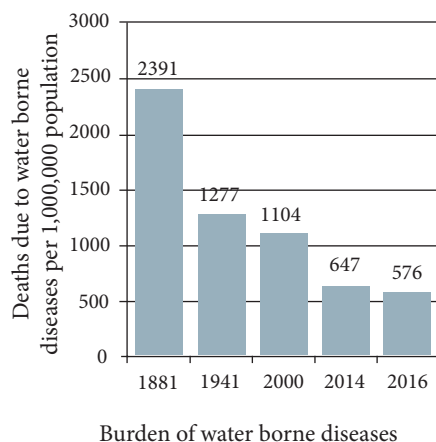
– Mahatma Gandhi

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In his book *Key to Health*, Mahatma Gandhi mentioned the importance of the quality of air, potable water, and food habits, in making a person healthy. He realized that the poor state of sanitation and cleanliness, and the lack of adequate toilets in rural India needed as much attention as his efforts towards the attainment of Swaraj. He proclaimed that unless “we rid ourselves of our dirty habits and have improved latrines, Swaraj can have no value for us.” [CW 14:56–58] His struggle for sanitation and cleanliness paralleled his endeavours to achieve Swaraj.

He observed that the people were unaware of the benefits of hygienic practices and hence they suffered from several diseases. The state of Indian villages disappointed him terribly. He felt the need to educate people about health and hygiene. He emphasized on

the consumption of ‘pure’ boiled water to avoid enteric infections. He was well aware of the fact that despite his advice, millions of people were forced to drink “impure water” due to the lack of infrastructure or resources. Unhygienic practices, lack of toilets and open air defecation were the major reasons for the occurrence and spread of diseases. For improving sanitation, he constituted a committee in South Africa, and later, in Ahmedabad, and had volunteers visit every residence, educating people about basic hygiene. The sight of untidy places of pilgrimage perturbed Gandhiji and led him to state that Indians needed to imitate western countries when it came to cleanliness. He was sharply focused on maintaining hygiene and sanitation in camps. In his books, Gandhiji narrated various ways of maintaining hygiene. The best solution he offered



TACKLING THE EPIDEMICS OF CHOLERA AND OTHER DIARRHEAL DISEASES

- Oral Rehydration Therapy through three tier approach
- Evidences for rotavirus vaccine inclusion in Immunization Program,
- Chlorinated water, 'Soraï' (narrow neck earthen pot) to prevent transmission of cholera
- Role of zinc and Vitamin A to prevent diarrhoea related morbidity
- New strain of cholera causing bacteria, *V. cholerae* O139
- Fluoroquinolones as a safe option for dysentery in children

was for every person to take charge of maintaining cleanliness, a dictum that he himself practised throughout his life. His ideas stay very relevant even in today's world, as we strive for healthy lives and well-being for all.

Cholera was a serious health problem particularly in colonial India, especially in places of pilgrimages and tourism which witnessed with mass agglomeration. The first cholera pandemic occurred in the Bengal region of India, near Calcutta (now Kolkata) from 1817 through 1824, and it was then dispersed to the rest of the world through trade routes. In the Imperial Gazetteer of India, W. W. Hunter reported more than 570,000 deaths annually (1881–90) attributable to cholera and other diarrhoeal diseases. ICMR-National Institute of Cholera and Enteric Diseases (ICMR-NICED), Kolkata, started its journey as the "Cholera Research Centre" way back in 1962, when there was a dire need for research on cholera and other diarrhoeal diseases. Since then, the centre has been involved in conducting trials for evaluating clinical efficacy

of alternative regimens and doses of therapeutics, efficacy of revised formulation of Oral Rehydration Solution (ORS), and efficacy trials of vaccines against cholera and other enteric infections. Both basic and applied clinical and epidemiological research have been carried out with equal emphasis. In 1968, the centre received the status of being an "International Reference Centre for *Vibrio* Phage Typing" from the World Health Organization (WHO) in view of its contribution to cholera phage research. In 1978, the centre earned the status of "WHO Collaborative Centre for Reference and Research on *Vibrios*" in recognition of the research work on *Vibrio* at the global level. In the year 1979, ICMR elevated this centre to a full-fledged research organization and renamed it the 'National Institute of Cholera & Enteric Diseases'. In 1980, this Institute was re-designated as the 'WHO Collaborative Centre for Research and Training on Diarrhoeal Diseases'.

With the development of modern infrastructure, improved diagnostics, state of the art research



Mahatma Gandhi getting ready to clean garbage, Wardha, Maharashtra, 1936. || Mahatma Gandhi instructing the cleaning squad, Segaon, Maharashtra, 1939.

laboratory and animal house facilities, ICMR-NICED has successfully carried out quality biomedical research, pursuant to the principles of Good Clinical Practice (GCP) and Good Laboratory Practice (GLP), and contributed significantly to national health programmes for the control of diarrhoeal diseases. One of the chief laurels of the Institute remains combating morbidity and mortality due to diarrhoea by generating awareness of ORS use and implementing Oral Rehydration Therapy (ORT) through the Department of Health and Family Welfare, Government of India. Recently, dictated by national and local needs, ICMR-NICED has further expanded the dimension of its research activities to other areas. These include research on typhoid, paratyphoid fever and gastritis; developing candidate enteric vaccines and rapid diagnostics for enteric diseases; addressing antimicrobial resistance through a search for alternative therapeutics; conducting efficacy trials for licensed enteric vaccines; viral hepatitis and vector-borne viral diseases; HIV/AIDS; environmental and climatic

drivers for diarrhoeal diseases; and surveillance of acute respiratory tract infections, including influenza. These efforts have resulted in valuable findings for improving public health.

ICMR-NICED will continue its journey towards achieving the Sustainable Development Goals (SDG), to ensure healthy lives and well-being for all, at all ages. This Institute routinely takes part in a wide spectrum of *Swachh Bharat Abhiyan* activities, involving school students, community workers, hospital staff, patient attendees and other key stakeholders. The Institute staff firmly believe in the philosophy of the Mahatma, which demands that everyone take charge of keeping their environment clean in order to have a clean body and mind, without which, healthy lives for all shall remain a distant dream.

The mandate of ICMR-NICED is conducting evidence-based research and developing policy directions to reduce the burden of diarrhoeal diseases, especially among under-five children. In the eighties and early nineties, several studies were undertaken by



ICMR-National Institute of Cholera and Enteric Diseases, Kolkata.

the researchers of ICMR-NICED to identify the factors contributing to the massive burden of diarrhoea in rural India. These studies were of immense importance, as they identified the benefits of chlorination of stored water; hand-washing practice of the mothers before feeding children; and the use of 'sorai', a narrow-neck earthenware pot for safe storage of drinking water to prevent the transmission of cholera, a feared disease of the time. Other risk behaviours like uncovered cooked food, uncovered stored water, not using soap for hand-washing and unhygienic excreta disposal were also found in families with children suffering from repeated bouts of diarrhoea. Advocacy for maintaining healthy personal behaviour and household hygiene, and contributing to the reduction of diarrhoeal disease burden have always remained the focus of field activities for the staff of this Institute. ICMR-NICED has worked to educate the mothers of young children to improve their knowledge, attitudes and practices (KAP) for ensuring personal as well as household hygiene.

ICMR-NICED has undertaken studies to evaluate alternative strategies for treatment and prevention of diarrhoea. In this regard, the Institute has played an important role in the relentless promotion of ORT in rural India, using the existing healthcare infrastructure, and leveraging community health workers as ORS providers. Another significant contribution of ICMR-NICED was in identifying the role of prophylactic supplementation of zinc and Vitamin A in preventing diarrhoea-related morbidity in under-five children.

Various treatment modalities of diarrhoea were compared at ICMR-NICED to determine the best

treatment options for diarrhoea, ensuring better outcomes in all patients.

In the late nineties, ICMR-NICED took a leading step by establishing a hospital-based diarrhoea surveillance system for the very first time in the country. The objective was to identify enteric pathogens causing acute watery diarrhoea, leading to hospitalization, and to determine their antimicrobial resistance profiles.

In 2006, the researchers attempted to identify the environmental determinants for the occurrence of diarrhoeal diseases in the coastal areas of West Bengal, to identify environmental markers for early warning signals for predicting the occurrence of diarrhoea outbreaks. The Institute is involved in community-based vaccine trials against cholera, typhoid, and rotaviral diseases; baseline research to estimate the disease burden is followed by efficacy determination of the respective vaccines in reducing the burden of the specific diseases in the community. The important areas where ICMR-NICED continues to work are in exploring the quality of drinking water, personal hygiene, good sanitation practices, including safe methods of waste disposal at the household level, promoting community awareness through education, and holding training camps. ICMR-NICED is focused on investigating various factors responsible for the transmission of enteric pathogens and taking appropriate actions to control the diarrhoeal disease burden in the community.

The *Swachh Bharat* Mission (SBM) has played a stellar role in tackling the menace of water-borne diseases. In a recent WHO report, it is estimated that this mission will result in averting more than 300,000 deaths (diarrhoea and protein-energy malnutrition) between 2014 and 2019. It is also mentioned that unsafe sanitation caused an estimated 199 million cases of diarrhoea annually before the start of the SBM in 2014. These have been gradually reducing, and will almost be eliminated when universal use of safe sanitation facilities is achieved by October 2019. That will indeed be a real tribute to the Father of Nation, Mahatma Gandhi, who throughout his life preached the need for sanitation and hygiene to avoid diseases.

FINANCIAL SUPPORT & SPONSORSHIP: *None*

CONFLICTS OF INTEREST: *None*

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Mahatma Gandhi, during his convalescence, walking with others on Juhu Beach, Bombay, December 1937.
Left: Dr. Sushila Nayyar; right: Gandhi's grandson Kahandas (Kanaa, Kanu).