

ORIGINAL ARTICLE

Sociodemographic characteristics, functional status, and health resource use of older patients treated in Spanish emergency departments: a description of the EDEN cohort

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Objectives. To describe the sociodemographic characteristics of and the health care resources used to treat patients aged 65 years or older who come to hospital emergency departments (EDs) in Spain, according to age groups.

Methods. We studied the phase-1 data for the EDEN cohort (Emergency Department and Elder Needs). Forty Spanish EDs collected data on all patients aged 65 years or older who were treated on the first 7 days in April 2019. We registered information on 6 sociodemographic and 5 function variables for all patients. For health resource use we used 6 diagnostic, 13 therapeutic, and 5 physical structural variables, for a total of 24 variables. Differences were analyzed according to age in blocks of 5 years.

Results. A total of 18374 patients with a median age of 78 years were included; 55% were women. Twenty-seven percent arrived by ambulance, 71% had not previously been seen by a physician, and 13% lived alone without assistance. Ten percent had a high level of functional dependence, and 14% had serious comorbidity. Resources used most often were blood analysis (in 60%) and radiology (59%), analgesics (25%), intravenous fluids (21%), antibiotics (14%), oxygen (13%), and bronchodilators (11%). Twenty-six percent were kept under observation in the ED, 26% were admitted to wards, and 2% were admitted to intensive care units (ICUs). The median stay in the ED was 3.5 hours, and the median hospital stay was 7 days. Sociodemographic characteristics changed according to age. Functional dependence worsened with age, and resource requirements increased in general. However, benzodiazepine use was unaffected, while the use of nonsteroidal anti-inflammatory drugs and ICU admission decreased.

Conclusions. The functional dependence of older patients coming to EDs increases with age and is associated with a high level of health care resource use, which also increases with age. Planners should take into consideration the characteristics of the older patients and the proportion of the caseload they represent when arranging physical spaces and designing processes for a specific ED.

Keywords: Emergency department. Geriatrics. Hospitalization. Health care resource planning. Efficiency.

Características sociodemográficas, funcionales y consumo de recursos de la población mayor atendida en los servicios de urgencias españoles:

Objetivos. Investigar las características sociodemográficas y consumo de recursos de los pacientes de 65 o más años que consultan en servicios de urgencias hospitalarios (SUH) en España, y su modificación por grupos etarios.

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Método. Se utilizaron datos de la cohorte EDEN obtenidos en fase 1 (*Emergency Department and Elder Needs*). Cuarenta SUH españoles incluyeron todos los pacientes de ≥ 65 años atendidos del 1-4-2019 al 7-4-2019 (7 días). Se analizaron 6 características sociodemográficas, 5 funcionales y 24 referidas a consumo de recursos (6 diagnósticos, 13 terapéuticos, 5 estructurales) y sus cambios a medida que avanza la edad (agrupada en bloques de 5 años).

Resultados. Se analizaron 18.374 pacientes (mediana edad: 78 años; 55% mujeres). El 27% acude a urgencias en ambulancia, el 71% sin consulta médica previa y el 13% vive solo sin cuidadores. Funcionalmente, el 10% tiene dependencia grave y el 14% comorbilidad grave. La solicitud de analítica sanguínea (60% de casos) y radiología (59%) destaca entre el consumo de recursos diagnósticos, y el uso de analgésicos (25%), sueroterapia (21%), antibioticoterapia (14%), oxigenoterapia (13%) y broncodilatadores (11%), entre los terapéuticos. El 26% requiere observación en urgencias, el 26% hospitalización y el 2% cuidados intensivos. La mediana de estancia en urgencias es de 3:30 horas y la de hospitalización es de 7 días. Las características sociodemográficas se modifican con la edad, las funcionales empeoran y el consumo de recursos aumenta (excepto benzodiacepinas, que no se modifica, y antiinflamatorios no esteroideos y cuidados intensivos, que disminuye).

Conclusión. Las características funcionales de la población mayor que consulta en los SUH empeora a medida que su edad avanza, y se asocia a un consumo de recursos alto que también se incrementa con la edad. Las características de esta población y su proporción en un determinado SUH deben tenerse en cuenta en su planificación estructural y funcional.

Palabras clave: Urgencias. Geriatría. Hospitalización. Planificación. Eficiencia.

Introduction

The population of western countries has aged considerably in recent decades. In Spain, life expectancy at birth has risen from 75 years in 1980 to 79 in 2000 and 83 in 2021.¹ Correspondingly, the population requiring medical care, both in the community and in hospitals, is getting older. In addition, these patients have more comorbidities and functional and cognitive limitations than was the case only a generation ago, adding to the complexity of care. The 2020 survey on the state of health of Spaniards showed that 5.6% of patients aged 65-69 years already had some limitation in basic activities of daily living (BADL), a percentage that increased to 52.8% in the population aged 85 years or older.²

Hospital emergency departments (EDs) are no strangers to the impact of aging. In this regard, a few years ago the European emergency and geriatric societies agreed on a curriculum with specific knowledge and skills to be acquired by professionals working in emergency departments to guarantee quality care for this segment of the population, which has been very well received in Europe and Spain.³⁻⁶ In fact, Spanish EDs have increasingly focused in recent years on adapting both their physical and human resources to the elderly population.⁷⁻¹⁴ However, much of the knowledge about the needs of elderly patients in the ED comes from population surveys, such as the one mentioned above, or from specific studies limited to a single ED or to a specific disease or process. Thus, there is a lack of knowledge about the global characteristics of the elderly population that consults in Spanish EDs.

Sensitive to this lack of information, the network SIESTA (Spanish Investigators on Emergency Situation TeAm) network launched the EDEN (Emergency Department and Elder Needs) challenge in May 2022, which aims to create a cohort of elderly patients attended in a large sample of Spanish EDs, to proceed first to their global analysis and then to the detailed in-

vestigation of some specific processes of greater prevalence. This study presents the results of the centers that participated in phase 1 of recruitment and focuses on presenting the main sociodemographic characteristics and resource consumption generated by patients aged 65 years or older who consult EDs in Spain and determining how these are modified in the various age groups.

Method

Description of the SIESTA network

The SIESTA network is formed by researchers mainly working in the ED and its main purpose is to face multidisciplinary research challenges of real clinical practice that concern Emergency Medicine from a multicenter perspective with a wide representation of Spanish EDs. The network has a stable coordinating core, and researchers from individual EDs can join when a research challenge arises according to their interest and availability. The SIESTA network was created in 2020, and its specific details have been previously published.¹⁵ Its first research challenge was the CO Its first research challenge was the COVID-19 challenge, in which 62 EDs (approximately 20% of Spanish public EDs) participated, and the results of this challenge have recently been presented.¹⁶

Description of the EDEN challenge

The EDEN challenge emanates from the SIESTA network and its primary objective is to increase knowledge about sociodemographic, organizational, baseline, clinical, care and evolutionary aspects of the population aged 65 years and over who consult in Spanish EDs. To this end, we used the strategy of creating a multipurpose registry that included all patients who consulted in the ED, regardless of the reason for consultation.

Two distinct periods were established, each comprising a full week. The first corresponded to a pre-COVID period, and was established between April 1 and 7, 2019 (7 days). The result of this registration was the EDEN cohort. The second corresponded to the COVID period of the first pandemic wave and was established between March 30 and April 5, 2020 (7 days). The result of this registry was the EDEN-Covid cohort. There was no reason for exclusion, and EDs wishing to participate were required to include all patients seen during the study periods.

Through the SIESTA network, the EDEN challenge was presented to 115 Spanish EDs and those potentially interested in participating were asked for the total number of patients they had attended in each of the above-mentioned periods and how many of these were aged 65 years or older. Initially, data were received from 73 EDs, and two telematic meetings were held with the principal investigators of each of these centers to explain in greater detail the scope of the project, the dynamics of patient inclusion and the data to be collected. These consisted of the extraction of 228 primary variables corresponding to sociodemographic data, comorbidity, functional status and basic treatments, clinical aspects, consumption of diagnostic and therapeutic resources, and final diagnosis in the emergency department, patient disposition after emergency care, hospitalization (if any) and follow-up after discharge (either directly from the emergency department or after hospitalization). Follow-up was carried out telematically by consulting the patient's clinical history. All the information was entered in an electronic data notebook, which required full completion for a patient to be included in the registry. To this end, a disjunctive response (Yes/No) was required for most variables, so that the number of variables with the possibility of answering "Unknown" was limited.

The coordinating group of the SIESTA network established two phases for EDs to join the EDEN challenge in an attempt to adapt to the research capabilities and possibilities of each specific center. Phase 1 began on May 15 and ended on July 31, 2022. In this phase, 40 EDs completed the inclusion of all their patients. At the time of writing, 22 additional EDs are active and will potentially join the challenge in phase 2 if they complete enrollment of all their patients by September 15, 2022.

Ethical considerations

The EDEN project was approved by the Clinical Research Ethics Committee of the Hospital Clínico San Carlos de Madrid (protocol HCSC/22/005-E). Due to the characteristics of the study and the time periods for which data collection was planned, the exemption of written informed consent by the patients was accepted. The use of the database was performed with coded patients, to preserve anonymity. The creation of the EDEN and EDEN-Covid cohorts and the work emanating from them always followed the ethical principles of the Declaration of Helsinki.

EDEN-1 study design

The EDEN-1 study consisted of an analysis of the patients included in the EDEN cohort during phase 1 recruitment. We analyzed 6 socio-demographic characteristics (age, gender, how the patient arrived at the emergency department, previous medical consultation and to whom, home accompaniment status, and whether the patient has social support) and 5 characteristics related to the patient's baseline functional status (dependence according to the Barthel Index -BI-, comorbidity according to the Charlson Comorbidity Index -ICC-, whether the patient has had falls in the previous 6 months and whether there are previous diagnoses of dementia and depression). 24 characteristics related to resource consumption were also analyzed: 6 related to diagnostic tests, 13 related to therapeutic actions and 5 related to the use of structural resources. The latter included the need for observation in the emergency department, hospitalization, intensive care during hospitalization and the total length of stay in the emergency department (for the whole cohort) and in hospital (only in hospitalized patients).

Statistical analysis

The absolute values and percentages of qualitative variables and the median and interquartile range (IQR) of continuous variables were recorded. To detect whether there were differences in sociodemographic characteristics, baseline functional status and resource consumption as the patient's age increased, age was grouped into 5-year blocks (65 to 69 years, 70 to 74 years, 75 to 79 years, 80 to 84 years, 85 to 89 years and patients aged 90 years and over) and the chi-square test was used for qualitative variables and the Kruskal-Wallis nonparametric test for quantitative variables. The association between all these variables and patient age was determined by calculating the odds ratio (OR) and its 95% confidence interval (95% CI), taking the 65-69 years age group as a reference. Differences between groups were considered statistically significant if the p value was less than 0.05 or the 95% CI of the OR excluded the value.¹ All statistical processing was performed using the SPSS Statistics V25 statistical package (IBM, Armonk, New York, USA), and figures were produced using Power Point 2016 (Microsoft Corporate Office, Redmond, Washington, USA).

Results

Forty EDs from 12 autonomous communities participated in phase 1 of the EDEN challenge: 8 from the Community of Madrid, 7 from Catalonia, 5 from the Community of Valencia, 4 from Andalusia, 4 from the Region of Murcia, 3 from Castilla y León, 2 from the Canary Islands, 2 from Castilla-La Mancha, 2 from Galicia, 1 from Asturias, 1 from Aragón and 1 from the

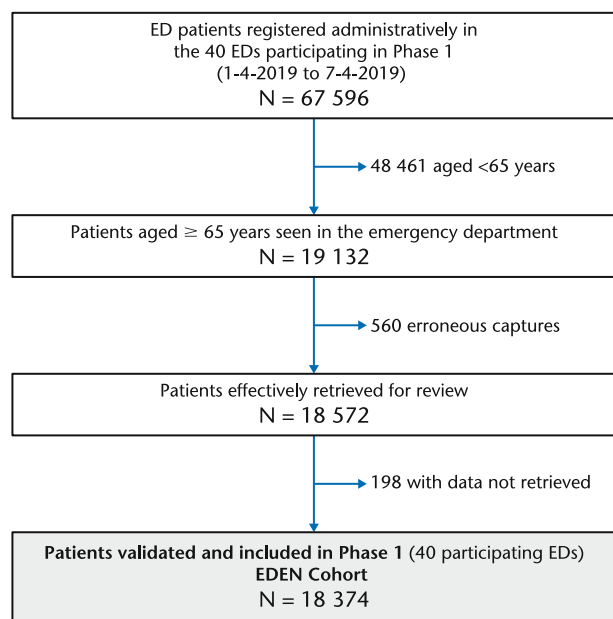


Figure 1. Flowchart of patient inclusion in the EDEN cohort. ED: hospital emergency department; EDEN: Emergency Department and Elder Needs.

Basque Country. In these EDs, 67 596 patients were attended, of whom 19 132 (28.3%) were aged 65 years and over, and finally 18 374 (96.0%) formed the EDEN cohort (Figure 1).

Regarding sociodemographic characteristics (Table 1), 55% were women and the median age was 78 years (IQR: 75-85). There were 19% of patients aged 65-69 years, 19% aged 70-74 years, 19% aged 75-79 years, 18% aged 80-84 years, 15% aged 85-89 years, and 10% aged 90 years and older. Most of them lived accompanied or cared for by someone (only 13% lived alone) and up to 18% had some type of social assistance. They mainly came to the emergency department on their own (73%) and without having previously consulted a physician (71%). Functionally, there was some degree of dependence in 35% of patients (10% severe or total dependence, with an IB < 60 points) and 74% had some comorbidity (14% severe comorbidity, with an CCI ≥ 5 points). The rest of the data can be consulted in Table 1.

The use of analytical tests (60% of cases) and radiology (59%) stood out among the consumption of diagnostic resources, and the use of analgesics (25%), serum therapy (21%), antibiotic therapy (14%), oxygen therapy (13%) and bronchodilators (11%) among the therapeutic resources (Table 2). Twenty-six percent of patients required observation in the emergency department and 26% hospitalization (2% required intensive care at some point during the process). The median length of stay in the emergency room was 3:30 hours and the median length of hospitalization 7 days (Table 2).

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Table 1. Characteristics of the EDEN cohort patients included in the present study

	All patients patients N = 18 374 n (%)
Sociodemographic characteristics	
Age [median (IQR)]	78 (72-85)
Female gender*	9828 (54.7)
Arrival at the emergency department	
Own means	13 441 (73.2)
Non-medicalized ambulance	3671 (20.0)
Medicalized ambulance	1262 (6.9)
Referred to the emergency department	
Patient or caregiver's own initiative	13 087 (71.2)
From primary care	3436 (18.7)
By medical specialist other than primary care	1425 (7.8)
From another hospital	426 (2.3)
Situation at home**	
Lives alone, no professional caregivers	1385 (12.6)
Lives with family members	8021 (72.8)
Lives with professional caregiver 24 hours	306 (2.8)
Lives with a professional caregiver for a few hours	181 (1.6)
Lives in a residence	1132 (10.3)
Has social assistance***	1201 (18.3)
Baseline situation	
Barthel Index	
Independent (100 points)	11 881 (64.7)
Mild-moderate dependence (60-95 points)	4655 (25.3)
Severe-absolute dependence (< 60 points)	1838 (10.0)
Charlson Comorbidity Index	
No comorbidity (0 points)	4797 (26.1)
Mild comorbidity (1-2 points)	7460 (40.6)
Moderate comorbidity (3-4 points)	3523 (19.2)
Severe comorbidity (≥ 5 points)	2594 (14.1)
Has had a fall in the previous 6 months	1366 (7.4)
Established diagnosis of cognitive impairment	2545 (13.9)
Diagnosis of depression	2497 (13.6)

*Percentages calculated with respect to a total of 17 962 patients for whom this data was available.

**Percentages calculated with respect to a total of 11 025 patients for whom this data was available.

***Percentages calculated from a total of 6558 patients for whom this data was available.

EDEN: Emergency Department and Elder Needs; n: number; IQR: inter-quartile range.

nostic resources, and the use of analgesics (25%), serotherapy (21%), antibiotic therapy (14%), oxygen therapy (13%) and bronchodilators (11%) among the therapeutic ones (Table 2). Twenty-six percent of patients required observation in the emergency department and 26% hospitalization (2% required intensive care at some point during the process). The median length of stay in the emergency room was 3:30 hours and the median length of hospitalization 7 days (Table 2).

With increasing age, significant increases were observed in the proportion of women, ED arrivals without prior medical assessment and in ambulance, and patients with social support, while the proportion of those living alone decreased. All baseline functional characteristics worsened with age (Figure 2). Resource use was progressively higher with increasing age, except for

Table 2. Resource consumption of patients in the EDEN cohort included in the present study

	All patients N = 18 374 n (%)
Diagnostic resources in the ED	
CBC	11 090 (60.4)
Simple radiology	10 788 (58.7)
Electrocardiogram	6656 (36.2)
Microbiological cultures	2105 (11.5)
Computerized tomography	2051 (11.2)
Ultrasound	947 (5.2)
Therapeutic resources in the emergency department	
Non-opioid analgesics and anti-inflammatory drugs	4511 (24.6)
Serum therapy	3978 (21.8)
Oxygen therapy	2308 (12.6)
Antibiotics	2666 (14.5)
Bronchodilators	2025 (11.0)
Diuretics	1823 (9.9)
Corticosteroids	1707 (9.3)
Anti-inflammatory drugs	1228 (6.7)
Benzodiazepines	1161 (6.3)
Bladder catheterization	764 (4.2)
Opiates	751 (4.1)
Neuroleptics	475 (2.6)
Mechanical restraint for agitation	30 (0.2)
Care resources	
Stay in emergency observation area	4813 (26.2)
Total length of stay in the ED (hours) [median (IQR)]	3:30 (1:46-6:59)
Inpatient hospitalization	4777 (26.0)
Total length of hospital stay (days) [median (IQR)]	7.1 (4.4-11.7)
Need for intensive care during hospitalization	341 (1.9)

EDEN: Emergency Department and Elder Needs; n: number; IQR: inter-quartile range.

benzodiazepine use, which remained unchanged, and nonsteroidal anti-inflammatory drugs and intensive care, which decreased (Figure 3).

Table 3 shows the association of each variable analyzed with patient age, taking patients in the 65-69 years age group as a reference. Thus, although most associations showed significant increases with increasing age, for some of them the increases were moderate (for patients aged ≥ 90 years, the ORs for severe comorbidity, use of analgesics (other than nonsteroidal anti-inflammatory drugs -NSAIDs- and opioids) and taking microbiological cultures were 1, 60, 1.49 and 1.77, respectively) while for others the increases were much greater (the ORs for cognitive impairment, severe or total dependence, existence of social support or mechanical restraint in the emergency department were 13.2, 12.8, 8.83 and 8.94, respectively).

Discussion

The present study provides 3 important findings. First of all, it establishes a snapshot of the sociodemographic and functional characteristics of the elderly population that consults in Spanish EDs. In addition, it quantifies the resource consumption of this population, which is high. For example, half of the patients require an analysis and a simple radiological examination, and a quarter require hospitalization. Finally, we found that the functional situation deteriorates as age advances and, correspondingly, the consumption of resources also increases significantly.

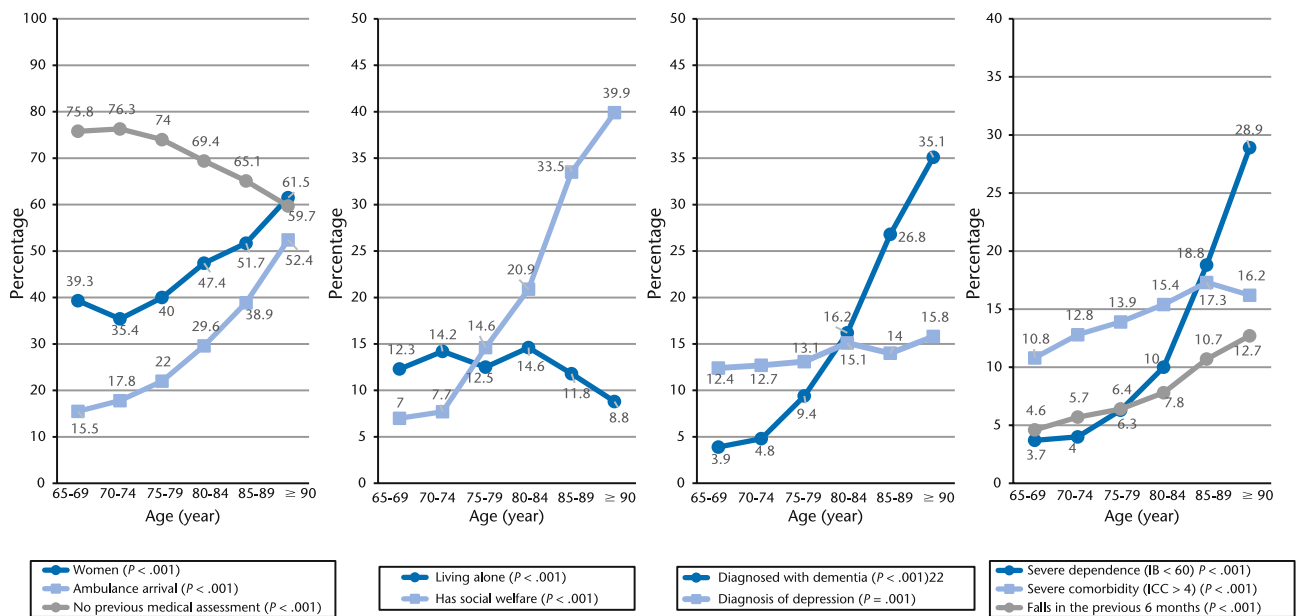


Figure 2. Sociodemographic and functional characteristics according to the age of the patients included in the EDEN (Emergency Department and Elder Needs) cohort. BI: Barthel index, CCI: Charlson comorbidity index.

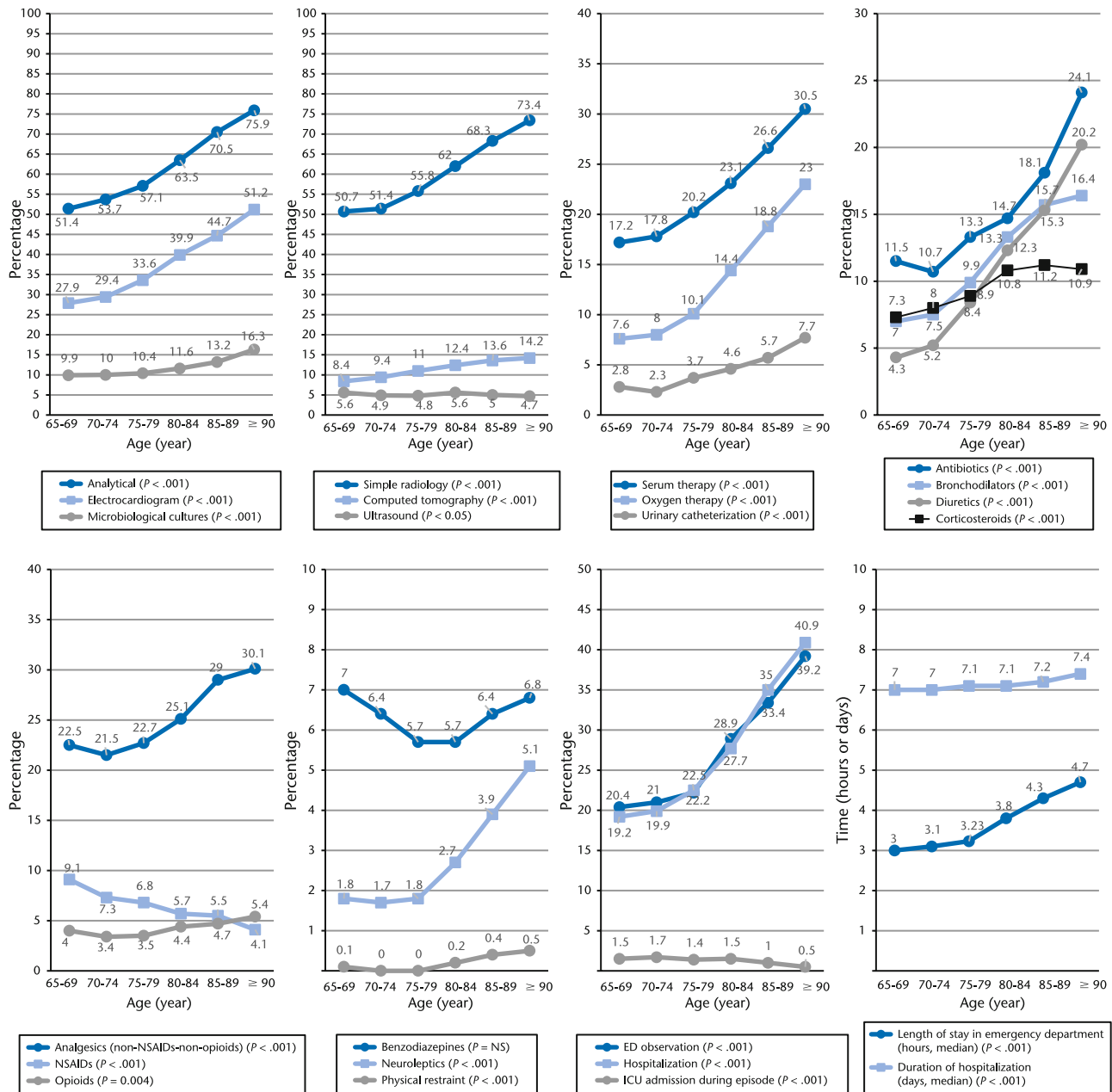


Figure 3. Analysis of resource consumption according to age of patients included in the EDEN (Emergency Department and Elder Needs) cohort.

NSAIDs: nonsteroidal anti-inflammatory drugs; ICU: intensive care unit.

As is well known in Spain and in many countries with a public health system, most patients who go to the ED do so on their own initiative, without having previously consulted another health professional.¹⁷ Moreover, the use of ambulance, mainly non-medicalized, is high (27% in the EDEN cohort), even among the younger age segment (15.5% in patients aged 65-69 years). In relation to functional status, as would be expected, a significant proportion of the elderly population attending the emergency department already has basic deficits. Thus, while the 2020 survey on the state of health of Spaniards indicated that 18.3% of people

aged 85 years or more were unable to perform ADLs, in the EDEN cohort this percentage is 18.8% for patients aged 85-89 years and 28.9% for those aged 90 years or more.² We believe that these data are important when organizing emergency care, especially with regard to the structural design and the help that these patients will need throughout the care process.

Regarding the high consumption of resources, part of this is justified by the processes that lead to emergency consultation, which are often more serious or need to be prioritized in older patients. Thus, although initially classified as low priority, patients aged 65 years

Table 3. Association between patient age and sociodemographic characteristics, functional status and resource consumption of the EDEN cohort patients included in the present study

	65-69 years N = 3480 OR (CI 95%)	70-74 years N = 3502 OR (CI 95%)	75-79 years N = 3491 OR (CI 95%)	80-84 years N = 3307 OR (CI 95%)	85-89 years N = 2756 OR (CI 95%)	≥ 90 years N = 1838 OR (CI 95%)
Sociodemographic characteristics						
Social assistance	1 (reference)	1.12 (0.83-1.50)	2.28 (1.74-2.99)	3.52 (2.71-4.57)	6.71 (5.21-8.65)	8.83 (6.77-11.5)
Arrival at the ED by ambulance	1 (reference)	1.18 (1.04-1.33)	1.53 (1.36-1.73)	2.29 (2.03-2.58)	3.45 (3.07-3.89)	5.99 (5.25-6.82)
Sex: Female	1 (reference)	0.98 (0.89-1.08)	0.99 (0.90-1.09)	1.16 (1.06-1.28)	1.34 (1.21-1.48)	1.54 (1.37-1.74)
Living alone no caretaker	1 (reference)	1.19 (0.98-1.44)	1.02 (0.84-1.25)	1.22 (1.01-1.47)	0.96 (0.99-1.17)	0.69 (0.54-0.87)
Arrival at the ED with no prior medical evaluation	1 (reference)	1.03 (0.92-1.15)	0.91 (0.82-1.15)	0.72 (0.65-0.80)	0.59 (0.53-0.66)	0.47 (0.42-0.53)
Baseline						
Established diagnosis of cognitive impairment	1 (reference)	1.24 (0.99-1.56)	2.54 (2.07-3.12)	4.71 (3.88-5.72)	8.94 (7.40-10.8)	13.2 (10.9-16.1)
Severe or absolute dependence (BI < 60 points)	1 (reference)	1.30 (1.01-1.68)	2.10 (1.66-2.66)	3.50 (2.80-4.38)	7.29 (5.89-9.03)	12.8 (10.3-15.9)
Has had any fall in the previous 6 months	1 (reference)	1.25 (1.01-1.54)	1.43 (1.16-1.76)	1.76 (1.44-2.16)	2.50 (2.05-3.04)	3.03 (2.45-3.74)
Severe comorbidity (CCI ≥ 5 points)	1 (reference)	1.21 (1.05-1.40)	1.34 (1.16-1.54)	1.51 (1.31-1.74)	1.74 (1.50-2.01)	1.60 (1.36-1.89)
Diagnosed with depression	1 (reference)	1.03 (0.89-1.18)	1.07 (0.93-1.23)	1.25 (1.09-1.44)	1.15 (0.99-1.33)	1.33 (1.13-1.56)
Diagnostic resources in the ED						
Analytical Analysis	1 (reference)	1.09 (0.99-1.20)	1.26 (1.14-1.38)	1.64 (1.49-1.81)	2.26 (2.04-2.51)	2.97 (2.62-3.38)
Electrocardiogram	1 (reference)	1.08 (0.97-1.19)	1.31 (1.18-1.45)	1.71 (1.55-1.90)	2.09 (1.88-2.32)	2.71 (2.40-3.05)
Plain radiology	1 (reference)	1.03 (0.94-1.13)	1.23 (1.12-1.35)	1.59 (1.44-1.75)	2.09 (1.89-2.32)	2.69 (2.37-3.05)
Computed tomography	1 (reference)	1.13 (0.96-1.34)	1.34 (1.14-1.58)	1.54 (1.31-1.80)	1.72 (1.47-2.02)	1.80 (1.51-2.15)
Microbiological cultures	1 (reference)	1.00 (0.86-1.17)	1.05 (0.90-1.23)	1.19 (1.02-1.39)	1.38 (1.18-1.61)	1.77 (1.50-2.10)
Echography	1 (reference)	0.87 (0.71-1.07)	0.85 (0.69-1.06)	1.00 (0.81-1.23)	0.89 (0.71-1.11)	0.83 (0.64-1.08)
Therapeutic resources in the ED						
Mechanical restraint due to agitation	1 (reference)	NC	0.50 (0.04-5.55)	3.27 (0.66-16.2)	7.36 (1.65-32.9)	8.94 (1.93-41.4)
Diuretics	1 (reference)	1.22 (0.98-1.52)	2.04 (1.67-2.49)	3.10 (2.55-3.76)	3.98 (3.29-4.83)	5.61 (4.60-6.86)
Oxygen therapy	1 (reference)	1.05 (0.88-1.25)	1.36 (1.15-1.61)	2.04 (1.74 (2.39)	2.81 (2.40-3.28)	3.63 (3.07-4.29)
Neuroleptics	1 (reference)	0.94 (0.66-1.35)	1.04 (0.73-1.49)	1.55 (1.11-2.15)	2.28 (1.66-3.12)	2.98 (2.14-4.14)
Bladder catheter	1 (reference)	0.81 (0.61-1.10)	1.33 (1.02-1.74)	1.66 (1.28-2.15)	2.08 (1.61-2.68)	2.87 (2.20-3.75)
Bronchodilators	1 (reference)	1.09 (0.91-1.30)	1.46 (1.23-1.74)	2.03 (1.72-2.40)	2.48 (2.10-2.92)	2.61 (2.18-3.13)
Antibiotics	1 (reference)	0.92 (0.79-1.07)	1.18 (1.02-1.36)	1.32 (1.15-1.36)	1.70 (1.47-1.95)	2.44 (2.10-2.83)
Suotherapy	1 (reference)	1.04 (0.92-1.18)	1.22 (1.08-1.37)	1.44 (1.28-1.63)	1.74 (1.55-1.97)	2.11 (1.85-2.41)
Corticosteroids	1 (reference)	1.10 (0.92-1.31)	1.24 (1.04-1.47)	1.54 (1.30-1.82)	1.60 (1.35-1.90)	1.55 (1.28-1.89)
Non-opioid analgesics and anti-inflammatory drugs	1 (reference)	0.94 (0.84-1.05)	1.01 (0.91-1.13)	1.15 (0.91-1.13)	1.41 (1.26-1.58)	1.49 (1.31-1.70)
Opiates	1 (reference)	0.85 (0.67-1.09)	0.87 (0.68-1.11)	1.10 (0.87-1.40)	1.18 (0.93-1.50)	1.36 (1.04-1.78)
Benzodiazepines	1 (reference)	0.91 (0.75-1.09)	0.81 (0.67-0.98)	0.81 (0.66-0.98)	0.91 (0.75-1.12)	0.98 (0.78-1.23)
Nonsteroidal anti-inflammatory drugs	1 (reference)	0.79 (0.66-0.93)	0.73 (0.61-0.87)	0.60 (0.50-0.73)	0.58 (0.48-0.71)	0.43 (0.33-0.56)
Care resources						
Hospitalization	1 (reference)	1.04 (0.93-1.17)	1.22 (1.08-1.37)	1.60 (1.43-1.80)	2.26 (2.02-2.53)	2.90 (2.56-3.29)
Stay in the emergency observation area	1 (reference)	1.04 (0.93-1.17)	1.12 (0.99-1.25)	1.58 (1.42-1.77)	1.96 (1.75-2.19)	2.52 (2.22-2.85)
Prolonged stay in the emergency department (> 6 hours)	1 (reference)	1.14 (1.02-1.28)	1.20 (1.07-1.34)	1.63 (1.46-1.82)	1.95 (1.74-2.18)	2.42 (2.13-2.74)
Prolonged hospital stay (> 7 days)	1 (reference)	1.02 (0.82-1.27)	1.12 (0.90-1.38)	1.04 (0.85-1.28)	1.10 (0.89-1.35)	1.11 (0.89-1.38)
Intensive care stay	1 (reference)	1.12 (0.78-1.63)	0.88 (0.58-1.30)	0.95 (0.64-1.41)	0.66 (0.42-1.04)	0.29 (0.14-0.61)

EDEN: Emergency Department and Elder Needs; ED: Emergency Department; n: number; CI: confidence interval; CCI: Charlson comorbidity index; BI: Barthel index; OR: odds ratio. Bolded data denote statistical significance.

or older are 16 times more likely to require hospitalization than the rest.¹⁸ A more difficult clinical history in some cases and a more atypical clinical presentation in others leads to a greater need for diagnostic resources compared to younger patients.¹⁹⁻²¹

In addition, the greater comorbidity in the elderly increases these needs, especially those of treatment. However, the high consumption of structural resources should be noted. On the one hand, the length of stay and the need for observation in the ED mean that the ED must be prepared to adequately accommodate this

population. On the other hand, hospitalization is one of the scarcest and most costly resources in any health system, and its use by the elderly population is high, 26% overall in our series, and up to 41% in patients aged 90 years and over. In the latter, priority should be given to transferring them to hospital wards to avoid potential complications in the ED, especially the appearance of delirium and the need for pharmacological and, occasionally, mechanical restraint (0.5% of patients aged 90 years and over in the EDEN cohort required it). Home hospitalization initiatives, especially

those that are initiated from the ED without requiring a stay in an inpatient ward, can serve this purpose very efficiently.²² On the other hand, for those who do not require admission, special care should be taken in the transfer of care from the emergency department to the medical and social services of the community. The patients themselves have pointed out important points for improvement at this level: abrupt discharges with lack of information on the explanation of the symptoms and the tests performed, failure to arrange outpatient follow-up check-ups, fear of facing new physical limitations that may make daily activities difficult, and lack of clear indications to them or their caregivers of when and where to seek further care if necessary.²³ Finally, specialized geriatric home care teams, whether organized from the hospital or from primary care, could contribute to improve the management of geriatric syndromes, to reconcile, de-escalate or reduce pharmacological treatment, or to manage hospitalization if necessary without having to consult the emergency department beforehand.²⁴

As patients get older, their functional impairment increases. Thus, patients aged 90 years and older have up to a 10-fold increased risk of cognitive impairment or severe or total dependence, and this age segment accounts for up to 10% of older patients (≥ 65 years) in the EDEN cohort. Therefore, their specific needs, no longer because of the current reason for ED consultation but because of their baseline characteristics, must be considered and planned for if truly patient-oriented care is to be offered in the ED. Resource consumption also increases with age. As for diagnostics, the greatest increase is observed for laboratory tests, simple radiology, and electrocardiogram, with similar increases, and to a lesser extent for microbiological cultures and computerized tomography.

It is noteworthy that the ultrasound study does not vary with age, as it remains stable in all age ranges. We have not found data in the literature that would allow us to know if this is something generalized and what the causes may be. It is striking when, in addition, the transfer of very elderly patients with cognitive and functional limitations to the scanner can be a challenge and bedside ultrasound examination can sufficiently meet the need to obtain clinically relevant information in many cases.^{25,26} The use of therapeutic resources also increased in general, and in some cases very markedly, such as mechanical restraint, with an OR of 8.94 for the population aged 90 years or more compared to those aged 65-69 years. In contrast, the use of benzodiazepines is not affected by age. It might be thought that the use of benzodiazepines is too restrictive, although we do not have data to investigate the reasons for this finding. On the other hand, the use of NSAIDs decreases with age, a fact that is possibly related to a more cautious use among the elderly, especially if they present alterations in renal function. Finally, the consumption of structural resources also increased with age. Again, this increase is not uniform, because while the increase in the OR of hospitalization is 190%, the in-

crease in prolonged hospitalization is only 11%. Possibly, the use of alternative resources such as hospitalization at home or discharge to socio-health centers will make it possible to contain the length of stay even in older patients.²⁷⁻²⁹ Undoubtedly, some of the aspects related to the consumption of resources in the emergency department by the elderly population will require a more detailed specific analysis in the future to better understand their causes.

Our study has several limitations. First, the 40 EDs in the SIESTA network that contributed patients were not chosen at random, but rather showed their willingness to participate. However, the broad representation both territorially (12 of the 17 autonomous communities were represented) and in terms of typology (there are university, high-technology, and county hospitals) means that the bias in this respect is probably small. Second, the analysis presented here was not performed by nosological groups, but rather globally. This may mean that the findings are conditioned by certain specific processes, which are not analyzed in this work. Nevertheless, we believe that the overall view of the needs of the elderly population during emergency care is better represented by including all patients who consulted in the emergency department, regardless of the reason. Third, this is a secondary analysis of a multipurpose cohort, so that the associations presented may be influenced by factors not contemplated in the cohort design and, therefore, the findings should be considered hypothesis-generating and should be confirmed by studies specifically designed for this purpose. Fourth, the diagnostic and therapeutic resources explored were limited to the emergency department and the events from that time until discharge were not explored in the case of hospitalized patients. Fifth, the length of stay, both in the emergency room and in the hospital, may be influenced by the individual dynamics of each hospital and may not be extrapolated to other centers. Furthermore, our results may also have been influenced by the changing prevalence of certain nosological processes throughout the year. In particular, the time period chosen (first week of April) is still under the conditions imposed by the usual influenza and viral pandemics of winter and early spring. Therefore, there could be variations when analyzing other periods of the year. Finally, the inclusion of patients in the EDEN cohort has been done by episodes rather than by patients, so it is possible that some episodes may correspond to the same patient. However, given that the inclusion period was very short (7 days), the chances of a repeat consultation for a particular patient can be considered low.

Overall, we can conclude that the sociodemographic and functional characteristics of the elderly population consulting in the ED worsen as they get older, and that they have a high consumption of resources that also increases with age. This study can be used at the local level to adequately plan emergency resources dedicated to the elderly population, with regard to the design of specific care circuits and the planning of the ar-

chitectural spaces of the ED for their correct location, with family accompaniment. The demographic data of the reference population of each ED can be the indicator of this structural and functional planning.

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References

- 1 Expansión. Datos Macro. España: Esperanza de vida al nacer. (Consultado 9 Agosto 2022). Disponible en: <https://datosmacro.expansion.com/demografia/esperanza-vida/espana>
- 2 Instituto Nacional de Estadística. Encuesta Europea de Salud 2020 en España. (Consultado 9 Agosto 2022). Disponible en: <https://www.ine.es/dynt3/inebase/es/index.htm?type=pcaxis&path=/t15/p420/a2019/p04/&file=pcaxis>
- 3 Bellou A, Nickel C, Martín-Sánchez FJ, Ganansia O, Banerje J, Björg Jónsdóttir A, et al. Creación del Currículum Europeo de Medicina de Urgencias y Emergencias Geriátrica: una colaboración entre la European Society for Emergency Medicine (EuSEM) y la European Union of Geriatric Medicine Society (EUGMS). *Emergencias*. 2016;28:295-7.
- 4 Mooijart SP, Lucke JA, Brabrand M, Conroy S, Nickel CH. Geriatric emergency medicine: time for a new approach on a European level. *Eur J Emerg Med*. 2019;26:75-6.
- 5 Bellou A, Conroy SP, Graham CA. The European curriculum for geriatric emergency medicine. *Eur J Emerg Med*. 2016;23:239.
- 6 Puig Campmany M, Ris Romeu J, Higa Sansone JL, Herrera Mateo S, Hernández Ontiveros H, Benito Vales S. El Currículum Europeo de Medicina de Urgencias y Emergencias Geriátrica, un paso más hacia la geriatización del servicio de urgencias. *Emergencias*. 2017;29:290.
- 7 Aznar Andrés E, Checa López M, González Martín J, Guevara Guevara A, Carnicero Carreño J, Rodríguez Mañas L. ¿Mejora el pronóstico de los pacientes mayores frágiles la intervención conjunta urgencias-geriatría? Estudio FRAILCLINIC. *Emergencias*. 2019;31:215-6.
- 8 Puig Campmany M, Bustamante Araujo M, Blázquez Andión M, Ris Romeu J. Una oportunidad de mejora en las caídas de ancianos: el urólogo y la ortogeriatría. *Emergencias*. 2019;31:70-1.
- 9 Martín-Sánchez FJ, Rodríguez-Adrada E, Vidan MT, Díez Villanueva P, Llopis García G, González Del Castillo J, et al. Impacto de las variables geriátricas en la mortalidad a 30 días de los ancianos atendidos por insuficiencia cardiaca aguda. *Emergencias*. 2018;30:149-55.
- 10 Rivero-Santana A, Del Pino-Sedeño T, Ramallo-Fariña Y, Vergara I, Serrano-Aguilar P. Valor de los instrumentos ISAR y TRST para predecir resultados adversos en población general geriátrica asistida en los servicios de urgencias: metanálisis. *Emergencias*. 2017;29:49-60.
- 11 García-Álvarez A. Seguridad e identificación de factores modificables en los pacientes mayores dados de alta desde urgencias por insuficiencia cardiaca aguda. *Emergencias*. 2021;33:161-2.
- 12 Martín-Sánchez FJ, Parra Esquivel P, Llopis García G, González Del Castillo J, Rodríguez Andrada E, Espinosa B, et al. Resultados a 30 días en los pacientes mayores frágiles con insuficiencia cardiaca aguda dados de alta desde urgencias o sus unidades vinculadas que cumplen los criterios de alto riesgo del estudio DEED FRAIL-AHF. *Emergencias*. 2021;33:165-73.
- 13 Puig Campmany M, Blázquez Andión M, Ris Romeu J. Aprender, desaprender y reaprender para asistir ancianos en urgencias: el secreto del cambio. *Emergencias*. 2020;32:122-30.
- 14 Martín-Rodríguez F, Sanz-García A, Ortega Moreno L, del Pozo Vegas C, Castro-Villamor MA, Martín-Conty JL, et al. Modelo de riesgo de mortalidad precoz en pacientes ancianos con enfermedad aguda

- atendidos por servicios de emergencias prehospitalarias. *Emergencias*. 2020;32:177-84.
- 15 Miró O, González Del Castillo J. Colaboración entre servicios de urgencias españoles para fomentar la investigación: a propósito de la creación de la red SIESTA (Spanish Investigators on Emergency Situations TeAm) y de la coordinación del macroproyecto UMC-19 (Unusual Manifestations of C. *Emergencias*. 2020;32:269-77.
- 16 Miró O, González Del Castillo J. Red de investigación SIESTA: memoria de resultados de su primer reto investigador (reto COVID-19). *Emergencias*. 2022;34:225-7.
- 17 Reinoso Hermida S, Díaz Grávalos GJ, Robles Castiñeiras A, Pereiro Sánchez E, Fernández Cardama E, López González A. Forma de acceso a los Servicios de Urgencia hospitalarios y pertinencia de la consulta. *Rev Clin Med Fam*. 2011;4:205-10.
- 18 Hendin A, Eagles D, Myers V, Stiell IG. Characteristics and outcomes of older emergency department patients assigned a low acuity triage score. *CJEM*. 2018;20:762-9.
- 19 McGarry M, Shenvi CL. Identification of acute coronary syndrome in the elderly. *Emerg Med Clin North Am*. 2021;39:339-46.
- 20 Liang SY. Sepsis and other infectious disease emergencies in the elderly. *Emerg Med Clin North Am*. 2016; 34:501-22.
- 21 Leuthauser A, McVane B. Abdominal pain in the geriatric patient. *Emerg Med Clin North Am*. 2016;34:363-75.
- 22 Arias-de la Torre J, Zioga EAM, Muñoz L, Estrada D, Espallargues M. Hospitalización domiciliaria substitutiva del ingreso y facilitadora del alta: resultados y factores relacionados. *Emergencias*. 2019;31:440-1.
- 23 Gettel CJ, Serina PT, Uzamere I, Hernandez-Bigos K, Venkatesh AK, Rising KL, et al. Emergency department-to-community care transition barriers: A qualitative study of older adults. Goldberg EM, Feder SL, Cohen AB, Hwang U. *J Am Geriatr Soc*. 2022 (en prensa).
- 24 Garmendia Prieto B, Sánchez Del Corral Usaola F, Avilés Maroto P, Rodríguez Gómez P, Gómez Pavón J, José Baztán Cortés J. Coordination between primary care and a geriatrics service, 20 years later. *Aten Primaria*. 2022; (en prensa).
- 25 Vauthier C, Chabannon M, Markarian T, Taillandy Y, Guillemet K, Krebs H, et al. Rendimiento de un algoritmo basado en ecografía cardiopulmonar a la cabecera del paciente (POCUS) para el diagnóstico de insuficiencia cardíaca aguda en pacientes que consultan en urgencias por disnea aguda. *Emergencias*. 2021;33:441-6.
- 26 Gil-Rodrigo A, Llorens P, Martínez-Buendía C, Luque-Hernández MJ, Espinosa B, Ramos-Rincón JM. Capacidad diagnóstica de la ecografía clínica pulmonar en pacientes con COVID-19. *Emergencias*. 2020;32:340-4.
- 27 Cai S, Intrator O, Chan C, Buxbaum L, Haggerty MA, Phibbs CS, et al. Association of costs and days at home with transfer hospital in home. *JAMA Netw Open*. 2021;4:e2114920.
- 28 Cabré M, Serra-Prat M. Factores que determinan la derivación a centros sociosanitarios o residencias geriátricas de pacientes ancianos hospitalizados en unidades geriátricas de agudos. *Rev Esp Geriatr Gerontol*. 2004;39:367-70.
- 29 Formiga F, A Ferrer, Duaso E, Olmedo C, Enriquez E, Pujol R. Diferencias entre nonagenarios según su lugar de residencia. *Estudio NonaSantfeliu*. *Rev Clin Esp*. 2007;207:121-4.