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# Simit Epidemiological Multicentric Study on Hospitalized Immigrants in Italy During 2002

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The aim of this article is to retrospectively evaluate the patient characteristics and the most common infectious diseases in immigrant patients hospitalized in 46 Italian infectious disease clinics during 2002. The main Italian infectious disease clinics were invited to fill in a questionnaire that regarded the number and type of hospital admissions, the country of origin, and demographic features (age, sex, and resident state) of immigrants. A total of 46 clinics including 2255 patients participated in the study. Most patients were men (63%) with an age between 16 and 40 years (63.4%) covered by the National Health Service (71%) and coming from Africa (44.3%). The main infectious diseases observed were: 378 (16.76%) cases of HIV infection, 303 (13.43%) cases of tuberculosis diseases, 282 (12.5%) cases of various forms of viral hepatitis, 177 (7.84%) cases of respiratory diseases, and 196 (8.69%) gastrointestinal diseases. Tropical diseases found were 134 (5.94%) including 95 cases of malaria (70.9%). In conclusion, a broad range of diseases was noted in immigrants which were directly correlated with conditions of poverty. Only a few tropical diseases were diagnosed and therefore the immigrant should not be considered as an infectious disease carrier.

**KEY WORDS:** HIV; hospitalization; immigration; infectious diseases; tuberculosis.

## INTRODUCTION

The migratory flow towards Italy has increased in the last 5 years; in fact, 85,337 persons were admitted in 1997 and 306,000 persons in 2001. Actually, the total number of legal immigrants can be estimated as 1,600,000 persons (2.8% of all Italian people) apart from the illegal clandestine subjects who are not easily quantifiable. The distribution throughout the country varies; 52.2% are located in the North, 31.8% in Central Italy and 16.0% in the South. The majority of these subjects immigrate for social/economic reasons and only a few can be considered students or political refugees (1, 2).

Considering these figures, it is obvious that many questions regarding human rights, and the social, economic, and cultural integration of these populations must be faced, and, in particular, an adequate health service organization must be provided.

Immigrant populations are often considered as a source of many known and unknown infectious diseases, such as Ebola, SARS etc. occasionally resulting in unjustified prejudice (3). In this context, the health service for immigrants, particularly if clandestine, is not sufficient as currently much assistance is furnished by religious or lay volunteer groups. Only lately have hospitals and local health services initiated the creation of out-patient clinics for immigrants, including the help of cultural workers and interpreters (3, 4).

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In the light of these considerations with the cooperation of SIMIT (The Italian Society of Infectious and Tropical diseases), a retrospective, epidemiological survey concerning problems of immigration has been performed, whose aim was to investigate the rate and causes of hospitalization in the infectious disease clinics throughout Italy during 2002.

## PATIENTS AND METHODS

The main Italian infectious disease clinics were invited to contribute to the analysis. Each participating center was requested to fill in a questionnaire regarding the number and type of hospital and out-patient clinic admissions, the country of origin, and demographic features (age, sex, resident status and inscription in the National Health Service) of immigrants as reported by the registers of each hospital during 2002. Data were received from 46 Italian centers and divided according to the three most important geographic areas: North (12 institutes), Central (22 institutes), and South (12 institutes) and according to country of origin.

A total of 2255 immigrants were screened both in ordinary hospital admissions and out-patient clinics and a dismissal diagnosis was recorded.

### Statistical Analysis

Descriptive statistics were calculated for demographic and clinical characteristics of all cases. The Chi-square-test was used to analyze the significance of categorical variables and a $p$ value $<0.05$ was considered significant.

## RESULTS

Data were collected for 2255 immigrants representing 5.98% of all the patients (37,661) followed by the infectious disease department cooperating in the study, including 1571 hospitalized patients (6.8%) and 684 out-patient subjects (4.7%). The main patient characteristics are reported in Table I. The percent of immigrants with respect to the total number of hospitalized patients (both ordinary hospitalizations and out-patient subjects) according to the three main geographical areas in Italy is reported in Fig. 1.

A total of 1420 patients (63%) were male. Age of patients was stratified into four groups: 1–15 years (18%), 16–40 years (63.4%), 41–65 years (17.3%), and >65 years (1.3%). The country of origin resulted Africa (44.39%), Asia (13.44%), North and South America (21.73%), Eastern Europe (21.73%), and Oceania (0.13%). Origin was unknown for 13 subjects.

Considering the resident status, 609 patients (27%) were illegal residents and 45 (2%) patients had an unknown legal status. The illegal immigrants were equally distributed among the three geographical areas: 279/962 (29%) in Northern Italy, 218/908 (24%) in Central Italy and 116/385 (30%) in Southern Italy.

A total of 1601 (71%) patients were covered by the National Health Service either as a regular resident or as a temporary foreign resident with a temporary anonymous health card.

**Table I.** Main Patient Characteristics

| Participating centers | (Number of centers) | North (12) | Centre (22) | South (12) | Total (46) |
|---|---|---|---|---|---|
| No. pts[a] (%)[b] | OH | 705 (13.2) | 648 (6.5) | 218 (2.8) | 1571 (6.8) |
| | OP | 257 (12.1) | 260 (4.1) | 167 (2.7) | 684 (4.7) |
| | Total | 962 | 908 | 385 | 2255 |
| Legal status (%)[c] | Illegal | 278 (29) | 209 (24) | 117 (30) | 604 |
| Sex | Males | Females | | | |
| No. pts (%) | 1420 (63) | 835 (37) | | | |
| Age (years) | 1–15 | 16–40 | 41–65 | >65 | |
| No. pts (%) | 405 (17.9) | 1430 (63.4) | 391 (17.3) | 29 (1.3) | 2255 |
| Provenience | Africa | Asia | America | East-Europe | Other |
| No. patents (%) | 1001 (44.4) | 445 (19.7) | 303 (13.4) | 490 (21.7) | 16 (0.7) |

[a]No. pts: number of patients admitted to hospital (OH: ordinary hospitalizations; OP: out-patients).
[b]%: percentages are calculated according to total number (native and immigrants) of patients.
[c]%: percentages are calculated according to total number of immigrants.

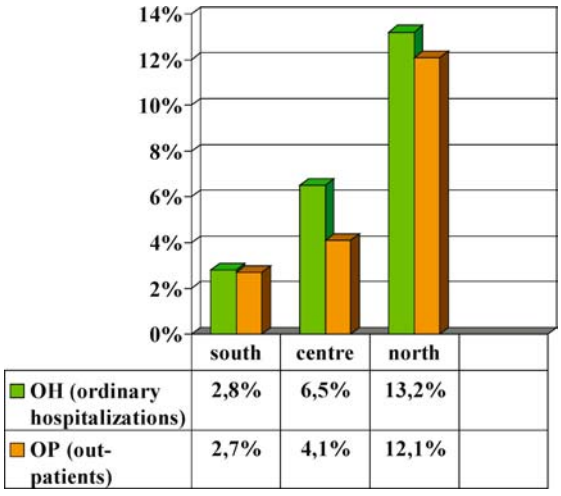


**Fig. 1.** Percent of immigrants with respect to total number ofhospitalized patients (both ordinary hospitalizations and outpatientsubjects) according to the three main geographical areas in Italy.

The main infectious diseases observed (Table II) were: 378 cases of HIV infection (16.76% of all immigrant patient screened), 303 cases of tuberculosis disease (13.43%), 282 various forms of viral hepatitis (12.5%), 177 cases of respiratory diseases (7.84%) including 148 (83.6%) cases of upper respiratory infections, and 196 gastrointestinal diseases (8.69%) of which 12 (6.12%) were caused by Salmonella. A total of 134 tropical diseases were diagnosed (5.94%) the majority of that was due to malaria (70.9%). Lastly, we observed other infectious diseases, such as meningitis, fever of unknown origin, herpes virus infections, etc. (35%).

When analyzing the pediatric subgroup from 0 to 15 years (405 patients), we noted a predominance of gastrointestinal disorders (65 cases, 16.04%) including 18 cases of salmonellosis whereas 49 patients (12.09%) showed respiratory diseases including 13 with lung or bronchopneumonia infections and 28 patients with tuberculosis. Twenty-eight children (6.9%) presented exanthematic diseases and another 24 (5.92%) had various tropical diseases, mainly malaria. A total of 16 children (3.95%) were positive for viral hepatitis (2 were chronic forms) and 8 (1.97%) were positive for HIV infection. Moreover, 37 cases (9.13%) of scabies were observed caused by an epidemic focus in one of the infectious disease clinics in our survey. Other noninfectious disorders (154 cases: 38%) included malabsorption syndromes, genetic diseases, and tumors (Table III).

As the three principle infectious diseases found in the immigrant population were HIV infection, tuberculosis, and viral hepatitis, these diseases were analyzed according to the country of origin and clinical features (Table II).

## HIV

A total of 378 patients were affected by HIV infection including 181 (47.88%) females. As to country of origin, 234 patients (61.94%) were from

**Table II.** Infectious Diseases in Enrolled Immigrant Patients

| | Number of cases | Total = 2555 (%) |
|---|---|---|
| HIV | 378 | (16.8%) |
| AIDS | 93 (24.6%) | |
| Asintomatic infection | 285 (75.4%) | |
| Prevalent opportunistic infections: TBC, Toxoplasma, PCP, LNH, KS, CMV | | |
| TBC | 303 | (13.4%) |
| Pulmonary | 195 (64.3%) | |
| Lymph node | 64 (21.1%) | |
| Other forms: peritoneal or pleural, meningeal, bone | | |
| Viral hepatitis | 282 | (12.5%) |
| Acute | 66 (23.4%) | |
| Chronic | 216 (76.6%) | |
| Acute: HAV (28), HBV (32), HCV (2), HEV (4) | Chronic: HBV (90), HCV (81), HDV + HBV(2) | |
| Tropical infections | 132 | (5.8%) |
| Malaria | 93 (70.4%) | |
| Others | 39 (29.6%) | |
| Others: HEV (4), dengue (2), schistosomiasis (14), amebiasis (9) | | |

**Table III.** Cases of Infectious Diseases in the Paediatric Population (0–15 years)

| Infectious diseases | Number of cases | % |
|---|---|---|
| TBC | 28 | 6.91 |
| HIV | 8 | 1.98 |
| Malaria | 24 | 5.93 |
| Viral hepatits | 16 | 3.95 |
| Gastrointestinal | 65 | 16.05 |
| Salmonellosis | 18 | 4.44 |
| Exanthematic diseases | 28 | 6.91 |
| Respiratory diseases | 62 | 15.31 |
| Others | 154 | 38.02 |
| Total | 403 | 100.00 |

African countries, 33 (8.72%) were Asiatic, 71 (18.77%) came from Central and South America, and 40 (10.57%) from Eastern Europe. Their Italian residence is divided as follows: 137 cases in the North (14.24%), 184 in the Center (20.26%) and 57 in the South (14.80%). Of the 93 patients will full-blown AIDS, there were several kinds of opportunistic infections. Firstly, we noted a high rate of TBC (29 cases), followed by HCV (11 cases), toxoplasmosis (11 cases), and pneumocystosis (8 cases).

### TBC

A total of 303 tuberculosis cases observed were mainly men (62.5%); 144 patients (47.52%) were African, 72 (23.76%) were Asiatic, 40 (13.2%) were Central or South American, and 47 (15.51%) were from Eastern Europe. In Italy, the geographical distribution was as follows: 140 (14.55%) cases in Northern Italy; 133 (14.64%) were observed in Central Italy and 30 (7.79%) were living in the South. The most important clinical forms were the lung (195 cases), lymph node tuberculosis (64 cases), tuberculosis of other internal organs (13 cases), bone TBC (10 cases), meningeal tuberculosis (8 cases), and 13 cases of different tubercular forms.

### Viral Hepatitis

We observed 282 cases of viral hepatitis (59.7% males). The country of origin was Africa in 83 (29.43%), Asia in 78 (27.66%), South America in 24 (8.52%), and 97 (34.39%) from Eastern Europe. As to geographical distribution, 100 cases resided in the North of Italy (10.39%), 112 in the Center (12.33%), and 70 in the South (18.18%). We found 216 variants of chronic viral hepatitis: 90 cases of HBV, 81 of HCV, and only 2 cases of HDV (for 43 cases etiology was unknown). A total of 22 clinical cases was caused by alcohol abuse. The acute form was found in 66 cases of whom 28 were due to HAV, 32 were related to HBV, 2 cases were due to HCV, and 4 were caused by HEV.

The distribution of HIV, TBC, and viral hepatitis according to geographical area is reported in Fig. 2.

Imported tropical diseases were found in only a few patients representing 6% of the total of immigrant hospitalized patients, in particular, malaria (95 cases: 70.89%). These patients were almost all from Africa (80%). The second most frequent disease was schistosomiasis with 14 cases (10.44%), followed by diseases such as HEV infection, Dengue, etc.

## DISCUSSION

According to our study that included 46 Italian clinics of infectious diseases, 2255 patients were examined during 2002, either as an ordinary admissions or as out-patients. The main part of these immigrants came from African regions (44.4%) while 21.7% of patients arrived from Eastern Europe, 19.7% from Asia and 13.4% from Central or South America. When compared to data from other European studies (5, 6); the only difference concerned the proportion of patients arriving from Eastern Europe. Italy is the most important reference point for emigrants from the Balkan and Slavic countries and from the ex-Soviet Union (7, 8); however, in general, the distribution of patients according to country of origin was similar in the North, Center, and South of Italy. The age medians for most immigrants was 16–40 (63%) and 41–65 (17%) years, justified by the need of relatively young and healthy male workers (2, 3–9).

When considering the prevalence of hospitalizations (either ordinary or out-patient) in the Northern, Central, or Southern regions of Italy, important results were observed. In fact, there was a higher rate of hospitalizations in Northern areas (up to 13%) versus 6.5% in the Central regions and less than 3% in Southern zones. These data reflect a disparity of immigrant distribution in Italy and indicate that Southern Italy is only an arrival point leading to a definite location in the Northern regions (according to the Caritas reports in 2002) (1).

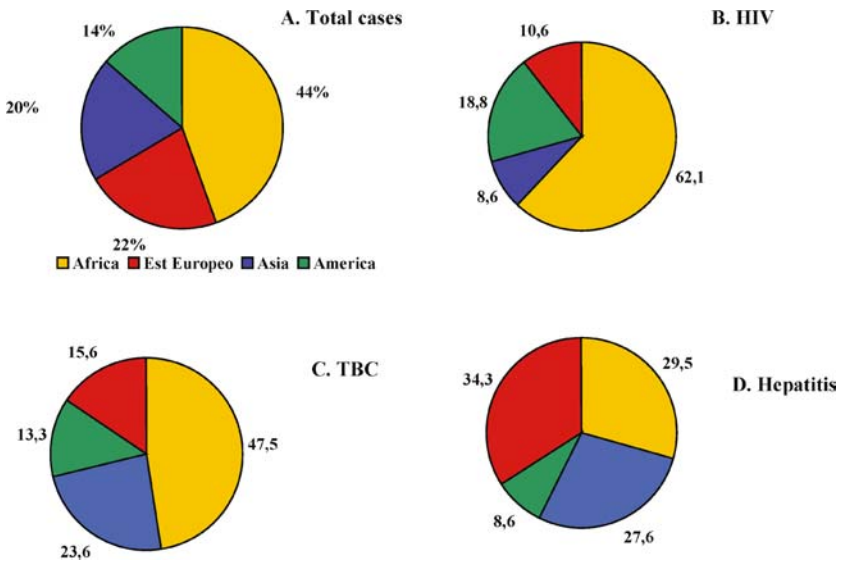


**Fig. 2.** Country of origin for the immigrant population studied (A) andfor patient affected by HIV infection (B), tuberculosis (C), and viral hepatitis (D).

An another important result regards the resident status of all patients either clandestine or legal residents. Only 30% of all hospitalized immigrants were clandestine persons compared to those with a legal resident status, that is, national health services are frequented more often by regular citizens even though, legally, facilities are available to the entire immigrant population.

With regard to the prevalence of infectious diseases in immigrant hospitalized patients, 16% of cases were HIV infections, 13% were clinical forms of tuberculosis, 12% were cases of viral hepatitis, and 5.9% were tropical diseases; the remaining disorders were due to other diseases, such as meningitis, unknown fever, endocarditis, etc. HIV and TBC were most common in African patients (62.1 and 47.5% of all cases, respectively) while viral hepatitis infections were mainly found in East-European immigrants (34.3%). It must be emphasized that TBC was the most widespread infectious disease in the Northern and Central regions of Italy while viral hepatitis forms were more commonly diagnosed in the Southern zones; there were no significant differences for HIV (10–14).

Tuberculosis was found in 303 patients; its clinical forms were lung tuberculosis (very frequent), followed by 21.1% of cases of the lymph node form. This prevalence is higher among immigrants and is probably the expression of a recent infection (depending on poor hygienic conditions) (13).

Tuberculosis was also the most frequent opportunistic infection in AIDS among immigrants, followed by Toxoplasmosis, PCP, and non-Hodgkin's lymphoma.

The cases of acute or chronic forms of viral hepatitis were most frequently related to HBV caused by the lack or incomplete prophylactic vaccination in the country of origin. Cases of noninfectious diseases or curable illnesses without need of hospitalization were also observed, typical of unsanitary living conditions.

A limited number of pediatric patients were also hospitalized in the infectious diseases institutes; in fact, 38% of these cases comprised a mixture pathologies such as viral infections, bacterial meningitis etc. but 16% were due to gastrointestinal diseases, 12% to respiratory pathologies, while cases of viral hepatitis, tuberculosis, and HIV were estimated at 12% (TBC was the most frequent with 7%). Our results were similar to those of other published studies for both adults (5, 6–10) and children (11, 12).

In conclusion, according to our study, the range of health problems in immigrants is inevitably broad and includes infectious diseases, such as HIV infection, tuberculosis, hepatitis, and other pathologies, such as respiratory or gastrointestinal disorders that reflect the deficiency of food, unhealthy conditions of life, and promiscuous sexual relationships. Only a few tropical diseases have been imported, in particular, malaria; therefore immigrants should not be

considered as an infectious disease carrier. The national health service for immigrants is actually ineffective in some cases (1, 4) and should be improved in order to avoid unnecessary hospitalizations.

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