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## On the occasion of world field epidemiology day; epidemiology of CKD around the world

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### ABSTRACT

World Field Epidemiology Day (WFED), observed annually on September 7, underscores the essential role of field epidemiologists in strengthening public health systems globally. Initiated by the training programs in epidemiology and public health interventions network, WFED aims to raise awareness about the contribution of field epidemiology training programs in preparing health systems for threats such as outbreaks, pandemics, and other emergencies. These epidemiologists are frontline health guardians who anticipate, detect, and control public health threats, thereby reinforcing global health security.

**Keywords:** Chronic kidney disease, Diabetes mellitus type 2, Hypertension, Obesity, Aging, Epidemiology

### Implication for health policy/practice/research/medical education:

World Field Epidemiology Day (WFED), observed annually on September 7, acknowledges the crucial role of field epidemiologists in safeguarding global population health. While WFED focuses on the broader field of epidemiology, chronic kidney disease is a significant global public health concern that epidemiologists help address.

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### Introduction

World Field Epidemiology Day (WFED) is observed on September 7 each year (1). It was established to raise awareness about the critical role of field epidemiologists who work on the front lines to protect public health by detecting, investigating, and responding to disease outbreaks and other health threats (2). The day recognizes the importance of in-service field epidemiology training programs worldwide, which improve global health security by building a skilled workforce capable of timely scientific public health actions (2). This initiative started in 2021 and is led by the training programs in

epidemiology and public health interventions network, involving institutions from over 60 countries (1). The day also emphasizes the need to strengthen health systems' preparedness and response capacities globally through the efforts of trained epidemiologists (3,4). Chronic kidney disease (CKD) affects a substantial portion of the global population (5). Its prevalence has increased markedly over recent decades, driven by demographic changes such as population growth and aging (6, 7). Chronic kidney disease is expected to become one of the leading causes of death worldwide in the coming decades (8). Recent findings show that CKD prevalence and mortality have

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risen globally, especially in low- and middle-income countries where healthcare access is limited (9). Diabetes mellitus type 2 and hypertension are the primary risk factors contributing to most CKD cases and associated disabilities (10). Aging populations also experience higher CKD rates, with elderly individuals bearing a disproportionate burden of disease and complications (11). Therefore, early detection and effective management of CKD risk factors like diabetes and hypertension are crucial to reducing its global impact (12). Enhancing data collection and surveillance systems is equally important for monitoring CKD trends and implementing timely interventions (13). Additionally, health policies tailored to regional CKD burdens and available resources are necessary to optimize prevention and treatment strategies (14,15).

### Method of the search

To identify relevant literature for this narrative review, we searched multiple electronic databases—PubMed, Scopus, Embase, Web of Science, EBSCO, DOAJ, and Google Scholar—using keywords such as chronic kidney disease, type 2 diabetes mellitus, hypertension, obesity, aging, and epidemiology

### WFED and chronic kidney disease

The teamwork of WFED with CKD is found primarily in how field epidemiologists contribute to understanding and managing CKD within the broader public health framework (5, 16). Chronic kidney disease is a growing global health concern characterized by long-term kidney function decline that often progresses silently until advanced stages (17). Epidemiological surveillance, characterization of risk factors, and intervention design are critical in addressing CKD at population and policy levels (13, 18). Field epidemiologists, through their training and roles, conduct essential activities such as disease surveillance, risk factor analysis, outbreak investigation, and implementation of preventative strategies that can be directly applied to chronic disease management, including CKD (19, 20). Field epidemiology's role in CKD includes tracking prevalence and incidence, identifying environmental and occupational risk factors (such as exposure to nephrotoxic agents), and evaluating interventions aimed at reducing CKD progression or complications (21, 22). Given that CKD often coexists with other non-communicable diseases like diabetes and hypertension, conditions frequently analyzed by epidemiologists, field epidemiology programs can extend their surveillance and research competencies toward CKD (5, 23). For example, epidemiologists contribute to detecting regional clusters of CKD of unknown origin, as an emerging public health challenge in specific parts of the world, and can inform targeted public health responses (24). Moreover, the epidemiological principles championed on WFED support evidence-based policymaking crucial to CKD

prevention and control (25,26). Effective public health responses depend on trained epidemiologists to interpret data accurately, guide resource allocation, and advocate for population-level interventions such as improved water quality, reduction of environmental toxins, and health education campaigns that are vital to CKD mitigation (21,27). In summary, while WFED is focused broadly on public health emergencies and infectious diseases, the principles and workforce it highlights are highly relevant to chronic disease epidemiology, including CKD (1,16). Field epidemiologists trained and celebrated on WFED contribute significantly to CKD through disease surveillance, risk factor identification, outbreak investigation of environmental nephrotoxins, and informing health policies (1, 20). Their role is critical to advancing population health and improving outcomes for diseases like CKD that require coordinated public health action (16).

### Collaboration in addressing CKD

Epidemiological techniques are vital for identifying, evaluating, and addressing CKD (28). Organizations such as the International Society of Nephrology (ISN) and the International Federation of Kidney Foundations (IFKF) jointly launch world kidney day, celebrated annually on the second Thursday of March, to raise awareness about CKD and advocate for early detection and prevention (16, 29). For instance, World kidney day 2014 focused on CKD and aging, highlighting the increasing prevalence in older populations (30). The Centers for Disease Control and Prevention (CDC) also maintains a kidney disease surveillance system to inform and stimulate public health action regarding kidney disease (13, 31). The field epidemiology sites are also part of a new consortium called chronic kidney disease of uncertain etiology (CKDu) in agricultural communities (CURE), focusing on forms of CKD not attributable to known causes (32). In fact, CKD epidemiology requires ongoing and enhanced surveillance efforts, particularly in regions experiencing shifts in risk factor profiles (5, 16). The global burden of CKD continues to rise, driven by increasing prevalence of key contributors such as diabetes, hypertension, obesity, and aging populations (6). This dynamic landscape underscores the importance of continuous epidemiological monitoring to detect emerging trends and identify high-risk populations early (16, 33). Effective management of known risk factors remains the cornerstone of CKD prevention and progression delay (34). For instance, strict control of high blood pressure and diabetes through lifestyle modification, pharmacotherapy, and regular clinical follow-up can significantly reduce CKD incidence and slow disease progression (35). Moreover, systematic screening programs aimed at early detection in vulnerable groups, comprising those with a family history of kidney disease, the elderly, or individuals with comorbidities play a critical role in improving outcomes by enabling timely

intervention (36,37). Epidemiological data also emphasize the heterogeneity of CKD across different regions, age groups, and etiologies (5, 11). For example, certain geographic regions may exhibit higher rates of CKD attributed to specific environmental or infectious factors, while others see increasing cases linked to lifestyle-related diseases such as diabetes and hypertension (38). Age-related risk is particularly important, as older adults typically have higher CKD prevalence and different clinical management needs (39, 40). Understanding these variations is essential for the development of targeted health policies and resource allocation strategies that maximize healthcare efficiency and cost-effectiveness (15,41).

## Conclusion

CKD epidemiology requires continued surveillance, especially in regions with emerging risk factor profiles; since, effective risk factor management like high blood pressure or diabetes control, screening, and early intervention are critical for reducing the global CKD burden. Notably, epidemiological data supports the need for targeted policies considering age, region, and underlying causes to optimize resource allocation and healthcare delivery. Therefore, sustained epidemiological surveillance integrated with risk factor management, early screening, and tailored public health policies are indispensable for addressing the global CKD burden. This approach facilitates optimized healthcare delivery and supports the goal of reducing CKD-related morbidity and mortality worldwide.

## Authors' contribution

**Conceptualization:** Mekhribon Yusupova and Bakhodirjon Samadov.

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**Writing—original draft:** All authors.

**Writing—review and editing:** All authors.

## Conflicts of interest

The authors declare that they have no competing interests.

## Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors utilized Perplexity.ai to refine grammar points and language style in writing. Subsequently, the authors thoroughly reviewed and edited the content as necessary, assuming full responsibility for the publication's content.

## Ethical issues

Ethical issues (including plagiarism, data fabrication, and double publication) have been completely observed by the authors.

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