

# Self-Reported Prevalence of Urinary Tract Infections Among Individuals with Type 2 Diabetes Mellitus

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## BACKGROUND

- Uncomplicated UTI is the most common bacterial infection encountered in clinical practice<sup>1</sup>
- Approximately half of all women will have at least 1 symptomatic UTI during their lifetime<sup>2,3</sup>
- About 20% of all UTIs occur in men<sup>4</sup>
- Diabetes has been associated with an increased risk of UTI<sup>5</sup>
- Patients with diabetes often have increased complications of UTI, including rare complications, fungal infections, and increased severity and unusual manifestations<sup>6</sup>
- Yet, there is limited information on the prevalence of UTI in diabetes and whether UTIs are more common among adults with T2DM than those without diabetes

## OBJECTIVES

- To estimate the prevalence of self-reported UTI among individuals with and without T2DM
- To assess age and gender differences in rate of UTI among individuals with T2DM
- To determine whether adults seek medical care for the UTIs

## METHODS

### Study Design

- Cross-sectional analysis of data collected in 2008 among SHIELD respondents with or without T2DM
- Study to Help Improve Early evaluation and management of risk factors Leading to Diabetes (SHIELD) is a 5-year population-based survey conducted to better understand the risk for the development of diabetes, as well as disease burden
  - Based upon a screening questionnaire mailed to 200,000 nationally representative households (TNS NFO Household Panel), responses for 211,097 adults from 127,420 households were obtained (64% response rate)
  - A baseline survey was sent in 2004 to 22,001 selected individuals derived from the screening respondents. Since 2005, annual SHIELD surveys have captured self-reported information on health status, attitudes and behaviors, quality of life, and anthropometry from this representative sample of the US population
  - The 2008 survey collected information from 14,921 individuals (71% response rate)

### Study Population

- Respondents were 18 years of age or older
- Self-reported diagnosis of T2DM was based on being “told by a doctor, nurse or other healthcare professional that you have type 2 diabetes”
- Individuals who did not report a diagnosis of T2DM, T1DM, or gestational diabetes were included as a comparison group

### Study Measures

- Respondents were asked how many times in the past 12 months they had a UTI
- Respondents were also asked to report the number of times they consulted with their doctor and/or nurse regarding a UTI and the number of times they treated the UTI themselves
- Overweight was defined as BMI of 25.0–29.9 kg/m<sup>2</sup>, and obese was defined as a BMI ≥30 kg/m<sup>2</sup>
- Comorbid conditions were self-reported based on survey questions of being told by a healthcare professional that they had the condition

### Statistical Analyses

- Respondents with T2DM were compared with respondents who did not report diabetes on the occurrence and frequency of UTIs
- Comparisons between respondents with and without reported diabetes were conducted using chi-square test for categorical variables and *t*-tests for continuous variables
- Logistic regression was used to adjust for age and gender
- Statistical significance was set *a priori* as *p* <0.05

## RESULTS

- There were 2,671 respondents with T2DM and 8,907 respondents without diabetes who responded to the UTI survey questions

Table 1. Characteristics of respondents with and without diabetes

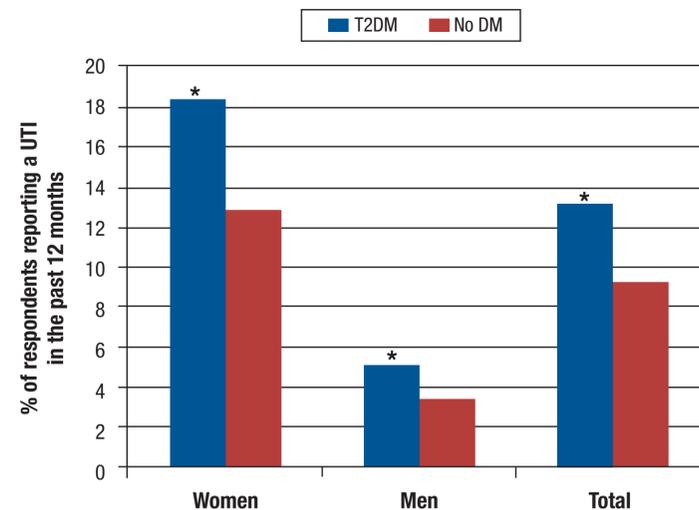
Characteristics	T2DM (n = 2,671)	No Diabetes (n = 8,907)
Age, years, mean (SD)	63.1 (11.7)*	56.9 (15.5)
Women, %	60.3	62.3
White, %	73.7*	67.0
Education, high school degree or less, %	34.1*	28.2
Household income, <\$30,000, %	36.2*	27.9
Overweight or obese, %	89.9*	75.6
Number of comorbid conditions, mean (SD)	5.3 (3.1)*	3.3 (2.7)
Atherosclerosis, %	9.1*	4.7
Cholesterol problem, %	74.5*	46.5
Heart disease, %	24.0*	12.9
Hypertension, %	72.4*	45.4

\**p* <0.05

- A significantly larger proportion of T2DM respondents were older, white, had lower education and income, were overweight or obese, and had more comorbid conditions, than those without diabetes (Table 1)

### Prevalence of UTI

Figure 1. Respondents reporting a UTI by diabetes status and gender

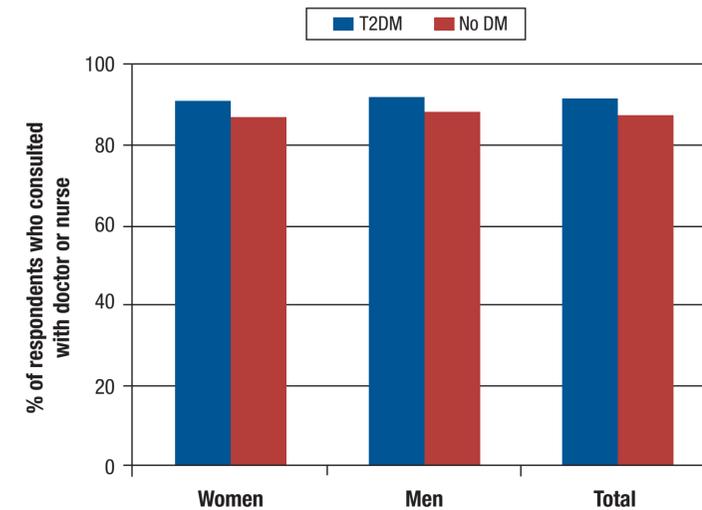


\**p* <0.01 for comparison between T2DM and No DM

- Among women, 18.4% of those with T2DM, compared with 12.8% of those without diabetes, reported at least 1 UTI (*p* <0.001) (Figure 1). The prevalence rate of UTI for women was 184.4 per 1,000 people for those with T2DM and 127.8/1,000 for those without diabetes
- Among men, 5.1% of those with T2DM, compared with 3.4% of those without diabetes, reported at least 1 UTI (*p* = 0.01) (Figure 1). The prevalence rate of UTI for men was 50.9 per 1,000 people for those with T2DM and 33.9/1,000 for those without diabetes
- Overall, 13.1% of respondents with T2DM and 9.2% of respondents without diabetes reported at least 1 UTI in the past 12 months
- A higher proportion of women with T2DM than men with T2DM reported at least 1 UTI (*p* <0.01)

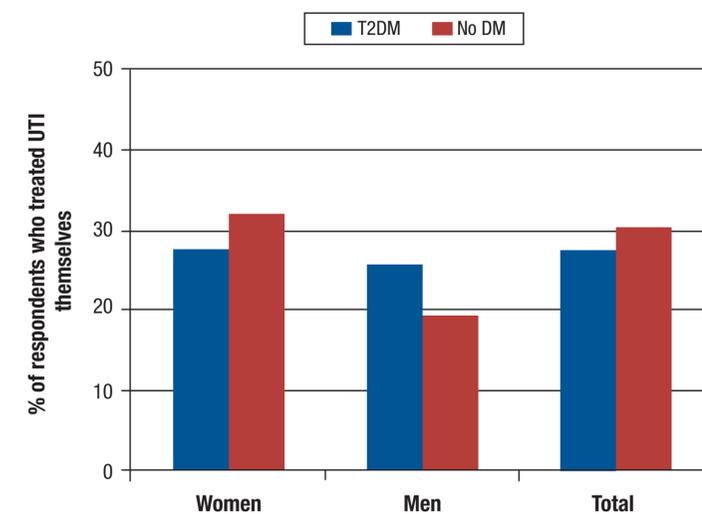
### Consulted with Health Professional about UTI

Figure 2. Respondents who consulted their doctor or nurse regarding a UTI



- Among those who reported ≥1 UTI, 87%–92% reported that they had consulted their doctor or nurse about the UTI (Figure 2)
- There was no difference in the proportion consulting their healthcare professional about a UTI between those with and without diabetes

Figure 3. Respondents who reported treating the UTI themselves



- Among those who reported ≥1 UTI, 19%–32% reported that they had treated a UTI themselves (Figure 3)
- There was no difference in the proportion self-treating a UTI between those with and without diabetes. No difference was found in the proportion self-treating a UTI between men and women with T2DM

Table 2. Odds ratio of having a UTI in the past 12 months, adjusting for age group and gender

Characteristics	Odds ratio (95% CI)	P value
T2DM (No DM as reference group)	1.54 (1.34–1.76)	<0.0001
Age group 50–59 (age group <50 years as reference group)	0.95 (0.80–1.23)	0.54
60–69 years	0.90 (0.75–1.08)	0.27
70–79 years	1.08 (0.90–1.32)	0.40
≥80 years	1.52 (1.21–1.90)	<0.0001
Women (men as reference group)	4.24 (3.58–5.02)	<0.0001

- Odds of having at least 1 UTI were 1.5 times higher among T2DM respondents than No DM respondents, after adjusting for age and gender (Table 2)
- Women were 4.2 times more likely than men to have at least 1 UTI, after adjusting for diabetes status and age
- Elderly (≥80 years of age) respondents were more likely than younger (<50 years of age) respondents to have a UTI, after adjusting for diabetes status and gender. Other age groups were not associated with increased odds of having a UTI compared with those <50 years of age

## LIMITATIONS

- Diagnosis of diabetes, other comorbid conditions, and UTI were self-reported and could not be validated with medical record review or administrative claims data. However, this bias is similar between the groups compared in this study
- Household panels, like the TNS NFO panel, tend to under-represent the very wealthy and very poor segments of the population and do not include military or institutionalized individuals

## CONCLUSIONS

- UTIs were more prevalent among respondents with T2DM, compared with respondents without diabetes
- UTIs were more frequent among women with T2DM, compared with men with T2DM and men without diabetes
- Elderly respondents were more likely than younger respondents to have a UTI
- Future research about risk factors for UTI other than age and gender among individuals with diabetes may allow evidence-based information to be used in the management of infections

## REFERENCES

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## LIST OF ABBREVIATIONS

<b>BMI</b>	Body mass index
<b>DM</b>	Diabetes mellitus
<b>SHIELD</b>	Study to Help Improve Early evaluation and management of risk factors Leading to Diabetes
<b>T1DM</b>	Type 1 diabetes mellitus
<b>T2DM</b>	Type 2 diabetes mellitus
<b>TNS NFO</b>	Taylor Nelson Sofres National Family Opinion
<b>UTI</b>	Urinary tract infection

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