

# Healthcare for African immigrants arriving to the Canary Islands: a descriptive study

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**Background:** The aim of this study was to describe the characteristics of health care provided to arriving African immigrants, including primary care, hospital emergency care, and hospital admissions.

**Methods:** A descriptive cross-sectional study was carried out from August 15 to December 31, 2006. Three datasets were used. One included all primary care visits. The second comprised all visits to hospital emergency rooms. The third covered all patients admitted to the 5 university hospitals on Tenerife and Grand Canary islands. The first 2 datasets included the entire area of the Spanish autonomous community of the Canary Islands.

**Results:** A total of 3658 primary care visits and 1122 emergency room visits were recorded during the study period; 111 patients were hospitalized. Most primary care visits were for a general health check-up, for trauma, or for gastrointestinal disorders. Fever and abdominal pain were the most common reasons for emergency visits. Malaria and dehydration or electrolyte imbalance were the reasons for most hospital admissions.

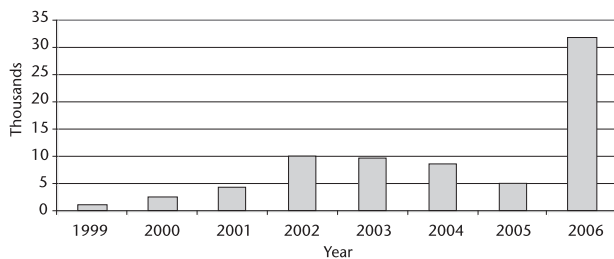
**Conclusions:** The boat crossings of thousands of kilometers affect the health of many immigrants to greater or lesser degrees. Health care was managed according to the number of patients who had to be attended, the time available, and the seriousness of the condition. [Emergencias 2008;20:411-418]

**Key words:** Immigration. Emigration. Epidemiology. Emergency health services.

## Introduction

Since the arrival of the first small boat with two young immigrants to the coast of Fuerteventura on August 28, 1994<sup>1</sup>, illegal immigration of African origin by sea to the Canary Islands has had its ups and down in the last years until 2006 at which time an historical rise was observed as shown in Figure 1. In 2002, an increase was reported in this phenomenon with the arrival of almost 10,000 persons to the Canary coasts. In the following years a gradual, albeit transitory, fall was produced which ended in 2005<sup>2</sup>. In this year an unusual event led to a significant change in this

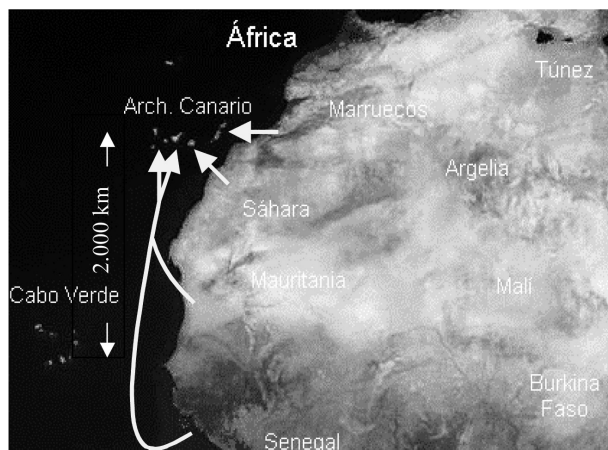
trend. On October 22, a vessel which was much larger than the usual small boats arrived to the coasts of Tenerife with a considerable number of persons from the sub Saharan region<sup>3</sup>. Different factors had contributed to this change in the departure points of the immigrants from the Moroccan coasts to others further south towards the coasts of Mauritius, Senegal and Guinea Bissau. This change of route led to the consequent modification in the characteristics of the vessels and the number of passengers aboard<sup>4</sup> (Figure 2). During the summer months, especially during the month of September 2006, the number of immigrants which arrived to the Canary Islands



**Figure 1.** Immigrants arriving to the Canary Islands by sea from Africa by years (Source: Ministerio de Trabajo y Asuntos Sociales).

reached previously unregistered values with 7,535 immigrants arriving in only one month<sup>5</sup>.

These events not only demonstrated a novelty in the routes and in the type of vessel used but also a change in the state of health of many emigrants who remained in precarious overcrowded conditions during a long journey of more than one week in length and were also from countries with a high prevalence of infectious diseases such as malaria<sup>6,7</sup>. This represented the need to design and implement healthcare procedures for all the immigrants on their arrival. The circuit established was initiated with care being provided to the patients in situ, on the beach or in the port by the Canary emergency services, primary care (PC) personnel from the Canary Healthcare Service (CHS) and volunteers from the Red Cross. The patients were thereafter transferred to healthcare centres, normal emergency departments (NED) or hospitals if their clinical situation so required. A healthcare protocol was elaborated in the healthcare centres which consisted in the reception, evaluation and admission into the corresponding departments. Thereafter, healthcare was continued in or from the shelters provided with the



**Figure 2.** The most frequent migratory routes towards the Canary Islands.

same criteria of referral as in situ care. The objective of this study was to describe the characteristics of the healthcare provided to immigrants from the African continent which arrive to the Canary Islands by sea from both a primary care and hospital setting.

## Methods

This study was performed in the Dirección General de Programas Asistenciales del Servicio Canario de la Salud (General Management of Healthcare Programmes of the Canary Healthcare Service) where all the information produced in relation to the care provided to the immigrants was centralised.

A transversal, observational study was designed to analyse the healthcare provided to illegal immigrants of African origin who arrived to the Canary Islands by sea from August 15 to December 31, 2006.

Three populations were studied: one included all healthcare carried out in primary care. The second consisted of the total number of assistance services performed in the hospital emergency departments and the third involved the total number of patients admitted in the 5 university hospitals of Tenerife and Gran Canaria. The geographical setting for the first two populations was all the Autonomous Community of the Canary Islands.

A registry sheet designed by the Management of Primary Care and the General Management of Healthcare Programmes was used as the source of PC data and this was completed weekly in the healthcare centres and extrahospital emergency services. The following variables were collected on this sheet: 1) the identification number, 2) age: adult or minor (a minor was considered a person under the age of 18 years), 3) sex: male/female, 4) origin: port or coast, police station or shelter, 5) healthcare area (island) where the care was provided, 6) date, 7) reason for assistance, 8) type of care (carried out by the PC team or by the emergency department), 9) intervening healthcare personnel: physician, nurse or both, and 11) transfer to hospital: yes/no. Of these variables, others were obtained from grouping the different categories. Thus, the reasons for care were grouped into 9 categories: review of health status, term used by the International Disease Classification 9-MC to refer to contact of the people in the healthcare services with potential healthcare risks, related to their personal and family history (consisted in examina-

tions, complementary tests and immunisation), dehydration, traumatisms (traumatic lesions with or without wounds and burns), dizziness, headaches and facial pain, gastrointestinal disorders, fever and general discomfort, alterations of the skin and mucosa, and lastly, undetermined processes. The data was grouped by weeks of the year. With regard to origin, a shelter was considered an installation where minors received shelter and tutorship and other centres where adults were pending repatriation. This variable was also grouped into two categories (port/police station and shelter) for comparison with other variables.

For the patients attended in the hospital emergency departments a registry sheet similar to that for PC was used and the following variables were taken into account. 1) identification number, 2) age (adult or minor), 3) sex (male/female), 4) origin (port or coast, police station or shelter), 5) reasons for care, 6) date, 7) observation period, and 8) hospital admission (yes/no).

The information of the patients admitted was obtained from the basic minimum dataset of hospital discharge (CMBDH). The variables selected for study were: 1) age, 2) sex, 3) data of admission, 4) date of discharge, 5) destination at discharge, 6) main diagnosis, 7) secondary diagnoses, 8) diagnostic procedures, and 9) surgical procedures. Of these variables the number of stays was obtained, that is, when a patient occupied a bed at the reporting time 00:00, mean stay and groups related to the diagnosis (GRD).

Data analysis was performed beginning with a description of the state of each variable measured for each sample, using the relative frequency in concordance with its qualitative scale. The comparison of variables of interest was performed with the Pearson chi-square test or the Fisher exact tests as required. Statistical significance was considered with a  $p$  value  $\leq 0.05$ . Statistical analyses were carried out with the SPSS version 12.1 (CoTM, Chicago, Ill., USA) statistical package.

## Results

During the study period a total of 19,845 immigrants arrived to the Canary coasts, 3% being under the age of 18 years. The data itemised in PC (including the NED), hospital emergency departments and in hospitals are presented.

### Primary care

A total of 3,658 services were made in PC which included both those carried out in the

healthcare centre and by continued and normal emergency care teams (76% of the total services provided). The Islands of Tenerife and La Gomera performed 91.3% of the PC services, with 56.9% in adults, 42.6% in minors and in 0.5% the age could not initially be determined. With respect to sex, 98.3% were males.

Table 1 shows the different reasons for healthcare by age groups and destination following the receipt of healthcare. Significant differences were observed in both distributions ( $p < 0.01$ ). According to the age of the patient, the reason "examination of health status" was more frequent among the minors than in the adults (77% versus 25%) while headache and traumatisms were more frequent in the adults than in the minors (15% versus 4%). The percentage of patients referred to hospital from the PC was 2.4%. The groups of reasons producing the greatest number of transfer to hospital were "febrile syndrome" and "behaviour disorders" with 43.2% and 20%, respectively. The adult patients referred to hospital represented 2.5% while 2.1% were minors ( $p = 0.39$ ).

Of the activity carried out during the study period 16.5% was done in week 38 (18 to 24 September, 2006) and 70% was between weeks 33 and 42 (August 15 and October 14, 2006). Figure 3 shows the healthcare activity during the period analysed.

After their arrival to the islands, the healthcare to the patients could have been immediate or deferred, after their placement in the sites assigned by the authorities. Most of the patients attended (52%) were from shelters or retention centres, 38% from the coast and 9.3% from the police station. On considering only the group of minors, 96.6% were from the shelters.

### Hospital Emergency Departments

In the hospital emergency departments of the islands, in the case of the islands which are not the capital and of reference as in Tenerife and Gran Canaria, 1,119 healthcare services were provided to immigrants. Of these patients, 12% were admitted to hospital and the remaining cases were resolved in the emergency departments involving a total of 1,557 days of stay with a mean of 1.8 days.

Of these services, 73.6% were in adults, 21.7% were minors and in 4.6% the age could not initially be determined. With regard to sex, 2% were females and 98% males.

With respect to the point of origin of the patients attended in these services, 54.2% were referred from shelters, 33.9% directly from the port

**Table 1.** Reason for care and destination of the patients attended in primary care (including normal emergency departments)

Reasons	According to age*		According to final destination*		Total (%)
	Minors (%)	Adultos (%)	Discharge (%)	Hospital (%)	
Febrile syndrome	10 (0.6)	27 (1.3)	21 (56.8)	16 (43.2)	37 (100)
Behaviour disorder	21 (1.3)	14 (0.7)	28 (80.0)	7 (20.0)	35 (100)
Eye diseases	7 (0.4)	17 (0.8)	21 (87.5)	3 (12.5)	24 (100)
Abscesses/cellulitis/dermatitis	35 (2.2)	81 (3.9)	107 (92.2)	9 (7.8)	116 (100)
Abdominal pain/other gastro-intestinal alterations	65 (4.1)	117 (5.6)	171 (94.0)	11 (6.0)	182 (100)
Musculoskeletal pain	28 (1.8)	36 (1.7)	61 (95.3)	3 (4.7)	64 (100)
General discomfort/unspecific symptomatology	10 (0.6)	15 (0.7)	24 (96.0)	1 (4.0)	25 (100)
Respiratory infection	33 (2.1)	29 (1.4)	61 (98.4)	1 (1.6)	62 (100)
Examination of health status	1.210 (77.2)	532 (25.4)	1.719 (98.7)	23 (1.3)	1.742 (100)
Dehydration/hypothermia	10 (0.6)	163 (7.8)	171 (98.8)	2 (1.2)	173 (100)
Wounds/traumatism	70 (4.5)	328 (15.7)	395 (99.2)	3 (0.8)	398 (100)
Headache/dizziness	22 (1.4)	602 (28.8)	621 (99.5)	3 (0.5)	624 (100)
Cavities/gingivitis	32 (2.0)	22 (1.1)	54 (100)	0 (0.0)	54 (100)
Undetermined	14 (0.9)	108 (5.2)	118 (96.7)	4 (3.3)	122 (100)
<b>Total</b>	<b>1.567 (100)</b>	<b>2.091 (100)</b>	<b>3.572 (97.6)</b>	<b>86 (2.4)</b>	<b>3.658 (100)</b>

\*Pearson chi-square test  $p < 0.001$

or coast, 5% from the police station, 2.7% from other hospitals and 2% from the healthcare centre/NED.

Table 2 shows the different reasons for which the patients were attended, with significant differences being observed between adults and children ( $p < 0.001$ ). It can be seen that in adults the reason for hospital attendance was more often a febrile syndrome in 14% while 63% of the minors it was the need for radiography to determine bone age. One patient died during emergency care.

### Hospital

A total of 11 patients were hospitalised. The mean age of the patients was 25 years (range: 13-45 years and standard deviation  $\pm 5$ ). The frequency of admissions according to age showed a significant difference with 14.7% of the adults being admitted to hospital versus 3.3% of the minors ( $p < 0.001$ ).

The most frequent diagnoses were related to infectious and parasitic diseases, among which malaria by *Plasmodium falciparum* represented a total of 228 stays as shown in Table 3.

Table 4 depicts the hospital discharges by department. Because of the already mentioned incidence of infectious diseases and metabolic disorders produced by dehydration, the internal medicine department was of note. The mean weight (complexity) excluding the extreme cases was of 1.63. Of the GRD, 14.4% were surgical and 85.6% medical. The mean stay was 10.2 days.

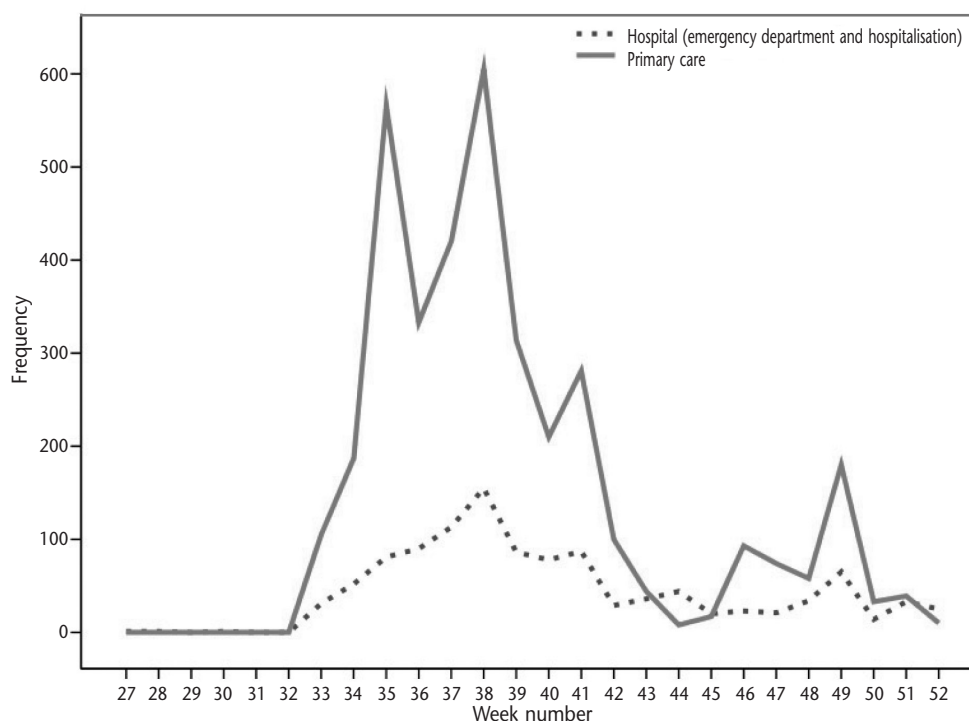
Four of the hospitalised patients died: 3 in relation to severe dehydration and one due to hollow viscera perforation with refractory shock.

### Discussion

During 2006, a large part of the migratory movement produced from the African coasts to the Canary Islands was marked by the long distance from the departure points and the overcrowding in the vessels used<sup>4</sup>. The physical condition of a relatively important number of immigrants declined in these conditions and healthcare assistance was required on arrival or within the following days.

One of the factors which have probably contributed to the spectacular increase in the arrival of vessels and thus, healthcare activity in the weeks of August and September is the climatology of the Canary Islands in these months, with a rise in temperature and generally calm winds which may sometimes be from the East and Southeast. The fact that 7,735 persons arrived to the islands only in the month of September made deployment similar to that made in humanitarian catastrophes necessary<sup>6</sup>. Of the data obtained it may be concluded that healthcare was not only centred on the immediate healthcare on arrival of the immigrants but rather care continued once the immigrants had been settled into shelters.

The low proportion of patients who were referred to the hospital is worthy of mention. This is probably due to two reasons. First, the triage carried out immediately on arrival of the boat by both the emergency teams as well as those of PC. The second reason is the resolution power of the latter, in which the NED, the first level of emergency medicine, is included. Thus, it should be pointed out that the reason for care which most frequently led to the hospital referral was fever and/or general malaise requiring specific diagnosis.



**Figure 3.** Number of care services provided by week of the year in hospitals (emergency department and hospitalisation) and primary care.

tic procedures for the detection of infectious or parasitic diseases such as malaria. The percentage of patients with no clear reason for care may have been due, on one hand, to linguistic barriers which condition the expression of the symptoms which constitute a frequent problem in healthcare to immigrants<sup>9</sup> and, on the other hand, the many unspecific reasons for consultation.

The results of the study demonstrate that PC healthcare was not limited to the diagnosis and treatment of acute processes, but also covered the review of the status of health. In fact, almost half of the care provided consisted in examinations, complementary tests and immunization, mainly in the minors. Care was thereby adjusted to that established in the protocol of action and coordination for healthcare to minor unaccompanied immigrants developed by the Dirección General de Programas Asistenciales del Servicio Canario de la Salud<sup>10</sup> and justifies the distribution of the reasons for consultation.

Similar to what occurred in PC, most of the patients attended in hospital emergency departments were already settled in shelters. Fever was the most frequent reason for care among the adults attended in these departments and who were largely referred from the PC for previously explained reasons. The emergency services were sensitised to the early diagnosis of malaria to ap-

ply treatment early and thereby avoid severe complications<sup>11</sup>. On the other hand, the most frequent reason, among the minors attended in the emergency departments, was to carry out radiography of the carpal bone to confirm the age since the determination of age was of great importance from a judicial point of view<sup>12</sup>. Remaining under observation in the emergency department for patients with less severe diseases, such as moderate

**Table 2.** Reasons for care in hospital emergency departments

Reasons	Adults* (%)	Minors* (%)
Febrile syndrome	128 (14.6)	8 (3.3)
Abdominal pain	108 (12.3)	8 (3.3)
Traumatisms	104 (11.9)	38 (15.6)
Determination bone age/judicial x-ray	85 (9.7)	155 (63.8)
Dehydration/hypothermia/hypoglycaemia	76 (8.7)	2 (0.8)
Respiratory infection	71 (8.0)	7 (2.9)
Abscesses/cellulites	41 (3.9)	3 (1.2)
General malaise / unspecific symptomatology	37 (4.2)	3 (1.2)
Musculoskeletal pain	34 (3.9)	8 (3.3)
Behaviour disorder	8 (0.9)	-
No disease	5 (0.6)	1 (0.4)
Conjunctivitis/other eye disease	4 (0.5)	3 (1.2)
Cavities/gingivitis	4 (0.5)	-
Pregnancy	4 (0.5)	-
Acute abdominal pain	2 (0.2)	-
Death	1(0.1)	-
Not determined	164 (18.7)	7 (2.9)
<b>Total</b>	<b>876 (100)</b>	<b>243 (100)</b>

Pearson chi-square test  $p < 0.001$ .

**Table 3.** Main diagnosis and stay of the immigrant patients admitted to hospital

Main diagnosis	Total n° of patients	Mean stay (days)	Sum of stays (days)
Malaria	38	6	228
Hyperosmolarity and/or hypernatremia and/or hyperpotassemia	18	21	377
Pulmonary TBC	5	28.4	142
Sepsis/systemic inflammatory response syndrome	6	22.1	133
Typhoid fever	4	15	69
Cellulitis in the extremities	6	10.1	61
Limb fracture	4	9.2	37
Wounds in the extremities	4	29	116
Mental diseases and disorders	3	23	69
2 <sup>nd</sup> and 3 <sup>rd</sup> degree burns on hand and wrist	2	50.5	101
Pneumonia	2	8.5	17
Bacterial infection/febrile syndrome	2	7	14
Trunk abrasion or burn	1	50	50
Toxic goitre	1	28	28
Acute phlebitis	1	21	21
Non specific ictericia	1	20	20
Chronic osteomyelitis	1	20	20
Acute bronchitis	1	18	18
Ascariasis	1	13	13
Hypothermia	1	10	10
Other respiratory system diseases	1	7	7
Dermatophytosis	1	7	7
Diabetes mellitus with type 1 ketoacidosis	1	7	7
Gastroenteritis by <i>Salmonella</i>	1	7	7
Respiratory failure	1	6	6
Perforated duodenal ulcer	1	6	6
Pyogenic arthritis of the hand	1	5	5
Nervous system diseases and disorders	1	3	3
Acute renal failure	1	2	2
<b>Total</b>	<b>111</b>	<b>10.2</b>	<b>1592</b>

dehydration or febrile processes under study for a mean of almost two days, was often sufficient for the recovery of the patient and thereby avoided unnecessary hospital admission.

The most frequent diagnosis among the patients admitted was malaria, with no death due to this disease being reported. At present, the cases of malaria declared in Spain are all imported with the exception of those induced by transfusions or by the exchange of syringes in intravenous drug addicts or airport malaria. The last case of malaria in Spain was registered in May 1961 and 1964 this disease was officially certified as eradicated<sup>13,14</sup>.

The results of the present study report the

scarce relevance of infectious diseases in the diagnoses performed in relation to the previously mentioned parasitic diseases. This circumstance led to the same conclusion as that by Caminero Luna et al who stated that immigration of sub-Saharan origin had practically no influence on the epidemiologic situation of diseases such as tuberculosis in the Canary Islands<sup>15</sup>. Although typhoid fever has practically been eradicated in most areas of the industrialised world with the advent of appropriate healthcare installations, most of the cases presented in developed countries are imported from endemic countries such as has been detected in the present study in which several hospitali-

**Table 4.** Discharges by hospital department

Department	Patients (n°)	Mean Stay (days)	Percentage of stays	Total stays
Internal medicine	65	11.28	46.6	740
Traumatology	16	19.5	17.9	284
Pneumology	7	16.4	7.3	115
Intensive medicine	7	6.5	2.9	46
Psychiatry	4	18	4.5	72
Nephrology	3	36.5	5.4	86
Endocrinology	2	17.5	2.2	35
Urology	2	6.5	0.8	13
Vascular surgery	1	53	3.3	53
Anaesthesia and reanimation	1	6	0.4	6
Paediatric surgery	1	50	3.1	50
Infectious diseases unit	1	28	1.8	28
Plastic and repair surgery	1	61	3.8	61
<b>Total</b>	<b>111</b>	<b>10.4</b>	<b>100</b>	<b>1589</b>

sations for this disease have been reported<sup>16</sup>. The number of patients with sepsis was also of note. The appearance of these severe infections is probably not only due to immune disorders. The weakness and exhaustion of some of the patients during the journey may be factors which trigger sepsis in the presence of a pathogenic bacteria<sup>17,18</sup>.

The group of diseases with the highest mortality and which also constituted the second most frequent diagnosis was dehydration with electrolyte disorders. The poor conditions of the journey and the ingestion of sea water<sup>19</sup> reported by the immigrants themselves provoke dehydration, which in association with hypothermia and infections, triggers a systemic inflammatory response which may affect tissue perfusion of the distal parts of the extremities followed by multiorgan failure and finally death<sup>20</sup>. Although hypothermia disorders are well documented in the literature<sup>21,22</sup>, a Medline search with references on voluntary and massive sea water intake did not provide any citation related to the study. The basic strategy of search was: ["Hyponatremia/etiology" (Mesh) OR "Hypernatremia" (Mesh) OR "Dehydration" (Mesh) OR "Kidney Failure Acute"(Mesh) AND "Seawater"(Mesh)] also used as descriptors such as "Castaway", "Ingestion" and "drink". All of the above explains, in part, that the complexity of the casuistic of the patients hospitalised was greater than the mean usually presented in the hospitals studied.

This study is one which is unprecedented in the present medical literature and, as expected, there are few references with which the results may be contrasted or discussed. On the other hand, this study may have several limitations. The beginning of the study period probably did not collect all the patients attended in the PC but the size of the sample provides the power necessary to reflect the situation of the problem with sufficient precision to be able to establish some comparisons. Secondly, the groups of the reasons for the healthcare provided may have included processes with sufficient entity to have been considered independently but the great range of reasons made grouping necessary. Lastly, the lack of data referring to the country of origin and the departure point/distance covered did not allow differentiation of the pathology related to the origin of the patient and that due to the sea crossing.

Nonetheless, it is important to carry out future epidemiological studies related to the needs for emergency healthcare and to the detection of emerging diseases which may be derived from the arrival of illegal immigrants to the Canary Islands.

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## **Características de la asistencia sanitaria a la llegada de inmigrantes africanos en las Islas Canarias**

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**Objetivo:** Describir las características de la asistencia sanitaria a la llegada de los inmigrantes tanto en el ámbito de atención primaria (AP) como en el hospitalario, y, en este último, tanto la atención en urgencias y como en hospitalización.

**Método:** Se diseñó un estudio descriptivo y transversal. El periodo de estudio comprendió desde el 15 de agosto hasta el 31 de diciembre de 2006. Se utilizaron tres tipos de población: una incluyó la totalidad de las asistencias realizadas en AP. La segunda abarcó el total de las asistencias realizadas en las urgencias hospitalarias y la tercera comprendió el total de pacientes ingresados en los 5 hospitales universitarios de Tenerife y Gran Canaria. Para las dos primeras el ámbito geográfico fue toda la Comunidad Autónoma de Canarias.

**Resultados:** Durante el periodo del estudio se realizaron en AP 3.658 asistencias y en las urgencias de los hospitales 1.122. El número de pacientes hospitalizados fue de 111. Los motivos de asistencias más importantes fueron la revisión del estado de salud, los traumatismos y trastornos gastrointestinales en AP; el síndrome febril y el dolor abdominal en las urgencias hospitalarias; y los motivos más frecuentes de ingreso en los hospitales fueron el paludismo y los trastornos hidro-electrolíticos.

**Discusión:** La llegada de embarcaciones con inmigrantes tras haber recorrido miles de kilómetros de distancia afectó en menor o mayor medida al estado de salud de muchos de ellos. Su asistencia sanitaria se gestionó en base al número de pacientes a atender en un intervalo de tiempo y por la gravedad de sus enfermedades. [Emergencias 2008;20:411-418]

**Palabras clave:** Emigración. Epidemiología. Urgencias.