

Report from the Field

Cite this article: Ganeshkumar P, Saigal R, Gopal B, Shankar H, Kaur P (2022) Provision of the continuum of care to noncommunicable diseases post-Floods in Kerala, India 2018. *Disaster Med Public Health Prep* **16**: 825–828 doi: <https://doi.org/10.1017/dmp.2020.461>.

First published online: 10 February 2021


Keywords:

emergency response; floods; noncommunicable diseases; primary health care

Corresponding authors:

Parasuraman Ganeshkumar,
Email: ganeshkumardr@gmail.com.

Provision of the Continuum of Care to Noncommunicable Diseases Post-Floods in Kerala, India 2018

Parasuraman Ganeshkumar MD¹ , Rontgen Saigal MBBS², Bipin Gopal MBBS², Hari Shankar MBBS DPH² and Prabhdeep Kaur DNB¹

¹ICMR, National Institute of Epidemiology, Chennai, India and ²Directorate of Health Services, Kerala, India

Abstract

Integrating noncommunicable disease (NCD) in health care delivery during emergency response posed a major challenge post-floods in Kerala. Kerala experienced an abnormally high rainfall during mid-2018 where more than 400 people lost their lives. State health officials and the Disaster Response Team were sensitized about the importance of including NCDs in the response action. More than 80% of patients with hypertension and diabetes were not under control in Kerala. Under the state NCD cell, an NCD expert group was consulted for drafting the treatment and referral strategies. Steps to tackle NCDs during the disaster response were formulated. The state NCD cell decided to integrate NCDs in the response measures. The technical guidance document by the World Health Organization South-East Asia Region was consulted to formulate actions. The activities were implemented in 6 steps: prioritizing of major NCDs, patient estimation and drug stock preparation, standard treatment protocol, mapping of referral facilities, public engagement, and daily reporting of NCD consultations. Prioritizing the continuum of care of NCDs during floods among the program managers and care providers was crucial. The health education and communication campaign was done to sensitize the known NCD patients to seek early care. Daily reporting of consultations was established.

During disasters, the functioning of a community at any scale is disrupted, which leads to human, material, economic, and environmental losses. Resilience is the ability of the system to resist, absorb, accommodate, adapt, transform, and recover from the losses due to a disaster in a timely and efficient manner.¹ A response is a vital action that is taken immediately after a disaster to save lives, reduce health impacts, and address the basic needs of the people who are affected. Traditionally, disaster responses had dealt with the prevention of communicable diseases. Recently, the inclusion of noncommunicable diseases (NCDs) in the disaster response has been given importance.^{2,3} Understanding this, the Office of World Health Organization South-East Asia Region (WHO SEAR) released a guidance document on the integration of NCD care in disaster response.² Through the global burden of NCDs, it has been shown that the low- and middle-income populations were affected the most. NCDs are responsible for 48% of premature deaths across countries, most being preventable. Among the premature deaths, 85% occurred in developing countries, including 41% in low- and middle-income countries.³ During disasters, NCD patients suffer due to disrupted medical facilities and limited access to medicines. Along with these issues, the difficulty in providing routine care to the patients further aggravates and precipitates complications. Kerala, a southern state of India, faced unprecedented floods throughout the state during the mid-2018. The population of the state is 33 million, comprising a high prevalence of people with uncontrolled hypertension and both type-1 and type-2 diabetes. These NCD patients were at risk of discontinuity in treatment and developing complications. This paper describes how we set up the continuum of care for NCDs in the disaster response.

Narrative

Kerala experienced an abnormally high rainfall from June 1, 2018, to August 19, 2018, which was about 42% above the normal.⁴ Because of this, 13 out of 14 districts faced severe floods. During these floods, more than 400 people had lost their lives and thousands of people were forced to displace from their homes.⁵ The health system was planning response strategies for tackling communicable diseases and restoring structural facilities during floods, which included the provision of safe water and sanitation measures. During the consultative meeting under the State Health Ministry, the Directorate of health services of Kerala and National Institute of

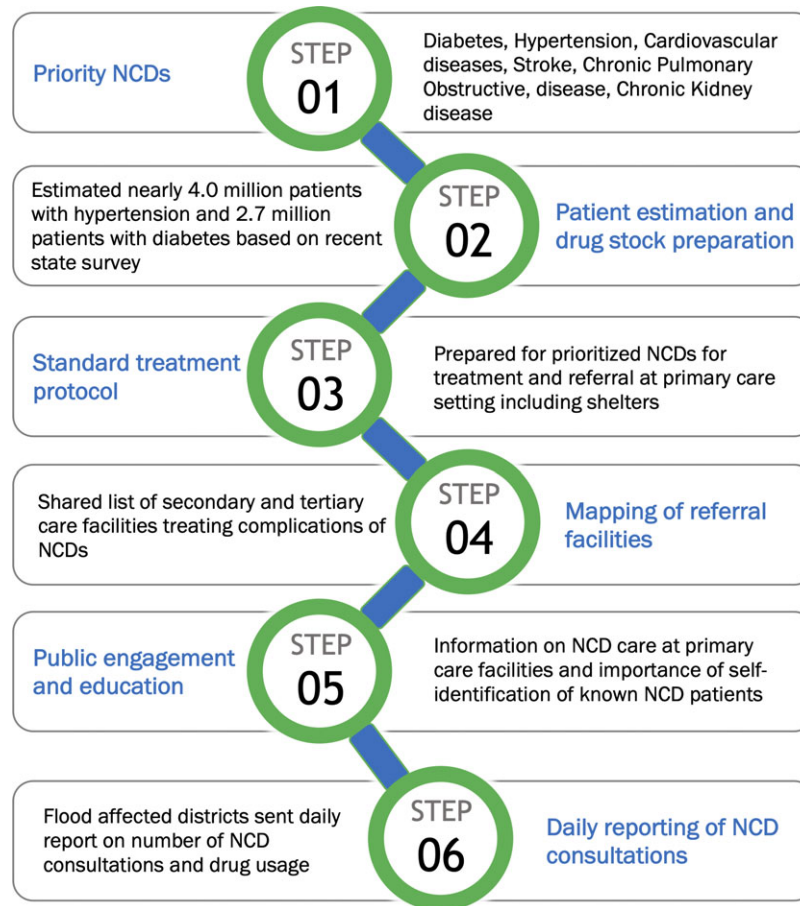


Figure 1. The 6-steps approach to address the care of noncommunicable diseases during floods.

Epidemiology (NIE) decided to integrate NCDs in the response measures. During the recent decade, Kerala recorded a rise in NCDs like diabetes, hypertension, coronary artery diseases.⁶ From a community-based survey conducted in Kerala, it was estimated that, on average, nearly 33% and 20% of adults in Kerala have hypertension and diabetes among adults over 18 years of age, respectively. More than 80% of patients with hypertension and diabetes were not under control in Kerala.⁷ WHO SEAR framed a technical guidance document² to integrate NCDs in the disaster response. This document was consulted and the recommendations considered were to (1) include NCD stakeholders in a crisis management group; (2) establish working groups for NCDs; and (c) ensure that NCDs are reported in situation reports and during disaster response. Adopting the above recommendations, a 6-steps approach (Figure 1) was designed to address the care of NCDs during floods.

Approach

On the first day of response (August 20, 2018), the state health officials and the Disaster Response Team were sensitized on the importance of including NCDs in the response action. The burden of major NCDs and their uncontrolled proportion was explained through State Representative Survey figures. Under the state NCD cell, an NCD expert group was formed. It comprised a cardiologist, a neurologist, a pulmonologist, an internal medicine specialist, a nephrologist, and an endocrinologist. This expert group was

consulted for drafting the treatment and referral strategies. NIE was part of the team in preparing the strategy for NCD care. Strategy planning for NCD care at the state NCD cell took 1 week of duration. Parallely, drug stocks were prepared for each district and supply was ensured. Residents from the India Field Epidemiology Training Program (FETP) of NIE were trained and deployed in 7 most flood-affected districts. Their major roles were sensitizing the district health system on addressing NCDs, informing the primary care providers on the standard treatment protocol, and including self-identification of existing NCD patients in the existing communication and education activities.

The planned 6 steps (see Figure 1) are (1) **priority NCDs**: After recommendation and consensus, 6 major NCDs were prioritized, which included diabetes, hypertension, cardiovascular disease (CVD), stroke, chronic obstructive pulmonary disease (COPD), chronic kidney disease (CKD); (2) **patient estimation and drug stock preparation**: The estimation was done by applying the proportion of patients with hypertension and diabetes obtained from recent survey findings⁷ to the adult population of each district. As per the calculation, there were 4.0 million patients with hypertension and 2.7 million patients with diabetes in the flood-affected regions. This rapid estimation helped prompt the health staff about the target number of patients with hypertension and diabetes to be reached and treated. Based on the number of patients per district, the required number of drugs for diabetes and hypertension was estimated and a 1-month drug supply was provided for each patient. To ensure drug availability, communication with the

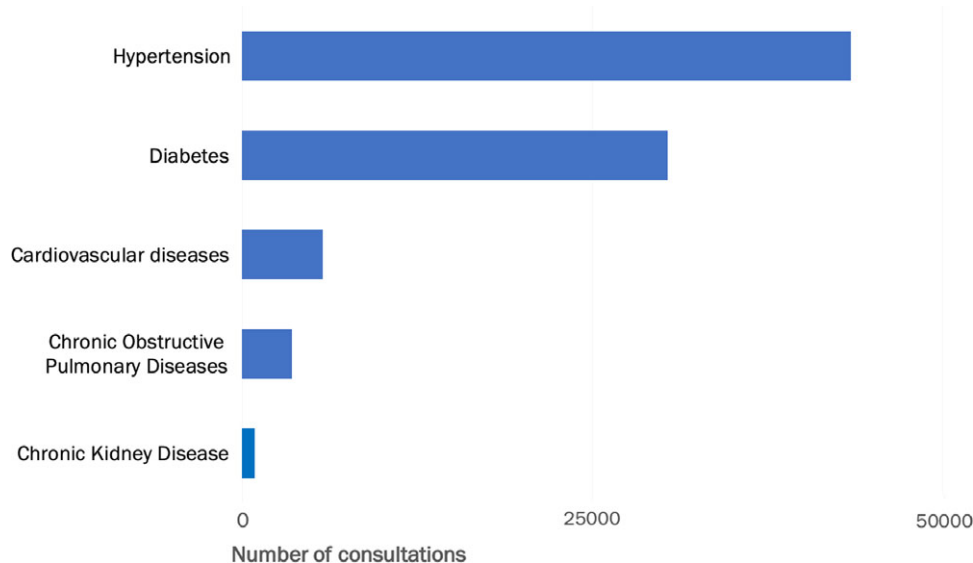


Figure 2. Consultations and major illnesses treated.

Central Drug Stock regarding the drug supply for each district was done; (3) **standard treatment protocol (STP) at primary care:** A 1-page STP was prepared for the priority NCDs at primary care. This STP was circulated to all the districts, both in hard and soft copy, through available communication channels. At the district level, FETP residents conceived a meeting with primary care physicians to train them on the STPs in coordination with the District NCD officer. As per the STP, patients were put on treatment and drugs were issued to them irrespective of the availability of the treatment cards; (4) **mapping of referral facilities:** secondary and tertiary facilities were mapped in each district for treating referral cases, including both functional private and public facilities. This list was shared with the primary health facilities through the district health administration; (v) **public engagement and education:** During the disaster response, constant information and education on the prevention of communicable disease were communicated through all existing media channels. These communications included self-identification of known NCDs like diabetes and information on the location of health facilities; and (vi) **daily reporting:** A reporting system was set up for NCD consultations during the disaster response using Google Sheets. Since the district health system was familiar with Google Sheets for reporting, it was understood that this method would be user-friendly as well as compatible with minimal data collection. The daily reporting sheet was designed for each district and was shared with them. These sheets were linked to the main Google Sheets, which was accessible at the state NCD cell. This enabled us to prepare a daily report of NCD consultations and referrals in each district. This daily report was shared with state officials for regular monitoring and necessary action. This NCD reporting was able to capture 105 229 consultations and 1798 referrals. Out of these consultations, hypertension ($n = 43\ 470$) and diabetes ($n = 30\ 368$) were the major illnesses treated (Figure 2).

Discussion

Many imperative lessons were learned while addressing NCDs during the disaster response. Sensitizing the incidental command system to integrate NCDs in the disaster response immediately

after emergencies was crucial. With the availability of the state representative data of Kerala on major NCDs, the number of patients at risk of discontinuation of treatment during floods could be estimated and highlighted. A uniform and simplified standard treatment and referral protocol on the major NCDs empowered the primary care physicians to prescribe and refer patients immediately. With the estimated numbers of patients, the required number of drugs as per standard treatment protocol was stocked in each district. In the disaster response phase, we witnessed intensified communication of information related to health, by the state government. We included the information on the availability of drugs for treating NCDs and the necessity of self-identification of known NCD patients at the nearest health facility. Standardized treatments along with the availability of drugs enabled the system to provide seamless NCD care. Most importantly, the drugs were provided to each patient for 30 days so that patients were under regular treatment. We perceived an averted occurrence of acute complications of NCDs. Encompassing the above, daily reporting of NCD consultations and referrals helped us monitor the progress of disaster response in each district. With prompt action, we accomplished the continuum of NCD care in all flood-affected districts. We briefed our actions and their successful outcomes regularly by sharing reports to the state health authorities. This was well commended in the public domain, and we believe this would have brought trust over the public health system among the general public.⁸ We consulted the viewpoint by Slama et al.,⁹ regarding the minimal adequate response to address NCDs in emergencies. Adopting that, NIE along with Kerala State NCD cell discussed to plan and prepare the guidelines on mitigation and preparedness of disaster response with integrated NCD care. This document would lay importance of including NCD care as part of the preparedness plan and NIE would continue to support the state government in implementing the same. NIE has commenced the advanced NCD Field epidemiology program for Kerala state health officers to strengthen the public health capacity of the state. This program provides a platform for both the institutes to discuss, appraise, and identify solutions to achieve the continuum of NCD care in the state.

Acknowledgments. We acknowledge the ICMR-NIE FETP residents Aarathree Renjith, Abishek S, Adalarasi K, Gurmeet Katoch, Hiten Banyal, Rubeshkumar Polani Chandrasekar, Saravana Kumar D, and Surya Prakash Gangwar who coordinated the steps in flood-affected districts. We thank Manoj Murhekar, Director ICMR – National Institute of Epidemiology; Rajeev Sadhanandham, Additional Chief Secretary, Kerala; and Sarita RL, Director of Health Services, Kerala, who supported and provided guidance.

Conflict(s) of Interest. The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this paper.

References

1. **UNISDR.** Terminology. 2020. <https://www.undrr.org/publication/2009-unisdr-terminology-disaster-risk-reduction>. Accessed April 22, 2019.
2. **World Health Organization.** Integration of NCD care in emergency response and preparedness. World Health Organization, Regional Office for South-East Asia. 2018. <http://www.who.int/iris/handle/10665/272964>. Accessed September 17, 2018.
3. **World Health Organization.** *Global action plan for the prevention and control of noncommunicable diseases 2013-2020*. Geneva, Switzerland: World Health Organization; 2013.
4. **Kerala floods of August 2018.** Study report. Central Water Commission Hydrological Studies Organisation Hydrology (S) Directorate, Government of India. 2018. <https://reliefweb.int/sites/reliefweb.int/files/resources/Rev-0.pdf>. Accessed April 23, 2019.
5. **Padma TV.** Mining and dams exacerbated devastating Kerala floods. *Nature*. 2018;561:13.
6. **Krishnan MN, Zachariah G, Venugopal K, et al.** Prevalence of coronary artery disease and its risk factors in Kerala, South India: a community-based cross-sectional study. *BMC Cardiovasc Disord*. 2016;16, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4712491/>. Accessed April 23, 2019.
7. **Prevention and control of non-communicable diseases in Kerala project report 2016-17.** Trivandrum, Kerala India. Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum and Kerala State Health Services Department. 2017. https://www.sctimst.ac.in/resources/Research_Report-Prevention_and_Control_of_NCDs_in_Kerala_2016-17.pdf. Accessed April 22, 2019.
8. **The Hindu.** Floods: success in treating NCDs. September 23, 2018. <https://www.thehindu.com/news/national/kerala/floods-success-in-treating-ncds/article25022497.ece>. Accessed June 2, 2019.
9. **Slama S, Kim H-J, Roglic G, et al.** Care of non-communicable diseases in emergencies. *Lancet*. 2017;389(10066):326–330.