Non-hip, non-spine fractures drive healthcare utilization following a fracture: the Global Longitudinal study of Osteoporosis in Women (GLOW)

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Abstract

Summary—We evaluated healthcare utilization associated with treating different fracture types in over 51,000 women aged ≥55 years. Over the course of 1 year, there were five times more non-

hip, non-spine fractures than hip or spine fractures, resulting in twice as many days of hospitalization and rehabilitation/nursing home care for non-hip, non-spine fractures.

Purpose—To evaluate the medical healthcare utilization associated with treating several types of fractures in women aged 55 years or older from various geographic regions.

Methods—Information from the Global Longitudinal study of Osteoporosis in Women (GLOW) was collected via self-administered patient questionnaires at baseline and year 1 (n=51,491). Self-reported clinically recognized low-trauma fractures at year 1 were classified as incident spine, hip, wrist/hand, arm/shoulder, pelvis, rib, leg, and other fractures. Healthcare utilization data were self-reported and included whether the fracture was treated at a doctor's office/clinic or at a hospital. Patients were also asked if they had undergone surgery or been treated at a rehabilitation center or nursing home.

Results—Over the 1-year study period, there were 195 spine, 134 hip, and 1,654 non-hip, non-spine fractures. In the GLOW cohort, clinical vertebral fractures resulted in 617 days of hospitalization and 512 days of rehabilitation/nursing home care, while hip fractures accounted for 1,306 days of hospitalization and 1,650 days of rehabilitation/nursing home care. Of particular interest is the result that non-hip, non-spine fractures resulted in 3,805 days in hospital and 5,186 days of rehabilitation/nursing home care.

Conclusions—While hip and vertebral fractures are well recognized for their associated increase in health resource utilization, non-hip, non-spine fractures, by virtue of their 5-fold greater number, require significantly more healthcare resources.

Introduction

For patients with osteoporosis, traditional fracture sites include hip, spine, and forearm, but low-energy trauma fractures may occur at virtually any site, including non-hip, non-spine fractures of the proximal humerus, ribs, tibia, pelvis, knee, and ankle [1–6]. Approximately 30% of postmenopausal women in the USA and Europe are estimated to have osteoporosis, of whom 40% will sustain one or more fragility fractures in their remaining lifetime [7]. In the European Union, the number of fractures is estimated at 3.79 million [8]. Over 200 million people worldwide are reported to have osteoporosis [9]. Of these fractures, non-hip, non-spine fractures have not been recognized for their impact on health services.

In addition to significant morbidity and mortality [10–12], fractures are associated with substantial healthcare resource utilization and cost [13]. The worldwide economic burden of osteoporosis is expected to increase in the future, as life expectancy and the elderly population, who are at high risk of fracture, increase [14–16]. The elevated burden may place a strain on accessing healthcare resources; thus, further research is needed into the healthcare utilization associated with various fracture types.

Using the Global Longitudinal study of Osteoporosis in Women (GLOW), we evaluated the direct medical healthcare utilization associated with treating several fracture types for

women aged 55 years or older in 10 countries. The results are intended to provide a frame of reference for evaluating the cost effectiveness of public health measures to prevent fractures, and to guide programs that assess healthcare resources. We hypothesize that non-hip, non-spine fractures will result in a high use of healthcare resources.

Methods

Details regarding the study design, participant selection and methods have been previously reported [10] and are outlined here. Briefly, GLOW is an ongoing, prospective, multinational, physicians' practice-based study that includes a total of 17 physician practice sites from 10 countries (Australia, Belgium, Canada, France, Germany, Italy, Netherlands, Spain, UK, and USA) in Australia, Europe, and North America. These sites were selected based on the ability of the local investigators to consistently administer the survey; on the availability of a wide spectrum of osteoporosis treatment options and bone densitometry; and the existence of prior studies in these regions, which would provide data for comparison with the GLOW sample. The study was designed to advance the understanding of international patterns of susceptibility, recognition, management, and patient outcomes in women aged 55 years or older at risk of osteoporosis. In general, some specific aims of the GLOW study were to describe the distribution of risk factors for osteoporosis and fractures, identify the differences in physician patterns of diagnosis and management of osteoporosis, characterize factors that influence patient persistence with treatment, and evaluate the cost effectiveness of care of interventions for the prevention and management of osteoporosis. Each study site obtained ethics committee approval to conduct the study in the specific location.

Physician and patient selection

Primary care practices typical of each region were recruited through primary care networks organized for administrative, research, or educational purposes, or by identifying all physicians in a geographic area. Physician networks included regional health system-owned or managed practices, health maintenance organizations, independent practice associations, and other primary care practice networks.

Primary care physicians were defined as those who spent most of their time providing primary healthcare to patients. Depending on the country in which the study site was located, this included internists, family practitioners, and general practitioners who provided primary care. If the physician network or study area included more eligible physicians than were required to recruit a sufficient number of patients, a random sample of those physicians within the network or study was invited. Each practice provided a list of the names and addresses of women aged 55 years or older who had visited their physician in the past 24 months. Based on these lists, participants were recruited. Sampling was stratified by age to ensure that two-thirds of participants were women aged 65 years or older. Approximately 3,000 patients were sought at each site. Patients were excluded if they were unable to complete the study survey due to cognitive impairment, language barriers, institutionalization, or illness severity.

Questionnaire design and administration

Information was collected at cohort entry via a self-administered patient questionnaire that covered the following domains: patient characteristics and risk factors, perception about fracture risk and osteoporosis, medication use (currently taking or ever taken), medical diagnoses, healthcare use and access, physical activity, and physical and emotional health status. Where possible, items from published validated instruments were used, including the National Health and Nutrition Examination Survey, EuroQol EQ-5D, and SF-36 [17–19].

An annual follow-up questionnaire was also sent to all study participants. The follow-up survey included items similar to the baseline questionnaire plus questions regarding persistence with medication, reasons for non-adherence, and new fracture status. Completed questionnaires were sent to the central coordinating center, where they were scanned electronically, and data fields were audited visually by a person trained to process the forms.

Fracture types

Clinically recognized, incident, low-trauma, vertebral and non-vertebral fractures were based on self-reports documented in the year 1 follow-up questionnaire. For the purposes of the current study, all participants were subdivided into eight fracture groups according to their incident fracture status: those with incident hip, spine (excluding neck fractures), wrist/hand, arm/shoulder, pelvis, rib, leg, and other fractures. Other fracture sites included ankle, foot, knee, clavicle, elbow, coccyx, sternum, and neck. Women who fractured more than one bone were included.

Healthcare utilization

Data on healthcare utilization were gathered from the year 1 follow-up questionnaire. A number of healthcare services were examined, including whether the patient had their fracture treated at a doctor's office/clinic or at a hospital. Patients were also asked if they had undergone surgery to treat their fracture, and whether they spent any time in a rehabilitation center/unit or nursing home. The length of stay for those who utilized hospital, rehabilitation center, or nursing home care was collected.

Other factors

Individual characteristics were collected from self-reports and included the age of the patient, prior fracture status, number of co-morbid conditions, osteoporosis medications, general health, height, weight, education level, insurance coverage, and region (North America, which included United States of America and Canada; South Europe, which included France, Italy, and Spain; and North Europe, which included Belgium, Germany, Netherlands, and UK). Comorbid conditions included asthma, emphysema, joint disease/osteoarthritis, stroke, colitis, celiac disease, Parkinson's disease, multiple sclerosis, cancer, type I diabetes, rheumatoid arthritis, hypertension, and heart disease. Osteoporosis medications included bisphosphonates, raloxifene, teriparatide, tibolene, calcitonin, and strontium ranelate.

Statistics

Descriptive statistics were calculated for all variables and included means and standard deviations (SDs) for continuous variables and counts and percentages for categorical variables. Wilcoxon rank sum tests were performed to compare differences in length of stay at the hospital, rehabilitation center, or nursing home between spine, hip, and non-hip, non-spine fractures. Multivariable linear regression analysis was conducted to assess the association among various participant characteristics and length of stay at the hospital, rehabilitation center, or nursing home. The participant characteristics that were examined include co-morbidities, prior fracture, osteoporosis medications and age. P-values from statistically significant results from F-tests were reported. ANOVA F-tests were performed to evaluate the association between regions and length of stay at the hospital, rehabilitation center, or nursing home. Australia was not included in the regional comparisons due to difficulty in placing this country in an appropriate region. All analyses were performed with SAS statistical software version 9.2 for Windows (SAS Institute Inc., Cary, NC, USA).

Results

Baseline characteristics of those patients with fracture(s) by year 1 were categorized according to fracture type (Table 1). Of the GLOW population of 51,491 participants, a total of 1,898 developed a new fracture over the 1-year study period. Among the 1,898 patients with fracture, their mean (SD) age was 71 (9) years, 44% (*n*=822) had a prior baseline fracture, and 83% had at least one other disease condition. General health reported as excellent/very good ranged from 21% for those with spine fractures to 35% for those with wrist/hand fractures (Table 1). Most new fractures occurred in individuals between 65 and 84 years of age and the percent of patients using health care services varied with age and place of service (Tables 2–3).

Healthcare service use between the different fracture types was driven by the number of fractures. There were a total of 195 clinical spine fractures, 134 hip fractures, and 1,654 non-hip, non-spine fractures. A breakdown of healthcare utilization by fracture type is shown in Table 4. For those that were hospitalized, the mean hospital length of stay for hip fractures was 13 days; for non-hip, non-spine fractures, it was 10 days (Table 4). The total number of hospital days was greatest for non-hip, non-spine fractures at 3805 days, 2.9 times greater than that seen for hip fractures (1,306 days) (Fig. 1). Total rehabilitation days were also greatest for non-spine, non-hip fractures at 4,083 days, compared to 1,252 for hip fractures and 392 for clinical spine fractures (Fig. 1). A similar pattern was also seen for total nursing home days: for non-hip, non-spine (1,103), hip (398), and clinical spine (120), respectively (Fig. 1). Results suggested that prior fractures were associated with longer hospital length of stay (p-value=0.004) compared with individuals without prior fracture. However, osteoporosis medications and other disease conditions were not found to be statistically significant with respect to length of stay at the three locations measured. Table 5 displays the descriptive statistics for length of stay by region and fracture type.

Healthcare service use varied by fracture type (Table 6). Only 3.3% of hip fractures were treated at the physician's office/clinic only, compared with 36% of rib fractures. A total of 92% of hip fractures received treatment at a hospital, while fewer than half of the patients

with rib fractures visited a hospital. Overnight stays in hospital were highest for hip fracture patients (92%) and lowest for wrist/hand (30%) and other fractures (34%). Women with hip fractures had the highest surgery rates (89%), whereas those with spine, pelvis, rib, and other fractures had surgery rates of 30% or less. Other than women with hip fractures (57%), less than 50% of patients with fractures used rehabilitation centers for treatment (Table 6). Fewer than 20% of patients with fractures went to a nursing home for treatment; while women with hip and pelvis fractures were most likely (16% and 17%, respectively) to be treated in a nursing home for their fracture.

Discussion

In our large, international, observational study, we found that healthcare resource utilization (total hospital days, total rehabilitation days, and total nursing home days) varied among fracture types. While we are accustomed to hip fractures having a significant impact on healthcare utilization, they should be viewed in the context of the incident rates of all fractures. In the past, hip fractures were the easiest fracture type to capture accurately; and their associated healthcare costs were the easiest to quantitate. Indeed, it was often argued that their costs dwarfed the costs of other fractures. We now recognize that most fractures after the age of 50 years [20], even fractures that occur after trauma [21], are fragility fractures and should be included in fracture analyses. In the current study, 93% of fractures were at sites other than the hip and, as a consequence, women with non-hip fractures used a greater total amount of healthcare resources than those with hip fractures.

Even though patients with hip fractures had longer mean hospital stays than those with spine or all non-hip, non-spine fractures combined, and are therefore the focus of most health economic studies, they do not represent the vast majority of fragility fractures seen clinically. In our study, non-hip, non-spine fractures comprised the vast majority of fractures, and therefore, consistent with our hypothesis, had a high number of total hospital days, total rehabilitation days, and total nursing home days. Investigators have also found differences in hospital admissions depending on fracture type. Knowelden et al. [20] estimated the percentage of hospitalized patients to be in the order of 95% for hip fractures, 39% for vertebral fractures, 20% for other sites (pelvis, hand and phalanges, femoral fractures excluding the neck, distal lower extremity), 14% for humerus, and 8% for forearm. However, hospital admission rates have also been shown to fluctuate for individual fracture types. For example, data suggest that between 8% and 33% of all patients with clinical vertebral fractures are hospitalized [21–24]. In addition, while a Swiss study demonstrated a 50% hospitalization rate for individuals with forearm fractures, others have found rates that were dramatically lower [25–27].

There are many potential reasons why hospital rates fluctuate within fracture types. The apparent variation in hospital use may be due to poor coding of vertebral fractures. For instance, 52% of vertebral fractures admitted to the hospital via an emergency department have "vertebral fracture" registered as the cause of hospitalization and recorded as the principal diagnosis at hospital discharge. In the remaining cases, hospital admission was linked to other diseases, including acute exacerbation of chronic obstructive pulmonary disease, pneumonia, acute bronchitis, or congestive heart failure [28]. Furthermore, not all

hospital admissions due to osteoporosis are documented as a spine fracture, but rather as back pain or kyphosis [29]. Other fracture types with obvious osteoporosis-associated features, such as peripheral fractures after minor trauma, are frequently inaccurately coded as "fracture" in the hospital statistics, rather than "fracture and osteoporosis". In general, coding errors may be caused by uncertainty regarding the relevance of the trauma or because the physicians regard osteoporosis as an age-related process rather than a disease [30]. In addition, the severity of a fracture may help to determine hospital admission. Researchers have shown that approximately 30% of patients with spine fractures seek medical attention when the fracture occurs, but this rate increases to 80% with more severe degrees of vertebral deformity [28]. The presence or absence of care paths may have an effect on length of hospital stay, with well-established care paths associated with shortened length of stays [33]. Furthermore, complications caused by fracture, including neurological deficits resulting from vertebral fractures or algodystrophy for wrist fractures, and the patient's quality of life prior to the fracture, may have an impact on hospitalization [30, 31]. Patients with rib fractures often do not seek any medical care as there is little that can be done other than pain relief.

In addition to the burden of hip fracture, other fracture types have a large impact on healthcare utilization, given the high incident rate of these fractures (93%) compared with hip (7%). Other investigators have found high admission rates for fractures not traditionally considered to be "osteoporotic". Johnell et al. found that between the ages of 50 and 54 years, bed occupancy is approximately four times higher from fractures at sites other than the hip [32]. Furthermore, fractures at sites other than the traditional hip, spine, and forearm/wrist contribute to 33% of hospital discharges with a primary diagnosis of fracture and 62% of discharges with a secondary diagnosis of fracture [33].

Our study method has several strengths. First, GLOW data allowed for the assessment of healthcare utilization in a "real-world" setting, and included areas of healthcare use such as office/clinic visits and rehabilitation that are not commonly investigated. In addition, we examined many different fracture types. We utilized data from patient questionnaires and collected the information in a similar manner from the different geographic regions, which enabled accurate comparisons of patients' healthcare use across different geographic areas and national boundaries. We therefore avoided problems with data quality due to differences in regional or national databases [32]. Finally, many osteoporotic patients, especially the elderly, are likely to have multiple conditions; we therefore included in our analyses many potential confounding factors that may influence healthcare utilization.

Our study also has several limitations, which should be considered when interpreting these results. GLOW is a practice-based rather than a population-based study and is therefore subject to biases both in the selection of physicians, and in the sampling and recruitment of patients. Nonetheless, we attempted to diminish selection bias by producing a survey method that imposed low respondent burden. Study patients were not required to participate in clinic visits, to avoid requirements that might make involvement more difficult for women who are in poor health or have no or limited access to transportation. Furthermore, high participant response rates at most sites suggest that the study burden was low. All data were collected by patient self-report and may be limited by recall bias. However, studies that have examined

the validity of self-report of prescription medication use and fractures have shown reasonable accuracy [34]. Other than surgery, the procedures performed at the hospital were not examined, and data that may explain geographic regional differences were not collected. As a result, further investigation is needed to fully explain regional differences observed in the current study. In addition, our questionnaire asked if patients went to a rehabilitation center or nursing home, and these differences may not have been appreciated by the participants. Other potential limitations are that data regarding differences among insurers (within and among third party insurers and publicly funded insurance), which may influence hospitalization rates for patients, were not collected. Also, we did not report subclinical vertebral fractures because X-ray films were not a part of GLOW. Research has found that subclinical vertebral fractures are less severe than clinically recognized fractures and severity may be associated with healthcare utilization. Finally, only women were included in the study, and given that other investigators have found that healthcare utilization differs between the sexes, inferences regarding healthcare use should not be generalized to men [32].

Conclusions

Osteoporosis is a common disease and has become a major public health problem worldwide. Patients who experience fractures are in need of healthcare services. The utilization of these resources is particularly high for hip fracture patients. Nonetheless, as a result of the high incidence of other fracture types, significant healthcare services are utilized for all fractures. Given that the negative consequences of fractures are dramatic and that effective therapies that reduce future fracture risk are available, it is important to promote the early detection of patients who are at high risk of fractures so that appropriate interventions may be implemented. Furthermore, the resource utilization patterns identified in the current study may assist health planners in developing future healthcare services.

Acknowledgments

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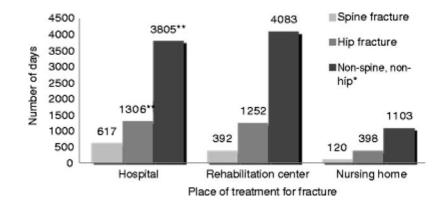
Figure 1.
Numbers of days in a hospital, rehabilitation center, or nursing home for patients with a fracture of the spine, hip, or non-spine, non-hip. *Single asterisk* (*): non-spine, non-hip fractures included wrist/hand, arm/shoulder, pelvis, rib, leg, and other fractures (other fractures sites included ankle, foot, knee, clavicle, elbow, coccyx, sternum, and neck). ***P* value<0.001, significant difference in LOS for hip versus non-spine, non-hip fractures

Table 1

Baseline characteristics of the 1,898 women with fracture(s) by year 1 [a]

Baseline characteristics	New fracture at specific location									
	Spine[b] (n=195)	Hip (n=134)	Non-spine, non-hip (n =1,654)	Wrist/hand (n=419)	Arm/shoulder (n=197)	Pelvis (n=89)	Rib (n=252)	Leg (n=207)	Other[c] (n=658)
Patient demographics, mean (SD)									
Age (years)	73 (9)	76 (9)	70 (9)	70 (9)	72 (9)	75 (9)	71 (10)	71 (10)	69 (9)
BMI (kg/m^2)	26 (7)	25 (5)	27 (6)	27 (6)	27 (5)	25 (5)	27 (6)	28 (7)	27 (6)
Patient history, n (%)									
Prior fractures	107 (56)	68 (52)	699 (43)	171 (42)	82 (43)	51 (61)	140 (57)	108 (53)	248 (39)
1 comorbid condition(s)	137 (87)	93 (87)	1,157 (82)	297 (81)	141 (83)	64 (93)	171 (86)	142 (78)	461 (83)
General health excellent/ very good	41 (21)	38 (29)	527 (32)	144 (35)	54 (28)	19 (22)	65 (26)	57 (28)	220 (34)
Insurance coverage	146 (82)	85 (73)	1,190 (80)	281 (76)	129 (76)	67 (85)	182 (78)	149 (81)	499 (82)
Highest education level	24 (13)	14 (11)	266 (17)	65 (16)	23 (12)	8 (9)	39 (16)	33 (17)	117 (18)

SD standard deviation

[a]Some women did not have complete data on all baseline characteristics

[b]Excluding neck fractures

[c]Other fractures included ankle, foot, knee, clavicle, elbow, coccyx, sternum, neck

Table 2

Fracture type by age group

Baseline characteristics	New fracture at specific location							
	Spine[b] (*n*=195)	Hip (*n*=134)	Non-spine, non-hip (*n* =1,654)	Wrist/hand (*n*=419)	Arm/shoulder (*n*=197)	Pelvis (*n*=89)	Rib (*n*=252)	Leg (*n*=207)	Other[c] (*n*=658)
Age group: %								
55–64 years	19.5	13.4	33.1	32.0	26.9	13.5	31.0	31.4	38.3
65–74 years	31.8	26.1	34.0	34.6	26.4	27.0	30.6	31.4	35.7
75–84 years	38.0	41.0	25.9	27.7	37.6	42.7	30.6	26.6	20.4
85+ years	10.8	19.4	7.0	5.7	9.1	16.9	7.9	10.6	5.6

Table 3

Health care service used by age group

Age group: %	Office/clinic (n=1266)	Hospital (n=1206)	Rehab (n=291)	Nursing home (n=66)
55–64 years	31.2	29.6	18.2	10.5
65–74 years	34.3	33.1	26.7	19.4
75–84 years	27.3	28.7	36.6	47.8
85+ years	7.2	8.6	18.5	22.4

Table 4

Length of stay by fracture type (n=1898[a])

Healthcare service used		New fracture at specific location								
	Spine[b] (n=195)	Hip (n=134)	Non-hip, non-spine (n=1,654)	Wrist/hand (n=419)	Arm/shoulder (n=197)	Pelvis (n=89)	Rib (n=252)	Leg (n=207)	Other[c] (n=658)
Hospital (n)	n=56	n=99	n=369	n=81	n=62	n=36	n=40	n=107	n=111
Mean (SD) days	11 (13)	13 (16)	10 (15)	7 (11)	9 (13)	18 (19)	17 (22)	15 (21)	9 (12)
Median days	6	8	5	3	4	10	6	7	4
Rehab (n)	n=20	n=58	n=149	n=19	n=25	n=23	n=14	n=59	n=41
Mean (SD) days	20 (12)	22 (20)	27 (25)	18 (21)	31 (28)	23 (13)	32 (29)	31 (27)	27 (26)
Median days	18.5	14	20	10	21	21	21	21	18
Nursing home (n)	n=7	n=14	n=38	n=6	n=8	n=10	n=4	n=12	n=9
Mean (SD) days	17 (15)	28 (25)	29 (27)	35 (37)	13 (8)	34 (29)	65 (39)	41 (35)	37 (26)
Median days	14	20	20	18	15.5	20	75	25.5	30

[a] Some women did not have complete data on all healthcare utilization characteristics

[b] Excluding neck fractures

[c] Other fractures included ankle, foot, knee, clavicle, elbow, coccyx, sternum, neck

Table 5

Length of stay by region and fracture type

n, mean (SD), median	LOS Hospital	LOS Rehab	LOS Nursing home
Spine			
North America	n=29, 7 (9) *, 3	n=10, 15 (7), 14.5	n=4, 20 (18), 17.5
North Europe	n=18, 13 (11), 9.5	n=5, 16 (9), 14	n=2, 7 (8), 6.5
South Europe	n=7, 20 (23) *, 7	n=2, 44 (23), 44	n=1, 28 (−), 28
Hip			
North America	n=57, 10 (15), 6	n=37, 16 (15), 14	n=9, 27 (28), 20
North Europe	n=16, 15 (9), 13	n=5, 41 (34), 28	n=1, 40 (.), 40
South Europe	n=22, 19 (21), 10	n=14, 28 (19), 20.5	n=4, 29 (21), 20
Non-spine, non-hip			
North America	n=175, 9 (16), 4	n=105, 27 (27), 17	n=27, 35 (30), 21
North Europe	n=95, 12 (10), 10	n=12, 27 (15), 23	n=4, 10 (3), 10
South Europe	n=76, 9 (12), 4	n=20, 33 (26), 25.5	n=6, 17 (11), 17.5

*
Statistically significant difference between North America and South Europe (p=0.016)

Utilization of healthcare services by fracture type (*n*=1,898[a])

Table 6

Healthcare service used	New fracture at specific location								
	Spine[b] (*n*=195)	Hip (*n*=134)	Non-hip non-spine (*n*=1,654)	Wrist/hand (*n*=419)	Arm/shoulder (*n*=197)	Pelvis (*n*=89)	Rib (*n*=252)	Leg (*n*=207)	Other[c] (*n*=658)
Office/clinic, *n/n*	121/165	76/124	1,111/1,522	270/379	130/181	45/81	164/236	140/191	456/596
(%)	(73)	(61)	(73)	(71)	(72)	(56)	(69)	(73)	(77)
Office/clinic only, *n/n*	44/152	4/121	384/1,443	66/367	28/174	14/76	78/219	26/183	181/557
(%)	(29)	(3.3)	(27)	(18)	(16)	(18)	(36)	(14)	(32)
Hospital, *n/n*	101/165	117/127	1,045/1,511	313/389	149/184	60/78	104/225	163/193	371/579
(%)	(61)	(92)	(69)	(80)	(81)	(77)	(46)	(84)	(64)
Overnight in hospital, *n/n*	57/95	102/111	385/960	85/281	66/138	37/57	43/98	110/152	115/339
(%)	(60)	(92)	(40)	(30)	(48)	(65)	(44)	(72)	(34)
Surgery, *n/n*	29/99	103/116	348/998	114/296	49/141	16/59	16/98	105/154	107/355
(%)	(29)	(89)	(35)	(39)	(35)	(27)	(16)	(68)	(30)
Rehabilitation center, *n/n*	24/161	69/122	225/1,441	47/357	43/176	27/79	19/217	73/178	64/563
(%)	(15)	(57)	(16)	(13)	(24)	(34)	(8.8)	(41)	(11)
Nursing home, *n/n*	8/153	19/116	50/1,394	8/349	12/168	13/75	6/216	17/174	13/534
(%)	(5.2)	(16)	(3.6)	(2.3)	(7.1)	(17)	(2.8)	(9.8)	(2.4)

[a] Some women did not have complete data on all healthcare utilization characteristics

[b] Excluding neck fractures

[c] Other fractures included ankle, foot, knee, clavicle, elbow, coccyx, sternum, neck