

Linkage to Care Literature Review OptTEST WP4

May 2017

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OptTEST is co-funded by the 2nd Health Programme of the European Union.



Data report was written by Sara Croxford, PHE - with input from all WP4 partners.
Published 22 May 2017. Available at www.opttest.eu.

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Linkage to Care Literature Review

Background

In May 2015, the World Health Organization (WHO) released strategic information guidelines in an effort to consolidate and prioritise key indicators to monitor national and global response of the health sector to HIV. Linkage to HIV care is one such indicator, defined by the WHO as the duration of time starting with HIV diagnosis and ending with enrolment in HIV care or treatment. Enrolment begins when a person with HIV presents to the facility where HIV care is provided and a patient file or chart is opened.(1)

Linking people who test HIV-positive to accessible and culturally appropriate care and support services is a crucial step in the HIV continuum of care. Delayed linkage in outpatient HIV care has been found to be associated with delayed receipt of antiretroviral medications, faster disease progression and increased mortality.(2-4) Though there have been efforts to describe existing applied definitions of retention in HIV care,(3) there has been little work done to describe linkage into care in Europe.

The primary objective of this investigation was to review existing research on linkage to HIV care following diagnosis in Europe. This involved investigating:

1. What definitions have been used to measure linkage to care in Europe?
2. What is the patient experience of linkage to care in Europe?
3. What are the barriers to being linked to care in Europe?

Methodology

This literature review was carried out between April and June 2015. A Population Intervention Comparison Outcome (PICO) framework was utilised to design the search strategy.

- **Population:** people newly diagnosed with HIV
- **Intervention:** HIV diagnosis
- **Comparison:** none
- **Outcome:** linkage into care
- **Limit:** geography (Europe)

PubMed and Google Scholar were used to search for relevant academic publications using “HIV” and search terms such as “linkage to care”, “integration into care”, “entry into care”, “enrolment in care”, “engagement in care”, “treatment cascade”, “continuum of care”, “newly diagnosed in HIV care” and “barriers to entry into care” etc. A full list of terms and results can be seen in Appendix 1. A grey literature review was performed to find relevant conference proceedings and reports.

Results

Overall, over 1,000 titles/abstracts were reviewed for relevance and 27 works were included (20 publications, 6 conference proceedings and 1 report). A table summarising each of the studies included can be seen below. See Appendix 2 for full details.

Table 1: Results of the literature review: Linkage into HIV care following diagnosis in Europe

Author	Country	Setting	Definition of linkage	Measurement of linkage	Barriers to linkage
1	Morrison (2011)	Albania	Clinic-level		x
2	Van Beckhoven (2014) - poster	Belgium	National	x	
3	Qvist (2014)	Denmark (Copenhagen)	Clinic-level	x	x
4	Rice (2014)	England, Wales and Northern Ireland	National	x	x
5	Supervie (2013) - presentation	France	National		x
6	Suzan-Monti (2011)	France	Clinic-level	x	x
7	Casalino (2012)	France (Paris)	Sub-national	x	x
8	Hall (2013)	France, Italy, Spain, Australia, Canada and the United States	National	x	x
9	Chkhartishvili (2014)	Georgia	National	x	x
10	Kakalou (2014) - poster	Greece (Athens)	Sub-national	x	x
11	Ankiersztejn-Bartczak (2015)	Poland	Sub-national	x	x
12	Pokrovskaya (2014)	Russia	National	x	x
13	Kelly (2014) - poster	Russia (St. Petersburg)	Sub-national		x
14	Oliva (2014)	Spain (7 autonomous regions)	Sub-national	x	x
15	Meulbroek (2013)	Spain (Barcelona)	Sub-national	x	x
16	Delpech (2013)	UK	National	x	x
17	Fakoya (2012)	UK (London)	Sub-national		x
18	Erwin (2002)	UK (London)	Clinic-level	x	x
19	WHO (2015)		International	x	
20	Kiriazova (2013)	Ukraine (Odessa Region)	Sub-national	x	x

21	Helleberg (2013)	Sweden/Denmark	National (Denmark); Sub-national (Sweden)	x	x	
22	Yin (2014) - poster	England	National	x	x	
23	Yin (2014) - poster	England	National	x	x	
24	Ndiaye (2011)	Belgium (Brussels), Northern France (Nord Pas-de-Calais)	Sub-national	x	x	
25	Burns (2006)	UK				x
26	Burns (2007)	UK	National			x
27	Van Veen (2015)	Netherlands	Sub-national	x	x	

Defining linkage to care

There were a variety of definitions of linkage to care applied in the literature with varying specificity. Seven studies defined linkage as the time between HIV diagnosis and first CD4 count and/or viral load, with prompt linkage defined as a measurement taken 1-6 months after diagnosis. Delayed linkage was defined by Ndiaye et al.(2011) as presentation to care with advanced HIV disease and HIV diagnosis >6 months before initiation of HIV care.(5) Five studies used registration or enrolment at an HIV clinic as a marker of being linked to care, three studies attendance to an HIV specialist clinic, three first HIV consultation and one an HIV unit referral. Two studies presented a figure of linkage with no definition.

Definitions of linkage to care applied in the literature include:

- CD4 count measurement within: 28 days,(6;7) 1 month,(8;9) and/or 3 months(8-10) of diagnosis
- CD4 cell count or viral load measurement after HIV diagnosis(11) within 3 months(12)
- First HIV consultation within 4 weeks,(13) 1 month of diagnosis(14) and/or within 6 months(14;15)
- Attendance to a specialist HIV care clinic(16;17) within 72 hours of their positive rapid test result(18)
- HIV unit referral within 4 weeks (\leq 28 days)(19)
- Registration/enrolment at an HIV clinic(20-22) within 1 month of diagnosis(23)

Measurement of linkage to care

Figure 1 shows the measurements of linkage to care among adults across 11 European countries including: Belgium, Denmark, France, Georgia, Greece, Italy, the Netherlands, Poland, Russia, Spain and the United Kingdom (UK). Figure 2 shows linkage to care broken down by HIV exposure including men who have sex with men (MSM), heterosexuals and people who inject drugs (PWID).

The data cover almost three decades from 1989-2013. The majority of measurements presented in the literature relied on national HIV surveillance data

(n=11). Five studies presented data at a sub-national level, collected from a variety of settings, such as hospitals in a particular area or city; three studies collected data from a single clinic (Figure 1).

Factors associated with poor linkage to care

In the literature, a number of factors were found to be independently associated with delays in being linked into care, most prominently, a history of injecting drug use.(5;10;11;21;24) Age was also identified as key factor , though some studies found younger age to be associated with poor linkage,(6;13;15) and another found patients of older age were more likely to be poorly linked.(5) In the UK, being of non-white ethnicity was significant in delays among heterosexuals.(6) While in Belgium, non-Belgian regions of origins were associated with lower entry into care.(24)

Barriers to being linked to HIV care

Six studies identified barriers to being linked to HIV care following diagnosis in Europe, set in Albania (n=1), Russia (n=1) and the UK (n=4). In all studies, data were collected through semi-structured interviews or by questionnaire.

Barriers identified in the literature have been divided into supply and demand side barriers using a WHO analytical framework. (25) A cultural/ societal category was added to capture the barriers associated with the sensitive nature of HIV.

Supply-side barriers:

- Poor treatment infrastructure and access (26)
- Lack of open access or community clinics (27)
- Convenience and visibility of services (28)
- Appointment systems and availability (27;28)
- Government implementation of asylum seeker dispersal (28)
- Medical provider's lack of knowledge of HIV(29)
- Inability of many general practitioners to address HIV (27)
- Medical services' lack of cultural understanding (27)
- Failure to integrate care with support organizations (27)

Demand-side barriers:

- Fear of medication (14)
- Dissatisfaction with quality of services and medical staff (26)
- Concerns over confidentiality and HIV status disclosure (26;27)
- Denial and coming to terms with diagnosis (14)
- Feeling well/no symptoms (14)
- Gender (men) (27;28)
- Language (27)
- Lack of perceived risk of HIV (28)
- Lack of patient knowledge of HIV medical care (14;29)

- Lack of perceived benefit in knowledge of HIV status and potential interventions (28)
- Poverty and economic equality - accessing HIV care may not take precedence over financial, housing or childcare issues (28)
- Cost of travel (14)
- Child care (14) and lack of family facilities (27)
- Time off work (14)
- Migration (27)

Cultural/societal barriers:

- Stigma and discrimination associated with HIV (14;26;27;29)
- Harm to family relationships (26)
- Negative consequences if status became known at work (14)
- Myths associated having an HIV+ status (14)
- Cultural norms (27)

In one study by Fakoya et al, it was found that strong religious beliefs about faith and are unlikely to act as a barrier to accessing HIV care.(30)

Conclusions

There have been a number of definitions of linkage to care following HIV diagnosis applied in the literature from Europe. The majority of studies rely on laboratory data on the dates of biomarker testing, which despite being relatively reliable, may not always accurately reflect the date when a patient is integrated into HIV specialist care.

The variety of settings, time periods, populations and definitions utilised, makes it difficult to compare measurements between countries and studies. A standard definition of linkage to care is necessary to ensure consistent assessment of quality of HIV care and clinical outcomes. The OptTEST project, in collaboration with the European Centre for Disease Prevention (ECDC), is hosting a workshop/expert meeting in Stockholm on the 8-9th September 2015 with an aim to develop such a standard definition for defining and measuring linkage to care for surveillance and monitoring purposes.

There was limited research focusing on barriers to patients being linked to care following diagnosis, with the vast majority being single-site studies from the UK. These are not necessarily generalizable to other European countries as barriers are often a product of a country's cultural, political and social environment. More work should be done to investigate barriers to entering HIV care in Europe, particularly among vulnerable populations and across a variety of settings. Understanding these barriers will identify areas for improvement within existing clinical care pathways and strengthen support for patients newly diagnosed with HIV.

Figure 1: Measurements of linkage to care among adults: Europe

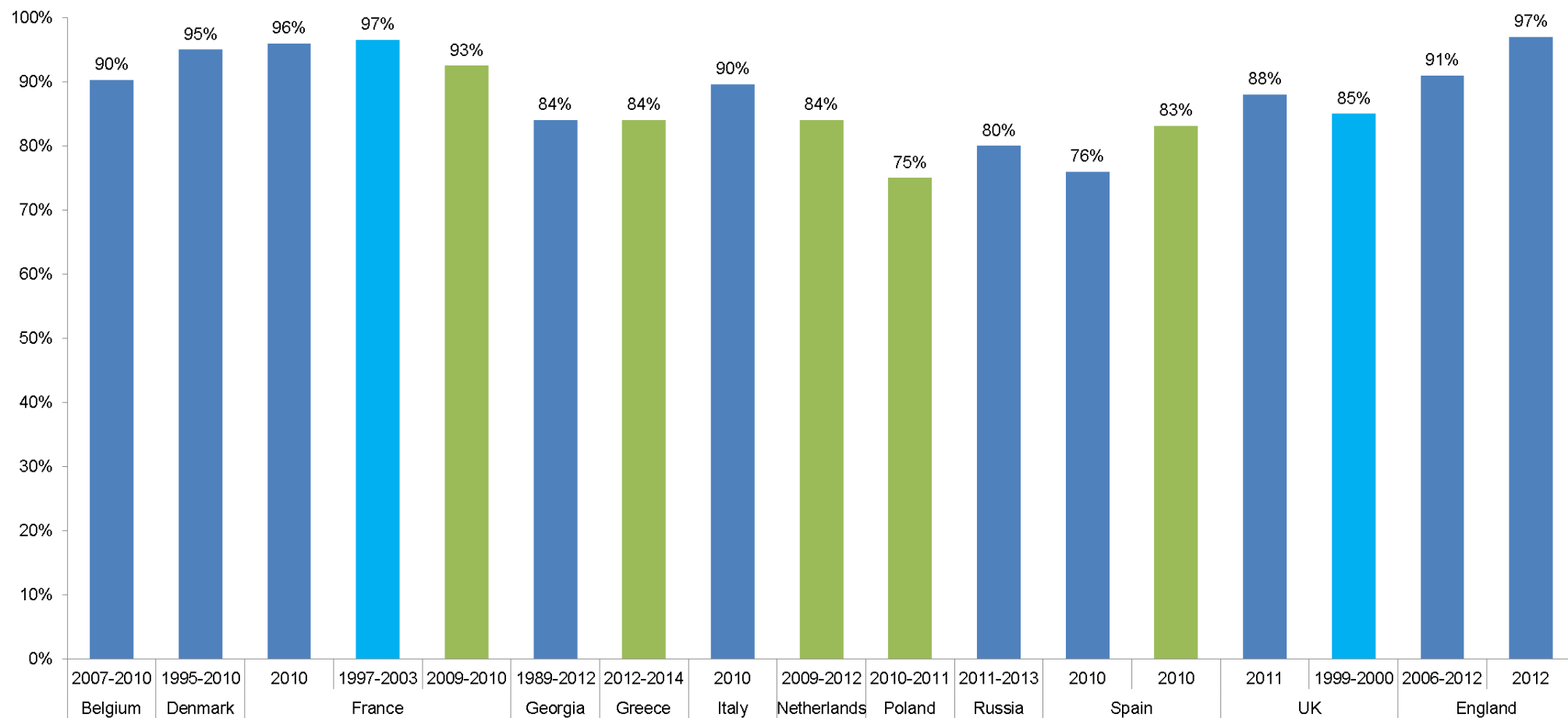
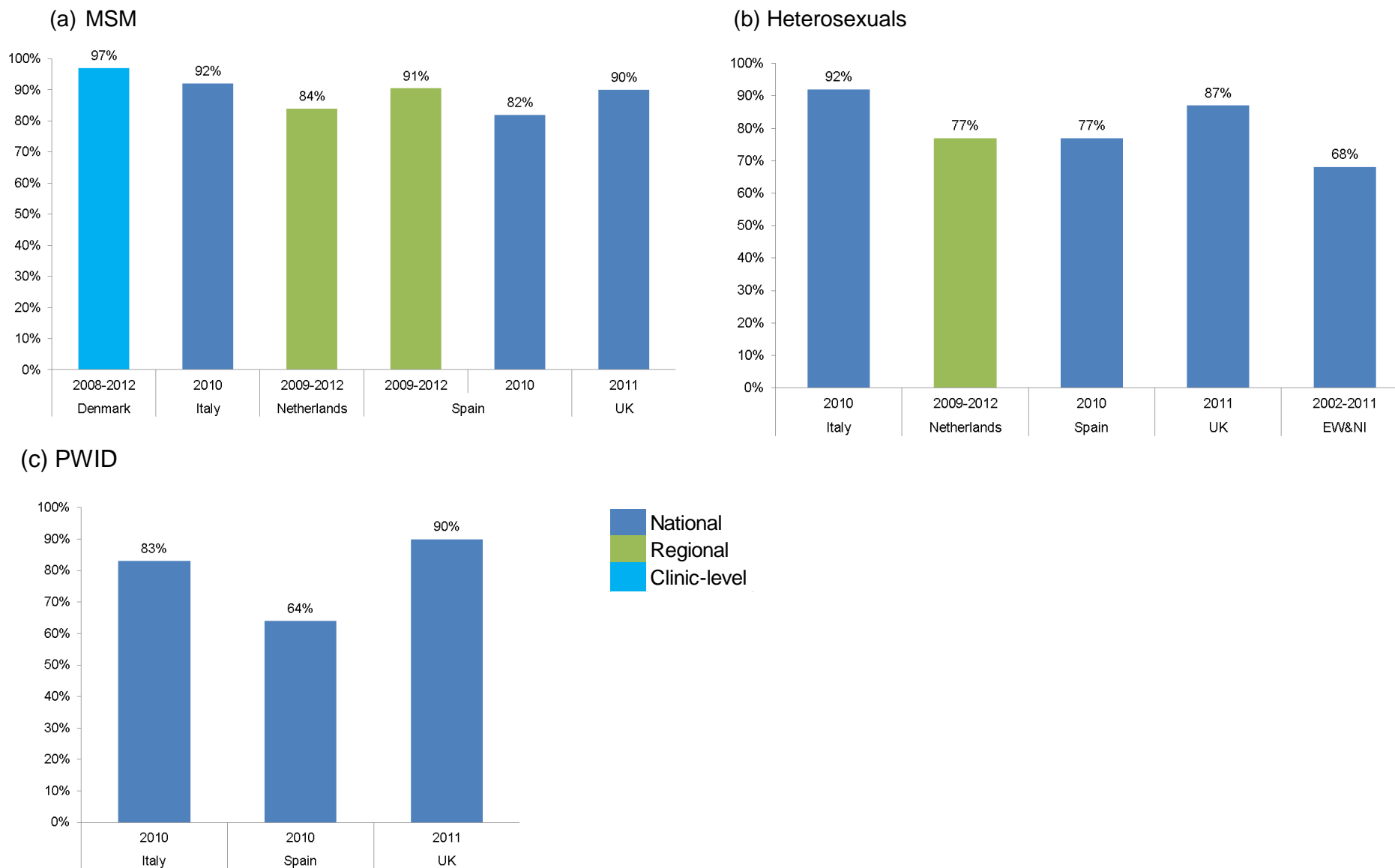


Figure 2: Measurements of linkage to care by HIV exposure: Europe



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Appendix 1

Terms	Results on PubMed
"HIV" + "linkage into care"	642
"HIV" + "link to care"	390
"HIV" + "entry into care"	651
"HIV" + "enrolment in care"	586
"HIV" + "treatment cascade"	27
"integration into HIV care"	838
"HIV" + "continuum of care"	725
"newly diagnosed HIV care"	736
"barriers to linkage to HIV care"	90
"barriers to entry to HIV care"	55
"HIV" + "barriers to care"	2099

Appendix 2

#	Author	Year of study	Country	Setting	Population	Data source	Study Design	Definitions	Indicators	Barriers to linkage	Barriers to access/retention
1	Chkharti shvili (2014)	January 1989 - June 2012	Georgia	National	All adult (age ≥ 18 years) HIV-infected patients diagnosed in Georgia (N=3295)	Routine surveillance data	Cohort	<u>HIV diagnosis</u> : a positive HIV test result obtained by any method and confirmed by a positive western blot or nucleic acid-based test	2545 (52%)		
								<u>Linkage into care</u> : at least one documented clinical visit (CD4 cell count or HIV-1 viral load measurement) after HIV diagnosis.	2135 (84%)		
								<u>Retention in care</u> : at least one documented clinical visit (CD4 cell count or HIV-1 viral load measurement) within 12 months prior to the date of censoring	1847 (73%)		
								<u>Eligible for ART</u> : a CD4 count < 350cells/μL or the presence of an AIDS-defining illness	1446		
								<u>On ART</u> : at least one documented prescription (of more than three drugs) refill within 3 months prior to the date of censoring	1273 (88%)		
								<u>Viral suppression</u> : a plasma HIV RNA level < 400 HIV-1 RNA copies/mL at the most recent measurement	985 (77%)		
2	Hall (2013)	2009 or 2010 data (most recent available)	Australia, Canada, France, Italy, Spain, and the United States	National	HIV-infected people diagnosed in 2009 or 2010 in the study countries	Routine surveillance data	Cohort	<u>Late diagnosis 1</u> : late diagnosis as a CD4,200 cells/mL or presence of an opportunistic illness within 3 months of diagnosis among people newly diagnosed with HIV	A: 18.8% (N=1051), C: 8.8% (N=1472), F: 15.3% (N=6265), I: 14.5% (N=3839); U: 28.7% (43130)		
								<u>Late diagnosis 2</u> : percentage of people who had an HIV diagnosis within 12 months before AIDS diagnosis	A: 65.6% (N=123), C: 64% (N=247), F: 64.5% (N=1613), I: 62.9% (N=1102); S: 56.7% (N=930); U: 53.3% (N=26599)		
								<u>Linkage to care</u> : ≥1 CD4 or viral load test within 3 months of diagnosis	A: 89.8% (N=1054), C: 72.6% (N=976), I: 89.6% (N=3245); S: 76.0% (N=1519); U: 80.3% (N=6674)		

3	Qvist (2014)	2008-2012	Denmark (Copenhagen)	Clinic-level	MSM attending Checkpoint (N=3012 tested, 37 HIV diagnoses)	Checkpoint: a community-based Walk-in Clinic and a Mobile Test Unit and 2 Copenhagen HIV care centres	Cohort	Linkage to care: attendance at an HIV outpatient care clinic	36 (97%)		
4	Oliva (2014)	2010	Spain (7 autonomous regions)	Regional	HIV-infected people diagnosed in 2010 in Spain (N=1769)	Routine surveillance data	Cohort	Linkage to care: at least one documented CD4 cell count after HIV diagnosis. Timely linkage to care: CD4 count taken within 3 months of diagnosis	83.1% (N=1769) 75.7%		
5	Meulbroek (2013)	2007-2012	Spain (Barcelona)	Regional	MSM attending BCN Checkpoint (N=144453 tested, 618 HIV positive)	BCN Checkpoint: MSM community based centre	Cohort	Linkage to care: the proportion of newly diagnosed individuals successfully linked to medical care Successful linkage to care: an HIV unit referral within 4 weeks (\leq 28 days)	2009-2012: 90.5% (N=495) 85%		
6	Delpech (2013)	2011	UK	National	HIV-diagnosed adults (\geq 15 years of age) in 2011 (N=6219)	Routine surveillance data	Cohort	Late HIV diagnosis: diagnosis with a CD4 count < 350 cells/ μ L reported within 3 months of diagnosis in 2011 Linkage to care: proportions of adults diagnosed in 2011 with a CD4 test reported within 1 and 3 months of HIV diagnosis. Patients with no CD4 count reported within 12 months of HIV diagnosis were excluded. Retention in care: proportion of patients diagnosed in 2010 seen again for HIV care in 2011. Patients who died were excluded from the analyses as were those diagnosed in Scotland Treatment coverage: proportion of patients diagnosed late in 2010 on treatment a year later One-year mortality: death within 1 year of HIV diagnosis	49% (N=4910) 88% in 1 month, 97% in 3 months (N=5087) 85% (N=5833) 92% (N=2264) 31.6 per 1000 population (199 deaths / 6299 diagnosed in 2010)		
8	Kelly (2014) - poster		Russia (St. Petersburg)	Regional	People diagnosed with HIV in St. Petersburg who had never been in HIV medical care, had previously been out of care, or had	Qualitative interviews	Interview			Medical service barriers were poor treatment infrastructure conditions and access; dissatisfaction with quality of services and medical staff; and concerns over confidentiality and HIV status disclosure	

					always been in care (N=80)						Social barriers were fears of potential harm to family relationships, negative consequences if status became known at work, and public stigmatization and myths associated having an HIV+ status
9	Kakalou (2014) - poster	Aug 2012 - Mar 2014	Greece (Athens)	Regional	People attending mobile testing units of the NGO PRAKSIS in community sites (N=117 tested, 108 HIV positive)	Mobile testing pilot (NGO PRAKSIS)	Cohort	<u>Linkage to care:</u> enrolment in HIV care	84% (N=100)		
								<u>Retention in care:</u> the proportion that remained in care for three months after the end of the project	77% (N=84)		
								<u>Treatment coverage:</u> proportion of patients with a CD4 count <350 on treatment	77.7% (N=54)		
10	Casalino (2012)	2009-2010	France (Paris)	Regional emergency departments	Persons 18 to 70 years old presenting at emergency departments who did not present for a vital emergency, for blood or sexual HIV exposure, or for HIV screening. HIV serostatus had to be unknown or the patient had negative HIV serology dating back more than 6 months (N=183 957, 7215 tested, 41 newly diagnosed)	Emergency departments	Cohort	<u>Linkage into care:</u> attendance to a specialist HIV appointment organized for patients, within 72 hours of their positive rapid test result	92.5% (N=48)		
								<u>Retention in care:</u> Not lost to follow-up at month 6	76% (N=44)		
11	Rice (2014)	1992-2011	EW&NI	National	Heterosexual adults (≥15 years) in England, Wales, and Northern Ireland (E,W&NI) newly diagnosed as having HIV between 1992 and 2011 (N=50791), or seen for HIV care in 2011	Routine surveillance data	Cohort	<u>Late HIV diagnosis:</u> having a CD4 cell count less than 350 cells/mm3 at diagnosis (only those who had a CD4 cell count measured within 91 days of diagnosis could be classified)	2002-2011: 64% (N=31072) were diagnosed late (66% in 2002 (N=3907) to 61% in 2011 (N=2631))		
								<u>Prompt linkage into care:</u> having a CD4 cell count measured within 28 days of HIV diagnosis	2002-2011: 68% (n=26003) (61.2% (n=2391) in 2002 to 77.8% (n=2048) in 2011)		
								<u>Short-term mortality:</u> death from any cause within 1 year of HIV diagnosis	2002-2011: 2.9% (n=1102); 3.0% (n=116) in 2002 to 1.5% (n=40) in 2011)		
								<u>Uptake of ART:</u> being in receipt of treatment within 1 year of HIV diagnosis.	2002-2011: 49.8% (n=19040) (45.2% (n=1766)		

									in 2002 to 51.9% (n=1366) in 2011)		
15	Fakoya (2012)	Apr 2004 - Feb 2006	UK (London)	Regional	HIV-positive adults (aged 18 years and older) born/raised in Africa (regardless of racial/ethnic group) newly diagnosed with HIV in the preceding year and attending one of 15 HIV treatment centres across London (N=710 eligible; 584 approached; 352 agreed to participate; 246 questionnaires included in analysis)	Study of Newly Diagnosed HIV Infection among Africans in London (SONHIA)	Cohort		No relationship between religiousness (as measured using frequency of attendance at religious services and religious attitudes or beliefs) and late diagnosis, changes in CD4 count/viral load 6 months post diagnosis, or initiation of ART.	Strong religious beliefs about faith and healing are unlikely to act as a barrier to accessing HIV testing or antiretroviral treatment for Black Africans living in London.	
16	Supervie (2013) - presentation	2010	France	National	HIV-infected persons in 2010 (N=149900)	Routine surveillance data (French health insurance scheme, FHDH-ANRS-CO4 cohort)	Cohort	<u>Undiagnosed HIV-infected individuals:</u> HIV surveillance data and a new back-calculation model 149900 (100%) <u>HIV-infected individuals diagnosed but not yet in care:</u> estimated number of undiagnosed HIV-infected individuals and the proportion of individuals who knew their HIV status for more than 3 months among individuals newly enrolled in care 121100 (81%) <u>HIV-infected individuals in care:</u> number of individuals having long-term disease agreement for HIV (LTD7) in the French health insurance scheme 111500 (74%) <u>On cART:</u> HIV-infected individuals (FHDH-ANRS-CO4 cohort) receiving cART >6 months 90100 (60%) <u>Viral suppression:</u> HIV-infected individuals in care with a viral load <50 copies/mL 77400 (52%) <u>Access to care:</u> in care within 6 months in France >96% <u>Retention in care:</u> having a CD4 measurement at least every 6 months 94%			
17	Pokrovskaya (2014)	2011-2013	Russia	National	HIV-positive persons in care in Russia (N=668032)	Routine surveillance data (Federal AIDS Centre)	Cohort	<u>HIV infected:</u> estimated 1363330 (100%) <u>HIV diagnosed:</u> Positive result for HIV antibodies confirmed by Western Blot 668032 (49%) - loss 51% <u>Linked to HIV care:</u> at least one visit to the AIDS centre after HIV diagnosis 516403 (39%) - loss 23%			

						database and from the national monitoring forms of Rospotrebnadzor)		<u>Retained in HIV care:</u> at least one visit to HIV-related physician within the calendar year <u>Need ART:</u> ART-initiation criteria according to Russian guidelines <u>On ART:</u> prescribed at least three antiretroviral drugs <u>Virally suppressed:</u> HIV RNA <1000 copies/ml during 12 months on ART	481783 (35%) - loss 7% 163822 (12%) - loss 66% 156858 (11%) - loss 4% 127064 (9%) - loss 19%		
18	Suzan-Monti (2011)	1982-2003	France	Clinic-level	HIV positive outpatients enrolled into the VESPA study (N=2932)	VESPA survey	Cohort	<u>Delayed linkage to care:</u> proportion of patients waiting ≥6 months for their first post-diagnosis HIV consultation	30.6% (N=840) diagnosed 1982-1989; 11.9% (N=1132) diagnosed 1990-1996; 3.5% (N=945) diagnosed 1997-2003		
20	Erwin (2002)	July 1999 - March 2000	UK (London)	Clinic-level	All HIV positive patients attending an HIV outpatient clinic in South London between July 1999 and March 2000 (N=392)	St. Thomas clinic questionnaire data	Cross-sectional	<u>Use of clinic services:</u> proportion of patients receiving HIV care within 1 month of diagnosis; within 6 months	1 month: 67% black Africans / 78% white; 6 months: 85% all patients	Reasons for the delay to linkage to care (black Africans) which included denial, coming to terms with diagnosis, not knowing where to go, feeling well/no symptoms, stigma and discrimination associated with HIV, and fear of medication. 42% Black Africans reported cost of	

										travel as a barrier to coming to clinic (vs. 2% white). Other barriers: child care, time off work	
2 1	Ankiersz tejn-Bartczak (2015)	2010-2011	Poland	Regional	All patients diagnosed HIV positive in community-based voluntary counselling and testing centres in the region (N=110)	Test and Keep in Care (TAK) project	Cohort	<u>Lost to care:</u> no registration at an HIV clinic following diagnosis.	42% (n=47) - 7 did not collect ELISA test results (uninformed of HIV status), 13 did not collect Western Blot confirmatory results, 7 did not agree to WB decoding - prevented future registration in an HIV clinic, 20 did not register at any HIV clinic		
								<u>Prompt linkage into care:</u> registration at an HIV clinic within 1 month of diagnosis	75% (N=63)		
2 2	Morrison (2011)	June-August 2009	Albania	Clinic-level	HIV-positive patients (≥18 years old) attending for HIV care in University Hospital Centre of Tirana (UHCT) - HIV/AIDS Ambulatory Clinic in 2009 (N=79)	Semi-structured interviews (UHCT - HIV/AIDS Ambulatory Clinic)	Cross-sectional			Barriers to care associated with social stigma (97.4%), lack of knowledge of HIV medical care (76.6%), and medical provider's lack of knowledge of HIV (70.9%). Social needs of the patients were also overwhelmingly unmet (90.0-95.7%).	
2 3	Van Beckhoven (2014) - poster	2007-2010	Belgium	National	Individuals diagnosed with HIV between 2007 and 2010 in Belgium	Routine surveillance data	Cohort	Diagnosed with HIV in Belgium between 2007 and 2010	100% (N=4038)		
								Linked to HIV care	90.3% (N=4038)		
								<u>Retained in HIV care:</u> seen for care in 2010 and again the following year	90.8 % (N=11684)		

								On ART	88.3% (N=11684)		
								<u>Suppressed VL</u> : VL <500 copies/ml and on treatment	95.3% (N=10317)		
2 5	WHO (2015)			International		Guidance		<u>Linkage to HIV care</u> : duration of time starting with HIV diagnosis and ending with the enrolment in HIV care or treatment. <u>Enrolment in HIV care</u> : begins when a person with HIV presents to the facility where HIV care is provided and a patient file or chart is opened. WHO recommends that all patients be enrolled in HIV care at their first facility visit following an HIV-positive diagnosis (which may take place on the same day as the HIV diagnosis). <u>Retention in HIV care</u> : describes when a patient who is enrolled in HIV care routinely attends these services, as appropriate to the need. This excludes people who have died or were lost to follow-up. <u>Lost to follow-up (LFU)</u> : Three months or more (90 days or more) since last missed appointment.			
2 6	Kiriazov a (2013)	1995-2010	Ukraine (Odessa Region)	Regional	Patients (aged ≥ 15 years) enrolled in HIV medical care at the Regional AIDS Center in Odessa Region, Ukraine from 1995 to 2010 (N=15434)	Clinical medical records	Cross- sectional	<u>Linkage to care</u> : elapsed time (days) between the dates of HIV diagnosis and enrolment in HIV care	1995-2010: PLHIV-IDU mean 687 days; PLHIV-sexual transmission: 376 days, 2010: 1140 days; 336 days		
2 8	Helleber g (2013)	1995-2010	Sweden/Den mark	National (Denmark); Regional (Sweden)	HIV patients who were ≥18 years of age when diagnosed and treated in Denmark or at one of the three largest HIV centres in Sweden (Karolinska, South Hospital, Sahlgrenska and Malmö) between 1 January 1995 and 1 September 2010. (N=10136)	Danish HIV Cohort Study / Swedish HIV Cohort Study	Cohort	<u>Linkage to care</u> : The number of patients enrolled in the Danish HIV Cohort Study, who were diagnosed from 1995 to 2010 of those newly diagnosed in the same time period (surveillance data) <u>Retention in care</u> : individual had visited an HIV care centre and/or undergone measurement of VL or CD4 count within 13 months before 1 July 2010.	95% (N=5519) Median time from HIV diagnosis to first visit in an HIV care centre was 14 days (IQR 2-40). (Denmark) 88% (N=5519) (93% of those linked); 73% (N=5519) had initiated HAART (83% of those retained). (Denmark only)		

								<u>Viral suppression:</u> VL <500 copies/mL at the last measurement	70% (N=5519) (Denmark only)		
3 1	Yin (2014) - poster	2006-2012	England	National	All adults (aged 15 years +) diagnosed between 2006 – 2012 in England with a CD4 count reported (N=37825)	Routine surveillance data	Cohort	<u>Prompt baseline assessment:</u> CD4 count within 28 days of diagnosis	80% (89% had a prompt assessment in 2012 compared to 70% in 2006)		
								<u>Delayed baseline assessment:</u> CD4 count between 29 – 91 days of diagnosis	11%		
3 2	Yin (2014) - poster	2012	England	National	Adults aged >15 years newly diagnosed with HIV in England in 2012 (N=4820) and adults seen for care at NHS HIV services in 2012 (N=71,023)	Routine surveillance data	Cohort	<u>Late/very late diagnosis:</u> CD4 count <350 cells/mm ³ / <u><200 cells/mm³</u> at diagnosis	47%		
								<u>Promptly linked to care:</u> CD4 taken with 1 month / 3 months of diagnosis	89% / 97%		
								<u>Retention in care among newly diagnosed adults:</u> newly diagnosed adults retained in HIV care after one year of diagnosis	85%		
								<u>Annual retention in all adults:</u> adults in care in 2011 were also seen for care in 2012	95%		
								<u>Antiretroviral therapy coverage among those with CD4 <350:</u> with a CD4<350 receiving ART.	89%		
								<u>Viral load suppression 1 year after start of treatment:</u> VL suppression (VL<50 copies/mL/ VL <200 copies/mL) after one year of treatment	88% / 95%		
<u>Immunological response after 1 year:</u> optimal immunological response (CD4>350/200) after one year in care, regardless of treatment	85% / 95%										
3 3	Ndiaye (2011)	1997-2007	Belgium (Brussels), Northern France (Nord Pas-de-Calais)	Regional	Patients enrolled in five clinical centres who were confirmed to be HIV-infected by Western Blot, were >18 years of age, had more than one follow-up consultation after their initial visit and gave informed consent. Diagnosed in Brussels (Belgium) and Northern France from January 1997 to December 2007 (N=1819)	Standardised questionnaire for clinic attendances	Cohort	<u>Advanced HIV disease:</u> CD4 count <200/mm ³ or clinically-defined AIDS at study inclusion	31.3% (N=1819)		
								<u>Late testing:</u> presentation to care with advanced HIV disease and HIV diagnosis ≤6 months before initiation of HIV care	83.3% (N=570)		
								<u>Delayed presentation to care:</u> presentation to care with advanced HIV disease and HIV diagnosis >6 months before initiation of HIV care	16.7% (N=570)		

3 5	Burns (2006)		UK	National	African communities within Britain					Patients must appreciate either a transmission risk or a change in health status to first access healthcare. Lack of perceived risk of HIV, or lack of perceived benefit in knowledge of HIV status and potential interventions, may contribute to poor accessing of HIV care in Britain. Availability of appointments, convenience, and visibility of services. Structural and social forces including poverty, gender and economic inequality, political violence, and racism. Accessing HIV care may not take precedence over financial, housing or childcare issues. Government implementation of asylum seeker dispersal may impact on HIV presentation and prevention measures.
3 6	Burns (2007)		UK	National	Informants with experience of working with African communities affected by HIV in a variety of settings (N=11)	Semi- structured interviews	Cross- sectional			High HIV awareness but this did not translate into perception of individual risk. Home country experience and community mobilization was highly influential on HIV awareness, appreciation of risk, and attitudes to health services. Institutional barriers to care exist; these include lack of cultural understanding, lack of open access or community clinics, failure to integrate care with support organizations, and the inability of many GPs to address HIV effectively. HIV-related stigma and fear of discrimination, confidentiality, migration, cultural norms, gender (men), language ,lack of family facilities, appointment systems
3 7	van Veen (2015)	2009-2012	Netherlands (Amsterdam, Rotterdam and Arnhem)	Regional	All patients testing newly HIV-positive at the STI clinics in Amsterdam, Rotterdam and Arnhem giving consent to be included (N=310)	Routine surveillance data	Cohort	<u>Linkage to care</u> : those linked to the HMF (Dutch HIV monitoring framework) database	84% (N=310); MSM (84% (N=279)); Hets (77% (N=31))	

								<p><u>Delayed linkage to care:</u> a time period of over 4 weeks between confirmed HIV diagnosis and first consultation at an HIV treatment centre according to the HMF database</p>	<p>69% (N=310); MSM 69.5% (N=279); Hets (67.7% (N=31))</p>		
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Co-funded by the 2nd Health Programme of the European Union

