HIV testing of relevance to general practice

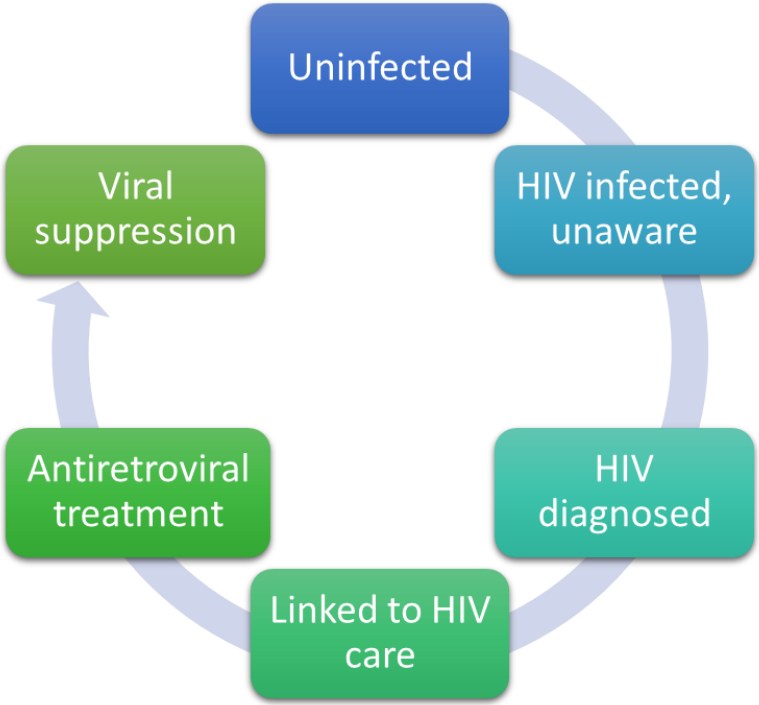
Second joint BHIVA/RCGP conference
September 09, 2016

Dr Werner Leber
Clinical Lecturer in Primary Care, QMUL

NHS
National Institute for Health Research

Collaboration for Leadership in Applied Health Research and Care
North Thames

HIV care continuum – GPs can support patients along their journey



Patient concerns about receiving care from GP (Keogh et al, 2016):

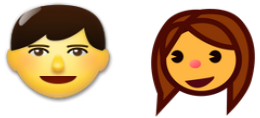
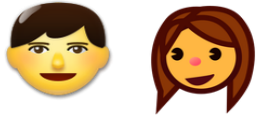
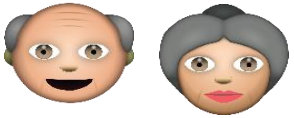
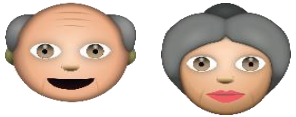
- Competence
- Collaboration
- Continuity

Patients, but not GPs want to test for HIV

- **Nationwide GP survey** (N=80): Major perceived barrier to testing are the patients (Hindocha et al, 2013)
- **Patient focus group** in Brighton (n=54): HIV testing in primary care preferable (Glew et al, 2014)
- HIV test coverage in non-traditional settings, including GPs (Elmahdi et al, 2015):

Reason for testing	Test coverage	Patient acceptance	HIV positivity
HIV indicator condition	**22.4%** (13.9% - 30.9%)	**87.4%** (57.7% - 100%)	**2.7%** (1.1% - 4.4%)
Routine HIV testing	**29.5%** (23.6% - 35.4%)	**69.2%** (52.7% - 85.6%)	**0.4%** (0.2% - 0.6%)

Want to avoid late diagnosis? Go and see a Dutch GP…

	Most likely diagnosed late in UK* (Public Health England, 2015)	**More likely diagnosed in Dutch general practice** (Joore et al, 2016)
Heterosexual		
Black African		
>50 years		

HIV Diagnosis in GP:

UK **10%**

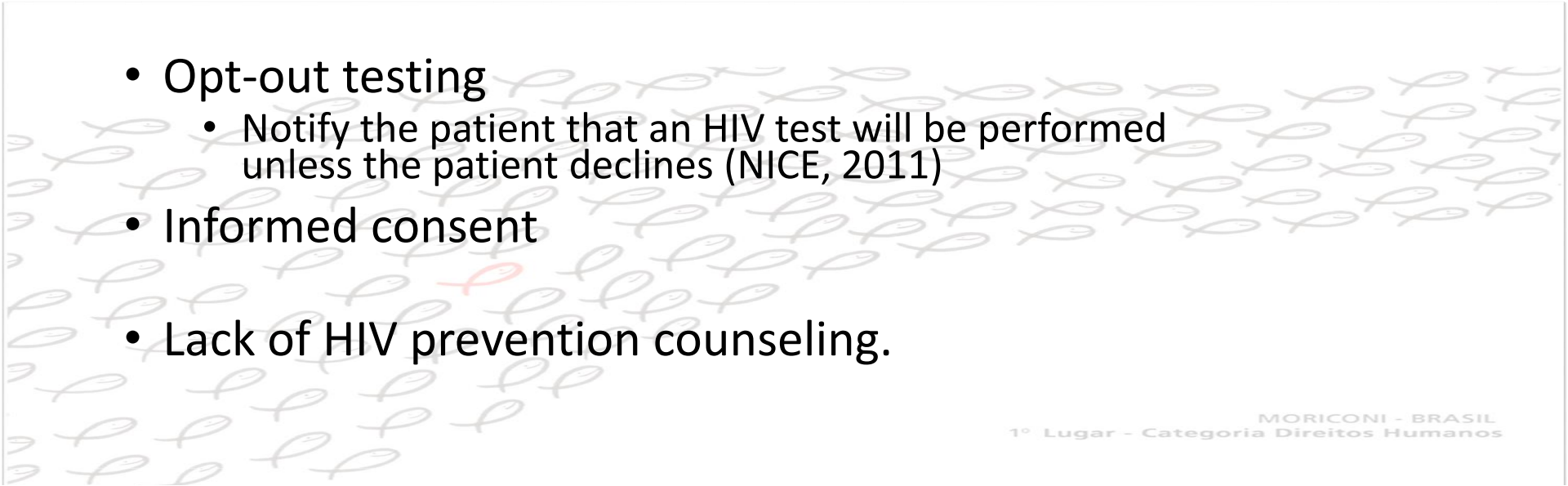
Holland **38%**

Hackney: **28%**

*People who inject drugs excluded

BHIVA 2008 – key ‘normalising’ HIV testing features

- Opt-out testing
  - Notify the patient that an HIV test will be performed unless the patient declines (NICE, 2011)
- Informed consent
- Lack of HIV prevention counseling.



Source of image: 1º Festival international de Humor DST & AIDS, Ministério da Saúde, Brazil

BHIVA 2008 – recommendations for primary care

- Any health care worker competent to obtain consent and conduct an HIV test
- Routine HIV testing at GP registration in HIV prevalence area (>2/1000 adults)
- NICE 2011: Special consideration for MSM and black Africans.

NICE HIV draft consultation 2016

The updated guidelines are expected to be broader and focus on **populations** at higher risk of HIV, including people:

- who live in areas or communities with a high prevalence of HIV
- whose lifestyle or sexual behaviour puts them at risk
- who have an illness that may be indicative of HIV infection

Primary care in high prevalence areas

- Anyone who receives a blood test for another reason
- Rapid point-of-care testing (POCT).

RHIVA2 – Applying BHIVA 2008 to general practice

Methods (Leber et al, 2015):

- Pragmatic cluster randomised controlled trial in Hackney (prevalence 8/1000)
- 20 intervention vs. 20 control practices
- Health care assistant offers opt-out POCT to new registrants

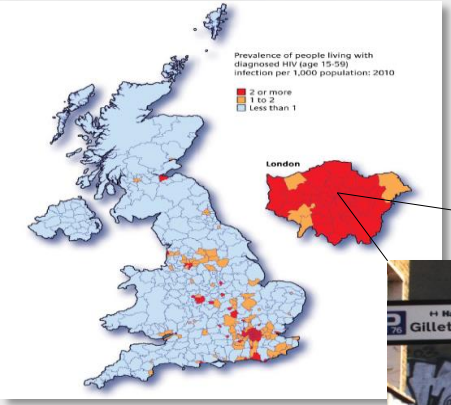
Can POCT at first presentation in general practice

- detect HIV earlier?
- diagnose more people living with HIV?

- RHIVA1 pilot demonstrating POCT feasibility and acceptability (Prost et al, 2009)
- TB screening trial (Griffiths et al., 2007)

RHIVA2 methods continued…

- Educational session, including competency training for POCT, lasting 1.5 hours
- Follow up training for practice lead nurse after 2 weeks
- Incentive payments: £300 one off, £10 per rapid test recorded.



Source: Health Protection Agency. HIV in the United Kingdom: Report 2011.

Source: Hackney Plus (www.hackney.co.uk)

POCT using INSTI™

- Finger prick test – result available in one minute
- Sensitivity = 99.6%; Specificity = 99.3%
- Any reactive test result needs confirmatory serology
- Quality Assurance (MHRA, 2010).

RHIVA2 safety netting

- Referral of any new diagnosis to an HIV clinic by the GP or senior nurse
- Failsafe for new diagnoses provided by the Homerton HIV liaison nurse
- Remote monitoring of HIV testing activity (EMIS codes) by the Clinical Effectiveness Group, QMUL.

RHIVA2 results – New patient characteristics

Study period: April 2010 – August 2012

Characteristics of new registrants	Intervention	Control
Number of new registrants	44,971	38,464
Mean age (years)	35.9	35.1
Male	45%	45%
White Black African	49% **17%**	57% **15%**

Results - HIV testing and diagnoses

HIV testing and diagnoses	Intervention	Control
POC tests offered	11,180	NA
POC tests received	4,978 (44.5%)	NA
POC tests confirmed positive*	11	NA
Total number of new diagnoses Black African MSM	**32** (incl. 3 antenatal) 20 (63%) 6 (19%)	**14** (incl. 4 antenatal) 8 (57%) Nil
Total number of patients defaulted care >12 months**	**4**	**2**

*All patients were successfully transferred to secondary care

** Indicating patients re-entering specialist care via general practice.

Primary outcome: Increase in early diagnosis of HIV

New HIV diagnosis:

- Intervention n=**32**
- Control n=**14**

CD4 count (cells/microL)	Intervention	Control
Mean	**356** (SD 254)	**270** (SD 257)

Square rooted CD4*	Coefficient	CI (95%)	P-value
Intervention	**3.1**	-1.2 to 7.4	0.160
Intervention excl. Antenatal	**6.4**	1.2 to 11.6	0.017

*Mixed effect models allowing for a random effect of practice and adjusted for randomisation stratification factors, including practice list size, male HIV testing rate and IMD score.

Secondary outcome: Increased rate of new HIV diagnosis

New HIV diagnosis:

- Intervention n=**32**
- Control n=**14**

Rate of new diagnosis (per 1000 patients per year)*	Coefficient	CI (95%)	P-value
Intervention	**4·5**	1.3 to 16.0	0.021
Intervention excl. Antenatal	**5·9**	1.7 to 20.2	0.006

*Mixed effect models allowing for a random effect of practice and adjusted for randomisation stratification factors, including practice list size, male HIV testing rate and IMD score.

POCT in general practice – staff experiences

- **Pros:**

"Yeah, I think, the impression I get is that they think that we' ve been quite thorough and that we're, you know, so I think it, I think it promotes us."

"I think I just like doing it because it is good. When you think about the end result, is good. It makes you feel you have done something good as well."

- **Cons:**

Health care assistants and nurses may worry about time and the instantaneous nature of the POCT.

McMullen et al, 2015

POCT in general practice – patient experiences

- POCT in general practice broadly acceptable to newly diagnosed patients (5/11 interviewed)
- HIV testing, but not an HIV diagnosis can be normalised
  - Patients may chose to take part in routine HIV testing for a particular reason

- Routine testing lets people deal with their own exceptionalism.

Heather McMullen, PhD student, QMUL. Personal communication.

Source of image: 1º Festival international de Humor DST & AIDS, Ministério da Saúde, Brazil

HIV-CLAHRC: Service evaluation of HIV testing and diagnosis in East London general practice

Hackney:

2007/8

Sep 2008
RHIVA1
1 practice

Apr 2010
RHIVA2 trial
20 intervention
20 control

Sep 2012
RHIVA3 follow up
32 practices
Late diagnosis service evaluation

Apr 2013
- Rapid HIV testing added
- Incentive payments

Sexual health local enhanced service (SH LES) (BHIVA 2008; NICE 2011)

Tower Hamlets:

SH LES (BHIVA 2008; NICE 2011)

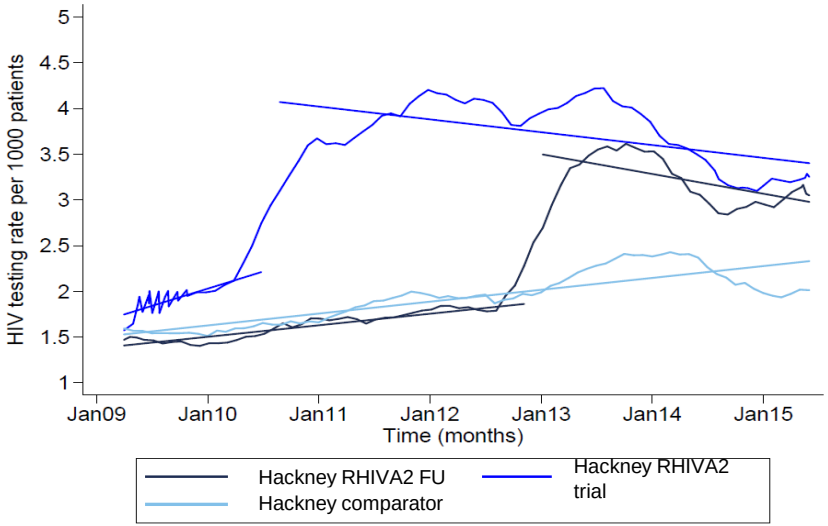
Apr 2011
Network improved service (NIS)
- Promotion of serology HIV testing
- Incentive payments

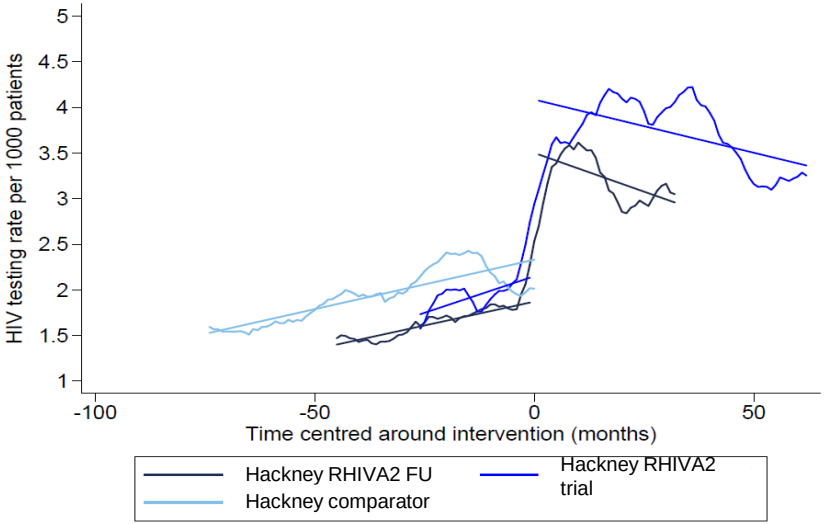
Newham:

Routine care (DoH, 2003; Donaldson 2007)

Unpublished data.

City & Hackney Sexual Health LES increases HIV testing, and is sustainable long term

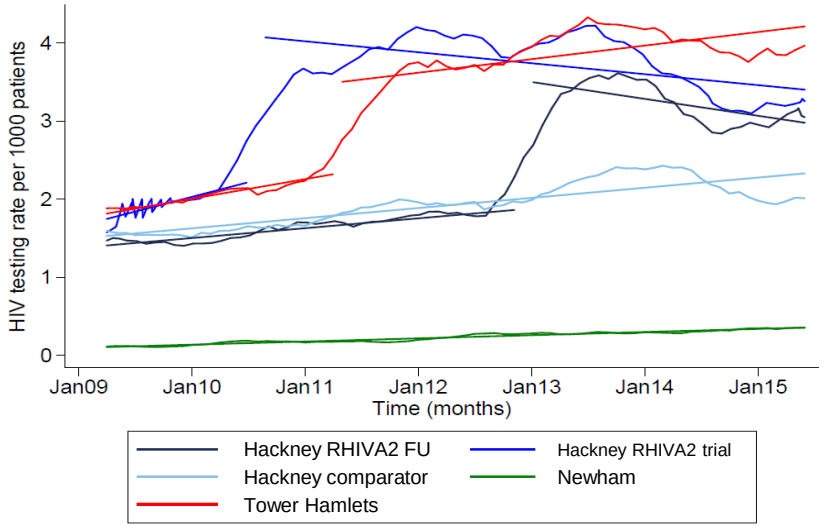


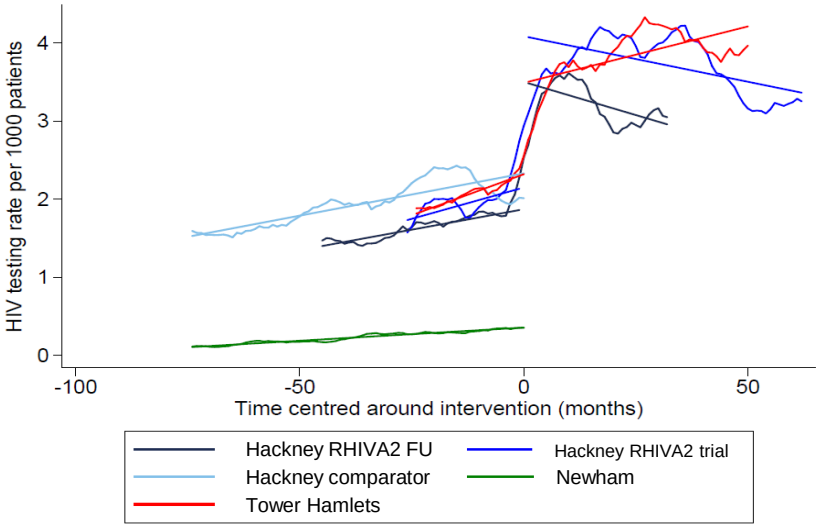


Interrupted time series analysis, using a negative binomial random effects model

Unpublished data.

The Tower Hamlets sexual health network improved service is equally effective





Interrupted time series analysis, using a negative binomial random effects model

Unpublished data.

Hackney GPs continue to diagnose HIV

	Hackney (n=)		Tower Hamlets (n=)		Newham (n=)	
Mode of Testing	RHIVA2* trial (2010-12)	RHIVA FU# (2013-15)	2010-12	2013-15	2010-12	2013-15
Serology	**35**	47				
POC	**11**	8				

*RHIVA2 trial period: **29 months**; RHIVA2 Follow up: **35 months**

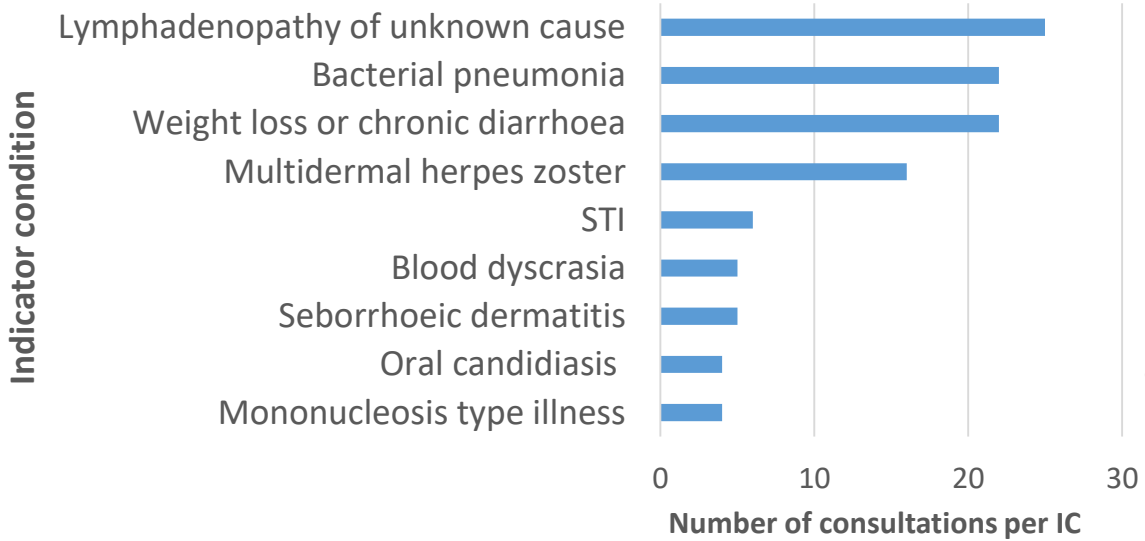
#**Please note, results are preliminary:** New diagnosis data awaiting validation by Public Health England.

Unpublished data.

HIV indicator conditions in primary care

Retrospective case notes review of new HIV diagnoses in Hackney general practice (n=89)
(Wellesley et al, 2015)

THIN case control study (n=939)
(Damery et al, 2013)



11.3 (4.5-28.3)
47.7 (5.6-404.2)
13.4 (5.0-36.0) Weight loss
25.4 (5.0-36.0)
10.8 (2.7-43.2)
5.7 (1.4 – 22.9)
NA
29.4 (6.9-125.5)
NA

Predictive value; OR (CI 95%)

Similar results: Joore et al, 2016

Think EBV? Test for HIV!

- **Hsu et al, 2013:**

  1046 primary care samples sent for EBV testing
  - 11 new diagnosis (GP: n=3)
    - 4 recently acquired (GP:1)

Source of image: 1º Festival international de Humor DST & AIDS, Ministério da Saúde, Brazil

Primary HIV infection commonly missed in general practice

- **Typically glandular fever-like illness**
- Incubation period: 2-4 weeks
- 30 - 80% symptomatic
- Fever, myalgia, rash, headache, and sore throat, lasting 1-2-(4) weeks.

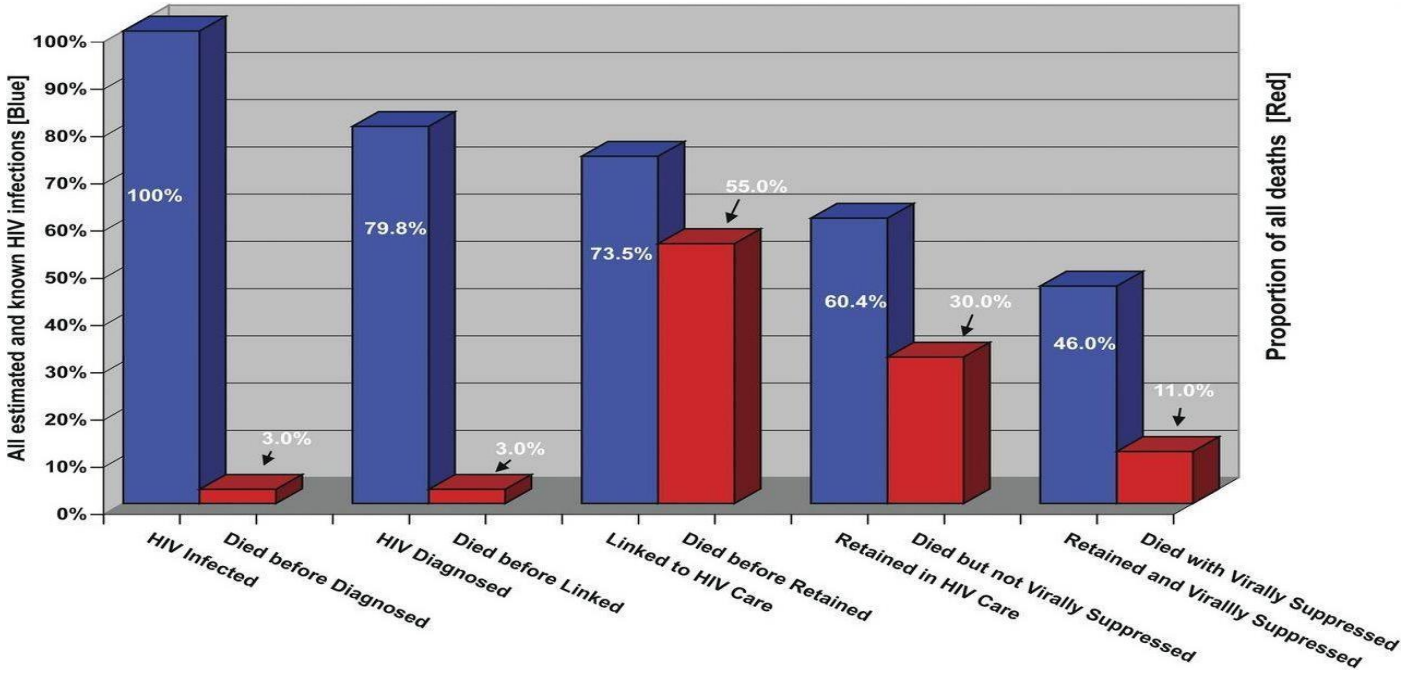
Source of images: http://www.aids-images.ch/

Primary HIV Infection – other features

- May present with predominantly gastrointestinal disease
- Oral or genital ulcers
- Convalescent phase (up to 50%), including severe lethargy, malaise and low grade fever, lasting for months (Gaines et al, 1988).

Source of images: http://www.aids-images.ch/

Dying in transition – newly diagnosed patients most at risk

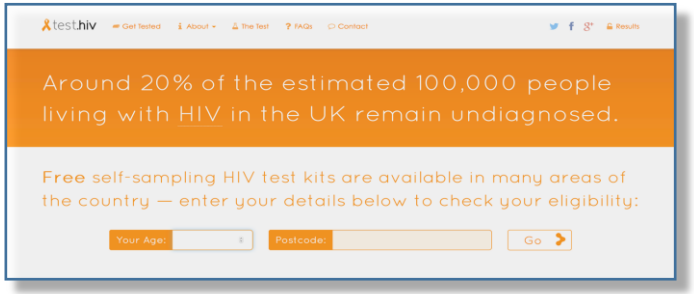


Krentz et al, 2014

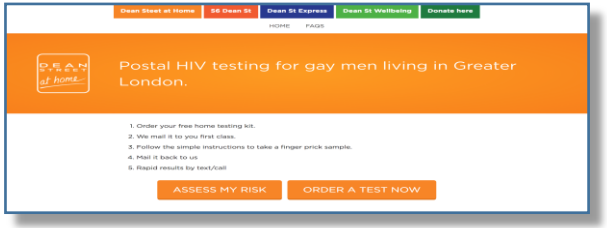
Innovative HIV testing in the community

- POCT for personal use at home, available since 2011
- To expand access to HIV testing and to reduce barriers experienced in health care settings
- Online risk assessment and ordering test kits, opportunity for health promotion

- Home testing
  - Patient self-tests and reads result at home
- Home sampling
  - Patient posts blood sample to the clinic
  - Health advisor calls for any reactive result.



Dean Street @ Home



- Service evaluation of home sampling provided at the Dean Street Clinic website (Elliot et al, 2016)

- During the 2-year study period:
  - 17,361 people completed online risk assessment
    - 10,323 POCT kits ordered
      - 5696 kits returned

  - 122 reactive result
    - **82 new diagnosis** (1.4% positivity rate); median CD4 505; 20% recent infections
    - 14 known positives
    - 11 unconfirmed; 14 false reactive.

Summary: Making HIV testing and diagnosis in general practice safe

- HIV testing must be meaningful – make sure patients enter secondary care safely following diagnosis
- Know your local prevalence and and engage with your community to inform service design
  - HIV indicator condition-targeted testing in any setting
  - Routine HIV testing in high prevalence areas for people attending a new patient check, sexual health screen, and to anyone having a blood test for another reason
- POCT effective at increasing uptake of HIV testing in primary care high prevalence areas and in the community

Acknowledgements

- Centre for Health Sciences, QMUL
  - Chris Griffiths
  - Heather McMullen
  - Farah El-Shogri
  - Sally Kerry
  - Nadine Marlin
  - Stephen Bremner
  - Claire Rutterford
  - Claire Nightingale
  - Lee Beresford
  - Richard Hooper
  - Kambiz Boomla
  - Keith Prescott
  - Martin Sharp
  - Jack Dunne
  - Rosie Wellesley

- School of Law, QMUL
  - Richard Ashcroft

- Homerton University Hospital NHS Trust
  - Jane Anderson
  - Sarah Creighton
  - Danna Millett
  - Sifiso Mguni
  - Damilola Awosika
  - Cynthia Sajani
  - Richard Castles

- City & Hackney NHS
  - Jose Figueroa
  - Alice Whittle

- UCL
  - Naomi Fulop
  - Graham Hart
  - Steve Morris
  - Maryam Shahmanesh

- Ambrose King Centre, Barts Health NHS Trust
  - Claudia Estcourt
  - Jane Hutchinson

- Newham University Hospital
  - Rebecca O'Connell
  - Kaya Widuch

- The London School of Hygiene and Tropical Medicine
  - Fern Terris-Prestholt
  - Andreia Santos
  - Rebecca Baggaley

- University of Warwick
  - Deirdre Hollingsworth
  - Mike Irvine

- Public Health England
  - Valerie Delpech
  - Alison Brown
  - Graeme Rooney

- GP staff and patients

Funding: National Institute for Health Research, NHS City and Hackney, Department of Health

Contact us: w.leber@qmul.ac.uk

References

- Keogh P, Weatherburn P, Reid D. Learning from the experiences of people with HIV using general practitioner services in London: a qualitative study. *Prim Health Care Res Dev* 2016;17(4):351-60. doi: 10.1017/S1463423615000481
- Elmahdi R, Gerver SM, Gomez Guillen G, et al. Low levels of HIV test coverage in clinical settings in the U.K.: a systematic review of adherence to 2008 guidelines. *Sex Transm Infect* 2014;90(2):119-24. doi: 10.1136/sextrans-2013-051312
- Glew S, Pollard A, Hughes L, et al. Public attitudes towards opt-out testing for HIV in primary care: a qualitative study. *Br J Gen Pract* 2014;64(619):e60-6. doi: 10.3399/bjgp14X677103 [published Online First: 2014/02/26]
- Hindocha S, Charlton T, Rayment M, et al. Feasibility and acceptability of routine human immunodeficiency virus testing in general practice: your views. *Prim Health Care Res Dev* 2013;14(2):212-6. doi: 10.1017/S1463423612000436
- Ellis S, Curtis H, Ong EL. HIV diagnoses and missed opportunities. Results of the British HIV Association (BHIVA) National Audit 2010. *Clinical Medicine* 2012
- Joore IK, Reukers DF, Donker GA, et al. Missed opportunities to offer HIV tests to high-risk groups during general practitioners' STI-related consultations: an observational study. *BMJ Open* 2016;6(1):e009194. doi: 10.1136/bmjopen-2015-009194
- Public Health England. HIV in the UK – Situation Report 2015. Incidence, prevalence and prevention 2015. 2016. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/477702/HIV_in_the_UK_2015_report.pdf (Accessed January 21, 2016)
- Public Health England. HIV New Diagnoses, Treatment and Care in the UK: 2015 report 2015. 2016. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/469405/HIV_new_diagnoses_treatment_and_care_2015_report20102015.pdf (Accessed January 21, 2016)
- British HIV Association. UK National Guidelines for HIV testing. 2008. http://www.bhiva.org/HIV-testing-guidelines.aspx (Accessed September 26, 2008)
- National Institute for Health and Care Excellence. Increasing the uptake of HIV testing to reduce undiagnosed infection and prevent transmission among men who have sex with men. 2011. https://www.nice.org.uk/guidance/PH34 (Accessed September 26, 2016)
- National Institute for Health and Care Excellence. Increasing the uptake of HIV testing to reduce undiagnosed infection and prevent transmission among black African communities living in England. 2011. https://www.nice.org.uk/guidance/PH33 (Accessed September 26, 2016)
- Leber W, McMullen H, Anderson J, et al. Promotion of rapid testing for HIV in primary care (RHIVA2): a cluster-randomised controlled trial. *The Lancet HIV* 2015;2(6):e229-e35. doi: 10.1016/S2352-3018(15)00059-4
- McMullen H, Griffiths C, Leber W, et al. Explaining high and low performers in complex intervention trials: a new model based on diffusion of innovations theory. *Trials* 2015;16:242. doi: 10.1186/s13063-015-0755-5
- Wellesley R, Whittle A, Figueroa J, et al. Does general practice deliver safe primary care to people living with HIV? A case-notes review. *Br J Gen Pract* 2015;65(639):e655-61. doi: 10.3399/bjgp15X686905 [published Online First: 2015/09/29]
- Medicines and Healthcare Products Regulatory Agency (MHRA). Device Bulletin: Management and Use of IVD Point of Care Test Devices 2010. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/371800/In_vitro_diagnostic_point-of-care_test_devices.pdf (Accessed Sep 26, 2016)
- Prost A, Griffiths CJ, Anderson J, et al. Feasibility and acceptability of offering rapid HIV tests to patients registering with primary care in London (UK): a pilot study. *Sex Transm Infect* 2009;85(5):326-9. doi: 10.1136/sti.2008.033233
- Damery S, Nichols L, Holder R, et al. Assessing the predictive value of HIV indicator conditions in general practice: a case-control study using the THIN database. *Br J Gen Pract* 2013;63(611):e370-7. doi: 10.3399/bjgp13X668159 [published Online First: 2013/06/06]
- Gaines H, von Sydow M, Pehrson PO, et al. Clinical picture of primary HIV infection presenting as a glandular-fever-like illness. *BMJ* 1988;297(6660):1363-8.
- Hsu DT, Ruf M, O'Shea S, et al. Diagnosing HIV infection in patients presenting with glandular fever-like illness in primary care: are we missing primary HIV infection? *HIV Med* 2013;14(1):60-3. doi: 10.1111/j.1468-1293.2012.01023.x
- Krentz HB, MacDonald J, John Gill M. High Mortality Among Human Immunodeficiency Virus (HIV)-Infected Individuals Before Accessing or Linking to HIV Care: A Missing Outcome in the Cascade of Care? *Open forum infectious diseases* 2014;1(1):ofu011. doi: 10.1093/ofid/ofu011 [published Online First: 2015/03/04]
- Elliot E, Rossi M, McCormack S, et al. Identifying undiagnosed HIV in men who have sex with men (MSM) by offering HIV home sampling via online gay social media: a service evaluation. *Sex Transm Infect* 2016;92(6):470-3. doi: 10.1136/sextrans-2015-052090