

UROLOGIC DISEASES IN AMERICA PROJECT: URINARY INCONTINENCE IN MALES—DEMOGRAPHICS AND ECONOMIC BURDEN

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ABSTRACT

Purpose: We quantified and describe the demographics and economic burden of male urinary incontinence in the United States of America.

Materials and Methods: The analytic methods used to generate these results have been described previously.

Results: Urinary incontinence (UI) affects men of all ages, including 17% of males older than 60 years in the United States, which is an estimated 3.4 million men. There is a strong trend toward an increasing prevalence of UI with increasing age as well as an increase in the prevalence of UI in males with time. Ethnicity has less of a role in prevalence estimates in men than in women. The largest impact of UI in elderly men is in physician office visits, followed by outpatient services and surgeries. Resource use is greatest in the nursing home setting, where more than half of men have UI and require assistance with toileting. The overall economic burden for male UI is estimated at \$18.8 billion in direct medical costs in 1998/1999 dollars. Medical expenditures for UI for male Medicare beneficiaries 65 years and older have doubled since 1992. Compared to persons without UI the presence of UI increases the annual expenditures per person yearly from \$3,204 to \$7,702.

Conclusions: The direct and indirect costs of male UI increased throughout the 1990s with annual expenditures per person yearly in men with UI more than double that in men without UI. Given the aging population and staggering impact of UI in nursing home settings, there is a compelling need for further research into effective prevention, treatment and management strategies.

KEY WORDS: urination; epidemiology; urinary incontinence; economics, medical; urinary tract

As baby boomers age, the number of men with urinary incontinence (UI) and the associated economic burden grow. Governments and health care institutions are increasingly concerned about this disease, particularly since UI is one of the leading reasons for a patient to move from independent living to a care home. The majority of reports on the demographics and economic costs of UI are limited to women or are not gender specific.

METHODS

The analytic methods used to generate these results have been described previously.^{1,2} Due to the lack of male-specific data available in the databases, these were supplemented with data from Thom³ and Langa et al.⁴

RESULTS

Prevalence. Based on pooled data from 21 international, population based surveys stratified for age, sex and incontinence frequency the prevalence of ever having had UI in older men was 11% to 34% (median 17%, pooled mean 22%), while the prevalence of daily UI was 2% to 11% (median 4%, pooled mean 5%). The prevalence of ever having had UI in middle-aged and younger men was 3% to 5% (median 4%, pooled mean 5%) (table 1).³

The prevalence of UI in adult males older than 60 years is

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17% according to National Health and Nutrition Examination Survey (NHANES) data, similar to the 13% in the report of Langa et al of community dwelling older people (table 2).⁴ Of the 17% of men who reported UI in NHANES 42% indicated that UI occurred on a daily basis, while 24% indicated that it occurred weekly (table 3). The 7% prevalence of daily UI in men older than 60 years (42% of 17%) is similar to the 4% of older men who reported daily episodes in the pooled data reported by Thom.³ Based on a prevalence rate of 17% for men of all ages and data from the 2001 United States Census Bureau intercensal population estimates approximately 3,930,000 American men younger than 60 years have UI.

Trends in health care resource use. Hospital Care (Inpatient Stays): Table 4 shows rates of hospitalizations in men with UI as a primary diagnosis. Data from the Healthcare Cost and Utilization Project inpatient sample indicate that the overall rate (all rates per 100,000 population) was steady at 1.4 to 2.1/100,000 with no meaningful change from 1994 through 2000. The rate remained low across all geographic regions. Small numbers made it difficult to reach any conclusions regarding temporal or regional differences.

Table 5 lists estimates of inpatient hospitalizations through the 1990s in the Medicare population. The overall rate of inpatient hospital stays in men 65 years or older with UI was stable at 13/100,000 male Medicare beneficiaries. The rate in men younger than 65 years in the Medicare population fluctuated more, probably as a result of peculiarities of data on the disabled population.

White men had higher inpatient hospitalization rates than black men. Asian and Hispanic men were not identified as

specific populations until 1995. The 1995 hospitalization rate for UI in Hispanic men was notably high at 30/100,000. Inpatient surgical procedures in male Medicare patients diagnosed with UI decreased from 1,804/100,000 with UI in 1992 to 1,751/100,000 in 1995 and then to 1,337/100,000 with UI in 1998 (table 6).

Consistent with secular trends, length of stay (LOS) in men with UI as a primary diagnosis decreased between 1994 and 2000 (data not shown). LOS decreased across all regions between 1994 and 1996 with the shortest mean LOS being 2.0 days in the West. LOS in the Northeast decreased from 5.1 days in 1994 to 2.5 in 2000. In 1994 mean LOS in rural hospitals (3.8 days) was similar to that in urban hospitals (3.7 days) but these values diverged with time. LOS at urban sites decreased to 3.0 days in 2000 but LOS at rural sites increased to 4.2 in 1996, decreased dramatically to 2.3 in 1998 and then increased to 4.3 in 2000.

Hospital Care (Outpatient Visits): According to data from the National Hospital Ambulatory Medical Care Survey for

1994, 1996, 1998 and 2000, 0.1% of all hospital outpatient visits were by men with UI as any listed diagnosis (table 7). In men older than 65 years with UI outpatient visits for UI were 2.8 times more frequent than inpatient visits for UI in 1992, increasing to 5.2 by 1998 (table 8). For men younger than 65 years with UI the difference in Medicare outpatient vs inpatient services was even more marked. Outpatient visits were 10 times more frequent than inpatient visits in 1992 and 11.4 times more frequent in 1998. Men 75 to 84 years old had the highest outpatient visit rates of 59/100,000 men in 1992 and 84/100,000 in 1995.

Regional Medicare data indicated that outpatient visit rates in 1992 were 2.9 to 4.4 times the rate of inpatient visits. By 1998 outpatient visit rates were much higher than inpatient visits (4.1 to 9.6 times) for all regions. In 1998, the most recent year for which data were analyzed, the South had the lowest rate of inpatient visits (42/100,000 men). In the Midwest outpatient visit rates achieved a high of 98/100,000 men in 1998, which was more than twice the rate in the South.

There was an inverse relationship between the rates of outpatient and inpatient services for black males and those for white males. From 1992 to 1998 rates of inpatient visits were consistently higher for white males, while rates of outpatient services were consistently higher for black males. The difference was greatest in 1995, when the ratio of outpatient visits for black males was 2.4 times that for white males, narrowing to 1.5 in 1998. Hispanic men had a markedly higher rate of outpatient visits, that is 179/100,000 in 1998, which was twice that of black males and 3 times that of white males.

Veterans Health Administration (VA) data, which are based on outpatient medical records, showed a strong trend toward an increasing prevalence of medically recognized UI with advancing age in males. The prevalence in men 85 years and older was approximately 10 times that in men 35 to 44 years old (data not shown). VA data also demonstrated an increase with time in the prevalence of medically recognized UI in male VA patients from 717/100,000 in 1999 to 975/100,000 in 2001. As expected, the prevalence of UI based on

TABLE 1. Summary UI prevalence by age, sex and frequency³

	% Ever UI	% Daily UI
Older women:		
Range	17-55	3-17
Median	35	14
Mean*	34	12
Older men:		
Range	11-34	2-11
Median	17	4
Mean*	22	5
Younger women:		Not available
Range	12-42	
Median	28	
Mean*	25	
Younger men:		Not available
Range	3-5	
Median	4	
Mean*	5	

* Calculated using numerator and denominator data from each available study.

TABLE 2. Prevalence of difficulty controlling bladder in men (NHANES, 1999 to 2000)

	No. Difficulty Controlling Bladder (%)			
	Total No.	Yes	No	Refused to Answer or Do Not Know
All	18,231,934	3,131,814 (17)	15,054,506 (83)	45,614 (0)
Age at screening:				
60-64	5,037,678	546,559 (11)	4,491,119 (89)	0
65-69	4,731,187	518,157 (11)	4,213,030 (89)	0
70-74	3,320,840	630,898 (19)	2,675,986 (81)	13,956 (0)
75-79	2,748,396	750,478 (27)	1,988,932 (72)	8,986 (0)
80-84	1,478,414	399,774 (27)	1,078,640 (73)	0
85 or Older	915,419	285,948 (31)	606,799 (66)	22,672 (2)
Race/ethnicity:				
NonHispanic white	14,790,935	2,395,212 (16)	12,395,723 (84)	0
NonHispanic black	1,436,582	296,022 (21)	1,122,588 (78)	17,972 (1)
Mexican American	559,680	81,134 (14)	478,546 (86)	0
Other race	429,299	142,015 (33)	273,598 (64)	13,686 (3)
Other Hispanic	1,015,438	217,431 (21)	784,051 (77)	13,956 (1)
Education:				
Less than high school	6,072,264	1,214,224 (20)	4,840,068 (80)	17,972 (0)
High school	4,516,092	698,919 (15)	3,817,173 (85)	0
High school or greater	7,572,244	1,198,317 (16)	6,373,927 (84)	0
Refused	25,054	11,368 (45)	0	13,686 (55)
Do not know	46,280	8,986 (19)	23,338 (50)	13,956 (30)
Poverty income ratio:				
Missing	631,305	111,353 (18)	505,996 (80)	13,956 (2)
0	22,159	12,082 (55)	10,077 (45)	0
Less than 1	1,806,996	440,261 (24)	1,366,735 (76)	0
1.00-1.84	3,408,381	653,095 (19)	2,755,286 (81)	0
Greater than 1.84	9,404,848	1,458,110 (16)	7,946,738 (84)	0
Refused	1,858,169	324,042 (17)	1,511,455 (81)	22,672 (1)
Do not know	1,100,076	132,871 (12)	958,219 (87)	8,986 (1)

Data based on question KI.Q.040; "In the past 12 months, have you had difficulty controlling your bladder, including leaking small amounts of urine when you cough or sneeze?"

TABLE 3. Frequency of bladder control problems in men who responded yes to difficulty controlling bladder (NHANES, 1999 to 2000)

	No. All	No. Daily (%)	No. Few/Wk (%)	No. Few/Mo (%)	No. Few/Yr (%)	No. Do Not Know (%)
All	3,131,814	1,307,755 (42)	747,906 (24)	577,835 (18)	459,015 (15)	39,303 (1)
Age at screening:						
60-64	546,559	187,452 (34)	204,858 (37)	48,555 (9)	105,694 (19)	0
65-69	518,157	172,945 (33)	153,221 (30)	104,208 (20)	87,783 (17)	0
70-74	630,898	299,011 (47)	111,501 (18)	118,464 (19)	100,100 (16)	1,822 (0)
75-79	750,478	377,370 (50)	101,664 (14)	176,165 (23)	86,293 (11)	8,986 (1)
80-84	399,774	137,186 (34)	134,527 (34)	60,591 (15)	54,106 (14)	13,364 (3)
85 or Older	285,948	133,791 (47)	42,135 (15)	69,852 (24)	25,039 (9)	15,131 (5)
Race/ethnicity:						
NonHispanic white	2,395,212	1,039,490 (43)	505,540 (21)	418,365 (17)	403,322 (17)	28,495 (1)
NonHispanic black	296,022	111,731 (38)	106,168 (36)	35,532 (12)	33,605 (11)	8,986 (3)
Mexican American	81,134	47,757 (59)	17,210 (21)	6,213 (8)	8,132 (10)	1,822 (2)
Other race	142,015	37,697 (27)	63,131 (44)	41,187 (29)	0	0
Other Hispanic	217,431	71,080 (33)	55,857 (26)	76,538 (35)	13,956 (6)	0
Education:						
Less than high school	1,214,224	423,490 (35)	386,717 (32)	244,357 (20)	157,838 (13)	1,822 (0)
High school	698,919	245,562 (35)	137,414 (20)	184,242 (26)	118,337 (17)	13,364 (2)
High school or greater	1,198,317	627,335 (52)	223,775 (19)	149,236 (12)	182,840 (15)	15,131 (1)
Do not know	8,986	0	0	0	0	8,986 (100)
Poverty income ratio:						
0	12,082	0	0	12,082 (100)	0	0
Less than 1	440,261	144,297 (33)	112,216 (25)	123,240 (28)	58,686 (13)	1,822 (0)
1.00-1.84	653,095	262,660 (40)	170,625 (26)	116,420 (18)	88,259 (14)	15,131 (2)
Greater than 1.84	1,485,110	640,720 (44)	356,276 (24)	193,356 (13)	254,394 (17)	13,364 (1)
Refused	324,042	156,956 (48)	47,695 (15)	47,079 (22)	47,312 (15)	0
Do not know	132,871	86,722 (65)	11,890 (9)	14,909 (11)	10,364 (8)	8,986 (7)
Missing	111,353	16,400 (15)	49,204 (44)	45,749 (41)	0	0

Data based on question KIQ.060, "How frequently does this (referring to KIQ.040) occur? Would you say this occurs . . . every day, a few times a week, a few times a month, or a few times a year?"

TABLE 4. Inpatient hospital stays by males with UI listed as primary diagnosis (Healthcare Cost and Utilization Project Nationwide Inpatient Sample, 1994, 1996, 1998 and 2000)

	1994		1996		1998		2000	
	Count	Rate (95% CI)	Count	Rate (95% CI)	Count	Rate (95% CI)	Count	Rate (95% CI)
Totals	1,431	2.1 (1.4-1.9)	1,529	1.7 (1.4-2.0)	1,490	1.6 (1.4-1.8)	1,332	1.4 (1.2-1.6)
Region:								
Midwest	397	2.1 (1.4-2.4)	285	1.3 (0.6-2.0)	435	2.0 (1.4-2.6)	334	1.5 (1.0-1.9)
Northeast	338	2.1 (1.3-2.5)	366	2.0 (1.4-2.6)	304	1.7 (1.2-2.2)	324	1.8 (1.2-2.4)
South	393	1.1 (0.9-1.7)	640	2.0 (1.4-2.6)	527	1.6 (1.2-1.9)	459	1.4 (1.0-1.7)
West	302	2.1 (0.8-2.3)	238	1.2 (0.8-1.6)	225	1.1 (0.8-1.4)	215	1.0 (0.6-1.4)

Rate per 100,000 based on 1994, 1996, 1998 and 2000 population estimates from Current Population Survey (CPS) (CPS Utilities, Unicon Research Corp., College Station, Texas) for relevant demographic categories of American male civilian noninstitutionalized population (counts may not sum to totals due to rounding).

TABLE 5. Inpatient stays by male Medicare beneficiaries with UI listed as primary diagnosis (Centers for Medicare and Medicaid Services, MedPAR and 5% Carrier File, 1992, 1995 and 1998)

	1992		1995		1998	
	Count	Rate (95% CI)	Count	Rate (95% CI)	Count	Rate (95% CI)
Age:						
Totals	1,520	10 (9.8-11)	1,680	11 (11-12)	1,620	11 (11-12)
Younger than 65	60	1.9 (1.5-2.4)	160	4.6 (3.9-5.4)	140	4.1 (3.4-4.7)
65 or Older	1,460	13 (12-13)	1,520	13 (12-14)	1,480	13 (13-14)
65-74	700	9.7 (9.0-10)	640	8.9 (8.2-9.6)	620	9.6 (8.9-10)
75-84	580	16 (15-18)	640	17 (16-19)	760	21 (19-22)
85-94	160	20 (17-23)	200	24 (20-27)	100	12 (9.2-14)
95 or Older	20	26 (14-37)	40	49 (34-63)	0	
Race/ethnicity:						
White	1,320	11 (10-11)	1,480	11 (11-12)	1,440	12 (11-12)
Black	120	9.4 (7.8-11)	80	5.8 (4.5-7.1)	120	9.0 (7.4-11)
Asian	Not available	Not available	0		0	
Hispanic	Not available	Not available	60	30 (23-38)	40	12 (8.3-16)
North American native	Not available	Not available	0		0	
Region:						
Midwest	420	11 (10-12)	620	16 (15-17)	660	18 (16-19)
Northeast	320	10 (9.0-11)	120	3.8 (3.1-4.4)	280	10 (8.9-11)
South	420	8.0 (7.3-8.8)	700	13 (12-14)	500	9.3 (8.5-10)
West	340	15 (14-17)	200	8.6 (7.4-9.8)	160	7.2 (6.0-8.3)

Unweighted counts multiplied by 20, rate per 100,000 Medicare beneficiaries in the same demographic stratum and persons of other race, unknown race and ethnicity, and other region included in totals (counts less than 600 should be interpreted with caution).

TABLE 6. UI procedures in male Medicare beneficiaries (Centers for Medicare and Medicaid Services, MedPAR and 5% Carrier File, 1992, 1995 and 1998)

	1992		1995		1998	
	Count	Rate	Count	Rate	Count	Rate
Totals	1,100	2,363	1,640	2,563	1,700	2,274
Operation to correct UI:	980	2,105	1,420	2,219	1,440	1,926
Ambulatory surgery center	140	301	280	438	420	562
Inpt	840	1,804	1,120	1,751	1,000	1,337
Hospital outpt	0		20	31	20	27
Physician office	0		0	0.0	0	
Prosthesis revision or repair:	120	258	220	344	260	348
Ambulatory surgery center	0		40	63	40	53
Inpt	100	215	160	250	220	294
Hospital outpt	0		20	31	0	
Physician office	20	43	0		0	

Unweighted counts multiplied by 20 and rate per 100,000 Medicare beneficiaries diagnosed with UI in same demographic stratum (counts less than 600 should be interpreted with caution).

International Classification of Disease-9 codes from office visits was substantially less than that found in NHANES, which is population based. Racial/ethnic differences in prevalence in men were modest compared to differences in women, although black men had a slightly higher prevalence, perhaps reflecting the higher incidence of prostate cancer in this group. Regional differences were slight and inconsistent with time.

Ambulatory care. UI as the primary diagnosis represented 0.1% of all visits to physician offices by males according to the National Ambulatory Medical Care Survey for 1992 to 2000 (table 9). Because counts were so low for this diagnosis, the 5 even years between 1992 and 2000 were collapsed to yield a

physician rate of 1,079/100,000 men for the 5 years combined or 216/100,000 annually.

Compared with inpatient or outpatient hospitalization rates, the rates for ambulatory services were higher (table 10). According to Medicare data the rate of physician office visits for male UI increased by 77% between 1992 and 1998 in all age groups. In men older than 65 years the rate of physician office visits increased for each age category in the 65 years and older group up to and including the 85 to 94-year-old group, which had a rate of 1,721/100,000 men in 1998. Increases in physician visits were consistent across all geographic regions. In 1998 the highest rate was 746/100,000 men in the West and the lowest rate was 646/100,000 in the Midwest. In 1998 the highest use of physician office services was for white men, followed by Asian, Hispanic and black men.

There was a consistent pattern of rates of ambulatory surgery increasing between 1992 and 1995 before decreasing between 1995 and 1998 across all age groups (data not shown). The 1998 rates were 17/100,000 and 44/100,000 in men younger and older than 65 years, respectively. This temporal pattern was consistent across all geographic regions. The lowest rate (33/100,000 men) was in the West.

Nursing home. The burden of UI in nursing homes is shown in National Nursing Home Survey (NNHS) data for 1995, 1997 and 1999 (table 11). Of nursing home residents 15% required assistance from some type of equipment to

TABLE 7. National hospital inpatient visits by adult males with UI (National Ambulatory Medical Care Survey, 1994, 1996, 1998 and 2000)

	Primary Diagnosis	Any Diagnosis
4-Yr count (95% CI)	38,629 (3,361-73,897)	83,762 (29,850-137,674)
No. visits 1994-2000	78,399,663	78,399,663
% Visits	0.0	0.1
4-Yr rate (95% CI)	42 (4-80)	90 (32-149)

Rate per 100,000 based on sum of weighted counts in 1994, 1996, 1998 and 2000 over mean estimated base population across those 4 years with population estimates from CPS for relevant demographic categories of American male adult civilian noninstitutionalized population.

TABLE 8. Outpatient hospital visits by male Medicare beneficiaries with UI listed as primary diagnosis (Centers for Medicare and Medicaid Services, MedPAR and 5% Carrier File, 1992, 1995 and 1998)

	1992		1995		1998	
	Count	Rate (95% CI)	Count	Rate (95% CI)	Count	Rate (95% CI)
Age:						
Totals	5,080	34 (34-35)	8,300	55 (53-56)	9,420	65 (64-66)
Younger than 65	900	29 (27-31)	1,620	47 (45-49)	2,040	59 (57-62)
65 or Older	4,180	36 (35-37)	6,680	57 (55-58)	7,380	67 (65-68)
65-74	1,840	25 (24-27)	2,900	40 (39-42)	2,960	46 (44-48)
75-84	2,080	59 (56-61)	3,120	85 (82-88)	3,080	84 (81-87)
85-94	240	30 (27-34)	620	73 (67-79)	1,300	150 (142-158)
95 or Older	20	26 (14-37)	40	49 (34-63)	40	46 (32-59)
Race/ethnicity:						
White	3,840	31 (30-32)	6,200	48 (47-49)	7,320	60 (58-61)
Black	900	71 (66-75)	1,580	114 (108-120)	1,160	87 (82-92)
Asian	Not available	Not available	20	27 (15-40)	100	73 (58-88)
Hispanic	Not available	Not available	240	121 (106-136)	600	179 (164-193)
North American native	Not available	Not available	40	199 (139-258)	0	
Region:						
Midwest	1,780	48 (46-50)	2,280	59 (57-62)	3,620	98 (95-101)
Northeast	1,260	40 (38-42)	1,880	59 (56-62)	1,920	69 (66-72)
South	1,060	20 (19-21)	2,260	41 (40-43)	2,280	42 (41-44)
West	980	44 (41-46)	1,880	81 (77-85)	1,580	71 (67-74)

Unweighted counts multiplied by 20, rate per 100,000 Medicare beneficiaries in same demographic stratum and persons of other races, unknown race and ethnicity, and other region included in totals (counts less than 600 should be interpreted with caution).

TABLE 9. National physician office visits by males 18 years and older with UI (National Ambulatory Medical Care Survey, 1992, 1994, 1996, 1998 and 2000)

	Primary Diagnosis	Any Diagnosis
5-Yr count (95% CI)	989,688 (665,142–1,314,234)	1,660,627 (1,245,549–2,075,705)
No. visits 1992–2000	1,122,162,099	1,122,162,099
% Visits	0.1	0.1
5-Yr rate (95% CI)	1,079 (725–1,433)	1,811 (1,358–2,263)

Rate per 100,000 based on sum of weighted counts in 1992, 1994, 1996, 1998 and 2000 over mean estimated base population across those 5 years with population estimates from CPS for relevant demographic categories of American male adult civilian noninstitutionalized population.

toilet, 52% required assistance from another person and 11% had an indwelling Foley catheter or an ostomy. There was little change in these parameters during the years studied.

Economics. Direct Costs: A small but notable proportion of Medicare expenditures for male UI was accounted for by males younger than 65 years, that is disabled individuals (data not shown). This is consistent with clinical experience in younger men with spinal cord injury and other neurological disorders that can affect the urinary tract. In male Medicare beneficiaries 65 years and older total costs doubled between 1992 and 1995 from \$19.1 million to \$38.1 million and then remained stable in 1998 (table 12). Most of the increase occurred in the ambulatory surgery setting, although expenditures for physician office visits also increased substantially. While the amount spent in the inpatient setting increased in absolute terms, it decreased from 44% to 29%, consistent with secular trends toward outpatient care in the 1990s (see figure).

Total annual expenditures in 1999 for privately insured adults 18 to 64 years old with a primary diagnosis of UI were \$7,702, almost \$4,500 more than those for similar individuals without a diagnosis of UI (table 13). Nonetheless, the aggregate cost was low given the relative infrequency of UI claims in men.

Although data on pharmaceutical costs are not available by gender, table 14 presents the relative expenditures for the medications most often used to treat patients with UI. Almost half of the expenditures in 1996 to 1998 were for α -blockers, which are generally prescribed in older men with bladder outlet obstruction. This suggests that prostate enlargement contributes to the human and the financial cost of

UI. Not surprisingly, most actual prescriptions for UI were written for anticholinergic agents. Because they were predominantly generic, they represent a disproportionately small fraction of total drug expenditures in this period. Since 1998, new long-acting agents in this class have been developed and marketed, altering the economic landscape for the pharmaceutical treatment of individuals with UI.

Indirect Costs: Relatively little work loss is associated with UI in men, as indicated in 1999 data (MarketScan, Chichester, United Kingdom). In fact, only 8% of the 51 men in this data set with claims for UI missed work because of it, which is about 3 times lower than the rate in women. Because these 51 men represent only 0.4% of the men in the sample, the proportion of men missing work for claims related to UI was only 0.03%. In those men who missed work the average annual work absence was only 2.3 hours and all were for outpatient services, less than a tenth the value in women. Men had much less time away from work per outpatient visit than women.

DISCUSSION

While urinary incontinence is widely thought of as a condition affecting women, it also affects men of all ages, including 17% older than 60 years in the United States with an estimated 3,400,000 men in this age group. There is a strong trend toward an increasing UI prevalence with increasing age in males as well as an increase in the prevalence of UI in males with time. Ethnicity appears to have less of a role in prevalence in men than in women.

Reports in the literature indicate that the total cost of urinary incontinence per person affected has increased since the 1980s. Estimates of the total cost of UI in 1995 dollars were \$16.3 billion in all persons older than 15 years⁵ to \$26.3 billion in persons older than 65 years.⁶ These 2 estimates demonstrate the huge variability in reported costs. Each study included indirect costs, costs of medical complications related to incontinence, nursing home costs and supply costs, such as pads and laundry. The overall economic burden is difficult to quantify from claims databases such as those presented since urinary incontinence is often not coded as a primary diagnosis. Further complicating the matter is the fact that likely only 25% to 50% of persons with incontinence seek treatment.

The overall economic burden for male UI is estimated to be

TABLE 10. Physician office visits by male Medicare beneficiaries with UI listed as primary diagnosis (Centers for Medicare and Medicaid Services, MedPAR and 5% Carrier File, 1992, 1995 and 1998)

	1992		1995		1998	
	Count	Rate (95% CI)	Count	Rate (95% CI)	Count	Rate (95% CI)
Age:						
Totals	58,240	395 (392–399)	83,800	551 (547–554)	101,080	698 (694–702)
Younger than 65	5,080	164 (160–169)	9,080	264 (258–269)	10,780	314 (308–320)
65 or Older	53,160	457 (453–461)	74,720	635 (630–639)	90,300	818 (812–823)
65–74	21,200	293 (289–297)	28,720	400 (395–404)	31,600	492 (486–497)
75–84	22,920	649 (641–657)	34,740	950 (940–960)	43,160	1,179 (1,168–1,190)
85–94	8,640	1,093 (1,070–1,116)	10,840	1,278 (1,254–1,302)	14,900	1,721 (1,694–1,748)
95 or Older	400	515 (465–565)	420	512 (463–561)	640	732 (676–788)
Race/ethnicity:						
White	50,280	405 (402–409)	74,320	572 (568–576)	88,900	727 (722–732)
Black	4,120	323 (313–333)	6,380	461 (449–472)	7,020	526 (514–538)
Asian	Not available	Not available	740	1,015 (943–1,088)	940	685 (642–729)
Hispanic	Not available	Not available	940	473 (443–504)	2,260	673 (646–701)
North American native	Not available	Not available	20	99 (55–144)	40	143 (100–186)
Region:						
Midwest	15,480	417 (411–424)	20,540	533 (526–540)	23,880	646 (638–654)
Northeast	11,840	373 (367–380)	17,880	562 (554–570)	19,660	707 (698–717)
South	21,180	404 (399–410)	30,440	555 (549–561)	39,760	741 (734–748)
West	8,900	396 (388–404)	13,900	599 (589–609)	16,680	746 (735–757)

Unweighted counts multiplied by 20, rate per 100,000 Medicare beneficiaries in same demographic stratum and persons of other races, unknown race and ethnicity, and other region included (counts less than 600 should be interpreted with caution).

TABLE 11. *Special needs of male nursing home residents regardless of continence status (NNHS, 1995, 1997 and 1999)*

	1995		1997		1999	
	Count	Rate (95% CI)	Count	Rate (95% CI)	Count	Rate (95% CI)
Indwelling Foley catheter or ostomy:						
Yes	50,298	11,961 (10,569–13,352)	53,938	12,141 (10,731–13,552)	51,457	11,266 (9,941–12,591)
No	369,452	87,854 (86,453–89,254)	389,880	87,762 (86,348–89,176)	401,402	87,884 (86,497–89,271)
Question left blank	781	186 (3.0–368)	430	97 (0–210)	3,883	850 (385–1,315)
Requires assistance using toilet:						
Yes	207,587	49,363 (47,203–51,523)	221,599	49,882 (47,736–52,028)	241,558	52,887 (50,755–55,020)
No	141,870	33,736 (31,689–35,783)	133,378	30,023 (28,069–31,977)	128,251	28,080 (26,154–30,005)
Question skipped for allowed reason	69,267	16,471 (14,863–18,080)	86,814	19,542 (17,809–21,275)	81,977	17,948 (16,308–19,588)
Question left blank	1,807	430 (146–714)	2,459	553 (238–869)	4,956	1,085 (571–1,599)
Requires equipment assistance when using toilet						
Yes	57,463	13,664 (12,183–15,145)	59,329	13,355 (11,901–14,809)	67,782	14,840 (13,323–16,357)
No	143,213	34,055 (32,011–36,100)	149,218	33,589 (31,564–35,614)	162,895	35,665 (33,630–37,699)
Question skipped for allowed reason	211,137	50,207 (48,047–52,368)	220,191	49,565 (47,419–51,711)	210,228	46,028 (43,899–48,156)
Question left blank	8,719	2,073 (1,466–2,680)	15,510	3,491 (2,702–4,281)	15,837	3,467 (2,650–4,285)
Requires another person assistance when using toilet:						
Yes	203,490	48,389 (46,230–50,548)	217,556	48,972 (46,827–51,117)	238,252	52,163 (50,029–54,297)
No	2,350	559 (237–881)	2,571	579 (234–924)	2,690	589 (237–941)
Question skipped for allowed reason	211,137	50,207 (48,047–52,368)	220,191	49,565 (47,419–51,711)	210,228	46,028 (43,899–48,156)
Question left blank	3,554	845 (451–1,239)	3,930	885 (482–1,287)	5,573	1,220 (681–1,759)
Difficulty controlling urine:						
Yes	218,491	51,956 (49,797–54,115)	232,536	52,344 (50,203–54,485)	242,189	53,025 (50,898–55,153)
No	170,988	40,660 (38,537–42,783)	175,090	39,413 (37,325–41,500)	177,128	38,781 (36,709–40,852)
Question skipped for allowed reason	29,338	6,976 (5,881–8,072)	36,416	8,197 (7,028–9,366)	34,206	7,489 (6,406–8,572)
Question left blank	1,715	408 (110–705)	207	47 (0–138)	3,220	705 (255–1,155)

Rate per 100,000 adult male nursing home residents in the NNHS for that year.

TABLE 12. *Expenditures for male Medicare beneficiaries 65 years and older for UI treatment (Centers for Medicaid and Medicare Services, 1992, 1995 and 1998)*

	\$ Million (%)		
	1992	1995	1998
Totals	19.1	38.1	39.0
Inpt	8.4 (43.9)	10.3 (27.0)	11.3 (29.0)
Outpt:			
Physician office	6.2 (32.5)	11.0 (28.9)	15.2 (39.0)
Hospital outpt	0.6 (3.1)	2.0 (5.2)	1.3 (3.3)
Ambulatory surgery	3.3 (17.3)	13.9 (36.5)	10.6 (27.2)
Emergency room	0.6 (3.1)	0.9 (2.4)	0.6 (1.5)

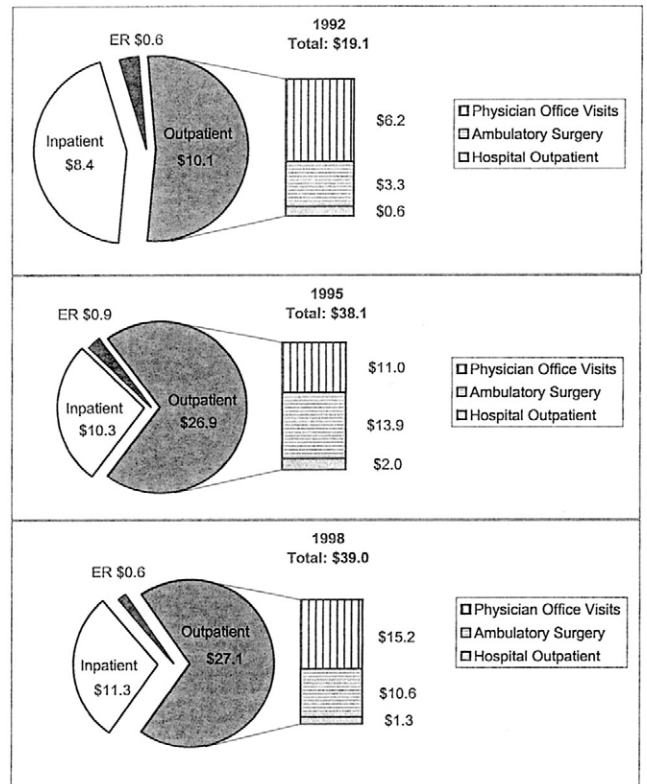
Percents may not total 100% because of rounding.

\$29.4 billion in direct medical costs in 1998/1999 dollars. Annual costs to individuals in the home setting have been estimated to be \$7.1 billion. Compared to persons without UI the presence of UI more than doubles annual expenditures per person yearly from \$3,204 to \$7,702. Additional costs of incontinence are borne by the patients, including the cost of pads for protection, condom drainage catheters, indwelling Foley catheters and external devices such as Cunningham clamps.

CONCLUSIONS

Data reporting. Data on men and women in national surveys must be reported separately, so that the burden of UI in men can be studied. In surveys of private insurance populations sample sizes must be increased, so that reliable statistics are obtained on UI in younger men, in whom UI occurs less frequently.

Future studies. Studies are needed of the outcome of UI treatment specifically in men and of the role of ethnicity in the risk of UI and likelihood of seeking treatment. Given the aging population and staggering impact of UI in nursing



Expenditures for male Medicare beneficiaries age 65 years and older for UI treatment in millions of dollars according to Centers for Medicare and Medicaid Services, 1992, 1995 and 1998.

home settings, there is a compelling need for further research into effective prevention, treatment and management strategies for UI.

TABLE 13. *Estimated annual expenditures of privately insured workers with and without a medical claim for UI in 1999 (Ingenix, Salt Lake City, Utah, 1999)*

	277,803	1,147 With UI		
	Without UI	Total	Medical	Prescription
	(\$/person)	(\$/person)	(\$/person)	Drugs (\$/person)
All	3,204	7,702	6,099	1,604
Age:				
18–44	2,836	7,361	5,993	1,369
45–54	3,305	8,442	6,695	1,747
55–64	3,288	7,247	5,623	1,623
Sex:				
M	2,813	*	*	*
F	3,933	*	*	*
Region:				
Midwest	3,086	8,500	6,861	1,639
Northeast	3,085	7,236	5,502	1,734
South	3,416	8,329	6,851	1,477
West	3,237	8,082	7,118	964

Primary beneficiaries 18 to 64 years old with employer provided insurance who were continuously enrolled in 1999 with estimated annual expenditures derived from multivariate models controlling for age, gender, work status (active/retired), median household income based on zip code, urban/rural residence, medical and drug plan characteristics (managed care, deductible, co-insurance/copayments), and 26 disease conditions.

* Value does not meet standard for reliability or precision.

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TABLE 14. *Annual spending and outpatient prescription drugs for UI treatment in males and females from 1996 to 1998 (Medical Expenditure Panel Survey, 1996 to 1998)*

Drug Name	No. Prescription Claims	Mean Price (\$)	Total Expenditures (\$)
α-Blocker doxazosin (brand)	378,895	43.71	16,561,486
Anticholinergics:			
Oxybutynin	485,044	19.79	9,599,027
Imipramine (brand)	247,249	13.13	3,246,379
Imipramine (generic)	162,184	6.59	1,068,790
Oxybutynin (brand)	130,390	32.91	4,291,146
Totals	1,403,762		34,766,828

Estimates include prescription drug claims with corresponding diagnosis of UI and exclude drugs with fewer than 30 claims since including expenditures on prescription drugs with fewer than 30 claims (unweighted) would increase total drug spending by approximately 83% to \$63.7 million.

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