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Background: To describe the epidemiology of HIV and AIDS by geographical origin in the EU, 1999–2006.

Methods: AIDS and HIV cases from the EU 27, Norway and Iceland reported to European Centre for Epidemiological Monitoring of AIDS were analysed. Results: Of 75,021 AIDS reports over 1999–2006, 35% were migrants. Of 2,988 heterosexual AIDS reports in 2006, 50% were migrants, largely from Sub-Saharan Africa (SSA), 20% of 1,404 AIDS cases in men who have sex with men (MSM) were migrants from Latin-America and Western Europe. Of 57 mother-to-child transmission (MTCT) AIDS cases, 23% were from SSA. AIDS cases decreased from 1999 to 2006 in natives (42%), Western Europeans (40%) and North Africa and Middle East (34%), but increased in people from SSA (by 89%), Eastern Europe (by 200%) and Latin-America (50%). Of 17,646 HIV infections in men and 9,066 in females in 2006, 49 and 76% were migrants, largely from SSA. Of 169 MTCT infections, 41% were from SSA. Conclusion: Migrants, largely from SSA, represent a considerable proportion of AIDS and HIV reports in EU, especially among heterosexual and MTCT infections. Their contribution is higher among female reports. A substantial percentage of diagnoses in MSM are migrants, largely from Western Europe and Latin-America.

Keywords: acquired immunodeficiency syndrome, epidemiology, Europe, HIV infections, transient, migrants

Introduction

The global HIV/AIDS pandemic reflects the gross socio-economic and gender inequalities between industrialized and non-industrialized countries. In 2007, 33 million people were living with HIV/AIDS (PLWHA) and >90% of the new HIV infections took place in low- and middle-income countries. Of all PLWHA, 22.5 million live in Sub-Saharan Africa (SSA) where adult HIV prevalence is 5%, considerably higher than the 0.8% HIV world estimate. The Caribbean, with 1% prevalence, ranks second followed by Eastern Europe, with a 0.9% HIV prevalence. The female-to-male ratio of new HIV infections is significantly higher in SSA and The Caribbean than in Western countries.1

According to the International Organization of Migration, 200 million people, 49.6% women, were international migrants in 2006.2 The United Nations (UN) defines an international migrant as anyone who changes his/her country of usual residence.2 The most common push factor for migration is seeking an economic improvement. This economic gradient, coupled with demographic imbalances worldwide, explains why two-thirds of migrants travel from developing to developed countries.2 Apart from economic migration, political and social dissidence force people to migrate. Particularly relevant to HIV epidemiology is the group of people who are persecuted because of their sexual identity. In 2005, Europe had 64 million international migrants representing 8.8% of the population,3 and the largest proportions of these migrants were born in neighbouring countries. The guidelines on HIV/AIDS and human rights developed by the UN Office of the High Commissioner for Human Rights and the Joint United Programme on HIV recognized migrants as one of the most vulnerable groups to HIV infection and its consequences.4 These guidelines call upon governments to fulfil their obligations on non-discrimination, rights to health and employment to reduce their vulnerability.4

The HIV epidemic is a major public health problem in the EU; the number of HIV infections has not ceased to increase since HIV reporting mechanisms came into place around 1999.5,6 Heterosexually transmitted HIV infection accounts for the largest number of people with HIV in Europe; a considerable proportion of these HIV cases are migrants, largely from SSA.5,6 Male-to-female sex accounts for most of the ongoing HIV transmission at EU level but hardly any data on the geographical origin of these men are available. Since 1998, former EuroHIV collects information on the geographical origin of all cases irrespective of their transmission category. The rationale behind this move was that health inequalities, including those by migrant status, need to be
monitored for developing appropriate responses. We aim to describe the epidemiology of reported HIV infections and AIDS cases according to geographical origin, sex and transmission category in the EU 27, Norway and Iceland in 1999–2006.

**Methods**

We used AIDS cases and HIV infections from National registries from the EU 27, Norway and Iceland reported to former EuroHIV, now based at the European Centre for Disease Prevention and Control (ECDC), from 1999 to 2006. Data on AIDS diagnoses were adjusted for reporting delays. HIV data were reported as date of notification.

Since 1998, EuroHIV collected information on the ‘origin’ of HIV/AIDS cases. It was recommended to derive this information from nationality or country of birth. The variable was classified as: people whose origin is the same as the reporting country, West Europe, Central Europe, East Europe, SSA, East Asia and Pacific, Australia and New Zealand, South and Southeast Asia, North Africa and Middle East, North America, Caribbean, Latin-America, Foreigner and unknown.

We examined absolute numbers and proportions of migrants according to geographical origin among AIDS and HIV reports from 1999 to 2006, stratified by sex and transmission category. We calculated relative changes in the number of AIDS cases in 2006 compared with 1999. We plotted the proportion of migrants among HIV infections reported in 2006 by country classified in five groups according to estimated HIV incidence per million people.6

**Results**

Of the 75 021 AIDS cases (55 664 were men) reported from 1999 to 2006, 26 098 (35%) were migrants. The proportion of migrants among the female AIDS cases, 46%, was higher than in male AIDS cases, 31%. Out of 6746 AIDS reports, 2472 (37%) were migrants (table 1) in 2006. The proportion of women among AIDS cases in migrants (40%) was higher than in cases whose geographical origin was the reporting country (28%). The 602 AIDS reports in SSA men and the 623 in SSA women accounted for 12 and 33% of the total number of AIDS cases reported for each sex in 2006. The number of AIDS cases in the European region experienced a 42% decline from 1999 to 2006 in natives and migrants from Western Europe, but increases are observed in migrants from Eastern Europe (by 200%), SSA (by 89%) and Latin-America (by 50%).

The largest number, in absolute and relative terms, of migrants among AIDS reports from 1999 to 2006 is observed in heterosexually transmitted cases (figure 1). Of all the heterosexual AIDS reports with known geographical origin in 2006, 1373 (50%) were from a country different to that reporting the case, largely from SSA (figure 1). Of 57 AIDS cases reported in 2006 due to mother-to-child transmission (MTCT) with known geographical origin, 23% were from SSA. Also, close to 20% of AIDS cases in men having sex with men (MSM) were migrants and the commonest origins were Latin-America and other Western European countries. Among 1545 cases in IDU diagnosed during 2006, 7% were migrants, largely from Western Europe and North Africa and Middle East (figure 1). Marked increases from 1999 to 2006 in the number of heterosexuals from SSA among AIDS cases are seen (figure 1). The proportion of migrants from Latin-America (3.0% in 1999 vs. 7.5% in 2006) and Western Europe (2.9% in 1999 vs. 3.6% in 2006) among AIDS reports in MSM has also increased (figure 1).

From 1999 to 2006, of the 16 222 tuberculosis (TB) cases reported as initial AIDS-defining condition (ADC), 8028 were migrants (3883 from SSA) and 2684 had unknown geographical origin. Prevalence of TB as initial ADC was 40% in Sub-Saharan Africans, 40% in Eastern Europeans, 32% in Southeast Asians, 30% in Latin-Americans, 16% in natives and 8% in North-Americans (figure 2). Among heterosexuals, TB represented 3499 (41%) of initial ADC in Sub-Saharan Africans, 26 (46%) in Eastern Europeans, 173 (32%) in Southeast Asians, 2055 (15%) in natives and between 20% and 25% in people from Central Europe, North Africa and Middle East, Caribbean and Latin-America. Prevalence of TB was higher in Injecting drug user (IDU), followed by heterosexuals, compared with MSM but the differences by geographical origin are maintained (data not shown).

In 2006, of 26 712 HIV infections reported, 15 517 (58%) were migrants and 7812 (29%) did not record the geographical origin of the infection. It was recommended to derive this information from nationality or country of birth.

**Table 1** Distribution by geographical origin and sex of AIDS cases and number of newly diagnosed HIV infections reported in 2006

<table>
<thead>
<tr>
<th>Geographic origin of cases</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country of report</td>
<td>4276</td>
<td>3404</td>
<td>872</td>
</tr>
<tr>
<td>West Europea</td>
<td>113</td>
<td>104</td>
<td>9</td>
</tr>
<tr>
<td>Centre Europeb</td>
<td>55</td>
<td>36</td>
<td>19</td>
</tr>
<tr>
<td>East Europe</td>
<td>24</td>
<td>19</td>
<td>5</td>
</tr>
<tr>
<td>Sub Saharan Africa</td>
<td>1225</td>
<td>602</td>
<td>623</td>
</tr>
<tr>
<td>East Asia and Pacific</td>
<td>10</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Australia and New Zealand</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>South and southeast Asia</td>
<td>120</td>
<td>61</td>
<td>59</td>
</tr>
<tr>
<td>North Africa and Middle East</td>
<td>92</td>
<td>72</td>
<td>20</td>
</tr>
<tr>
<td>North America</td>
<td>14</td>
<td>14</td>
<td>0</td>
</tr>
<tr>
<td>Caribbean</td>
<td>78</td>
<td>51</td>
<td>27</td>
</tr>
<tr>
<td>Latin-America</td>
<td>209</td>
<td>149</td>
<td>60</td>
</tr>
<tr>
<td>Others</td>
<td>11</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Unknown</td>
<td>518</td>
<td>355</td>
<td>163</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HIV infectionsd</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country of report</td>
<td>11 195</td>
<td>8979</td>
<td>2216</td>
</tr>
<tr>
<td>West Europe</td>
<td>539</td>
<td>461</td>
<td>78</td>
</tr>
<tr>
<td>Centre Europe</td>
<td>251</td>
<td>182</td>
<td>69</td>
</tr>
<tr>
<td>East Europe</td>
<td>222</td>
<td>137</td>
<td>85</td>
</tr>
<tr>
<td>Sub Saharan Africa</td>
<td>5046</td>
<td>1901</td>
<td>3145</td>
</tr>
<tr>
<td>East Asia and Pacific</td>
<td>34</td>
<td>34</td>
<td>1</td>
</tr>
<tr>
<td>Australia and New Zealand</td>
<td>14</td>
<td>14</td>
<td>0</td>
</tr>
<tr>
<td>South and southeast Asia</td>
<td>363</td>
<td>184</td>
<td>179</td>
</tr>
<tr>
<td>North Africa and Middle East</td>
<td>214</td>
<td>161</td>
<td>53</td>
</tr>
<tr>
<td>North America</td>
<td>59</td>
<td>57</td>
<td>2</td>
</tr>
<tr>
<td>Caribbean</td>
<td>329</td>
<td>168</td>
<td>161</td>
</tr>
<tr>
<td>Latin-America</td>
<td>456</td>
<td>345</td>
<td>111</td>
</tr>
<tr>
<td>Others</td>
<td>178</td>
<td>124</td>
<td>54</td>
</tr>
<tr>
<td>Unknown</td>
<td>7812</td>
<td>4902</td>
<td>2910</td>
</tr>
</tbody>
</table>

a: West Europe countries: Andorra, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Luxembourg, Malta, Monaco, Netherlands, Norway, Portugal, San Marino, Spain, Sweden, Switzerland, UK.
b: Centre Europe countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Hungary, Former Yugoslav Republic of Macedonia, Montenegro, Poland, Romania, Serbia, Slovakia, Slovenia, Turkey.
c: East Europe countries: Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan.
d: All EU countries except Bulgaria, Italy, Malta and Rumania due to missing HIV data.
Men who have sex with men

IDU

Heterosexual

MTCT

**Figure 1** Trends in AIDS cases by geographical origin within each transmission category: 1999–2006

**Figure 2** Cumulative percentage of TB as the initial AIDS-defining condition in AIDS cases reported, 1999–2006
The proportion of women (44%) among HIV reports in migrants was higher than in natives (34%). People from SSA are the second largest group among HIV reports in the EU (table 1), migrants from other Western European country are the third, followed by Latin-Americans, Southeast Asians and Caribbeans (table 1). The numbers of men and women from SSA among HIV infections reported in 2006 were 1901 and 3145, respectively (table 1). The number of HIV reports in women from SSA exceeds by close to 1000 that of native women and by over 1000 that of men from SSA. It has to be acknowledged that there are 2910 HIV infections in females with unknown geographical origin. After SSA, those from Western Europe account for the largest group followed by Latin-Americans. After Sub-Saharan African women, the most common origins of HIV infections in female migrants were Southeast Asia and Caribbean (table 1). As it can be seen in figure 3, the number of HIV reports acquired heterosexually in migrants ceased to increase by 2006, and even a slight decline was observed, coupled with a slight increase in the number of cases with unknown geographical origin.

The largest number of migrants, both in absolute and relative terms, was observed among heterosexually transmitted infections whose commonest origin was SSA (figure 3). Of the 169 MTCT HIV reports with known geographical origin, 41% were from SSA (figure 3). Of the 5048 HIV infections with known geographical origin in MSM, 18% were migrants and the commonest regions of origin were Western Europe, Latin-America and North-Africa and Middle East. Among the 1590 HIV infections in IDU with known geographical origin, 14% migrants, largely from Western and Eastern Europe (figure 3). Interpreting absolute trends between 1999 and 2006 is difficult due to the major changes in the implementation of the HIV reporting systems and it seems that the relative contribution of migrants to the HIV infections reported has increased over time for all transmission categories, especially in heterosexuals (figure 3).

There is substantial heterogeneity in the proportion of migrants among HIV reports between countries (figure 4). Among countries with HIV incidence below 20 cases per million, largely Central Europe, the proportion of migrants among HIV reports is low, while is higher for most of the countries with high HIV incidence, with notable exceptions like Estonia.

Finally, for most countries, the most common region of origin of the AIDS and HIV reports was SSA, with some exceptions like Spain where the absolute number of people from Latin-America outnumbered that of SSA.
Discussion

Migrant populations, largely Sub-Saharan Africans, represented a considerable and growing proportion of both AIDS cases and HIV infections reported in the 27 EU countries, Norway and Iceland during 1999–2006. The drop in AIDS cases observed in native populations is seen only in migrants from Western countries, while in migrants from other geographical origins increases are seen. The contribution of migrants to the AIDS and HIV epidemics is notably higher among female reports, in particular for women from SSA. Closely linked to the high burden of HIV infection in women from SSA is the high proportion of migrants from SSA among MTCH HIV reports. Although the largest proportion of migrants is, by far, among heterosexually acquired HIV and AIDS reports, a significant percentage of diagnoses in MSM are also migrants, largely from Western Europe and Latin-America and North-Africa and Middle East. A higher proportion of migrants developed TB as their initial ADC compared with natives; people from SSA and Eastern Europe had the highest prevalence of TB, closely followed by people from Southeast Asia. There is substantial heterogeneity in the proportion of migrants among AIDS cases and HIV infections between EU countries being notably higher in Northern and Western EU countries compared with Eastern and Central EU.

The number of AIDS reports from most EU countries experienced a marked decline from the mid-1990s onwards, largely attributed to the impact of High Activity Antiretroviral Therapy (HAART). However, for migrants from outside Western European countries actual increases are observed that may respond to late diagnosis of HIV.

Figure 4 Proportion of migrants among HIV infections reported in 2006 in 23 EU countries plus Norway and Iceland. Countries are classified in five groups according to HIV incidence rates per million populations. Asterisk indicates unknown origin: based in country of probable infection, missing information was observed in 24% of cases and double asterisk indicate Spain data: 2005.
infection, poor access and response to HAART or immigration of people with advanced HIV disease. Our results are in line with an article by Prost et al., where authors identify that the features affecting Sub-Saharan African migrants living with HIV/AIDS in Europe are more advanced disease at diagnosis, higher TB rates, major difficulties related to immigration status, social discrimination and stigma and high levels of poverty and unemployment.8 Delayed diagnosis of HIV infection is a major public health problem in the EU, and various publications suggest that this trend is commoner in migrants.7−13 Poorer response to HAART has also been described.14

The contribution of migrants to national HIV epidemics is heterogeneous in the EU as it depends on migration patterns, neo-colonial history, state of HIV epidemics in countries of origin and destination and health and social responses. The heterogeneity in the proportion of migrants among HIV/AIDS cases between the EU found in this study is consistent with migratory trends; countries with high proportion of migrants among HIV cases are also the countries with higher proportion of migrants in the general population.15

The contribution of migrants, largely from SSA, to the number of HIV reports in the EU is higher in female reports. Among HIV reports in women with known geographical origin, the number of HIV-positive women from SSA outnumberers that of native women and that of HIV-positive African men, whereas the number of registered African women in population registries across the EU does not outnumber that of African men.15 Acknowledging the limitations resulting from a high proportion of missing information and various possible explanations such as selective HIV testing of women from SSA during pregnancy, these data suggest that women from SSA, not only in their countries of origin, but also when migrating to another country, suffer a greater burden of HIV disease.1 The reasons for female vulnerability to HIV infection have both social and biological bases,16 and the need to address gender vulnerability within migrants is needed.17 Closely linked to the high burden of HIV infection in women from SSA is the high proportion of migrants from SSA among MTCT reports. Close to 40% of the HIV infections through MTCT were from SSA and this proportion has increased from 1999 to 2006. Given that geographical origin is not always equivalent to country of birth and acknowledging that some of these children may have been born to HIV-infected mothers outside the EU, it is likely that some of these children have been infected by HIV due to failure to diagnose and treat their mothers in the EU. While the decreases in perinatal HIV infections in the EU represent an important achievement in public health, substantial challenges remain, particularly among migrant mothers.18,19 In France, testing during pregnancy was the commonest reason to diagnose HIV in women from SSA.19 Though HIV-positive African women presented later to antenatal care, once they accessed, uptake of HIV treatment and elective caesarean section was the same than French women.19

We have identified a considerable proportion of migrants among HIV diagnoses in MSM, mainly from other Western EU countries, Latin-America and North-Africa and Middle East. MSM are hardly ever acknowledged when addressing the HIV epidemic in migrant populations.20 Although numerically inferior to heterosexuals, their contribution is not negligible and it has distinct characteristics. MSM may share with the heterosexual population some reasons to migrate but also have specific reasons related to homophobia. While homophobia may certainly be a driving factor for abandoning one’s country in MSM from Western countries, it is more of an issue for MSM from many countries where basic human rights for gay people are violated. These figures highlight the need to acknowledge the sexual diversity of migrants living with HIV/AIDS in Europe.

These data do not allow distinguishing where actually HIV infection occurred. Other reports suggest that most heterosexually acquired HIV infections among Sub-Saharan Africans are likely to have been acquired in countries of origin.21,22 Recently, Burns et al. have published that as many as a quarter of HIV infections diagnosed among heterosexuals and half among gay men from SSA acquired the infection in the UK.23 Given that the majority of people tend to choose sexual partners within their own communities, assortative sexual mixing may take place.24 Fenton et al., documented the high proportion of people engaging in unprotected sex when travelling to home countries.25 Discussing country of probable infection is extremely controversial as it has, unfortunately, given rise to racist reactions but understanding where HIV infections and development of AIDS take place has important implications from a public health perspective as it may represent failure in primary HIV prevention, secondary HIV prevention or both.

These data have to be interpreted in the context of certain limitations. Former EuroHIV recommended deriving information on geographical origin from nationality or from country of birth which may lead to misclassification.26 The role of selective HIV testing in migrants may also lead to overestimates of HIV prevalence when compared with groups not exposed to similar testing practices. This is particularly relevant for women from SSA who may be more exposed to antenatal HIV screening than men and native women who have lower numbers of children. The overall increase in HIV infections has to be interpreted in the context of the implementation of HIV reporting which is not yet complete and may have led to an overestimate of this trend. The absence of HIV reporting systems in some countries and poor completion of the variable ‘geographical origin’ in others is a caveat in interpreting figures. Finally, most countries do not collect information on ethnic background in health-information systems and in many it is not allowed.26 It is likely that HIV is affecting disproportionately ethnic minorities in the EU who are currently invisible to surveillance systems that will be classified as ‘natives’ as their country of origin is the same as the country of report.

The most recent ECDC figures from the surveillance strategy 2008–12 also reflect the high proportion of migrants among HIV-positive people in all transmission categories. Although some variable coding changes may hamper complete comparability with the data presented here, these most recent figures highlight that the number of new HIV diagnoses acquired heterosexually in migrants from countries with generalized epidemics seems to have halted. However, given the high number of missing values for the geographical origin variable, care has to be taken in interpreting these trends.27

Our data confirms that failure of both primary and secondary HIV prevention in migrant populations is taking place, especially migrant women, and urgent action is needed. Controlling the HIV/AIDS epidemic implies breaking barriers to HIV prevention and treatment.28 These barriers have a hierarchical structure and it has to be stated that in a framework of prosecution of migrants, irrespective of their administrative and legal residency status, public-health strategies and recommendations aimed to decrease language, cultural and gender barriers are bound to fail. Fear of deportation will abort many of the public-health initiatives aimed to prevent HIV and AIDS in migrants. Since the early days of the HIV epidemic, it became clear that ensuring the rights of the PLWHA were the pillars of the fight against the epidemic. This is still the framework that is needed to fight HIV/AIDS in migrant communities in the EU.
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Conflicts of interest: None declared.

Key points

- These are the first data to quantify that migrants, largely from SSA, represent a considerable proportion of AIDS and HIV reports in EU, especially among heterosexual and MTCT infections, and that their contribution is higher among female reports.
- Although the largest proportion of migrants is, by far, among heterosexually acquired HIV and AIDS reports, a significant proportion of diagnoses in MSM are also migrants, largely from Western Europe and Latin-America and North-Africa and Middle East. A higher proportion of migrants developed TB as their initial ADC compared with nates.
- The declines seen in the number of AIDS cases in EU from the mid-1990s onwards are not seen in migrants from outside Western European countries, where actual increases are observed.
- These data confirm that failure of both primary and secondary HIV prevention in migrant populations in Europe is taking place, especially migrant women, and urgent action is needed.

References