

Short Communication

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Early Warning Mechanism for Waterborne Diseases: Contribution of Food Technologies to Health Prevention

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ABSTRACT

Limited access to safe drinking water remains a major challenge in sub-Saharan Africa and is a direct cause of numerous waterborne diseases such as cholera, typhoid fever, and acute diarrhea. This article highlights the role of food and digital technologies in establishing early warning mechanisms capable of preventing these diseases. The proposed approach integrates water purification, safe food packaging, detection sensors, and mobile telephony as community alert vectors.

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Background and Issues

According to the WHO (2023), nearly 2 billion people worldwide consume contaminated water, resulting in more than 500,000 annual deaths related to waterborne diseases [1]. In Africa, vulnerability is increased by the lack of sanitation infrastructure and weak health surveillance. Current prevention mechanisms remain inadequate, as they rely on delayed interventions. Hence the need for a technological early warning system capable of anticipating and reducing risks in real time.

Role of Food Technologies in Prevention

- **Water Purification:** Biosand filters, chlorination, UV systems, and low-cost membranes.
- **Safe Packaging:** Smart packaging signaling contamination.
- **Sensors and IoT:** Pathogen detection devices integrated into health surveillance networks.
- **Chain of Custody:** Maintaining the quality of sensitive foodstuffs.

Proposed Alert Mechanism

An integrated mechanism is structured in four stages:

- **Monitoring:** Installation of water quality sensors and rapid tests in at-risk areas.
- **Transmission:** Sending data via mobile phone, SMS, or USSD applications accessible to rural communities.
- **Analysis:** Processing information using artificial intelligence to identify potential outbreaks.
- **Disseminating the Alert:** Notifying populations, health authorities, and local NGOs for a rapid response (chlorine distribution, awareness raising, medical interventions).

Challenges and Prospects

- Affordability of technological devices.
- Limited digital infrastructure in rural areas.
- Equipment durability and maintenance.

- Need for community training to ensure system ownership.

Conclusion

Waterborne diseases represent a major public health threat in Africa. Integrating food technologies into an early warning mechanism offers an innovative, effective solution adapted to local realities. This system could save thousands of lives each year, strengthen community resilience, and contribute to the Sustainable Development Goals, particularly SDG 6 (Clean water and sanitation) and SDG 3 (Good health and well-being) [2-4].

References

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