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Health Protection Agency, London
Reducing onward transmission: Viral suppression among key population groups living with HIV in the United Kingdom

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Venkata Polavarapu
Zing Yin
We gratefully acknowledge all the patients living with HIV as well as clinicians, health advisors, nurses, microbiologists, public health practitioners, data managers and other colleagues who contribute to the surveillance of HIV and STIs in the UK.
People living with HIV can expect a near normal life expectancy resulting in large increases in persons living with diagnosed HIV.

UK epidemic is largely concentrated in key prevention groups: MSM, BA, PWID.

Access to and quality of HIV care is excellent.

Viral load is a marker of infectiousness.

Good evidence that treatment as prevention works in serodiscordant couples, less convincing evidence that it can reduce incidence at the population level.
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New HIV diagnoses in the UK by exposure category: 2003 - 2012

- Sex between men (adjusted)
- Heterosexual contact (adjusted)
- Injecting drug use (adjusted)
- Other (adjusted)
- Not reported
New HIV diagnoses in the UK by PHE region: 2012

People living with HIV can expect a near normal life expectancy resulting in large increases in persons living with diagnosed HIV

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The proportion of UK acquired infections is increasing (>50%)

Access to and quality of HIV care is excellent
A new method to assign country of HIV infection among heterosexuals born abroad and diagnosed with HIV in the UK

Brian D. Rice\textsuperscript{a,b,\textasteriskcentered}, Jonathan Elford\textsuperscript{b}, Zheng Yin\textsuperscript{a} and Valerie C. Delpech\textsuperscript{a}

Objective: To apply a new method to ascertain likely place of HIV infection among persons born abroad and diagnosed with HIV in the United Kingdom (UK).

Design: Analyses of heterosexual adults born abroad, diagnosed with HIV in the UK between 2004 and 2010, and reported to the national HIV diagnoses database.

Methods: Year of infection was ascertained by applying an estimated rate of CD4-cell count decline between an individual's CD4-cell count at diagnosis and estimates of CD4-cell count at infection. A person was classified as having probably acquired HIV while living in the UK if estimated year of infection was later than reported year of arrival in the UK.

Results: Of 10,612 heterosexual adults born abroad included in the analyses, 85\% (9065) were of black-African ethnicity. We estimate that 33\% (26\%-39\%) of persons acquired HIV whilst living in the UK. This percentage increased from 24\% (16\%-39\%) in 2004 to 46\% (31\%-50\%) in 2010 (p < 0.01). The estimate of 33\% is three times higher than national estimates of HIV acquired in the UK based on clinic reports (11\%) (p < 0.01).

Conclusions: Assigning place of HIV infection using routinely available clinical and demographic data and estimated rates of CD4-cell decline is feasible. We report a high and increasing proportion of persons born abroad who appear to have acquired their HIV infection whilst living in the UK. These findings highlight the need for continued targeted HIV prevention efforts, particularly among black-African communities.

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AIDS 2012, 26:000–000
New HIV diagnoses by probable country of infection and exposure group: 2001–2010

MSM=men who have sex with men
Background

People living with HIV can expect a near normal life expectancy resulting in large increases in persons living with diagnosed HIV.

UK epidemic is largely concentrated in key prevention groups: MSM, BA, PWID.

The proportion of UK acquired infections is increasing (>50%).

Access to and quality of HIV care is excellent.

Viral load is a marker of infectiousness.

Good evidence that treatment as prevention works in serodiscordant couples, less convincing evidence that it can reduce incidence at the population level.

Proportion of patients linked into care after HIV diagnosis:

- 76% within 2 weeks (n=3,800)
- 88% within 1 month (n=4,500)
- 97% within 3 months (n=4,900)

Time between diagnosis and date of first CD4 count.
ART coverage among adults with a CD4 cell count of <350 cells/mm³: United Kingdom, 2011

- **Overall (n=1,900)**: 88%
- **MSM (n=700)**: 87%
- **Heterosexuals (n=900)**: 89%
- **People who inject drugs (n=100)**: 87%

Risk groups
Viral load is a marker of infectiousness.

Good evidence that treatment as prevention works in serodiscordant couples, less convincing evidence that it can reduce incidence at the population level.
Aim

To present estimates of the proportion of all diagnosed and undiagnosed adults who are virally suppressed (and therefore uninfectious) by key population groups.

Show findings in a ‘treatment cascade’ image and compare these with other countries to illustrate differences in prevention, testing and delivery of care.
Methods

Linking of national datasets

• Cohort of HIV diagnosed persons accessing care (longitudinal SOPHID)
• Newly diagnosed persons reported by clinics and laboratory
• CD4 laboratory counts

Undiagnosed calculated using Multi Parameter Evidence Synthesis (MPES) model (1)

Credible intervals are omitted for simplification

Numbers are rounded off to nearest 100

Assumptions

National cohort is comprehensive and ‘closed community’

Undiagnosed are assumed to all have a detectable viral load

Viral load of 50 copies/mL is used as a cut-off

Sensitivity analyses were conducted using a VL=200 and VL =1500 copies/mL
Treatment cascade of adults living with HIV: United Kingdom, 2011

HIV infected (n=94,900)

MPES 100%

HIV diagnosed (n=72,900)

77%

Retained in care (n=69,200)

SOPHID 73%

On treatment (n=60,700)

64%

Undetectable VL (n=52,200)

58%
## Treatment cascade of adults living with HIV: United Kingdom, 2011

<table>
<thead>
<tr>
<th>Category</th>
<th>Total HIV infected</th>
<th>% diagnosed</th>
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</tr>
</thead>
<tbody>
<tr>
<td>All adults</td>
<td>94,900</td>
<td>77%</td>
<td>73,000</td>
</tr>
<tr>
<td>Men 15 – 44 yrs</td>
<td>36,400</td>
<td>70%</td>
<td>26,200</td>
</tr>
<tr>
<td>Men 45+</td>
<td>26,600</td>
<td>85%</td>
<td>22,500</td>
</tr>
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<td>Women 15 – 44</td>
<td>23,300</td>
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</tr>
<tr>
<td>Men who sex with men</td>
<td>40,100</td>
<td>80%</td>
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<td>70%</td>
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</tr>
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<td>75%</td>
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</tr>
<tr>
<td>People who inject drugs</td>
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<tr>
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<th>Total HIV diagnosed</th>
<th>% diagnosed Retained in care</th>
<th>% diagnosed on ART</th>
<th>% diagnosed VL&lt;50</th>
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Treatment cascade of adults living with HIV: United Kingdom, 2011

- HIV infected (n=94,900)
- HIV diagnosed (n=72,900)
- Retained in care (n=69,200)
- On treatment (n=60,700)
- Undetectable VL (n=52,200)
Treatment cascade of People with HIV in France 2010, Supervie V et al

*Data from health insurance scheme (CNAMTS) and French Hospital Database on HIV ANRS-CO4
Number of HIV-Infected Persons Engaged in Selected Stages of the Continuum of HIV Care – United States

Sensitivity analysis: Varying definitions of viral load suppression among HIV infected adults: United Kingdom, 2011

Proportion of adult patients with an undetectable viral load

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<td>&lt;50 (n=55,200)</td>
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Estimates of the proportion of people living with HIV that remain undiagnosed by risk group: United Kingdom, 2011
Estimated undiagnosed infections in MSM; Birrell et al
CD4 count distribution among undiagnosed and at newly diagnosed MSM, England and Wales
Theoretical basis for the stochastic and deterministic transmission models - Schematic diagram of the change in infectivity with time in a person who survives for 10 years. The infectivity during all three phases (a−c) can be varied, as can the duration of the acute and final phases (d and e).

Proportion recently infected among new diagnoses, 2011
England, Wales and Northern Ireland

- MSM: 23%
- Heterosexual men: 8%
- Heterosexual women: 8%
- Overall: 16%

Percentage recently acquired
Impact of ART at diagnosis on prevention is likely to minimal given the large pool of undiagnosed

Transmission dynamics are complex

Predictors of very high VL >40,000 copies/mL - see poster P128

- Role of primary infection
- Role of sexual networks
- Role of PN
- Role of multiple partners
- Role of ‘regular’ vs ‘casual’

- What is the optimal testing frequency in MSM, BA, general population

- Impact of Prep - >60% of newly diagnosed MSM had not attended the same STI clinic in past 3 years (GUMCAD)
Conclusions

Treatment Cascade is a useful tool to illustrates access to HIV care and quality of care received, as well as highlight prevention needs.

Estimates of the ‘infective’ population rely on good estimates of the undiagnosed population

Caution should be taken when interpreting differences across subgroups due to less robust undiagnosed estimates and complex transmission dynamics

Treatment cascade from the time of diagnosis are more robust and can reliably be used to compares demographic, risk and geographies

Link to care and ART uptake indicators have been included in the HIV dashboard

This works highlights the need for continued efforts in primary prevention and HIV testing in reducing transmission.
Thank you!

We gratefully acknowledge all the patients living with HIV as well as clinicians, health advisors, nurses, microbiologists, public health practitioners, data managers and other colleagues who contribute to the surveillance of HIV and STIs in the UK.
British HIV Association
BHIVA

19th Annual Conference of the British HIV Association (BHIVA)

16–19 April 2013

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