Introduction

Control of sexually transmitted diseases (STDs) is a public health priority in the acquired immunodeficiency syndrome (AIDS) era. Indeed, STDs are responsible for significant sequelae in women, such as pelvic inflammatory disease, ectopic pregnancy and infertility, but also in men (urethral stricture and infertility) and in neonates when their mothers are infected (prematurity, ophthalmia and pneumonia). Of utmost importance is the interaction between STDs and the human immunodeficiency virus (HIV): both ulcerative (Cameron et al. 1989; Laga et al. 1991) and inflammatory (Laga et al. 1993) STDs enhance HIV transmission. STDs treatment on a syndromic basis has proved its effectiveness to reduce HIV incidence (Grosskurth et al. 1995). It is indeed the major argument to control STDs.

Côte d’Ivoire is a West African country with 15 million inhabitants; Abidjan is the main city with 2.5 million inhabitants. In this country, the well-developed road network and the great influx of foreign workers contribute to the intermixing of populations and facilitate the spread of STDs, including HIV infection. Surveys have documented HIV seroprevalence figures of 14.2% in Abidjan in 1995 (Sylla-Koko et al. 1997) and 8.9% in Côte d’Ivoire outside Abidjan in 1997 (Kassim et al. 1997) among pregnant women attending antenatal clinics.

Research report

Surveillance of STD syndromes: contributing to the STD programme in Côte d’Ivoire

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In Côte d’Ivoire, management of sexually transmitted diseases (STDs) is based on a syndromic approach. The National Health Information System (NHIS), set up in 1995, supervises data drawn monthly on three STD syndromes: genital ulcers, discharges and warts. Information is collected in each community-based public clinic, collated in the 29 districts, then in the 10 regions, and finally centralized. We assessed the relevance of this information and its usefulness for the STD programme. The number of cases notified in adults of 15 years and above was compared in men and women for the years 1995 and 1996. The absolute number of cases was related to the number of consultations to evaluate the relative share of STDs in health care services, and to the population size to estimate STD annual incidence. Between 1995 and 1996, the number of reported STD cases remained steady in men, 32 410 and 31 470 cases, respectively, but increased by 35% in women, from 64 794 to 87 622 cases. As a result, STD annual incidence was unchanging in men (8%), but increased in women from 17 to 23%. However, between these two years, the relative contribution of STDs to all consultations decreased from 4.7 to 3.5% in men, while remaining steady in women, at around 7.0%. In this 2-year period, the ratio of the numbers of ulcers in men and women was about 1:1, and did not vary by district. In contrast, discharges were reported 2.7 times more by women, with a differing sex ratio from district to district. We suggest that vaginal discharges are often physiological, and are poorly instructive for STD surveillance. In contrast, ulcers in both genders, and male discharges, provide relevant information for the STD programme, for example to estimate the volume of STD drugs needed for public health services and to assess the epidemiological trends of STDs.
African countries. Management of STDs, carried out by doctors, nurses or midwives, has been based on a syndromic approach, with no requirement for laboratory tests at the peripheral health care level. Therapeutic algorithms, which include affordable and available drugs, have proved their clinical efficiency and acceptability in the field conditions (La Ruche et al. 1995). The National Health Information System (NHIS), set up in 1995, supervises monthly the epidemiological surveillance of 40 diseases or health conditions in the public health sector. A common agreement between the NHIS and the STD programme led to the inclusion of three STD syndromes in this surveillance during a 2-year testing period: genital ulcers, genital discharges and genital warts. The objective of this surveillance was to assess the extent of STD syndromes in health care services and to detect changes in trends or distribution in order to initiate investigative or control measures. The aims of this article are to report the results of the early surveillance comparing data in men and women from one year to the next, and to determine the relevance of this information for the STD programme of Côte d’Ivoire.

**Methods**

The NHIS collects information from 850 public community-based clinics and 65 public hospitals covering the 29 districts of Côte d’Ivoire. These public health services receive most of the patients seeking care in the country. For all patients, reasons for consultation are reported in registers by each health care provider. In each centre, one trained nurse is in charge of compiling information in a monthly report. The 40 diseases reported are broken down by gender and age (<15 and ≥15 years) - the adult patients were selected as the target group in this study. Information is computerized at the district level, compiled at the regional level and sent to the national level for analysis. The neighbouring urban areas of Abidjan constitute the district of Abidjan, whereas the city itself reports directly at the regional level. Thus, we considered 30 separate geographical districts for the purpose of analysis, the 29 districts plus the city of Abidjan.

In this descriptive study, we determine the relevance of the information from a pragmatic point of view. The number of STD cases reported in adults of 15 years and above were compared in men and women between 1995 and 1996. The absolute number of cases was related to the number of consultations to evaluate the relative role of STDs in health care services, and to the population as a whole to estimate STD incidence. The incidence rates for each district were calculated using age and sex-specific population data based on projections using the 1988 census as the denominator. We plotted box-plots, using SPSS 6.1 software (SPSS Inc., Chicago, IL), to evaluate the variability in the number of STD cases declared between the 30 districts.

**Results**

Table 1 shows the absolute number of STD cases reported nation-wide for each of the three syndromes in men and women during the 2-year period. A total of 97 204 and 119 092 cases were notified in the public health sector in 1995 and 1996, respectively. The overall annual number of STD cases reported was steady in men, 32 410 in 1995 and 31 470 in 1996, but increased by 35% in women, from 64 794 to 87 622. This increase was attributable to an increased number of female genital discharges, whereas the numbers of male discharges, and ulcers and warts in both genders, were almost constant during the 2-year period (Table 1). Of note, the number of genital ulcers was similar in both genders, whereas warts and discharges, the most frequent STD syndrome, were reported two to three times more often in women than men. About 40% of female discharges were reported by antenatal clinics.

Referring the number of STD cases to the corresponding adult population allowed us to estimate the incidence of STDs in each district. The national STD incidence rate was 12.7% in 1995 and 15.5% in 1996. It was steady in men during the 2-year period, about 8%, but increased in women from 17 to 23%. The great variability in reporting female discharges among districts led to a wide range of discharge incidence in women from district to district (Figure 1). In contrast, discharge incidence figures in men and ulcer incidence in both genders were consistent from district to district, around 6.3 and 1.5 per 1000 adults, respectively (Figure 1). Genital warts incidence was slightly more variable between districts than ulcer incidence (data not shown).

Referring the number of STD cases to the number of consultations in adults allowed us to estimate the relative contribution of STDs to the utilization of health care services (Table 1). Overall, STDs represented 6.0% of the reasons for consultation in 1995 and 5.5% in 1996, due to a greater increase in the number of consultations compared to the increase in the number of STD cases reported during this period. More precisely, between 1995 and 1996, the relative role of STDs decreased from 4.7 to 3.5% in men, but was steady, at around 7%, in women. Taking into account each STD syndrome and the variability between districts (Figure 2), discharges represented an excessively variable part of the consultations in women, whereas ulcers in both genders represented a remarkably steady contribution, about 0.7% of the consultations, in all the districts. Between these two extremes, an intermediate interdistrict variability was observed for the relative contribution of male discharges.

To assess the relevance of reporting male or female genital discharges or ulcers, we computed two ratios for the 30 districts in the country. In this descriptive study, we determine the relevance of the information from a pragmatic point of view. The number of STD cases reported in adults of 15 years and above were compared in men and women between 1995 and 1996. The absolute number of cases was related to the number of consultations to evaluate the relative role of STDs in health care services, and to the population as a whole to estimate STD incidence. The incidence rates for each district were calculated using age and sex-specific population data based on projections using the 1988 census as the denominator. We plotted box-plots, using SPSS 6.1 software (SPSS Inc., Chicago, IL), to evaluate the variability in the number of STD cases declared between the 30 districts.

**Table 1. Number of STD cases and relative contribution of STD (%) in utilization of health care services for each STD syndrome by sex and calendar year, Côte d'Ivoire, 1995–1996**

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<tr>
<td>Genital discharge</td>
<td>25 320</td>
<td>56 203</td>
<td>24 602</td>
<td>77 505</td>
</tr>
<tr>
<td>(3.64%)</td>
<td>(6.02%)</td>
<td>(2.73%)</td>
<td>(6.17%)</td>
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<tr>
<td>Genital ulcer</td>
<td>5 956</td>
<td>5 831</td>
<td>5 878</td>
<td>7 042</td>
</tr>
<tr>
<td>(0.86%)</td>
<td>(0.62%)</td>
<td>(0.65%)</td>
<td>(0.56%)</td>
<td></td>
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<tr>
<td>Genital wart</td>
<td>1 134</td>
<td>2 760</td>
<td>990</td>
<td>3 075</td>
</tr>
<tr>
<td>(0.16%)</td>
<td>(0.30%)</td>
<td>(0.11%)</td>
<td>(0.24%)</td>
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districts: first, the female-to-male ratio of the number of STDs for each of the two syndromes (Figure 3), and secondly, the ratio of the number of discharges to the number of ulcers for each gender (Figure 4). The number of ulcers reported was similar in both genders (Figure 3) in the 2-year period and the ratio was consistent from district to district. In contrast, if the number of discharges was always higher in women, the women:men ratio was very different from district to district and from one year to the other. When antenatal clinics were excluded from the analysis (Figure 3, right part), the female: male ratio for discharges was lower and the variability between districts was considerably reduced, even though it remained higher than for ulcers. Finally, discharges were five times more frequent than ulcers in men and the discharge: ulcer ratio was of the same order of magnitude between districts, whereas discharges were reported about ten times more than ulcers in women with a variable discharge: ulcer ratio from district to district (Figure 4). Excluding antenatal clinics from the calculation reduced this variability but did not eliminate it (Figure 4).

Discussion

This surveillance system of STD syndromes in public health facilities has shown that about 100 000 cases were reported per year in Côte d’Ivoire and, thus, STDs accounted for 6% of the reasons for consultation among adults, the fourth leading cause of perceived morbidity in Côte d’Ivoire. This surveillance provides usable data to orientate the investment in the STD control programme.

Routine surveillance data are used both to determine the need for public health action and to assess the effectiveness of STD control programmes. The main purpose of epidemiological surveillance in a NHIS is the detection of changes in trends to initiate subsequent measures. Our work, which takes place at the beginning of the surveillance programme, could not determine the actual changes in trends, but allows us to distinguish information that is probably relevant from information that seems not. Routine surveillance data systems will not usually provide data that explain the cause of detected change or evolution, but should act as the catalyst for further research, be it epidemiological, clinical or behavioural.

A routine surveillance system gives an incomplete picture of the epidemiological situation. As the notification only concerned symptomatic STDs in the public health sector, our computed annual incidence of STDs in adults, around 14%, must be considered a minimal estimate. Furthermore, there is general evidence that many cases of STD are not accounted for because of the high frequency of asymptomatic infections, and the frequent tendency for STD patients to seek care outside the public health services (Catchpole 1996). Indeed, in Côte d’Ivoire, as in many developing countries, STD patients either seek health facilities available outside working hours and providing confidential services, and thus frequently rely on private clinics run by physicians or nurses, or buy themselves drugs in pharmacies or through the informal market or attend traditional healers. For example, in rural South Africa almost half of STD cases are treated by private practitioners (Wilkinson et al. 1998). Beside this probable underestimation of the magnitude of STD incidence, the lack of specificity of some of the STD syndromes reported, particularly vaginal discharge, leads to the problem of possible inaccuracy of some of these syndromic diagnoses.

These limitations in the routine surveillance of STD syndromes must be taken into account for interpreting or using our data. Describing the variability of the surveillance indicators between districts allowed us to detect those that could
be more relevant for an enhanced STD programme. The variability of results between districts could be due to real epidemiological differences, but could also represent the inadequacy and lack of relevance of the indicator. In contrast, a very low variability between districts for an indicator could be regarded as the evidence of its reliability. Reported ulcers in both genders, expressed as incidence figures or proportion of consultations, were remarkably similar in all districts and stable for the 2-year period. Data concerning female discharges were extremely variable from district to district and from one year to the other, which probably conveys the lack of specificity of this syndrome, making it difficult to distinguish between physiological and pathological female discharges, particularly in pregnant women. Excluding antenatal clinics reduced only marginally this variability between districts. Variability concerning male discharges was higher than for ulcers, but much lower than for female discharge. When the male discharge:ulcer ratio was considered, the interdistrict variability was sufficiently low and stable from one year to the other to consider this information accurate.

To sum up our observations, the incidence rate of vaginal discharges seems of little relevance, whereas data on ulcers in both genders and on male discharges are relevant for the STD...
programme, both from a programmatic standpoint to estimate the quantity of STD drugs needed for public health services and from an epidemiological standpoint to assess the trends of STDs incidence. This information is of great value for a country like Côte d’Ivoire, merging its efforts to control STDs and HIV. We suggest that new ways of presenting surveillance data to inform policy makers, clinical and public health practitioners should be developed. The challenge to clinicians and epidemiologists is to continue to work together to explore new approaches to control and prevent STDs, particularly in developing countries.

References

Figure 4. Discharges/ulcers ratio in men and women in the 30 districts of Côte d’Ivoire, 1995–1996 (white = 1995; grey = 1996) Note: see Figure 1.

Acknowledgements
We give special thanks to Mrs Firmin Seka, Théodore Sery and Frédéric Kouassi for their active collaboration. We also wish to acknowledge Prs. François Dabis and Daniel Letouze for their thoughtful review of the manuscript.

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