How to reduce erroneous Emergency Department admissions for the frail elderly

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Abstract

Background. *Readmission after a first hospitalization is a common occurrence. It may be due to incomplete treatment, poor care for underlying problems or reflect bad coordination with health services at the time of discharge. The aim of this study was to identify the factors and classify the pathologies that expose elderly patients to erroneous access to the Emergency/Urgency Department (EUD).*
Study design. *Retrospective observational study.*
Materials and methods. *From January 2016 to December 2019 we studied patients who had at least one readmission to the EUD in the six months following discharge. All EUD accesses of the same patient that occurred for the problem treated during the previous hospitalization were identified. Data was provided by the University Hospital of Siena. Patients were stratified by age, gender, and municipality of residence. We used an ICD-9-CM coding system to describe health problems. Statistical analysis was carried out with Stata software.*
Results. *We studied 1,230 patients (46.6% females) the mean age was 78.2 ± 14.3. Most of them, 721 (58.6%) were ≥80 years old, 334 (27.1%) were 65-79, 138 (11.2%) were 41-64, and only 37 (3.0%) were ≤40. Patients who lived in Municipality of Siena had a lower probability to return than to those living in other municipalities (OR 0.76; 95%CI: 0.62-0.93; p<0,05). The main causes of readmission for ≥65 years old were "symptoms, signs and ill-defined conditions" (18.3%), "respiratory diseases" (15.0%), "injury and poisoning" (14.1%), "cardiovascular diseases" (11.8%), "classification of factors influencing health status and contact with health services" (9.8%), "genitourinary diseases" (6.6%) and "digestive diseases" (5.7%).*

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Conclusions. *We observed that patients residing a greater distance from the hospital facilitates the risk of readmission. The factors that were exposed could be used to identify frequent users and initiate measures to reduce their access.*

Introduction

The Emergency and Urgency Department (EUD) is conceived to provide emergency care for acute and chronic illnesses, various accidents, and injuries. Use of EUDs is rapidly increasing worldwide (1, 2) due to the ageing population, which has a significant impact on health services. In comparison to other age groups, older adults have a higher use rate of the EUD, longer stays, and require more resources and medical interventions. A subset of EUD patients is characterized as frequent users. Increasing numbers of studies relating to frequent users is directly proportional to the increase of (public) health care resources used by them (3-6).

There are many interpretations to explain the frequent "frail elderly" use of the EUD, for example, avoidable visits for elective problems. The elderly present multiple vulnerabilities from which complex and discordant care needs arise. According to a hospital's organizational needs, they should take charge of the acute stage of illnesses and leave the patients' next stage of management to territorial care.

Identifying the individual characteristics of elderly users could improve our understanding and management of their medical and social needs. For example, timely palliative care reduces the number of EUD visits near the end of life due to the specific care given to patients, while patients with asthma may require more EUD visits as they are more prone to exacerbations (7, 8).

Frequent users could be classified according to their number of annual EUD admissions. According to some authors, "frequent users" are patients who have had from two to twelve or more readmissions per year (9), while for others they are patients who have been readmitted three or more times per year (10, 11). The time frame for return visits ranges from 28 days to 6 months (12).

Readmission after a first hospitalization is a common occurrence. This could be due to incomplete treatment, poor care of underlying problems, bad coordination between the hospital and health services at the time of discharge or as a result of incomplete discharge planning (13). Several studies have documented the relationship between readmissions and quality of care; an accurate analysis of readmissions could provide information on care profiles and levels, thus providing useful tools for clinical evaluation (14).

Erroneous admissions contribute to wasted economic resources. On one hand this way to access care is responsible for a high marginal cost of non-urgent examinations, and, on the other hand, it affects quality since overcrowding is the main reason for lack for effectiveness of services (15). Although the amount of potential savings is still debatable, McWilliams et. al have shown that public costs are 320-728% higher than private costs, yielding a potential savings of 69-86% if non-emergency patients were treated in primary facilities rather than in emergency rooms (16).

Some previous studies have shown that although frequent users often represent a low percentage of the total number of patients, their absolute number disproportionately affects costs. Furthermore, they are responsible for crowded EUDs and wait times that cause decreased quality of emergency services offered (17). Therefore, understanding the characteristics of this category of patients is essential in developing policies that reduce the costs associated with

frequent emergency and urgency department use and adequately address these patients' real needs. In addition, the projected aging of the population will characterize the coming decades along with increased migration flows and will likely increase the demand for emergency services and their associated costs (18).

The aim of the study was to identify potential risk factors, and to classify pathologies that expose the elderly patient to EUD admission in order to focus on multidisciplinary management to reduce relapses and consequent hospitalization.

Material and methods

We conducted a retrospective, observational study from January 2016 to December 2019 on patients who had at least one readmission in the six months following the first hospitalization. Data was provided by the University Hospital of Siena (UHS) and extracted from EXPRIVIA 2.0 software. Other data relating to this period was provided by the Emergency Department of UHS. The health-related issues of 1,230 patients were described using the International Classification of Diseases, 9th revision-Clinical Modification (ICD-9-CM) coding system. Patients were stratified by gender, age group and municipality of residence. For this last stratification two groups were created: one of patients residing in the Municipality of Siena, the other of patients residing elsewhere.

We identified all patients who had been discharged from the Emergency and Urgency Department, and within a 6-month period had been back at least once to the same hospital.

In order to compare readmission diagnosis with that of the previous discharge we compared the first three digits of the diagnosis indexed for chronic diseases of the frail elderly over 65 years of age manifesting only one of the following diseases: renal failure, chronic bronchitis, emphysema, respiratory failure, bronchial asthma, stroke or cerebral ischemia, diabetes, myocardial infarction, cardiac ischemia or coronary artery disease, other heart disease, tumors (including leukemia and lymphoma), chronic liver disease and cirrhosis. Fisher's test, Kruskal-Wallis's test and Odds Ratio were carried out with Stata ver. 14 software. Differences were considered at a statistically significant level of 95% (p < 0.05).

Results

We studied 1,230 patients (46.6% females), whose mean age was 78.2 ± 14.3, admitted to EDU. Most of them, 721 (58.6%) were ≥80 years old (53.3% females), 334 (27.1%) were between 65 and 79 (64.1% males), 138 (11.2%) were between 41 and 64 (58.0% males), and only 37 (3.0%) were ≤40 (70.3% males) (p=0.0000). Most of the patients, 746 (60.7%), did not live in the Municipality of Siena (57.6% males) while 484 (39.3%) were residents (46.9% males) (p=0.0000).

Table 1 shows ICD-9-classified discharge distribution and patients' age. In the ≤40 age group 18.92% of patients were discharged for "genito-urinary diseases" and "injury and poisoning" followed by 16.22% for "cardiovascular diseases" and "respiratory diseases". In the 41-64 age group 22.46% of patients were discharged for "injury and poisoning" followed by 21.01% for "cardiovascular diseases", and 15.94% for "respiratory diseases". In the 65-79 age group 23.05% of patients were discharged for "respiratory diseases" followed by 20.96% for "cardiovascular diseases", and 18,86% for "injury and poisoning". In the ≥80 age group 23.50% were discharged for "injury and poisoning" followed by 20.49% for "cardiovascular diseases", and 15.37% for "respiratory diseases".

Table 1 - Discharge by ICD-9 and patients' age group.

Discharge (ICD-9)	Age ≤40		Age 41-64		Age 65-79		Age ≥80		Total	
	N	%	N	%	N	%	N	%	N	%
Infectious and parasitic diseases (001-139)	3	8.11	10	7.25	20	5.99	23	3.19	56	4.55
Neoplasms (140-239)	0	0.00	4	2.90	18	5.39	40	5.55	62	5.04
Endocrine, nutritional, metabolic and immunity diseases (240-279)	0	0.00	2	1.45	4	1.20	10	1.39	16	1.30
Blood and blood-forming organs diseases (280-289)	0	0.00	0	0.00	3	0.90	8	1.11	11	0.89
Mental disorders (290-319)	0	0.00	0	0.00	2	0.60	3	0.42	5	0.41
Nervous and system organs diseases (320-389)	2	5.41	1	0.72	4	1.20	13	1.80	20	1.63
Cardiovascular diseases (390-459)	6	16.22	29	21.01	70	20.96	147	20.39	252	20.49
Respiratory diseases (460-519)	6	16.22	22	15.94	77	23.05	84	11.65	189	15.37
Digestive diseases (520-579)	3	8.11	17	12.32	23	6.89	77	10.68	120	9.76
Genitourinary diseases (580-629)	7	18.92	14	10.14	22	6.59	67	9.29	110	8.94
Skin and subcutaneous diseases (680-709)	0	0.00	0	0.00	2	0.60	3	0.42	5	0.41
Musculoskeletal and connective tissue diseases (710-739)	1	2.70	0	0.00	4	1.20	4	0.55	9	0.73
Congenital anomalies (740-759)	0	0.00	0	0.00	0	0.00	1	0.14	1	0.08
Syntoms, sign, and ill-defined conditions (780-799)	2	5.41	8	5.80	22	6.59	53	7.35	85	6.91
Injury and poisoning (800-999)	7	18.92	31	22.46	63	18.86	188	26.07	289	23.50
Total	37	100.00	138	100.00	334	100.00	721	100.00	1230	100.00

Table 2 - Readmissions by ICD-9 and patients' age group.

Readmissions (ICD-9)	Age ≤40		Age 41-64		Age 65-79		Age ≥80		Total	
	N	%	N	%	N	%	N	%	N	%
Infectious and parasitic diseases (001-139)	1	0.58	4	1.31	13	1.82	15	0.99	33	1.22
Neoplasms (140-239)	0	0.00	3	0.98	5	0.70	14	0.92	22	0.81
Endocrine, nutritional, metabolic and immunity diseases (240-279)	5	2.91	11	3.59	5	0.70	49	3.23	70	2.58
Blood and blood-forming organs diseases (280-289)	19	11.05	3	0.98	21	2.95	46	3.03	89	3.29
Mental disorders (290-319)	12	6.98	13	4.25	29	4.07	65	4.28	119	4.39
Nervous and system organs diseases (320-389)	8	4.65	15	4.90	24	3.37	55	3.63	102	3.77
Cardiovascular diseases (390-459)	21	12.21	42	13.73	72	10.10	191	12.59	326	12.04
Respiratory diseases (460-519)	17	9.88	45	14.71	128	17.95	206	13.58	396	14.62
Digestive diseases (520-579)	11	6.40	13	4.25	34	4.77	90	5.93	148	5.47
Genitourinary diseases (580-629)	8	4.65	13	4.25	46	6.45	102	6.72	169	6.24
Complications of pregnacy, childbirth, and the puerperium (630-679)	0	0.00	1	0.33	1	0.14	4	0.26	6	0.22
Skin and subcutaneous diseases (680-709)	3	1.74	3	0.98	5	0.70	13	0.86	24	0.89
Musculoskeletal and connective tissue diseases (710-739)	4	2.33	10	3.27	14	1.96	30	1.98	58	2.14
Congenital anomalies (740-759)	0	0.00	0	0.00	0	0.00	2	0.13	2	0.07
Certain condition originating in the perinatal period (760-779)	0	0.00	0	0.00	0	0.00	1	0.07	1	0.04
Syntoms, sign, and ill-defined conditions (780-799)	35	20.35	64	20.92	132	18.51	277	18.26	508	18.76
Injury and poisoning (800-999)	17	9.88	42	13.73	105	14.73	209	13.78	373	13.77
Codes V-classification of factor influencing health status and contact with health services (v01-v82)	11	6.40	24	7.84	76	10.66	143	9.43	254	9.38
Uncoded	0	0.00	0	0.00	3	0.42	5	0.33	8	0.30
Total	172	100.00	306	100.00	713	100.00	1517	100.00	2708	100.00

Kruskal-Wallis's test showed that the ICD-9 of discharges significantly differed depending on age group (p<0.005).

Table 2 shows the distribution of ICD-9-classified readmissions and patients' age. In the ≤40 age group, 20.35% of patients were readmitted for "symptoms, signs and ill-defined conditions" followed by 12.21% for "cardiovascular diseases" and 11.05% for "blood and blood-forming organs diseases". In the 41-64 age group 20.92% of patients were readmitted for "symptoms, signs and ill-defined conditions" followed by 14.71% for "respiratory diseases", and 13.53% for "cardiovascular diseases" and "injury and poisoning. In the 65-79 age group 18.51% of patients were readmitted for "symptoms, signs and ill-defined conditions" followed by 17.95% for "respiratory diseases", and 14.73% for "injury and poisoning". In the ≥80 age group 18.26% were readmitted for "symptoms, signs and ill-defined conditions" followed by 13.78% for "injury and poisoning", and 13.58% for "respiratory diseases".

Kruskal-Wallis's test showed that ICD-9 readmissions were notable diverse depending on by age group (p<0.005).

Focusing our analysis on 1,055 (52.2% males) patients admitted to the EUD who were ≥65, we can observe that most of them 611 (57.9%) lived outside of the Municipality of Siena (56.8% males) while the other 444 (38.4%) were residents (54.0% females) (p<0.05).

Table 3 shows the distribution of discharges by ICD-9 and patients' gender. Twenty-five percent of females and 22.69% of males were discharged for "injury and poisoning", for "cardiovascular diseases" 21.83% of females and 19.42% of males and for "respiratory diseases" 13.89% of females and 16.52% of males.

Table 4 shows the distribution of ICD-9 code readmissions and patients' gender as follows: 18.73% of females and 18.02% of males for "symptoms, signs, and ill-

defined conditions", 14.97% of females and 13.35% of males for "injury and poisoning", 13.18% of females and 16.46% of males for "respiratory diseases", and 13.38% of females and 10.07% of males for "cardiovascular diseases".

Table 5 shows the association between patients' residence and readmission. Patients who lived in the Municipality of Siena had a statistically significant lower probability to undergo readmission than the non-residents (OR= 0.76 95%CI= 0.63-0.93, p<0,05). No association was found between age ≥65 and residence. (OR= 0.81 95%CI= 0.65-1.02; p>0,05).

Discussion

According to the regional epidemiological data of Tuscany (19) the ageing index is confirmed, including the greater presence of elderly (≥85 years) female patients who are more probable to be readmitted in the EUD. The District of Siena is confirmed as being among the oldest; the frequent users of the University Hospital of Siena are also residents in other municipalities.

The burden of chronic-degenerative diseases with their consequential disabilities are becoming increasingly significant with ageing societies, because they are now the main causes of death. Often morbidity and the loss of years of a healthy life simultaneously affect a person, which imposes a deep change in the setting of care and the care needed for patients thus affected (20).

As the data analysis reveals, the higher percentage of discharge diagnoses are "injury and poisoning" followed by "cardiovascular diseases" and "respiratory diseases". These findings suggest the need to implement specific changes. First, appropriate treatment during hospitalization, a clear discharge program and a post-discharge follow-up could be of great use.

Further, coordination between hospital

Table 3 - Discharge by ICD-9 and patients' gender.

Discharge (ICD-9)	Females		Males		Total	
	N	%	N	%	N	%
Infectious and parasitic diseases (001-139)	16	3.17	27	4.90	43	4.08
Neoplasms (140-239)	25	4.96	33	5.99	58	5.50
Endocrine, nutritional, metabolic and immunity diseases (240-279)	9	1.79	5	0.91	14	1.33
Blood and blood-forming organs diseases (280-289)	5	0.99	6	1.09	11	1.04
Mental disorders (290-319)	1	0.20	4	0.73	5	0.47
Nervous and system organs diseases (320-389)	5	0.99	12	2.18	17	1.61
Cardiovascular diseases (390-459)	110	21.83	107	19.42	217	20.57
Respiratory diseases (460-519)	70	13.89	91	16.52	161	15.26
Digestive diseases (520-579)	56	11.11	44	7.99	100	9.48
Genitourinary diseases (580-629)	35	6.94	54	9.80	89	8.44
Skin and subcutaneous diseases (680-709)	4	0.79	1	0.18	5	0.47
Musculoskeletal and connective tissue diseases (710-739)	4	0.79	4	0.73	8	0.76
Congenital anomalies (740-759)	1	0.20	0	0.00	1	0.09
Syntoms, sign, and ill-defined conditions (780-799)	37	7.34	38	6.90	75	7.11
Injury and poisoning (800-999)	126	25.00	125	22.69	251	23.79
Total	504	100.00	551	100.00	1055	100.00

Table 4 - Readmissions by ICD-9 and patients' gender.

Readmissions (ICD-9)	Females		Males		Total	
	N	%	N	%	N	%
Infectious and parasitic diseases (001-139)	10	0.99	18	1.47	28	1.26
Neoplasms (140-239)	8	0.79	11	0.90	19	0.85
Endocrine, nutritional, metabolic and immunity diseases (240-279)	29	2.87	25	2.05	54	2.42
Blood and blood-forming organs diseases (280-289)	30	2.97	37	3.03	67	3.00
Mental disorders (290-319)	36	3.57	58	4.75	94	4.22
Nervous and system organs diseases (320-389)	35	3.47	44	3.60	79	3.54
Cardiovascular diseases (390-459)	140	13.88	123	10.07	263	11.79
Respiratory diseases (460-519)	133	13.18	201	16.46	334	14.98
Digestive diseases (520-579)	58	5.75	66	5.41	124	5.56
Genitourinary diseases (580-629)	57	5.65	91	7.45	148	6.64
Complications of prengnacy, childbirth, and the puerperium (630-679)	3	0.30	2	0.16	5	0.22
Skin and subcutaneous diseases (680-709)	11	1.09	7	0.57	18	0.81
Musculoskeletal and connective tissue diseases (710-739)	19	1.88	25	2.05	44	1.97
Congenital anomalies (740-759)	0	0.00	2	0.16	2	0.09
Certain condition originating in the perinatal period (760-779)	0	0.00	1	0.08	1	0.04
Syntoms, sign, and ill-defined conditions (780-799)	189	18.73	220	18.02	409	18.34
Injury and poisoning (800-999)	151	14.97	163	13.35	314	14.08
Codes V-classification of factor influencing health status and contact with health services (v01-v82)	97	9.61	122	9.99	219	9.83
Uncoded	3	0.30	5	0.41	8	0.36
Total	1009	100.00	1221	100.00	2230	100.00

Table 5 - Association between place of residence and patients who had/hadn't a readmission.

Type	Odds Ratio	95%CI	P-value
All patients	0.76	0.63 – 0.93	0.0075
≥ 65 years old	0.81	0.65 – 1.02	0.0709

and territory to implement a global therapy for specific categories of patients could contain overall care costs.

Thus, what emerges is that this class of patients' risk of readmission is essentially determined by multifactorial conditions and not by specific causes. In fact, our study confirms that the elderly over 80 are readmitted for "symptoms, signs and ill-defined states of morbidity", proving that they present complex management. Then, in line with the discharge diagnoses, there are the "injury and poisonings" that highlight not only physical but also cognitive, economic, and social fragility.

Regarding new methods of intervention there is a need to identify the best practices for the simultaneous treatment of interconnected conditions. At national level, organization models of territorial care are being reconsidered in view of the socio-demographic changes in our country. In fact, we are witnessing:

- progressive ageing of the population (21);
- an increase in people with at least one chronic pathology (40.8 per cent of the population) and co-morbid conditions, in particular in people over 75 (66.6 per cent);
- progressive decrease in family size, with 29.6 per cent of people over 65 living alone (22);
- about a 50% decrease in a disability-free (years of) life in people over 65, with substantial differences according to socio-economic conditions (23).

These characteristics need a significantly different care model from the one utilized by the hospital, oriented towards a territorial model which enhances an approach that is more focused on the context of the person's daily life. At the same time, the aim is to contain health expenditure, to mitigate the impact of disease on quality of life, and to make patients responsible for their lifestyles by actively involving them in the management of their own health condition (self-care).

The most common intervention tested in order to reduce frequent hospital use are personalized care programmers who help frequent users become more independent in managing their condition and help organize a plan for them to follow involving a specialized team of professionals, etc. (24). Such case management policies work through the establishment of multidisciplinary teams composed of nurses, social workers and medical doctors who provide specific mental health and counselling services for vulnerable patients. These policies have been adopted in several settings and show encouraging results (25). A study in Maastricht (Netherlands) confirmed that extending primary care opening hours reduces EUD use by 53% and increases primary care use by 25% (26).

Differences between experiences reflect the process of adaptation in the local context of a model that is, however, shared. WHO framework identifies the Family and Community Nurse as a professional who "helps individuals to adapt to chronic illness and disability by spending a large proportion of their time working in the home of the person being cared for and their family..." (27).

Similar policies have been successfully implemented in other settings, showing a reduction in the number of EUD visits and costs (28). Wassmer et al. estimated that a case management program would lead to a cost savings of 9 million dollars for 157 patients analyzed over 2 years (29). The expected savings is a strong argument for supporting such a policy oriented towards educating frequent users on how to better use existing primary care services as alternatives to emergency services, as the cost reduction seems to be able to finance the cost of the policy alone. On a different note, specific services should be provided to help illegal immigrants who are excluded from general practice services.

The design of this study was conceived in the pre-Covid period. The general restructuring of the services and concepts underlying the management of chronic diseases, in association with the reduction of EUD access during the lockdown phase for both chronic and acute pathologies, have led to a change in the way hospital structures and the EUD are generally used. Triage and management methods have changed. Family and institutional caregiver hospital access has also been regulated. In order to generalize the data obtained and to propose it as a basis for much larger and certainly metacentric studies, preferably on a regional or national basis, it is necessary to allow the profound changes that have taken place to settle.

Limitations

Although geographically and demographically diverse, the study sample is not regionally representative. The use of the EUD by some frequent users may have been underestimated if they were served by other hospitals.

Future studies could expand the characterization of frequent users by linking with additional databases to include potential predictors of frequent EUD use such as indicators of socioeconomic status.

Additionally, a need to produce tools to support informed consent and empowerment of the selected citizen or their family members surfaced from difficulty in finding certain information that would have produced more reliable results, such as during hospitalization which could have helped better target the actions taken and improve overall care, both at the hospital and at home before a potential re-access.

Conclusions

The analysis conducted on the EUD of the University Hospital of Siena is to be considered an aid for identifying clinical paths, making the field of evaluation of repeated hospitalizations specific and objective.

Thanks to the compelling results, it is opportune to widen the catchment area of data to other areas of the Region and compare them by replicating this type of study. Then, the analysis could be widened to the other Departments of the Hospital and the results shared with the general practitioners responsible for different territories of the area. It could also be useful to expand the study to include the category of hospitalization and stratifying by prescriptions, urgencies or autonomous decisions of the patient and of the family.

This suggests that in order to reduce the rate of repeated hospitalizations it is indispensable to focus attention on territorial care and verifying that appropriate therapeutic strategies are maintained after hospital discharge.

It is clear that the clinical evolution of the pandemic data must lead to a partial revision of the study design, and above all of the nosography categories taken into consideration. The long-term effects in those patients who have been affected by severe forms of Covid-19 are currently neither

known nor predictable. Many reports, which are becoming more and more structured, speak of chronic pain syndromes, fatigue, chronic respiratory failure to such an extent that transplantation has been necessary in some cases, psychological maladjustment, ischemic heart disease and post-stroke pathology. The impact of the evolution of frailty and untreated chronicity during the lockdown, and in the subsequent phases of the evolution of the clinical care picture should also be re-evaluated. Notwithstanding the above, we believe that the theoretical assumption that led to the definition of this preliminary study remains valid and can be successfully developed.

Lastly, the factors found in our study could be used in clinical practice to identify those prone to be future frequent users of the EUD. In this way, we could develop more personalized and effective interventions and reduce the related disparities and inequalities associated with frequent use. Finally, the results of this study support the application of this conceptual framework in future research settings and health policy efforts aimed at various vulnerable patient populations, including frequent users, the so-called "super-users" of other health services.

Riassunto

Come ridurre gli accessi impropri al Dipartimento Emergenza/Urgenza da parte dell'anziano fragile

Background. La riammissione dopo il primo ricovero è un evento comune. Può essere dovuta a un trattamento incompleto o a una scarsa cura dei problemi sottostanti oppure può riflettere un cattivo coordinamento tra ospedale e servizi sanitari al momento della dimissione. Lo scopo dello studio è stato quello di identificare i fattori e classificare le patologie che espongono il paziente anzia-

no ad accedere in maniera inappropriata al Dipartimento di Emergenza/Urgenza (DEU).

Disegno dello studio. Studio osservazionale retrospettivo.

Materiali e metodi. Abbiamo studiato i pazienti che hanno avuto, da gennaio 2016 a dicembre 2019, almeno una riammissione al DEU nei sei mesi successivi alla dimissione: sono stati indentificati tutti gli accessi dello stesso paziente al DEU avvenuti per la problematica trattata durante il precedente ricovero. I dati sono stati forniti dall'Azienda ospedaliero-universitaria Senese. Abbiamo utilizzato il sistema di codifica ICD-9-CM per descrivere i problemi di salute. I pazienti sono stati stratificati per età, genere e comune di residenza. L'analisi statistica è stata effettuata con software Stata.

Risultati. Abbiamo studiato 1.230 pazienti (46,6% femmine) con un'età media di 78,2 ± 14,3 anni. La maggior parte di essi, 721, avevano un'età ≥80 anni, 334 un'età compresa tra 65 e 79 anni, 138 un'età compresa tra 41 e 64 anni e solo 37 un'età ≤ 40 anni. I pazienti residenti nel Comune di Siena avevano una probabilità inferiore di accedere di nuovo rispetto a quelli residenti in altri comuni (OR 0,76; 95%IC: 0,62-0,93; p<0,05). Le principali cause di riammissione per i pazienti di età ≥65 anni sono state i "sintomi, segni e condizioni mal definite" (18,3%), le "malattie respiratorie" (15,0%), le "lesioni e avvelenamenti" (14,1%), le "malattie cardiovascolari" (11,8%), la "classificazione dei fattori che influenzano lo stato di salute e contatto con i servizi sanitari" (9,8%), le "malattie genitourinarie" (6,6%) e le "malattie dell'apparato digerente" (5,7%).

Conclusioni. Si osserva che la maggiore distanza dei pazienti dall'ospedale facilita il rischio di riammissione. I fattori riscontrati potrebbero essere utilizzati per identificare gli utenti frequenti e avviare misure per ridurne l'accesso.

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