INTRODUCTION

The HIV epidemic in England is largely concentrated among men who have sex with men (MSM) and heterosexuals who acquired HIV in a high prevalence country before migration.

Currently, national estimates for HIV incidence exist only for MSM. These are based on back-calculation\(^1\) and simulation\(^2\) models, both of which do not take migration into account.

Here we used a Recent Infection Testing Algorithm (RITA),\(^3\) consisting of biomarker and clinical information to examine national trends in incidence for all persons attending sexual transmitted infection (STI) clinics, where 80% of diagnoses are made. In England, HIV testing and treatment is free and confidential.

METHODS

Data source: National HIV case report information from STI clinics in England was linked to biological and testing information

Laboratory methods: The AxSYM assay, modified to determine antibody avidity, was used to classify HIV infections as likely recently acquired. A recency index cut-off of 80% was used, giving an estimated mean duration of recent infection of 181 days. All cases with a viral load <400 copies/mL or on ART or with an AIDS diagnosis within a year were classified as longstanding infections. We calculated a 1.9% 95% C.I. (1.0%-3.4%) proportion false recent using known longstanding infections.

Statistical methods: HIV incidence was estimated using the WHO formula for cross-sectional studies:

\[
I_r = \frac{R - E}{P(1 - E)n}
\]

Where: \(I_r\) = Annual rate, \(R\) = the number of recent infection cases, \(E\) = the False Recent Rate (FRR), \(P\) = the number of HIV positive people, \(n\) = the mean duration of recent infection and \(N\) = the number of people that tested negative. Results are presented with 95% confidence intervals.

RESULTS

For each year between 2009 and 2013, 144, 141, 136, 150 and 125 of the 210 STI clinics in England submitted specimens for recent infection testing, representing between 69% and 71% of all STI clinics in England.

The number of HIV tests per diagnosis increased from 162 in 2009 to 215 in 2013. (Figure 2)

This was higher among heterosexuals (increasing from 236 tests per diagnosis in 2009 to 424 in 2013) compared to MSM, increasing from 263 tests per diagnosis in 2009 to 41.4 in 2013.

Among black Africans, the number of tests per diagnosis was similar to that of MSM, increasing from 22.1 in 2009 to 55.0 in 2013.

Incidence was stable over the period among heterosexuals at between 0.03% (0.02%-0.05%) and 0.05% (0.05%-0.07%). (Figure 4)

However, in the subgroup of black African heterosexuals, incidence was 4-5 times higher each year compared to heterosexuals overall, increasing slightly but non-significantly from 0.15% (0.05%-0.26%) to 0.19% (0.05%-0.33%) Among MSM it rose non-significantly from 1.24% (0.96%-1.52%) to 1.46% (1.23%-1.70%).

Analysis by age showed the increase in incidence among MSM occurred in all age groups with highest rates among those aged 25-34 years followed by those aged 35-50 years. There was little difference in incidence by age among heterosexuals.

The coverage of new HIV diagnosis tested for recent infection increased over the period to 24% (1448/5965) in 2009 to 53% (3012/5634) in 2013.

Overall, the proportion of recent infection diagnosed was 9.8% (145/1478) in 2009, increasing to 19.3% (321/1665) in 2013. (Figure 3)

Recent infection increased among all subgroups over the period (among MSM from 14.5% (103/715) to 27.3% (265/970); among heterosexuals from 5.3% (36/681) to 8.4% (46/546) and among black African heterosexuals from 1.7% (8/440) to 4.4% (11/256).

We estimated annual HIV incidence among STI clinic attendees to have increased from 0.13% (95%CI 0.10%-0.16%) in 2009 to 0.20% (95% CI 0.17%-0.23%) in 2013.

CONCLUSIONS

Findings suggest a slight increase in HIV incidence among MSM attending STI clinics over the period, although this was not statistically significant.

Data show a disparity in incidence among the different subgroups. However the HIV diagnosis rate ranged widely between risk groups reflecting both the variation in testing patterns and underlying HIV prevalence in these populations.

Trends in incidence (or lack of) are difficult to interpret despite large sample sizes. This may question value of incidence tests if sample sizes required to determine significant changes over time aren’t achievable.

Future use of biomarkers may be compromised with the roll out of pre-exposure prophylaxis.

ACKNOWLEDGEMENTS

We gratefully acknowledge Sam Lalitmore and Ruth Simmons for their role in recruiting clinics and laboratories to the RITA programme and the continuing collaboration of clinicians, microbiologists, immunologists, public health practitioners, occupational health doctors and nurses and other colleagues who contribute to the surveillance of HIV and STIs in the UK.

REFERENCES