

*Editorial*

# Nutritional Public Health in the Age of Climate Change and Digital Health

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Nutrition remains a cornerstone of both physical and mental well-being, and improving dietary behavior is among the most effective and accessible strategies to prevent disease and extend life. Nutritional public health operates at the intersection of population health, dietary practices, and nutritional status, emphasizing structural approaches such as policy development, education, and healthier food environments, alongside emerging innovations including precision nutrition and mobile health technologies. Among these, climate change has emerged as a critical and escalating determinant of nutritional health. Its effects extend beyond food production to influence disease patterns, dietary behaviors, and broader socio-economic conditions. Climate-related disruptions such as rising temperatures, unpredictable rainfall, and extreme weather events undermine agricultural productivity and reduce the availability and nutritional quality of food. These pressures exacerbate food insecurity and contribute to all forms of malnutrition. Importantly, climate change intensifies the “double burden” of malnutrition, where undernutrition in early life is linked to a higher risk of overweight, obesity, and non-communicable diseases (NCDs) later in life.<sup>(1)</sup>

The pathways through which climate change affects nutritional status are multiple and interconnected. Directly, it increases the risk of nutrition-related and infectious diseases, thereby impairing nutrient utilization. Indirectly, it alters dietary intake by affecting food availability, access, and feeding practices, while also disrupting livelihoods and food systems.<sup>(2)</sup> Environmental stressors such as heat exposure can suppress appetite and limit physical activity, further contributing to unhealthy weight gain and increased NCD risk. These impacts are particularly pronounced in vulnerable settings. For instance, countries like Indonesia face a dual challenge of high susceptibility to climate change and persistent child malnutrition, which together deepen health inequities.<sup>(2)</sup> The resulting increase in NCD burden also imposes significant economic and healthcare costs.<sup>(1)</sup>

Concurrently, the rapid advancement of digital health technologies is transforming the landscape of nutritional public health. Digital tools—including mobile applications, wearable devices, telemedicine, and artificial intelligence—enable more precise, scalable, and personalized approaches to nutrition care. These technologies support real-time dietary monitoring, enhance patient engagement, and facilitate long-term behavior change. They also allow healthcare providers to track progress, deliver tailored interventions, and manage chronic conditions more effectively. Evidence suggests that digital platforms can improve dietary adherence, promote physical activity, and contribute to better outcomes in weight

management and glycemetic control.<sup>(3)</sup>

The integration of digital health with personalized nutrition represents a particularly promising approach for addressing complex conditions such as obesity and diabetes.<sup>(4)</sup> In resource-limited settings, digital solutions can also expand access to nutrition education and healthcare services, helping to bridge existing gaps. However, these benefits are not without challenges. Issues related to digital access, literacy, data privacy, and equity must be addressed to ensure that technological advancements do not reinforce existing disparities. In this context, nutritional public health must evolve toward more comprehensive and adaptive strategies. Addressing climate-related nutritional risks requires resilient and sustainable food systems, supported by policies that promote dietary diversity, food security, and environmental stewardship. At the same time, strengthening digital infrastructure and fostering cross-sector collaboration will be essential to fully leverage technological innovations.

## Competing Interests

The authors declare no conflict of interest.

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