Trends in fall-related hospital admissions in older persons in the Netherlands

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Abstract

Background: Fall-related injuries, hospitalizations and mortality among older persons represent a major public health problem. Due to aging societies worldwide, a major impact on fall-related healthcare demand can be expected. The aim of the study was to determine time trends in numbers and incidence of fall-related hospital admissions and in admission duration in older adults. **Methods:** Secular trend analysis of fall-related hospital admissions in the Dutch older population between 1981 and 2008, using the National Hospital Discharge Registry. All fall-related hospital admissions in persons aged ≥65 years were extracted from this database. Outcome measures were the numbers, and the age-specific and age-adjusted incidence rates (per 10,000 persons) of fall-related hospital admissions in each year of the study. **Results:** Between 1981-2008, fall-related hospital admissions increased by 137%. The annual age-adjusted incidence growth was 1.3% for males versus 0.7% for females ($p<0.001$). The overall incidence rate increased from 87.7 to 141.2 per 10,000 persons (increase 61%). Age-specific incidence increased in all age groups, in both males and females, especially in the oldest old. Although the incidence of fall-related hospital admissions increased, the total number of fall-related hospital days was reduced with 20%, due to a reduction in admission duration. **Conclusions:** In the Netherlands, numbers of fall-related hospital admissions among older persons increased drastically between 1981 and 2008. The increasing fall-related healthcare demand has been compensated for by a reduced admission duration. These figures demonstrate the need for implementation of falls prevention programs in order to control for increases of fall-related healthcare consumption.

Keywords: older persons, fall incidents, hospital admissions, trends, healthcare consumption

Introduction

Approximately one third of all people aged 65 years and over fall each year, and half of those fall repeatedly.[1, 2] Even a low energy trauma, such as a fall incident, causes physical injuries. Around 10% of all fall incidents result in serious injuries and require a hospital admission. Fall-related hospital admissions in older patients are generally due to hip fractures (50%), fractures of the arm (13%), and head injuries (10%).[3, 4] Falls do not only lead to physical injuries, but may also have a large impact on the quality of life of the old[2, 3, 5-10] and on healthcare costs.[11-13]

The cause of a fall incident in the older age groups is often multifactorial. Risk factors associated with fall incidents include a higher age, female gender, the use of fall-risk-increasing medication, and certain co-morbidities. Many older patients visit their General Practitioner (GP) or the Emergency Department after a fall.[7] Treatment is usually restricted to management of the direct fall-related injuries. Since the cause of the fall is often not investigated, the patient may remain at risk for future falls, which calls for the implementation of preventive services.[5]

In the Netherlands, the population of people aged 65 years and over is expected to increase to up to 25% of the population in 2040 (15% in 2008).[14] These figures are comparable to worldwide trends[15] and it can be expected that this will have an enormous impact on the fall-related healthcare consumption.

Therefore we aimed to quantify time trends of fall-related hospitalization and in-hospital length of stay in older patients over the last decades.

Methods

For this study all accidental fall-related hospital admissions between 1981-2008 were collected. Throughout the study period an accidental fall was defined using the International Classification of Diseases, 9th revision, code E880 – E888 (Table 1) for external causes of injury. Older persons were defined as persons of ≥65 years. The age-specific fall-related clinical incidence rates were calculated in 5-year age groups. Data were retrieved from the Statistics Netherlands[16] (CBS, http://www.cbs.nl, The Hague, The Netherlands), which combines information of the National Medical Registration (LMR) with the National Hospital Discharge Registry. The LMR collects hospital data of all hospitals in the Netherlands. Data regarding hospital admissions, admission diagnosis, length of hospital stay in days, gender, age, causes of external injuries, main diagnosis (such as fractures) and mortality are stored in this database. Data on hospital admissions, mortality, and population numbers were verified with the Dutch Birth Registry. The LMR uses a uniform classification and coding system for all hospitals and has an almost complete national coverage (missing values less than 5%).[17] These figures were extrapolated to full national coverage for each year. An extrapolation factor was estimated by comparing the adherence population of the participating hospitals with the total Dutch population in each year. Specification of data on admission duration, fall mechanisms and main injuries were not fully available in the first years of the study, due to data aggregation in the past. The Medical Ethical Review Board of the Erasmus MC approved the study.

Numbers of fall-related hospital admissions, main injuries and length of in-hospital stay were specified for age and gender in 1981, 1986, 1991, 1996, 2001, 2006 and 2008. The age-specific incidence was calculated using the number of the fall-related hospital admissions in that specific age group, divided by the number of total population within that specific age-group for male and female patients, and was expressed per 10,000 persons in that age-group. Overall growth in the number of hospital admissions was calculated for 2008 in percents

relative to the year 1981. The population numbers on the 1st of January were used in each year of the study.

To model the trend in hospital admissions, a linear regression model with Poisson error and log link was built with log (population size at 1st January of each year of the study) as offset factor. A linear spline model, with age, year, gender and population size, was built to assess whether the annual growth changed over the study period for both genders. The parameter for calendar year, corrected for gender and age-group was transformed into Percentage Annual Change (PAC). Our spline function accommodated two piecewise linear fits, connected with one another at the knot.[18] The knot was placed in the middle of the study period (January 1, 1995). The analysis including splines yielded estimates of annual changes in admission rates within each 14-year period (1981-1994 and 1995-2008). Comparison of these two periods enabled us to detect and quantify changes in the secular trend in admission rates such as a stagnation or and increase of admission rates. A likelihood ratio test was performed to assess the significance of the spline over a single trend for the study period. Interactions of the spline versus gender and age were added and tested to investigate differences in increase for gender and age. All statistical analyses were performed using SPSS software (version 16.1.1). A p-value <0.05 was considered statistically significant.

Results

In the Netherlands, the number of fall-related hospital admissions in older persons has grown from 14,398 in 1981 to 34,091 in 2008 (137% increase). This reflects an annual growth of 778 fall-related hospital admissions during the study period. Especially the number of persons ≥80 year showed a strong increase from 6,535 in 1981 to 20,253 in 2008 (increase of 210%). The mean age of the patients increased from 79.3 years in 1986 to 81.0 years in 2008 and three-quarters of the patients were female (Table 2). Fall incidents resulted mainly in hip, wrist and upper arm fractures as well as skull/brain injury and superficial injuries (Table 2). Numbers of the main injuries all increased, but the proportion of hip fractures slightly decreased (48.0% in 1986 to 41.8% in 2008). The incidence rate of hospital admissions due to a fall with a hip fracture in older Dutch adults increased from 51.2 per 10,000 older adults in 1986 to 63.6 in 1996, while in the period 1997-2008 the incidence rate of hospital admissions for hip fractures due to a fall decreased to 59.0 per 10,000 older adults. The proportion of wrist and upper arm fractures together with superficial and head injuries increased from 13.6% (2,563) in 1986 to 23.8% (8,095) in 2008. Mechanisms of fall incidents hardly changed over time. Most fall incidents happened on the stairs, or near bed or chair; were due to slipping, tripping or stumbling; and remained stable at 96% throughout the study period.

Annual growth of fall-related hospital admissions for males and females differed ($p<0.001$) and was 1.3% for males versus 0.7 % for females respectively throughout the study period, corrected for age and population at risk. The annual growth, however, was not constant during the whole period. The linear spline model revealed an annual growth of 1.62% (CI95%: 1.47-1.78) in males and 1.10% (CI95%: 1.01-1.18) in females in the period 1981-1994. The growth decreased to 1.07% (CI95%: 0.94-1.20) in males and 0.37% (CI95%: 0.30-0.44) for females in the period 1995-2008. The age-specific annual change is shown in Table 3, and was highest in males ≥80 years.

For all age-specific groups, the incidence of admissions in the female population exceeded the incidence in males. A 5-10 year shift was noticed in the age-specific incidence

between males and females and the incidence was consistently higher for females than males. For example in 2008 the admission rate for males aged 85-90 years was 280.4 per 10,000 compared to 277.0 per 10,000 females aged 80-85 years (Table 4).

Gender and age-specific incidence rates of fall-related hospital admissions increased in all age-groups, both for males and females (Table 4). The overall incidence rate increased from 87.7 in 1981 per 10,000 older adults to 141.2 per 10.000 in 2008 (increase of 61%). Regarding the age-specific incidence in females, the largest absolute and relative increase was seen in patients aged ≥95 years (57.0% CI95% 33.8-84.3). For males, the largest absolute and relative increase was also seen in patients aged ≥95 years (15.7% CI95% 87.2-254.6).

The Length of Stay (LOS) for fall-related hospital admissions was age-related and peaked in patients of 85-90 years. However, the duration of a fall-related hospital admission in older persons decreased over the last 25 years for all age-specific groups. Overall, the admission duration was reduced from 26.3 days (SD 33.3) in 1991 to 11.1 days (SD 12.4) in 2008. The mean LOS in days is shown in Table 5.

The change in LOS affected the total number of hospital-bed-days. Total number of fall-related hospital-bed-days decreased from 487,769 days in 1981 to 388,650 days in 2008. The overall number of hospital-bed-days remained stable for male patients ≥65 years (approximately 103,000 days) between 1981 and 2008. For females between 65 and 80 years the number of hospital-bed-days decreased gradually from 192,360 days in 1981 to 87,475 days in 2008 (54% reduction). In females ≥80 years, on the other hand, the number of hospital-bed-days increased from 191,077 in 1981 till 297,825 in 1993 days and decreased to 202,343 days in 2008, see Figure 1.

Discussion

In order to gain insight into the absolute numbers, incidences and trends of fall-related hospital admissions in older patients, registration data of all persons aged ≥65 years in the Netherlands were studied between 1981 and 2008. Both the absolute numbers and the incidences of fall-related hospital admissions in older people strongly increased over time. This increase was more pronounced in male patients than in female patients, although the total incidence rate remained consistently higher for female patients in all age groups. Main injuries at admission were hip, wrist and upper arm fractures and these accounted together with superficial and skull or brain injuries for two thirds of all injuries. Because the LOS was reduced over time, the increased numbers of fall-related hospital admissions did not lead to an increased overall number of admission days, up till now.

A major strength of this study is the availability of population-based in-hospital data for an extensive period of 28 years, for which recording started in 1981. Since that year, absolute numbers of fall-related hospital admissions and hospital bed days in all hospitals in the Netherlands have been recorded in a highly accurate and electronic database with an almost complete national coverage. A possible limitation of this study is that the data describe a national situation for one country, which may not directly translate to other countries, because demographics and healthcare system characteristics may differ. Nevertheless, since falls data in older populations in western societies are comparable with the data of the Netherlands,[19] we have no reason to assume that the prevalence of fall-related hospital admissions is different.[20] However, further studies are required to confirm if these trends in fall-related injuries and hospital admissions are comparable to other populations. Furthermore, patients who were not admitted to the hospital, were not registered in the National Hospital Discharge Registry databases and, consequently, not included in this study. Therefore, this study mainly reflects trends regarding the incidence rates of serious fall-related injury and excludes isolated minor fall-related injuries. The actual societal impact of all fall-related injuries, both major and minor, is most likely to exceed the burden as described in this

study.

A limitation of the use of this link administrative database is that it does not contain data regarding underlying diagnosis, co-morbidities, treatments, injury severity, life style, or medication use of the patients. This hampers the interpretation of causal mechanisms behind the observed trends.

Readmissions in one calendar year were not excluded and could potentially lead to some 'double registration'. However, readmissions most likely did not influence our results because readmissions constitute only 2.6% (at the maximum) in the Netherlands, as was found in a study by Polinder *et al.*[21]

Trends in hospital admission rates and LOS as observed in this study are important for two reasons: first the population at risk is increasing worldwide[15] and secondly the age-specific incidence of fall-related hospital-admissions is increasing. Multiple studies, focusing on fall-related injuries, such as hip fractures, proximal humeral fractures, and severe head injuries in the elderly, have shown a comparable trend over time.[20, 22-26]

Throughout the study period, no major policy changes were introduced in the Netherlands, which might have affected the increase in admission rates. The Dutch healthcare system is characterized by full health insurance coverage and full accessibility for the whole population during the study period. As in other countries, clinical practice has changed during the study period (*e.g.*, introduction of geriatric medicine, improved anesthetical care and surgical techniques for older adults), but this probably only marginally affected the admission policies, because of the low general admissions threshold in the Netherlands. But rapidly increasing rates of admissions for wrist and upper arm fractures may be partly explained by improved surgical procedures and techniques in the oldest old and an associated drop in admission threshold.

Another potential cause for the observed increase in fall-related hospital admission rates might be 'the aging society'. Since life expectancy is increasing in the Netherlands[27] and older persons are living longer with multiple medical problems, the risk of falls and fall-

related injuries can be expected to increase. Nevertheless, population health analyses in the Netherlands have shown that these patients are reporting fewer problems of mobility,[28, 29] which may be explained by improved medical care, the use of walking aids and other equipment (*i.e.* electric mobility scooters). The consequence of sustained walking abilities among older persons with multiple morbidities is, that these patients remain at risk for fall incidents. This trend of improved mobility in older adults is seen in other countries as well.[30, 31] Other causes for the observed increased incidence of fall-related injuries might be due to an increasingly active lifestyle (*i.e.*, cycling, jogging, walking). All these factors do have an influence on fall risk and outcomes and may (partly) explain the observed rise in incidence rate of fall-related hospital admissions. Besides a more active life style, other fall mechanisms, a lower surgical intervention threshold and improved anesthetical care for older adults may have also contributed slightly to the changed distribution of main injuries.

The deceleration of growth in admission rates in the most recent period might partly be explained by a reduction in hip fracture rates, as observed in our study and other studies worldwide.[22, 32-34] The possibility of a birth cohort effect resulting in a healthier aging population with improved functional abilities and a reduced level of injurious falls has been suggested.[22] Our findings raise the question, which other factors could be associated with a more favorable trend in fall-related admission rates in recent years. We have no clear answers to this specific question.

The total number of hospital-bed-days due to falls has decreased between 1981-2008. This can be explained partly by the larger decline in trend in the number of hospital admissions in females compared to males, which has been shown previously in fall-related injury studies outside the Netherlands.[25, 32-34] A further explanation for the phenomenon may be that during the last decade, multiple medications with proven positive effects on bone quality have become available and clinical practice guidelines have been introduced[35, 36], primarily focusing on older females. Further research is needed to determine the causes behind the observed differences between trends in males and females. In addition, life style

interventions and falls prevention programs have been implemented following the recent introduction of falls (prevention) guidelines.[37] This might be one of the reasons for the decline in age-specific incidence rates in fall-related hospital admissions in older females in the most recent period. However the total burden is still increasing due to an increased population of older females.

Despite the fact that the society is aging and co-morbidities are increasing in number, the total number of hospital-bed-days decreased, because the mean hospital admission duration decreased in all age-groups. This reduction may, at least partly, be explained by improvement in surgical techniques (e.g., minimally invasive procedures), the development of clinical guidelines (e.g., hip fracture guidelines) and more efficient treatment strategies.[36-39] With respect to the LOS, in the Netherlands specific and fast rehabilitation places for older patients with hip fractures, supported by multidisciplinary teamwork, have been made available in nursing homes. However, the oldest old appear to need more time in hospital, most probably because of more co-morbidities and reduced functional reserves.

In summary, our data highlight the importance of monitoring hospitalization trends over time across age-groups and gender, in order to visualize possible changes in healthcare needs and usage. Insight into fall-related hospital admission numbers can contribute to optimization of planning, resource allocation and staff distribution in the future. Improved implementation of falls prevention programs in older populations and specialized ‘in-hospital tracks for older fallers’ seem required in order to control for possible further increases in fall-related morbidity and healthcare consumption.

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Table 1. International Classification of Diseases 9th revision – falls by external cause

ICD9 code	Description
E880	Accidental fall on or from stairs or steps
E881	Accidental fall on or from ladders or scaffolding
E882	Accidental fall from or out of building or other structure
E883	Accidental fall into hole or other opening in surface
E884	Other accidental falls from one level to another
E885	Accidental fall on same level from slipping, tripping or stumbling
E886	Accidental fall on same level from collision, pushing or shoving by or with other person
E887	Fracture cause unspecified
E888	Other and unspecified fall

Table 2. Patient characteristics of hospital admissions due to falls, length of stay, main injury diagnosis and external cause in older adults between 1981-2008 in the Netherlands

Characteristic	1981	1986	1991	1996	2001	2006	2008
Population (* 1,000 persons)	1,642	1,769	1,934	2,061	2,175	2,330	2,415
Population female sex (%)	59.0	59.9	60.2	59.8	58.9	57.6	57.0
Hospital admissions (n)	14,398	18,872	21,879	26,281	25,490	30,368	34,091
Males (n)	3,440	4,415	4,974	6,134	6,059	7,705	8,830
Females (n)	10,958	14,457	16,905	20,147	19,431	22,663	25,261
Mean LOS (days) ± SD	33.8 ± n.a.	29.5 ± n.a.	26.3 ± 33.3	21.1 ± 24.3	20.5 ± 27.9	12.9 ± 13.7	11.1 ± 12.4
Incidence (per 10,000 persons)	87.7	106.7	113.1	127.5	117.2	130.3	141.2
Mean age patients (years)	n.a.	79.3	79.8	79.9	80.5	80.7	81.0
Main injuries: n (%)							
Hip fractures	n.a.	9,059 (48.0)	11,200 (51.2)	13,110 (49.9)	13,478 (52.9)	13,884 (45.7)	14,258 (41.8)
Wrist fractures	n.a.	591 (3.1)	639 (2.9)	843 (3.2)	889 (3.5)	1,444 (4.8)	1,760 (5.2)
Upper arm fractures	n.a.	356 (1.9)	484 (2.2)	769 (2.9)	764 (3.0)	1,284 (4.2)	1,440 (4.2)
Skull brain injury	n.a.	840 (4.5)	888 (4.1)	1,131 (4.3)	1,056 (4.1)	2,081 (6.9)	2,798 (8.2)

Superficial injuries	n.a.	776 (4.1)	716 (3.3)	1,073 (4.1)	837 (3.3)	1,573 (5.2)	2,097 (6.2)
Accidental fall (external cause): n (%)							
on or from stairs or steps	n.a.	5,151 (27.3)	5,630 (25.7)	5,923 (22.5)	5,608 (22.0)	7,285 (24.0)	7,651 (22.4)
on or from ladders or scaffolding	n.a.	267 (1.4)	277 (1.3)	383 (1.5)	481 (1.9)	702 (2.3)	664 (1.9)
from or out of building or other structure	n.a.	156 (0.8)	134 (0.6)	140 (0.5)	140 (0.6)	165 (0.5)	182 (0.5)
on or from chair or bed		3,670 (19.4)	4,180 (19.1)	4,569 (17.4)	4,020 (15.8)	4,844 (16.0)	5,233 (15.3)
on same level from slipping, tripping or stumbling	n.a.	9,407 (49.8)	11,329 (51.8)	14,937 (56.8)	14,923 (58.5)	17,074 (56.2)	19,990 (58.6)
on same level from collision, pushing or shoving by or with other person	n.a.	197 (1.0)	294 (1.3)	276 (1.0)	249 (1.0)	234 (0.8)	330 (1.0)
Other and unspecified	n.a.	23 (0.1)	35 (0.2)	54 (0.2)	68 (0.3)	64 (0.2)	41 (0.1)

Abbreviations: LOS, admission duration; n.a,. not available.; SD, Standard Deviation; n, number

Table 3. Percentage annual change in fall-related hospital admissions, corrected for population size in males and females in the Netherlands between 1981-1994 and 1995-2008

	Males		**Females**	
Period	1981-1994	1995-2008	1981-1994	1995-2008
Age-group	**Change (CI95%)**	**Change (CI95%)**	**Change (CI95%)**	**Change (CI95%)**
65-70 years	0.49 (0.11-0.87)	1.19 (0.85-1.52)	0.02 (-0.24-0.27)[#]	0.31 (0.07-0.55)
70-75 years	0.75 (0.40-1.11)	1.04 (0.73-1.36)	1.08 (0.86-1.30)	-0.36 (-0.56- -0.16)
75-80 years	1.65 (1.32-1.99)	0.38 (0.10-0.66)	1.33 (1.14-1.52)	0.31 (0.14-0.48)
80-85 years	2.42 (2.07-2.77)	1.01 (0.73-1.28)	1.40 (1.22-1.58)	0.42 (0.27-0.57)
85-90 years	2.49 (2.08-2.90)	1.47 (1.14-1.79)	1.15 (0.95-1.34)	0.76 (0.60-0.92)
90-95 years	2.28 (1.69-2.88)	1.95 (1.47-2.44)	1.28 (0.99-1.57)	0.35 (0.13-0.57)
≥95 years	3.27 (2.09-4.47)	1.41 (0.43-2.40)	1.92 (1.31-2.53)	0.73 (0.30-1.16)
Overall	1.62 (1.47-1.78)	1.07 (0.94-1.20)	1.10 (1.01-1.18)	0.37 (0.30-0.44)

Abbreviations: CI95%, 95% Confidence Interval; A $p<0.05$ was observed in all cases, except in [#] $p=0.892$

Table 4. Incidence rate of fall-related hospital admissions per 10,000 persons in older adults in the Netherlands between 1981 and 2008

	65-70 year		70-75 year		75-80 year		80-85 year		85-90 year		90-95 year		≥95 year	
Year	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
1981	27.9	49.5	34.4	73.8	57.4	117.0	92.0	198.0	137.8	304.7	237.2	382.9	217.1	459.6
1986	29.8	51.7	45.9	81.9	67.7	135.9	109.1	227.4	182.1	360.2	275.4	465.4	330.7	492.3
1991	28.3	51.5	41.6	84.7	70.1	145.3	126.5	228.5	211.9	359.9	310.6	521.9	411.7	533.2
1996	33.1	55.7	48.6	94.3	83.2	155.1	145.5	260.8	230.6	392.2	334.2	536.1	408.2	576.5
2001	29.2	46.6	42.3	79.4	74.1	143.1	130.1	238.3	216.0	370.0	337.2	483.2	464.4	545.3
2006	33.7	53.2	45.8	87.5	78.5	155.1	146.3	252.8	263.4	406.9	392.9	537.2	560.0	605.4
2008	34.7	60.9	53.9	89.0	82.5	157.0	154.0	277.0	280.4	450.4	451.4	565.5	558.6	721.5
Change*		11.4 (7.6-	19.5	15.3	25.0	40.0	62.0	79.0	142.6	145.7	213.9	182.6	342.3	261.8
(CI95%)	6.7 (3.7-	15.6)	(14.8-	(10.2-	(18.2-	(32.3-	(48.9-	(66.4-	(114.6-	(122.7-	(152.4-	(138.1-	(189.4-	(155.3-
	10.2)		24.7)	20.6)	32.5)	48.0)	76.3)	92.3)	173.6)	169.9)	285.1)	231.0)	552.7)	387.7)
Percent	24.2	23.1	56.7	20.7	43.6	34.1	67.4	39.9	103.4	47.8	90.2	47.7	157.7	57.0
change*	(13.1-	(15.2-	(42.9-	(13.9-	(31.7-	(27.6-	(53.1-	(33.5-	(83.2-	(40.3-	(64.3-	(36.0-	(87.2-	(33.8-
(CI95%)	36.4)	31.4)	71.9)	27.9)	56.6)	41.0)	82.9)	46.6)	126.0)	55.7)	120.2)	60.3)	254.6)	84.3)

* change is 2008 compared to 1981

Table 5. Mean admission duration in days (with SEM) due to falls in the older Dutch population between 1981 and 2008

	1981		1986		1991		1996		2001		2006		2008	
Males	Mean	SEM	Mean	SEM	Mean	SEM	Mean	SEM	Mean	SEM	Mean	SEM	Mean	SEM
65-70 years	26.9	n.a.	21.6	n.a.	17.8	0.6	15.7	0.7	12.5	0.8	8.2	0.3	8.0	0.3
70-75 years	27.3	n.a.	26.7	n.a.	21.4	1.0	19.0	0.7	15.9	0.7	10.0	0.3	9.1	0.3
75-80 years	33.0	n.a.	28.3	n.a.	24.7	0.9	21.5	0.7	20.4	0.8	12.3	0.3	11.4	0.3
80-85 years	32.1	n.a.	29.0	n.a.	27.6	1.1	22.0	0.6	21.8	0.8	14.6	0.4	12.6	0.3
85-90 years	32.6	n.a.	30.0	n.a.	28.3	1.4	25.2	1.0	25.0	1.1	14.7	0.4	12.5	0.3
90-95 years	28.6	n.a.	26.9	n.a.	24.3	1.3	22.0	1.2	22.1	1.2	14.6	0.5	13.7	0.5
≥95 years	21.1	n.a.	21.8	n.a.	21.1	2.2	18.3	1.6	20.9	3.4	12.5	1.0	11.4	0.9
Females														
65-70 years	29.3	n.a.	25.4	n.a.	19.6	0.5	14.5	0.3	12.1	0.4	8.2	0.2	7.3	0.2
70-75 years	33.9	n.a.	27.8	n.a.	22.3	0.5	18.1	0.4	16.6	0.5	10.4	0.2	8.8	0.2
75-80 years	36.0	n.a.	30.1	n.a.	26.0	0.5	21.0	0.4	20.2	0.5	11.9	0.2	10.6	0.2
80-85 years	37.3	n.a.	31.5	n.a.	29.8	0.6	22.5	0.3	22.8	0.4	14.0	0.2	12.1	0.2
85-90 years	36.8	n.a.	32.8	n.a.	30.7	0.7	24.4	0.4	23.8	0.5	14.7	0.2	13.1	0.2
90-95 years	35.2	n.a.	31.7	n.a.	29.9	1.0	23.2	0.6	23.3	0.6	14.9	0.3	13.3	0.3

≥95 years	33.0	n.a.	31.7	n.a.	26.3	1.5	22.7	1.1	21.9	1.2	14.8	0.6	13.0	0.4

Mean is shown in days. Abbreviations: n.a., not available; SEM, Standard Error of the Mean.

Figure 1. Total number of fall-related hospital admission days in the older Dutch population (1981-2008)