Primary and secondary prevention are essential components of the response to HIV and sexually transmitted infections (STIs). We present findings from nationally implemented HIV/STI prevention interventions. In 2003, of those attending STI clinics at least 64% of men who have sex with men (MSM) and 55% of heterosexuals accepted a confidential HIV test; 88% of all HIV infections in women giving birth in England were diagnosed before delivery; 85% of MSM eligible for hepatitis B vaccination received a first dose of vaccine at their first STI clinic attendance; 74% of STI clinic attendees for emergency appointments, and 20% of those for routine appointments were seen within 48 hours of initiating an appointment; the National Chlamydia Screening Programme in England found a positivity of 10% and 13% among young asymptomatic women and men, respectively. Prevention initiatives have seen recent successes in limiting further HIV/STI transmission. However, more work is required if current levels of transmission are to be reduced.
Table 1  Summary of aims and outcomes of prevention interventions nationally monitored by the Health Protection Agency and its collaborators*

<table>
<thead>
<tr>
<th>Prevention aim</th>
<th>Year aim introduced</th>
<th>Indicator Data source</th>
<th>Area covered</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>All STI clinics to offer VCT to all attendees on their first screening for STIs, and subsequently according to risk</td>
<td>2002</td>
<td>Percentage MSM attending STI clinics accepting VCT</td>
<td>UAPMP E, W &amp; NI</td>
<td>47%</td>
<td>48%</td>
<td>50%</td>
<td>57%</td>
<td>62%</td>
<td>64%</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>2002</td>
<td>Percentage heterosexuals attending STI clinic accepting VCT</td>
<td>UAPMP E, W &amp; NI</td>
<td>26%</td>
<td>27%</td>
<td>31%</td>
<td>39%</td>
<td>41%</td>
<td>54%</td>
<td>NA</td>
</tr>
<tr>
<td>To reduce the proportion of individuals newly diagnosed with HIV who have a “late diagnosis”</td>
<td>NA</td>
<td>Percentage of MSM newly diagnosed with CD4 count below 200 cells x 10^6/µl</td>
<td>CD4 surveillance England &amp; Wales</td>
<td>30%</td>
<td>29%</td>
<td>27%</td>
<td>24%</td>
<td>25%</td>
<td>21%</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>NA</td>
<td>Percentage of heterosexuals newly diagnosed with a CD4 count below 200 cells x 10^6/µl</td>
<td>CD4 surveillance England &amp; Wales</td>
<td>45%</td>
<td>46%</td>
<td>44%</td>
<td>42%</td>
<td>44%</td>
<td>40%</td>
<td>NA</td>
</tr>
<tr>
<td>The universal offer and recommendation of an HIV test as a routine part of antenatal care</td>
<td>1999</td>
<td>Percentage HIV infected women diagnosed before delivery</td>
<td>UAPMP and NHSPC England</td>
<td>40%</td>
<td>59%</td>
<td>71%</td>
<td>84%</td>
<td>82%</td>
<td>88%</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>1999</td>
<td>Percentage exposed infants becoming HIV infected</td>
<td>UAPMP and NHSPC England</td>
<td>17%</td>
<td>12%</td>
<td>9%</td>
<td>6%</td>
<td>7%</td>
<td>5%</td>
<td>NA</td>
</tr>
<tr>
<td>To monitor the proportion of HIV infected individuals on triple ARV or more</td>
<td>NA</td>
<td>Percentage of diagnosed HIV infected MSM on triple ART therapy or more</td>
<td>SOPHID E, W &amp; NI</td>
<td>56%</td>
<td>66%</td>
<td>66%</td>
<td>64%</td>
<td>67%</td>
<td>65%</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>NA</td>
<td>Percentage of diagnosed HIV infected heterosexuals on triple ART therapy or more</td>
<td>SOPHID E, W &amp; NI</td>
<td>50%</td>
<td>63%</td>
<td>65%</td>
<td>65%</td>
<td>64%</td>
<td>63%</td>
<td>NA</td>
</tr>
<tr>
<td>To offer all MSM hepatitis B vaccination at their first STI clinic attendance</td>
<td>2003</td>
<td>Percentage MSM taking up first dose at their first STI clinic attendance</td>
<td>HepB3 survey England</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>85%</td>
<td>59%</td>
<td>59%/6553</td>
</tr>
<tr>
<td></td>
<td>2003</td>
<td>Percentage MSM taking up third dose</td>
<td>HepB3 survey England</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>59%/6553</td>
</tr>
<tr>
<td>To reduce waiting times at STI clinics</td>
<td>2004</td>
<td>Percentage patients with emergency appointments seen within 48 hours</td>
<td>STI waiting times survey England</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>74% 1359/1843</td>
</tr>
<tr>
<td></td>
<td>2004</td>
<td>Percentage patients with routine appointments seen within 48 hours</td>
<td>STI waiting times survey England</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>20% 3044/15520</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2004</td>
<td>Percentage patients with walk-in appointments seen within 48 hours</td>
<td>STI waiting times survey England</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>79% 4960/6307</td>
<td></td>
</tr>
<tr>
<td>To control genital chlamydial infection through early detection and treatment of asymptomatic infection among individuals aged under 25</td>
<td>2004</td>
<td>Chlamydia prevalence among women aged under 25</td>
<td>NCSP England</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>10.1% 1538/1524</td>
</tr>
<tr>
<td></td>
<td>2004</td>
<td>Chlamydia prevalence among men aged under 25</td>
<td>NCSP England</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>13.3% 156/1172</td>
</tr>
<tr>
<td>To reduce the proportion of injecting drug users who share injecting equipment</td>
<td>NA</td>
<td>Percentage current injectors who report sharing needles/syringes</td>
<td>UAPMP E, W &amp; NI</td>
<td>32%</td>
<td>33%</td>
<td>31%</td>
<td>33%</td>
<td>34%</td>
<td>29%</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>NA</td>
<td>Percentage current injectors who report sharing other injecting equipment</td>
<td>UAPMP E, W &amp; NI</td>
<td>54%</td>
<td>54%</td>
<td>52%</td>
<td>51%</td>
<td>52%</td>
<td>30%</td>
<td>NA</td>
</tr>
</tbody>
</table>

*Health Protection Scotland; The Institute of Child Health (London); Collaborators on the Unlinked Anonymous Programme.
HIV infection) in attendees of 16/232 STI clinics in England, Wales, and Northern Ireland undergoing syphilis tests.\textsuperscript{10} Residual blood from syphilis testing is irreversibly unlinked from patient identifiers and anonymously HIV tested. Retained information includes sexual orientation and sexual health screen uptake (including VCT, further details are available on the STI website).

The UAPMP surveys of pregnant women (utilising residual serum from newborn infant dried blood spots, covering 80% of births in England and Scotland) provide a proxy measure of HIV prevalence in the overall population. Live births to diagnosed HIV infected women in the United Kingdom are reported to the National Study of HIV in Pregnancy and Childhood (NSHPC).\textsuperscript{4} The proportion of HIV infected women diagnosed before delivery is calculated by aligning NSHPC reports\textsuperscript{11 12} with the total number of births to diagnosed and undiagnosed HIV infected women. The number of infants who become infected themselves is estimated by applying UK specific observed transmission rates for infants born to diagnosed and undiagnosed HIV infected women.\textsuperscript{13}

**CD4 surveillance**

CD4 T lymphocyte counts in HIV infected individuals (CD4 Surveillance Scheme) are reported from 60 laboratories in England and Wales (representing approximately two thirds of all reported new diagnoses) and are used to monitor trends in immunosuppression at HIV diagnosis.\textsuperscript{14} Individuals who have a CD4 count below 200 cells $\times 10^9/L$ (the recommended threshold for beginning therapy\textsuperscript{15}) at HIV diagnosis are categorised as having a “late HIV diagnosis.”

**Antiretroviral therapy monitoring among diagnosed HIV infected individuals**

The annual Survey of Prevalent HIV Infections Diagnosed (SOPHID) provides a census of the total number of individuals receiving HIV related care in England, Wales and Northern Ireland.\textsuperscript{16 17} Subsidiary information is collected on ARV uptake and most recent CD4 count.

**Uptake of hepatitis B vaccination among men who have sex with men**

The HepB3 survey monitors hepatitis B vaccination uptake among eligible men who have sex with men (MSM) on their first STI clinic attendance. Since the study started in 2003, 187/209 English clinics have participated.

**Chlamydia screening programme**

The National Chlamydia Screening Programme (NCSP) aims to control genital chlamydial infection through early detection of asymptomatic infection\textsuperscript{18 19} outside STI clinic settings. From April 2003 to March 2004, 302 screening venues (including contraceptive clinics, GPs, young people’s services, and termination clinics) participated from 10 programme areas. The target population is sexually active individuals aged under 25. Demographic and behavioural data are also collected.

**STI clinic waiting times**

Since 2004, a biannual audit of waiting times is conducted among all new attendees at all STI clinics in England for 1 week. Age and sex specific waiting times are collected for each clinic as discreet categorical units.

**Behavioural and serosurveillance of injecting drug users**

The UAPMP survey of injecting drug users (IDUs) collects self reported behavioural data (for example, injecting equipment sharing) in addition to measuring the prevalence of blood borne viruses among injectors attending 63 specialist services in England, Wales, and Northern Ireland.\textsuperscript{20} Sharing rates are calculated for those who reported injecting in the previous 4 weeks.

![Proportion of individuals leaving the clinic with an undiagnosed HIV infection](image-url)

**RESULTS: PREVENTION MONITORING UPDATE**

**VCT uptake**

Overall, VCT uptake rose by 17% (95% CI 15% to 19%) from 47% (2956/6294) in 1998 to at least 64% (4920/7697) in 2003 among MSM and by 28% (95% CI 27% to 28%) from 27% (16 886/62 295) in 1998 to at least 55% (44 312/80 435) among heterosexuals (fig 1A and B). Of those who did not have VCT, at least 29% (817/2777) of MSM and 31% (11 312/
36 123) of heterosexuals are known to have been offered, but declined, VCT (fig 1C). Of those that declined VCT, 7% (56/817) of MSM and 1% (83/11 312) of heterosexuals were HIV infected.

The proportion of HIV infected individuals who could have been diagnosed during their attendance, but who left the clinic remaining unaware of their HIV infection, fell by 9% (95% CI 1% to 17%) from 48% (104/217) in 1998 to 41% (160/394) in 2003 among heterosexuals.

Late diagnoses
In 2003, 65% (9991) of people receiving HIV care, 65% (9991) were receiving at least three antiretroviral drugs in 2003 compared to 56% (5231) in 1998. Among heterosexuals, equivalent figures were 63% (9956) and 50% (2158). Thirty three per cent of MSM (5065) and 35% (5466) of heterosexuals were not receiving HIV therapy in 2003.

Uptake of antiretroviral therapy
Of MSM receiving HIV care, 65% (9991) were receiving at least three antiretroviral drugs in 2003 compared to 56% (5231) in 1998. Among heterosexuals, equivalent figures were 63% (9956) and 50% (2158). Thirty three per cent of MSM (5065) and 35% (5466) of heterosexuals were not receiving HIV therapy in 2003.

Uptake of hepatitis B vaccine among MSM
MSM were considered to be eligible for hepatitis B vaccination (dose 1) if they were not known to be either immune or fully/partially vaccinated. Overall, 85% (5598/6533) of eligible MSM were vaccinated with dose 1.

MSM eligible for the third vaccine dose (dose 3) included those who had had fewer than three doses, but excluded those who had had a booster dose, and those known to have immunity through blood testing following previous doses. The coverage rate for dose three was 39% (2588/6624) overall but showed regional variation (fig 4). Nearly one half (46%, 2588/5669) of MSM eligible for dose 1 completed the three dose course.

STI clinic waiting times
Nationally, 74% (1359/1843) of emergency appointments, 79% (4960/6307) of people attending walk-in clinics, and 20% (3044/15 520) of people with routine appointments were seen within 48 hours. Lower proportions of 16–24 year olds and women of any age were seen within 48 hours. Full results have been published elsewhere.10

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Figure 2 Late diagnosis* of HIV infection by exposure category, England and Wales, 1994–2003. (*Percentage of patients with CD4 count under 200 cells ×10⁶/l within 90 days of diagnosis.) Data source: CD4 surveillance scheme.

Figure 3 Estimated proportion of HIV infected women diagnosed before delivery*, and of exposed children becoming HIV infected, England, 1998–2003. (*Includes previously diagnosed and those diagnosed through antenatal testing. †Assumes a vertical transmission rate of 26.5% in undiagnosed women and 2.2% in diagnosed women. ‡These data contain reports received by the end of September 2004 and are subject to reporting delay, particularly for 2003.) Data source: Unlinked Anonymous Programme and the National Study of HIV in Pregnancy and Childhood.

Figure 4 Coverage rates for hepatitis B vaccination (first and third dose) among eligible MSM attending STI clinics for the first time, by region, England, 2003. Data source: HepB3 survey.

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Among men and 32% among women. 7 Chlamydia at STI clinics rose by 8%, and syphilis by 28% equipment sharing among IDUs is concerning. The number of HIV/STI diagnoses are increasing annually. In England, 16 413 young people were screened for chlamydia outside STI settings during April 2003–March 2004.19 A 10% (1538/15 241, 95% CI 9.6% to 10.6%) and 13% (156/1172, 95% CI 11.4% to 15.4%) positivity among women and men aged under 25 was found respectively (fig 5). Women aged 16–19 were more likely to test positive for chlamydia than those aged 20–24; men aged 20–24 were twice as likely to be infected as younger men.

Risk behaviours among IDUs
Thirty per cent (494/1677, 95% CI 28% to 32%) of injectors reported sharing needles and syringes in 2003; a level similar to that observed since 1998.20 In 2003, 85% (331/384) of IDUs who had first injected in the previous 3 years reported ever having accessed a needle exchange service.

DISCUSSION
Monitoring individual HIV/STI prevention initiatives in 2003 demonstrated successes. VCT uptake among STI clinic attendees was at the highest level ever recorded. Almost 90% of HIV infected women had their infection diagnosed before delivery in England leading to an increase in the proportion able to take advantage of interventions to prevent vertical transmission (for example, ARV and avoiding breast feeding), thereby decreasing the proportion of infants who become infected. The proportion of diagnosed HIV infected individuals on at least triple therapy has increased from 14% (156/1172, 95% CI 11.4% to 15.4%) positivity among women and men aged under 25 was found respectively (fig 5). Women aged 16–19 were more likely to test positive for chlamydia than those aged 20–24; men aged 20–24 were twice as likely to be infected as younger men.

Are prevention initiatives reducing transmission?
Despite the individual success of many prevention initiatives, the number of HIV/STI diagnoses are increasing annually. In 2003 there were 6606 new HIV diagnoses, more than double the 2835 diagnoses in 1998. From 2002 to 2003, diagnoses of chlamydia at STI clinics rose by 8%, and syphilis by 28% among men and 32% among women.7

Hepatitis B vaccination
The HepB3 study demonstrates that high proportions of MSM are vaccinated with dose 1 on their first STI clinic attendance, but lower proportions complete the three dose course. Patient identifiers are not collected, so it is impossible
to monitor movement of patients between clinics. This, combined with reporting delay, may lead to an underestimate of the true performance.

**STI clinic waiting times**
Although the national waiting times survey show a high proportion of attendees cannot get a timely appointment, it is not possible to calculate the median waiting time since data is collected in categories.

**Chlamydia screening programme**
While the NCSP has improved access for chlamydia screening since its implementation in England, it is not currently possible to calculate national coverage. When the programme is fully rolled out throughout England, coverage will be calculated by dividing the number of people aged 16–24 screened by the total eligible population (sexually active population aged 16–24).

**Risk behaviour monitoring**
The Unlinked Anonymous IDU survey only includes those in contact with services for drug users and therefore the data may not be generalisable to all injectors, specifically, those not in contact with services, who may have different levels of risk behaviour.

**Are prevention initiatives effective?**
The effectiveness of prevention initiatives to reduce transmission requires assessment. For instance, although the promotion of VCT has reduced the proportion of HIV infected individuals leaving the clinic remaining undiagnosed, it may not target those who have been recently infected, who may be more infectious. Research is required to elucidate the role of “recently HIV infected” people in contributing onward HIV transmission. For IDUs, there is evidence of a recent shift in needle exchange provision towards pharmacy based services. Studies suggest that IDUs using pharmacy based services may be more likely to share equipment owing to absence of harm reduction counselling in these settings.**

**Are prevention initiatives implemented on the correct scale?**
Since the prevalence of an infection drives onward transmission, recent increases in the prevalent pool of diagnosed and undiagnosed infections may limit the ability of prevention programmes to reduce transmission levels.

For example, the success in reducing the proportion of infants exposed to maternal HIV infection who become infected, has not substantially reduced the absolute number, because prevalence among pregnant women has increased. Continuing investment in prevention activities is essential, and activities need to adapt to meet the challenge of the evolving epidemics.

**What next?**
While individual prevention initiatives have had an impact, and rates of ongoing transmission would have been higher in their absence, investment needs to be strengthened and sustained in order to reduce HIV/STI transmission. Current prevention initiatives partially accommodate the diversity of populations at high risk of infection, but require flexibility if they are to match the evolving epidemic. Evaluation of prevention initiatives, both individually and in combination, is needed to measure how much they reduce transmission. Novel monitoring tools require development to assess prevention initiatives aimed at populations who have poor access to health services, but who play an important part in HIV/STI transmission.

Local and national surveillance systems are essential in ensuring that the effectiveness of prevention initiatives are continually reviewed and updated to meet the diversity of needs of the populations at risk of HIV/STIs.
REFERENCES


