Article Title: Temporal trends in the prevalence of urinary tract infections among women of childbearing age in global (1990-2019)

Running Title: prevalence of UTIs in childbearing women

Authors:

Zhouting Tuo[1, *], Ruicheng Wu[2, *], Jie Wang[2, *], Dexiong Li[2, &], Mang Ke[3, &], Dechao Feng[2,3,4, &]

[1]Department of Urology, The Second Affiliated Hospital of Anhui Medical University, Hefei 230601, China

[2]Department of Urology, Institute of Urology, West China Hospital, Sichuan University, Chengdu 610041, China

[3]Department of Urology, Taizhou Hospital of Zhejiang Province Affiliated to Wenzhou Medical University, Taizhou, China.

[4]Division of Surgery & Interventional Science, University College London, London W1W 7TS, UK.

*Zhouting Tuo, Ruicheng Wu, and Jie Wang have equally contributed to the manuscript.

[&]Corresponding Author:

Dechao Feng, Department of Urology, Institute of Urology, West China Hospital, Sichuan University, Chengdu 610041, China/Division of Surgery & Interventional Science, University College London, London W1W 7TS, UK.

Email: fdcfenix@stu.scu.edu.cn; dechao.feng@ucl.ac.uk

Phone: +447786411893

Dear Editor,

Previous reports reported a rising global burden of urinary tract infections (UTIs), yet a comprehensive assessment of temporal trends in UTI prevalence remains lacking [1, 2]. Thus, we analyze the temporal trends in UTIs prevalence among women of childbearing age (WCBA) at global, regional, and national levels, employing an age-period-cohort (APC) model and leveraging data from the Global Burden of Disease (GBD).

The data sources utilized to assess the burden of UTIs globally from 1990 to 2019 are detailed in the Global Health Data Exchange GBD Results Tool (date of data extraction: November 12, 2023) [3].

Our analysis incorporated the Socio-demographic Index (SDI) for each country, with nations categorized into one of five SDI quintiles based on their 2019 SDI values [4]. WCBA, as defined by the World Health Organization, encompass those between the ages of 15 and 49. To estimate overall annual percentage changes in prevalence (*net drifts*), annual percentage changes from 15 to 49 years (*local drifts*), and period and cohort relative risks (period/cohort effects) between 1990 and 2019, we applied an age-period-cohort model [5]. Data analysis and visualization process were conducted using R (version 4.2.1).

We conducted an assessment of epidemiological data pertaining to UTIs patients, encompassing global and regional populations, prevalence numbers, age-standardized prevalence rates, and net drifts in prevalence rates (**Table S1**). Over the period from 1990 to 2019, concurrent with the global population's increase, the prevalence of UTIs in WCBA surged by approximately 49.81%, reaching 3.71 million (95% UI: 3.11 to 4.28) in 2019. **Figure S1A** illustrates the age-standardized prevalence rate for UTIs in WCBA in 2019, while **Figure S1B** depicts the net drift of prevalence from 1990 to 2019 for UTIs in WCBA. We examined the annual percentage change in UTIs prevalence across different age groups in WCBA, incorporating local drift in prevalence as calculated by the APC model (**Figure 1A**). Globally, UTIs prevalence displayed increasing trends in the 15-29 age group but exhibited decreasing trends in the 30-49 age group. In high and high-middle SDI regions, UTIs prevalence decreased across all age groups, whereas in low, low-middle, and middle SDI regions, it increased across all age groups. Temporal changes in the age distribution of UTIs prevalence in WCBA are depicted in **Figure 1B**. The APC model was employed to compute age, period, and birth cohort effects on UTIs prevalence in WCBA. Overall, a consistent pattern of age effects emerged across different SDI regions, with the lowest risk observed in the adolescent phase (15-19 years) and risk increasing with age (**Figure S2A**). The period effect exhibited a significant global increase and variation across SDI regions (**Figure S2B**). Concerning the birth cohort effect, there was a notable rise in prevalence risk in successive birth cohorts globally (**Figure S2C**). To provide a comprehensive depiction of temporal trends in UTIs prevalence in WCBA globally, we included several representative countries with different SDI quartiles, showcasing varying age, period, and birth cohort effects. These countries encompass the United Kingdom, Greece, China, India, and Ethiopia (**Figure S 3A-E**).

Declarations

AUTHOR CONTRIBUTIONS

Dengxiong Li, Mang Ke, Dechao Feng designed the project. Zhouting Tuo, Ruicheng Wu and Jie Wang performed data collection and analysis. Zhouting Tuo, Dexiong Li, Ruicheng Wu and Jie Wang conducted data analysis. Zhouting Tuo and Dechao Feng wrote the manuscript. All authors have read the final manuscript and approved it for publication.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

All Data from this study were downloaded to the Global Health Data Exchange GBD Results Tool 2019 (https://ghdx.healthdata.org/gbd-2019).

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Figure. 1 Local drift and age distribution of prevalence from 1990 to 2019 for UTIs in WCBA across SDI quintiles. (A) *Local drift* of prevalence from 1990 to 2019 for UTIs in WCBA for seven age groups (15–19, 20–24, 25–29, 30–34, 35–39, 40–44, 45–49 years). The dots and shaded areas denote the *local drift* (ie, annual percentage change of age-specific prevalence, % per year) and their corresponding 95% CIs. (B) Temporal changes in age distribution of UTIs prevalence in WCBA from 1990 to 2019. UTIs,urinary tract infections; SDI, sociodemographic index; WCBA, women of childbearing age.