

RECENT ADVANCES IN PUBLIC HEALTHCARE AND HYGIENE: GLOBAL TRENDS WITH A PERSPECTIVE FROM UZBEKISTAN

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Abstract: Background; Public healthcare and hygiene are fundamental pillars of disease prevention and health promotion. In recent years, global health systems have undergone major transformation driven by technological innovation, policy reforms, and increased attention to sanitation and hygiene.

Objective; To review recent advances in public healthcare and hygiene globally, with a focus on developments in Uzbekistan.

Methods; A narrative review of literature and reports from international organizations between 2023 and 2025 was conducted, including publications from WHO, UNICEF, and regional agencies were used.

Results; Advances include digital health transformation, strengthened primary healthcare systems, and improved WASH strategies. Uzbekistan has made significant progress in healthcare reform, sanitation coverage, and hygiene promotion programs.

Conclusion; Global improvements are evident, but disparities persist. Uzbekistan demonstrates meaningful progress, though challenges remain in rural sanitation and long-term sustainability.

Key words: Public, Healthcare, Hygiene, Global Trends, Perspective

Introduction

Public healthcare has evolved from a reactive model to a preventive and community-centered system. Hygiene, once considered a basic intervention, is now recognized as a critical determinant of population health outcomes (1,2).

The COVID-19 pandemic further highlighted the importance of infection prevention, sanitation infrastructure, and resilient healthcare systems worldwide (2). Countries like Uzbekistan are actively reforming their healthcare systems to align with global standards (3).

The real challenge doesn't just lie in introducing hygiene measures but in creating lifelong habits amongst the general public. In addition to investing in infrastructure, the GHC is calling upon policy makers and relevant stakeholders to put more effort into effectively communicating information about when and how to adopt new hygiene behaviours. This messaging should be easy to understand, tailored to the specific target population and should encourage a lasting shift towards sustainable hygiene habits (4).

Global Advances in Public Healthcare

1. Strengthening Primary Healthcare Systems; Primary healthcare (PHC) has become the cornerstone of modern health systems. Global strategies now emphasize:1) Preventive care 2) Community engagement 3) Integrated service delivery

WHO reports indicate that strengthening PHC is essential for achieving universal health coverage (1).

2. Digital Health and e-Health Transformation; The integration of digital technologies has transformed healthcare delivery. Key innovations include: 1) Telemedicine 2) Electronic health records 3) AI-based disease surveillance. These tools improve access, efficiency, and real-time monitoring of public health systems (1,3).

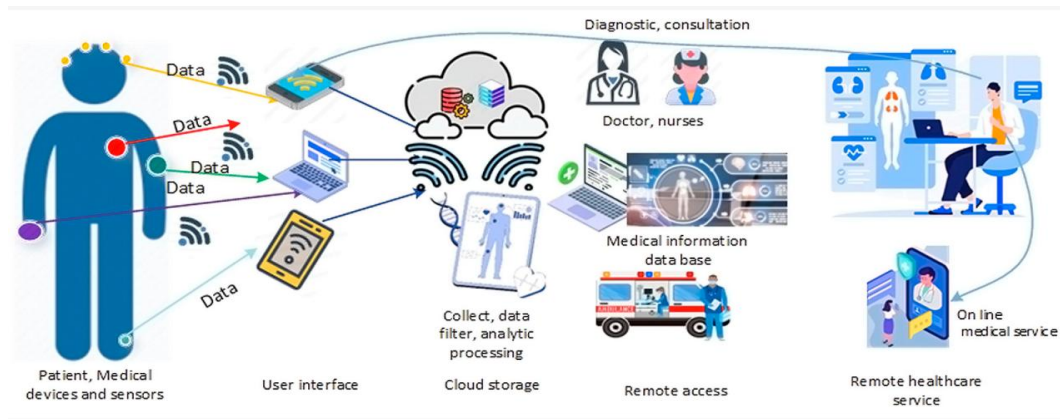


Fig:Real-time Disease Tracking using AI-based Surveillance Systems



Summary: Taiwan is improving rural health center access to dermatology, ENT, and ophthalmology specialists with the VSee telehealth platform + Advantech's mobile telemedicine cart solutions

3. Infection Prevention and Control (IPC); Post-pandemic strategies have reinforced infection control measures in healthcare settings. Improved hygiene practices, sterilization protocols, and antimicrobial stewardship programs have significantly reduced healthcare-associated infections (2). Copper, silver, zinc oxide, titanium and silver-doped titanium impregnated in textiles used by patients to reduce the microbial load of these textiles and/or the Hospital acquired infection rates



UV-C Light Disinfection Robots



Antimicrobial textiles

Advances in Hygiene and WASH

1. **WASH Integration in Healthcare;** Water, sanitation, and hygiene (WASH) have become integral components of healthcare delivery. WHO emphasizes that safe WASH practices are essential for quality care and patient safety (2).



Fig Hand hygiene monitoring

2. **Climate-Resilient Hygiene Systems;** Climate change has influenced sanitation strategies, leading to the development of: 1) Sustainable water supply systems 2) Resilient sanitation infrastructure 3) Improved waste management practices. These measures are crucial for maintaining hygiene standards during environmental challenges (8).

3. **Behavioral Change Strategies;** Modern hygiene programs focus on behavior change, including: 1) Hand hygiene campaigns 2) School-based interventions 3) Community awareness programs These approaches are essential for long-term sustainability of hygiene practices (2).

Public Healthcare and Hygiene in Uzbekistan

1. **Health System Reforms;** Uzbekistan has implemented major healthcare reforms aimed at improving accessibility and efficiency. These include strengthening primary healthcare, introducing digital systems, and improving financing mechanisms (3,5).

2. **Water and Sanitation Progress;** Significant progress has been made in improving access to water and sanitation: 1) 96.8% population access to improved drinking water 2) 93.6% access to improved sanitation. However, disparities persist, particularly in rural areas, and approximately 17.9% of the population lacks basic hand washing facilities (4).

3. **National Hygiene Initiatives;** The “Clean Hands” program launched in 2025 aims to improve hygiene practices and infrastructure across healthcare facilities and communities. It emphasizes hand hygiene promotion and sanitation upgrades (6,7).

4. **International Collaboration;** Uzbekistan has strengthened partnerships with international organizations, including WHO, UNICEF, and UNECE. The country’s participation in the Protocol on Water and Health highlights its commitment to improving public health standards (8,10).

Achievement and Challenges in Uzbekistan

Uzbekistan has made remarkable progress in public health and hygiene, especially in: Disease control, Maternal-child health, WASH infrastructure and Health system reforms.

Despite progress, several challenges remain: Rural-urban disparities in sanitation access (9), Climate-related water scarcity (8), Limited healthcare funding and high out-of-pocket expenditure (3,9), Need for sustained behavioral change in hygiene practices (2) and Non communicable diseases.

Discussion

Globally, public healthcare is shifting toward prevention, digitalization, and sustainability. Hygiene is increasingly recognized as a central component of health systems rather than a supplementary measure (1,2). Uzbekistan reflects this transition through strong policy reforms and infrastructure improvements. However, achieving equity in healthcare access and hygiene services remains a key challenge (3,9).

Future Perspectives; Future directions in public healthcare and hygiene include: Integration of artificial intelligence in disease surveillance, Expansion of climate-resilient WASH systems, Strengthening universal health coverage, Community-based hygiene promotion strategies.

Conclusion

Advances in public healthcare and hygiene highlight a global shift toward prevention, sustainability, and equity. Uzbekistan has made notable progress through reforms and targeted programs, yet continued investment and policy implementation are necessary to address remaining challenges and ensure long-term success (3,8,10).

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