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Urologic Diseases in America

ANNUAL DATA REPORT

Urinary Incontinence

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Note

This document is one of the seven that collectively comprise the 2024 *Urologic Diseases in America: Annual Data Report (ADR)*. This document reports and discusses findings on Urinary Incontinence (UI). Other topics in the 2024 ADR are Introduction and Methods; Benign Prostatic Hyperplasia and Associated Lower Urinary Tract Symptoms (BPH/LUTS); Urinary Stone Disease (USD); Urologic Chronic Pelvic Pain Syndrome (UCPPS); Fournier's Gangrene (FG); and Healthcare Expenditures of Urologic Diseases. These analyses are available as separate documents on the UDA website. Additional details on the methodology and data sources are provided in Appendices A and B, respectively, in the Introduction and Methods document.

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Urinary Incontinence

Main Takeaways

- The claims-based prevalence of urinary incontinence (UI) among persons aged 65 and older was estimated at 6-8% annually from 2012 to 2021, which suggests that healthcare providers and patients may underreport UI.
- UI frequently co-occurred with hypertension, obesity, diabetes, urinary tract infections, and for men, BPH and prostate cancer; the rates of these comorbidities were higher than those observed in the overall study population.
- During 2012-2021, the percentage of patients with urgency UI filling antimuscarinic prescriptions decreased from 49% to 34%, while that for beta-3 adrenergic agonists increased from 0.2% to 17%. Antimuscarinics remain the most commonly prescribed medication for this condition.
- From 2012 to 2021, there was a decline in the percentage of patients aged 65 and older with stress UI who underwent sling procedures, from 4.2% to 2.0%.
- From 2012 to 2021, the utilization of botulinum toxin A (BoNTA) increased among patients aged 65 and older with urgency UI, rising from 0.5% to 2.5%.

1 Overview

Urinary incontinence (UI) is a common condition defined by the involuntary loss of urine during the bladder storage phase.[1] The International Continence Society expands on this definition as the "involuntarily loss of urine that is a social or hygienic problem and is objectively demonstrable."[2] This section presents an overview of the evaluation and management of UI. Section 2 shows results on prevalence, incidence, comorbidities, and diagnostic testing; prescription drugs filled and procedure use; and resource use, based on contemporary data on the different age cohorts (see 2024 Methods document for details on databases and related methods). Section 3 discusses these results relative to the literature.

Depending on the etiology, UI can be acute or chronic. Acute and mostly temporary UI can be related to delirium, infection, pharmaceuticals, restricted mobility, and stool impaction. Chronic UI is usually classified as stress urinary incontinence (SUI), urgency urinary incontinence (UUI), mixed urinary incontinence (MUI), overflow, functional, or continuous (such as in the case of a vesical fistula) incontinence. Chronic UI is associated with pregnancy, childbirth, diabetes, pelvic organ prolapse, prostate surgery, and increased body mass index.[3]

As the severity of UI increases, quality of life tends to decline significantly. UI can trigger social isolation, embarrassment, and depression. Fortunately, treating UI can yield positive results such as improved depression symptoms and reduced social isolation.[4]

For the majority of patients, diagnosing UI involves only a medical history, physical examination, and urinalysis. If this initial workup is unremarkable, if conservative treatment is not working, or there is concern for neurological diseases, urodynamic studies may be performed to determine bladder function. Urodynamics is not specifically required prior to intervention for uncomplicated stress incontinence.

The treatment of urinary incontinence depends on the type of incontinence and may encompass behavioral modifications, physical therapy, medications, and surgical options. For example, for patients with UUI, a step-by-step approach is often recommended, beginning with avoiding bladder irritants, implementing bladder training and control techniques, and undergoing pelvic floor muscle therapy. If these measures are ineffective, antimuscarinic or beta 3 agonist medications can be tried, with regular monitoring of their effectiveness and potential side effects. If these medications do not work, neuromodulation options such as posterior tibial nerve stimulation or sacral neuromodulation may be considered. Alternatively, botulinum toxin A (BoNTA) injections may be used to calm an overactive bladder through chemodenervation. In extreme cases, chronic catheterization, urinary diversion, or bladder augmentation may be necessary, but these are considered last resorts.

For SUI, medications such as duloxetine and imipramine, which are not approved by the Food and Drug Administration (FDA) for incontinence, have been used. In women, surgical treatment of SUI should involve a physical evaluation of the pelvic floor to assess for conditions such as prolapse and urethral diverticulum. Common surgical options include mid-urethral slings, autologous fascial pubo-vaginal slings, Burch colposuspension, and bulking agents. Other procedures for pelvic floor prolapse may also be necessary. In men, mild or moderate post-prostatectomy incontinence is typically treated with a male pelvic sling, and with artificial urinary sphincter placement if UI is severe.

Procedures and pharmacological classes considered for UI analysis are shown in Table 1 below.

Table 1. Procedures and pharmacological classes considered for UI analysis

Procedures	Pharmacological Classes
• Artificial urinary sphincter • BoNTA injections • Injectable procedures • Neuromodulation • Reconstruction • Sling • Suspension	• Antimuscarinic • Antispasmodic • Beta-3 adrenergic agonist • BoNTA • Opioid / Antimuscarinic • Tricyclic antidepressant

2 Results

➔ Study population

Table 2 shows the total number of patients with any UI as well as the total population in each cohort in 2021 (note the cohorts in Medicare Advantage [MA] and Medicaid are only discussed for results on prevalence and comorbidities).

Table 2. Total number of patients with any UI, 2021

Population	Commercial Insurance Age 18-64		Medicare FFS Age 65+		Medicaid Age 18+		MA Age 65+	
Gender	Male	Female	Male	Female	Male	Female	Male	Female
Total	2,865,943	2,776,873	10,779,115	13,694,802	14,640,922	21,590,273	9,268,173	12,286,189
Patients with Any UI	6,432	30,405	428,214	1,056,022	105,258	354,347	469,207	1,357,624

➔ Prevalence

The overall claims-based prevalence of any UI among persons aged 65 and older in Medicare fee-for-service (FFS) increased from 5.6% in 2012 to 6.1% in 2021 (Figure 1a). The prevalence of any UI for the same age cohort in MA increased from 6.3% in 2015 to 8.5% in 2021. Among privately insured persons aged 18-64, prevalence of any UI was approximately 0.6% during 2012-2021. Among those in Medicaid aged 18 and older, prevalence of any UI was approximately 1.5% during 2016-2021.

Prevalence of any UI was substantially higher for women compared to men. For women aged 65 and older, it ranged from 7.0% to 7.8% among those in Medicare FFS and 8.2% to 11.1% among those in MA. For men aged 65 and older, it ranged from 3.6% to 4.0% among those in Medicare FFS and 3.7% to 5.1% among those in MA. Among privately insured women aged 18-64, prevalence was approximately 1.1% compared to 0.2% for men. Among persons aged 18 and older in the Medicaid population, prevalence of any UI for women was approximately 1.8% compared to 0.9% for men during 2016-2021.

Prevalence of UI was associated with age among all cohorts (e.g., 3.7% for ages 65-69 and 10.6% for ages 85 and older in 2021 for those in Medicare FFS). For the cohort aged 65 and older in Medicare FFS, patients who were eligible for Medicare and Medicaid had higher prevalence rates of any UI compared with patients who were not (9.4% compared to 5.7% in 2021). A similar pattern applies to the same age cohort in MA (12.9% compared to 7.6% in 2021).

Figure 1a. Claims-based prevalence of any UI, by year and insurance type (2012-2021)

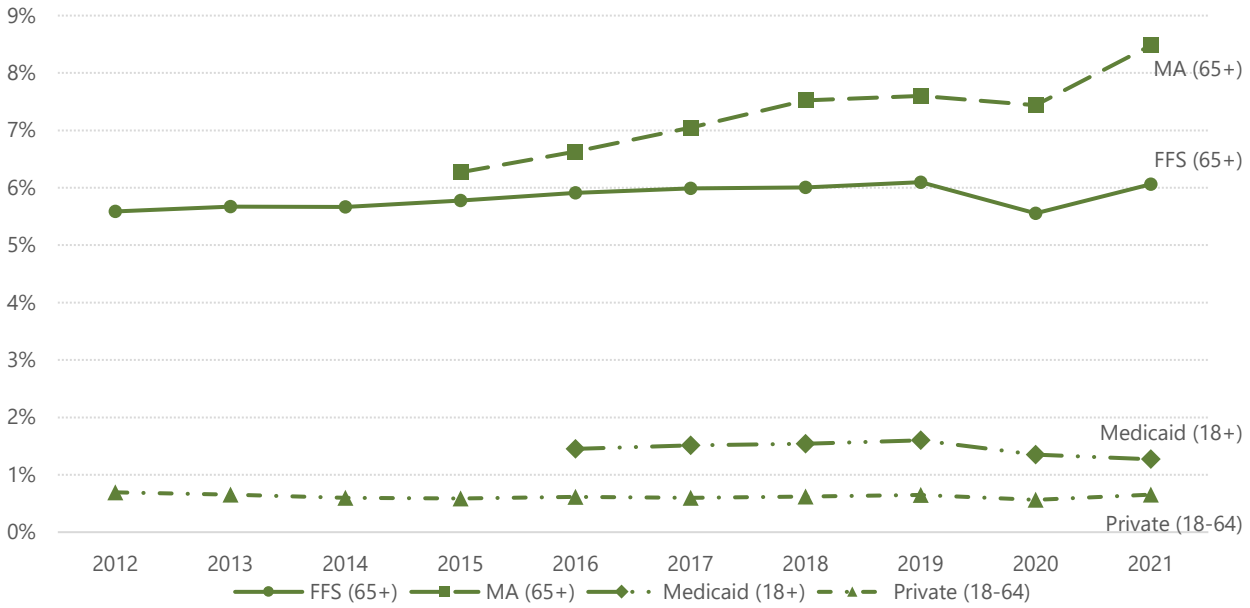
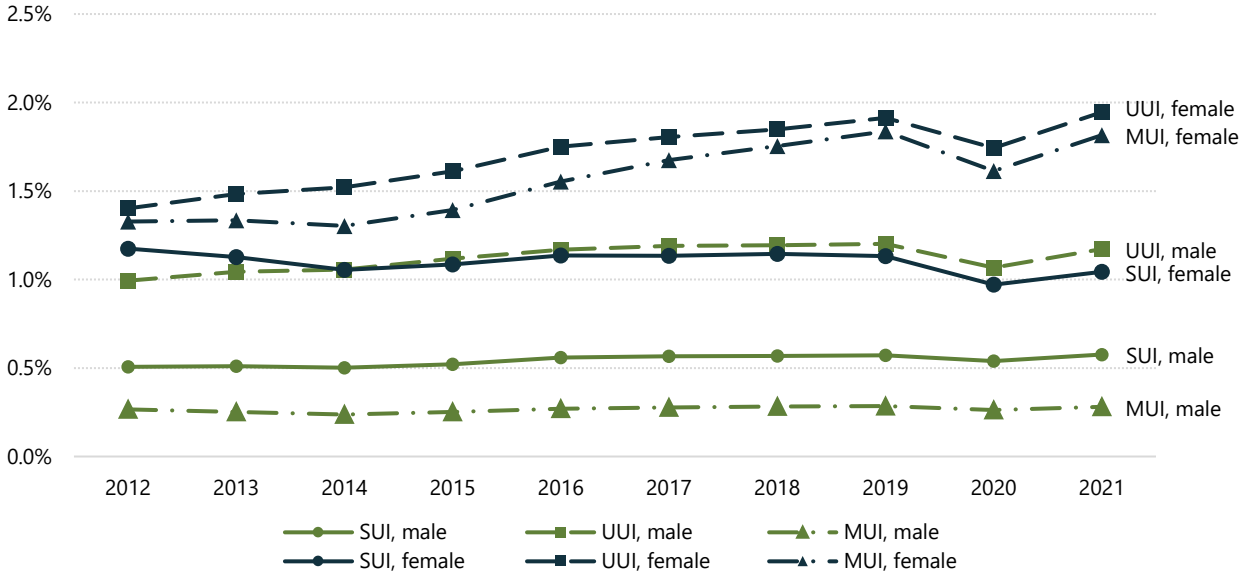


Figure 1b. Claims-based prevalence of UI by type and gender, patients aged 65+ (2012-2021)



Notes: In panel (a), for each age cohort, denominator denotes the total number of persons under each type of insurance. In panel (b), denominator denotes the total number of persons aged 65+ in each UI type-gender cohort among those in Medicare FFS.

Among persons aged 65 and older in Medicare FFS, the claim-based prevalence of SUI was approximately 0.5% among men and 1.1% among women during 2012-2021 (Figure 1b). For the same age cohorts, the prevalence of UUI, MUI, and Other UI among men was approximately 1.1%, 0.3%, and 1.8%, respectively. For the same cohorts of women, the prevalence of UUI, MUI, and Other

UI was approximately 1.7%, 1.6%, and 2.8%, respectively. Overflow UI and UI due to fistula were less common, with prevalence less than 0.2% for the age 65 and older cohort in Medicare FFS. Similar patterns were found in the same age cohort for those in MA.

➔ Incidence

The annual incidence of any UI was 290 per 10,000 persons (2.9%) among persons aged 65 and older during 2015-2021. Among this age cohort, annual incidence was 210 and 340 per 10,000 persons (2.1% and 3.4%) in men and women, respectively. On average annually, 651,446 persons aged 65 and older (212,875 men and 438,572 women) were newly identified with any UI.

➔ Comorbidities

For privately insured patients with any UI aged 18-64, common comorbidities in 2021 were hypertension (37%), obesity (34%), and UTI (26%). For patients with any UI aged 65 and older in Medicare FFS, common comorbidities were hypertension (83%), UTI (41%), and diabetes (36%). For the same age cohort in MA, common comorbidities were hypertension (84%), diabetes (40%), and obesity (39%).

Among men with any UI in commercial insurance, Medicare FFS, and MA; BPH and prostate cancer were also common comorbidities (58% and 28%, respectively, of privately insured men aged 18-64; 73% and 34%, respectively, of men aged 65+ in Medicare FFS; and 69% and 29%, respectively, of men aged 65+ in MA). Compared to their respective entire study populations, patients with UI exhibited a higher prevalence of the common comorbidities observed (Figures 2a,b).

Among patients with UUI, common comorbidities in 2021 were hypertension, UTI, diabetes, and obesity for those aged 65 and older in Medicare FFS. Patterns were broadly similar for those in MA and commercial insurance (albeit with notably lower hypertension rates for privately insured patients aged 18-64). Among men and women with SUI, common comorbidities in 2021 included hypertension, obesity, and diabetes. In addition, prostate cancer and BPH in men and UTI in women were common comorbidities.

Figure 2a. Common comorbidities for any UI by gender, age 18-64 (2021)

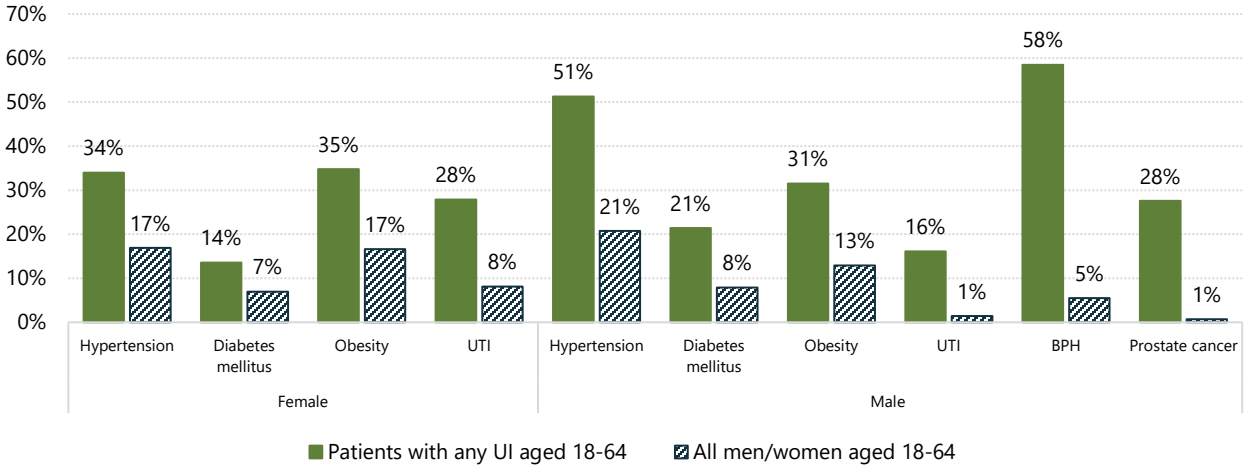
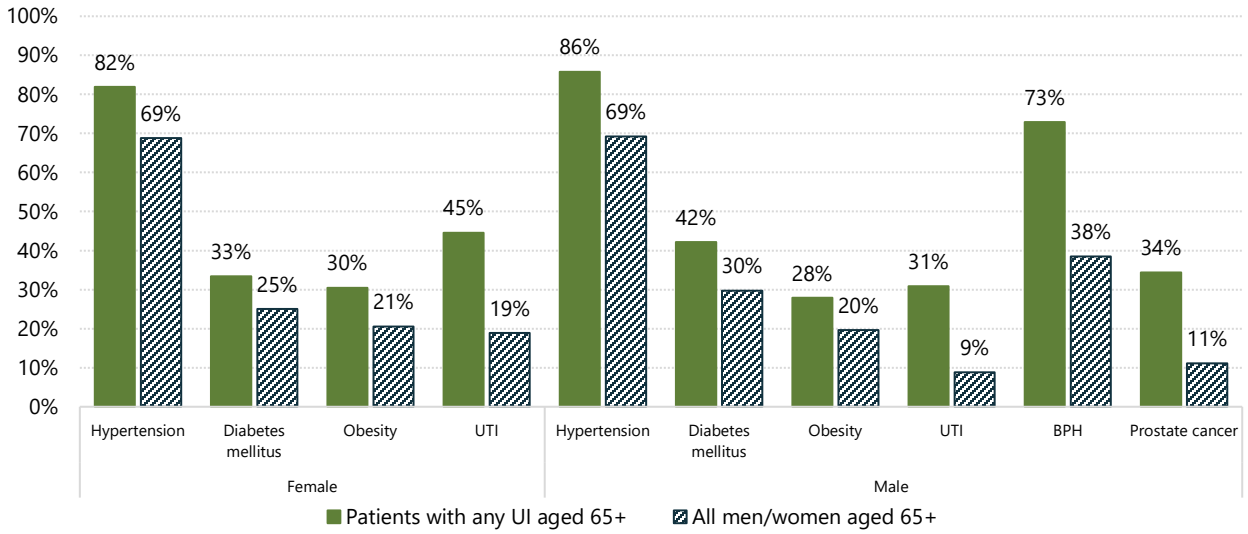


Figure 2b. Common comorbidities for any UI by gender, age 65+ (2021)



Notes: Columns in solid denote percentage of patients with any UI who were also identified with the comorbidity referenced. Columns in patterns denote the analogous metric for all men or women (including those without UI) in each referenced age cohort. The age 18-64 cohort refers to those in commercial insurance, while the age 65+ cohort refers to those in Medicare FFS.

➔ Diagnostic tests

We evaluated the rates of diagnostic testing conducted for patients aged 65 years and older from three months prior to the first diagnosis of UI to 12 months after the diagnosis. We found that 97% of patients received at least one diagnostic test during this 15-month window, and this rate did not vary substantially from 2015 to 2020.

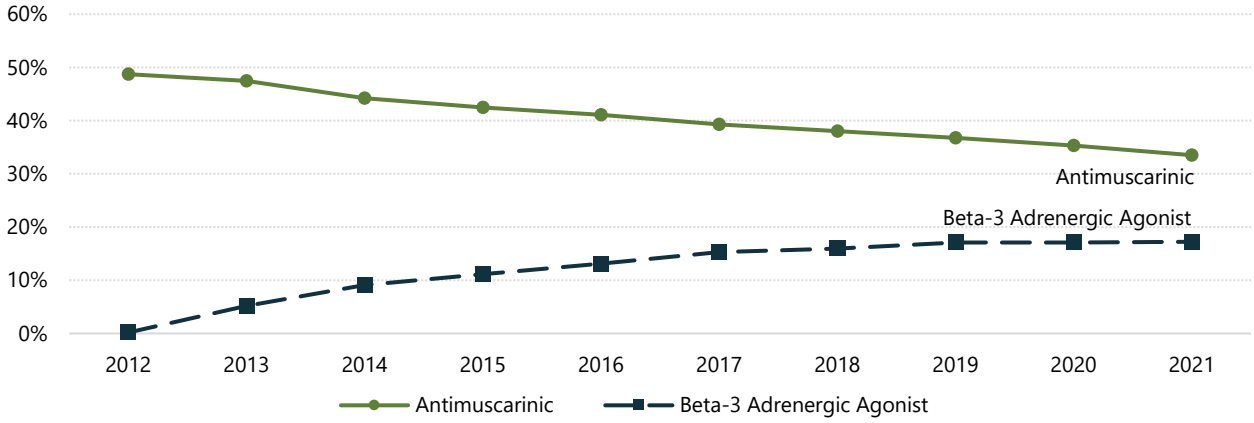
From 2015 to 2020, the most commonly ordered diagnostic test for UI was serum creatinine, which was ordered annually at a rate of 96%. During this same period, an average of 80% received a urinalysis, while 27% had a post-void residual urine test. The corresponding percentages for cystoscopy and urodynamics were 13% and 7%, respectively, and less than 1% of patients received an intravenous pyelogram or fluorodynamics.

➔ Prescription drugs

Overall, the percentage of patients with any UI who filled a prescription with labeled indication for any UI decreased from 25% in 2012 to 23% in 2021 for those aged 18-64 and from 36% to 32% for those aged 65 and older. This decline was steeper among women (from 38% to 34% for those aged 65 and older) than men (from 28% to 26%).

Among patients with UUI aged 65 and older with full-time Part D enrollment, the most commonly filled prescriptions were antimuscarinics and beta-3 adrenergic agonists, which were filled by 34% and 17% of patients in 2021, respectively. However, the percentage of patients filling prescriptions for antimuscarinics declined from 49% in 2012 to 34% in 2021, while that for beta-3 adrenergic agonists increased from 0.2% in 2012 to 17% in 2021 (Figure 3). These patterns were similar between men and women but antimuscarinics were more commonly filled for women (35% in 2021) than men (30% in 2021).

Figure 3. Prescriptions filled among patients with UUI aged 65+ (2012-2021)



Notes: Figure shows the percent of patients with UUI aged 65+ who filled a prescription for each referenced drug in each year. Denominator denotes number of patients with UUI who were aged 65 years and older and had full-time Part D enrollment in each year (Medicare FFS). The number of patients with UUI and full-time part-D enrollment was 291,628 in 2021.

Among patients aged 65 and older newly identified with any UI, 43% filled a prescription for a disease-related medication within 5 years. 83% of first prescriptions filled were for antimuscarinics and 16% were for beta-3 adrenergic agonists. On average, patients took 11 months to fill their first prescription for any UI.

➔ Procedures

The percentage of women aged 18-64 with any UI who underwent related procedure decreased from 11% in 2012 to 7.4% in 2021, while for men of the same age group, there was a slight decrease from 2.1% to 1.6% during the same period. Among those aged 65 and older, there was a slight increase in this percentage from 1.9% to 2.2% for men and from 3.5% to 4.0% for women during the same period. These percentages were slightly lower in 2020, which can be attributed to patients seeking less urologic care due to the COVID-19 pandemic.

Among patients aged 65 and older with UUI, the most common procedures used were neuromodulation and BoNTA. The percentage of patients in this age group who underwent neuromodulation increased slightly from 2.3% to 3.2% between 2012 and 2021, with similar trends observed in both men and women (Figure 4a). Since 2013, there has been a rise in the use of BoNTA. The percentage of patients aged 65 and older with UUI who underwent BoNTA increased from 0.5% to 2.5%. In 2021, the use of BoNTA was more common in women than in men, with percentages of 3.0% and 1.4%, respectively.

The sling procedure was the most frequently performed procedure among patients aged 65 and older with SUI. The percentage of patients with SUI who underwent a sling procedure decreased from 4.2% to 2.5% from 2012 to 2015 (Figure 4b), and the decline continued at a slower rate from 2.3% to 2.0% from 2016 through 2021. In 2021, sling procedures were more commonly performed on women than men, with percentages of 2.3% and 1.1%, respectively. In 2021, less than 1% of patients with SUI underwent other procedures.

Figure 4a. BoNTA and neuromodulation for patients with UUI aged 65+ (2012-2021)

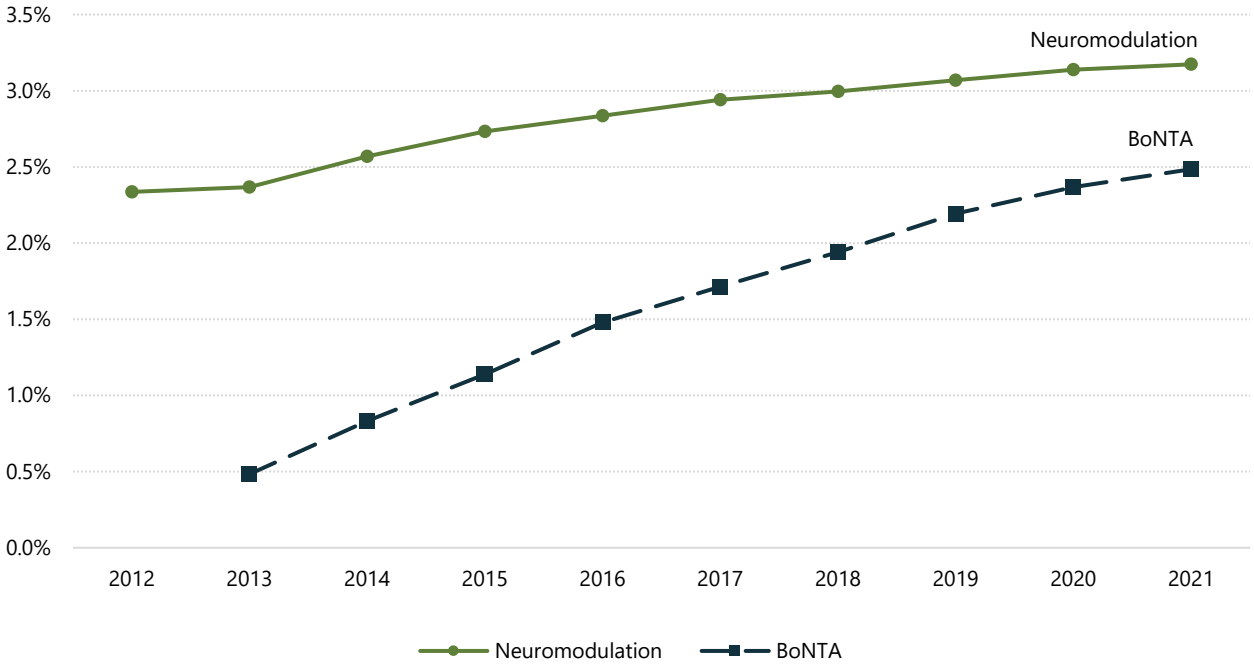
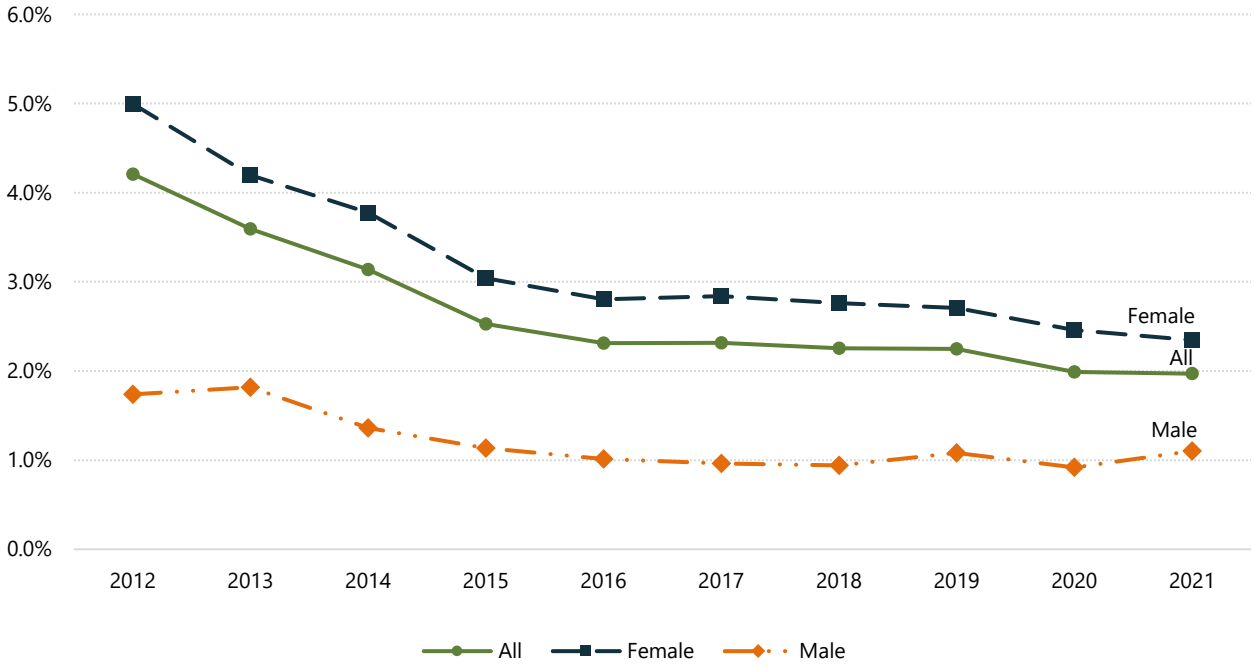


Figure 4b. Sling procedures for patients with SUI aged 65+, by gender (2012-2021)



Notes: This figure shows the percent of patients aged 65 and older with each referenced UI type who underwent each referenced procedure during 2012-2021 (Medicare FFS). The number of patients with UUI was 392,735 in 2021. The number of female and male patients with SUI in 2021 was 142,996 and 62,101, respectively.

Among the incident cohort aged 65 and older, 5.4% of patients with any UI underwent a UI-related procedure within 5 years after initial diagnosis. 36% of first procedures during this period were sling, while neuromodulation and BoNTA accounted for 35% and 14%, respectively. The average time to first procedure within 5 years after initial diagnosis in 2015 was 18 months. This metric for sling, neuromodulation, and BoNTA was 13, 20, and 26 months, respectively.

➔ Service utilization

On average, patients aged 65 and older who received an incident diagnosis of any UI between 2015 and 2020 had 1.6 E&M visits within 12 months. During the same period, 0.04% of the same group had an inpatient hospitalization, 0.06% had an observation stay, and 0.2% had an emergency department visit with a primary diagnosis of urinary incontinence within 12 months after their initial diagnosis.

3 Discussion

Our analysis of UI yielded several noteworthy results. First, the claims-based prevalence of UI among persons aged 65 and older was approximately 6-8% from 2012 to 2021, with women showing higher rates than men. Second, the use of diagnostic tests like urinalysis and post-void residual urine measurement were relatively low for this population. Third, among patients with UUI, prescriptions

filled for antimuscarinics remained the most common but declined during 2012-2021, while prescriptions filled for beta-3 adrenergic agonists increased during the same period. Lastly, we observed a decrease in the use of sling procedures for patients with SUI, and an increase in the use of BoNTA and neuromodulation for patients with UUI.

Our estimate of the annual prevalence of any UI at 6-8% likely underestimated the true extent of the condition.[5] UI is stigmatized, which may discourage some patients from seeking treatment, leading to lower reported prevalence rates. In fact, less than 40% of adults with self-reported incontinence inform their physicians.[6] The reported prevalence of incontinence varies greatly across studies. In women, the 1-year prevalence of incontinence has been reported to be between 5% and 70%, and UI is estimated to occur in 25-45% of women.[7] A study based on the National Health and Nutrition Examination Survey (NHANES) found that 49.6% of women reported UI.[8] Cultural differences in the perception and reporting of UI across countries, as well as differences in data collection and reporting definitions, may account for significant disparities between the true and reported prevalence of UI.

Like prevalence rates, our incidence rates may also have been low due to patients' reluctance to disclose their diagnosis to healthcare providers. The incidence rate changed little over time, suggesting that the stigma surrounding UI has not changed.

In regard to diagnostic testing for UI, we found that rates of urinalysis and post-void residual measurement were lower than expected. The American Urological Association (AUA) Guidelines on Overactive Bladder and the AUA/Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction (SUFU) Guidelines on Surgical Treatment of Female Stress Urinary Incontinence recommend obtaining a urinalysis as part of initial diagnostic process. Our lower-than-expected rate of urinalysis tests may indicate that the majority of patients had uncomplicated symptoms that did not necessitate additional investigations, or the tests were performed outside of the time frame we examined. Furthermore, we may observe differences in diagnostic testing conducted by urologists and primary care physicians, which can be explored in future ADRs.

Regarding procedures for SUI, our findings indicate that sling placement was the most common procedure. However, we observed a sharp decline in its use from 2012 to 2015, which then decreased at a slower rate from 2016 to 2021. These results are consistent with another report that suggests the percentage of patients undergoing a sling procedure was stable at 4% from 2004 to 2011, but then sharply declined from 2011 to 2013, presumably due to a 2011 FDA notification regarding complications associated with the mesh used for prolapse repair and SUI.[9] According to a separate study with data through 2015, there was a 43% drop in sling placement for SUI from 2011 to 2015.[10]

Regarding the management of UUI, we found a significant increase in the use of beta-3 agonists, accompanied by a decline in the use of antimuscarinics. This trend aligns with published literature on the topic.[11] Despite this, antimuscarinics remained the most commonly used prescription for patients

with UUI. Neuromodulation and BoNTA increased from 2012 to 2021; however, by 2021, both were still used in less than 4% of patients with UUI. This finding is also consistent with the literature on the utilization of third-line therapies for overactive bladder.[12]

There are several important limitations to our analysis. First, our reliance on claims-based diagnosis of UI may result in underreporting and limits our ability to classify the types of incontinence. For instance, a patient who is diagnosed with SUI may also have some degree of UUI that is not captured in the claims as MUI. Secondly, we cannot assess the severity of symptoms using standard measures such as voiding diaries or the number of pads used per day. Lastly, we did not evaluate the primary drivers of incontinence, such as childbirth, diabetes, or prostate surgery, which would impact several of our outcomes, including the use of diagnostic testing and treatments.

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