the most detailed condom usage definition and the largest sample size was selected.

After these exclusions, 25 studies remained for analysis. Thirteen cross-sectional studies contained 12 samples describing male-to-female transmission and four samples of female-to-male transmission (Table 1, page 273). Twelve longitudinal samples contain seroconversion data for those who always use condoms; there are seven samples of male-to-female transmission, three of female-to-male transmission and two that do not specify the direction of transmission (2).

The proportion of seroconversions among those who always used condoms did not differ significantly across the 12 cohort studies, regardless of the direction of transmission (p = .666), the average length of follow-up time (χ² for trend, p = .159) or the date when the study started (χ² for trend, p = .851). The incidence per 100 person-years was 0.7 per 100 (95% confidence interval, 0.2–1.7) for male-to-female transmission and 1.8 (95% confidence interval, 0.4–5.3) for female-to-male transmission. Across all 12 samples, regardless of the direction of transmission, there were eight seroconversions in 504 people (861.2 per-person-years), yielding an incidence of 0.9 (95% confidence interval, 0.4–1.8) per 100 person-years. The incidence rates and corresponding 95% confidence intervals from each sample of always-users (from Table 2) are shown in Figure 1.

Additionally, one may make a simple overall estimate of incidence graphically, by examining the confidence intervals for these studies. Described as the "odd man out" method, it involves constructing a single interval from a small number of samples by finding the confidence region that encompasses the confidence interval calculated for each sample of always-users (from Table 2) and thus provides better estimates of the actual transmission rate. Twelve cohort samples contain seroconversion data for those who always use condoms; there are seven samples of male-to-female transmission, three of female-to-male transmission and two that do not specify the direction of transmission (2).

HIV Transmission with Condom Use

Cross-sectional studies (a single blood sample and retrospective reporting of behaviors) indirectly provide information on transmission by indicating the prevalence of HIV infection. Among those who always used condoms and who were heterosexual individuals, the nine cross-sectional samples provided an HIV prevalence estimate of 8.2% (95% confidence interval, 4.9–13.2%).

HIV Transmission Rate Without Condoms

Lack of consistency in prevalence estimates from cross-sectional studies suggests that never-users cannot be compared across populations. The prevalence of HIV among never-users in the eight male-to-female cross-sectional samples is significantly

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**Table 2. Characteristics of and seroconversion data from longitudinal and cohort studies of HIV transmission, by condom usage category, according to direction of transmission**

<table>
<thead>
<tr>
<th>Study date</th>
<th>Study site</th>
<th>Predominant mode of infection</th>
<th>Follow-up (interval)</th>
<th>Condom usage</th>
<th>Total seroconversions</th>
<th>Seroconversion rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Always</td>
<td>25/165</td>
<td>15.2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Some</td>
<td>24/211</td>
<td>11.4%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Never</td>
<td>4/26</td>
<td>3.0%</td>
</tr>
</tbody>
</table>

*First author. †In index case. ‡Mean duration of follow-up (in months), with follow-up interval in parenthesis. §Cumulative frequencies.*

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*For this study, authors provided detailed classification of data for Roumeliotiou-Karyannidis A et al. (reference 20). In addition, for an earlier analysis (reference 14), authors of Ragni MV et al., Padian N et al., and Kim HC et al. (reference 20) provided detailed data.