

# Barriers and facilitators to HIV testing in people age 50 and above: a systematic review

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## ABSTRACT

Approximately 13% of people living with HIV in the UK are unaware of their infection. New diagnoses among people  $\geq 50$  years is increasing. Unique factors may be associated with testing in this group. This systematic review aims to identify patient and clinician-related barriers/facilitators to HIV testing in people aged  $\geq 50$  years. A systematic electronic search was conducted. Papers were assessed for eligibility and data from eligible studies were extracted. Barriers/facilitators were grouped, and the number of times they were reported was noted. Because of considerable heterogeneity, a narrative approach has been undertaken to synthesise data. In total, 17 studies were included. Main barriers to testing were low perceived risk and clinicians' preconceptions about older people. Main facilitators were regular use of healthcare services or being offered/encouraged to test by a healthcare provider. Although being encouraged to test was a common facilitator, clinicians' preconceptions about older people was the biggest barrier. This shows a divide between clinicians' preconceptions and patients' expectations, which may impact on testing rates. This review is an important first step in identifying potential barriers/facilitators for further study or to be addressed in the design of future interventions.

**KEYWORDS:** Barriers, facilitators, HIV testing, older age, systematic review

## Introduction

Effective treatment has transformed HIV into a manageable long-term condition. Despite advances in treatment, approximately 13% (95% CI 10–17%) of people living with HIV in the UK are unaware of their infection.<sup>1</sup> Most new transmissions occur from someone who is unaware of their HIV infection;<sup>2</sup> therefore, improving testing and reducing undiagnosed HIV is key to improving treatment outcomes and reducing onward transmission.

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Although overall rates of new HIV diagnoses in the UK are decreasing, the number of older people (age  $\geq 50$  years) newly diagnosed with HIV in the UK is increasing.<sup>3</sup> Furthermore, people diagnosed with HIV aged  $\geq 50$  years are much more likely to be diagnosed late (with a CD4 count of  $< 350$  cell/mL or presenting with an AIDS defining event)<sup>4</sup> and continue to be disproportionately affected by late diagnosis (LD).<sup>5</sup> LD has significant implications for patients and health services in terms of poorer health outcomes and increased healthcare costs, both of which are increased in older age. Further, older people experience a faster clinical decline than someone younger.<sup>6</sup>

The high rate of LD in older people suggests unique factors may be associated with testing for HIV in this group. HIV testing guidelines suggest testing in general practice and in all general medical admissions where the HIV prevalence is high ( $> 2$  per 1000).<sup>7,8</sup> However, despite varied testing initiatives – such as routine testing in primary and secondary care, community outreach programmes and home sampling<sup>9</sup> – increasing rates of LD suggest the older population are not routinely testing for HIV. Although adults remain sexually active into older age, preconceptions about a lack of sex in this group may impact on test offer rate. One UK study in a high prevalence area found that although uptake of HIV tests was high among patients admitted to hospital ( $> 90\%$ ), older people were less likely to be offered a test by a clinician. This may partly explain the continued rise in LD among older people despite a significant proportion having seen a healthcare provider (HCP) shortly before their diagnosis.<sup>10</sup> This systematic review aims to specifically identify patient and clinician-related factors associated with HIV testing in people aged  $\geq 50$  years.

## Methods

A systematic electronic search was conducted on 7 April 2016 using MEDLINE, Embase, PsychINFO, CINAHL and the Cochrane library; relevant conference abstracts were also searched. Search terms can be found in Table 1.

All retrieved articles were exported to Endnote, de-duplicated and tabulated in Excel for abstract review. Two reviewers independently reviewed abstracts to identify studies potentially meeting the inclusion criteria (Box 1). Any study published before 1997 was excluded because we felt that attitudes towards testing would be significantly different in the pre-therapy era when an HIV diagnosis would have meant a significantly poorer outcome. Any disagreement was solved through

**Table 1. Search terms**

HIV	Advanc* adj3 age*	Barrier* adj3 HIV
	Advanc* adj3 year*	Facilitat* adj3 HIV
	Age* adj2 (50* OR fifty)	Facilitat* adj2 factor*
	Ageing	Test* adj3 barrier*
	Aging	Late* diagnos*
	Middle age*	Diagnos* late*
	Elderly	Delay* diagnos*
	Geriatric	
	Increas* age*	
	Mature	
	Old* age	
	Old* adult*	
	Old* cohort*	
	Old* people	
	Old* person*	
	Senior	
	over adj2 (50* OR fifty)	

Note: terms within columns were combined with 'OR', terms between columns were then combined with 'AND' – ie papers were identified if the title/abstract/keywords contained at least one term from each column.

discussion. Full text of potentially eligible studies was retrieved and assessed further for eligibility.

Once relevant articles had been identified, reference and citation searching were conducted to identify any additional articles. Data from all eligible studies were independently extracted by two reviewers and tabulated in Excel from published reports. Factors associated with HIV testing reported by each study were also independently extracted and tabulated. Thematic analysis was conducted to identify systematically recurring themes/factors across the studies. Significant heterogeneity meant a narrative approach was used to synthesise data in order to identify factors associated with testing. Although an estimation of effect size was not investigated, number of times each factor was reported was noted as a way of identifying repeatedly recurring factors.

Data were then assessed for study quality by two reviewers using the standardised Critical Appraisal Skills Programme (CASP) tools. This consisted of 10 criteria each rated as met (scored 1) or not met/can't tell (scored 0). Scores were summed for each paper and they were graded as high quality (score = 9–10), moderate quality (score = 5–8) or low quality (score = 1–4). Any disagreement was solved through discussion.

### Box 1. Inclusion criteria

1. Articles published since 1 January 1997
2. Studies describing barriers and facilitators to HIV testing
3. Analysis in adults age  $\geq 50$  years
4. Published in the English language
5. Published papers/reports and conference abstracts
6. Studies utilising any study design

## Results

Electronic database searching identified 1,752 potentially relevant papers. After removal of duplicates ( $n=655$ ), 1,097 were subjected to abstract review, of which 204 met the eligibility criteria (Box 1). Full text review was conducted, resulting in 14 eligible papers being included in the review. Reference and citation searching of eligible papers yielded a further three papers to be included (Fig 1).

The majority of included studies were conducted in the USA ( $n=14$ ), with the remainder conducted in the UK ( $n=1$ ), Brazil ( $n=1$ ) and Uganda ( $n=1$ ) (Table 2). Studies were mainly descriptive and data were both qualitative and quantitative using a range of methodologies. Sample sizes ranged from 11 to  $>143,000$ . Studies tended to include a greater proportion of men although three studies were conducted solely in women.<sup>11–13</sup>

Study quality ranged from 2 to 10 (Table 3). Of the 17 included studies, two (12%) were good quality and 12 (71%) moderate quality. Included quantitative studies lacked information on whether potential confounding factors were identified and taken into account, and whether participants were recruited in an acceptable way to avoid selection bias. Included qualitative studies lacked detail on the methodology used and reported little information on the interaction between the researcher and participants, including how this interaction may affect bias. Three studies (18%) were low quality.

Percentage uptake of HIV testing was reported in nine studies. Three studies reported testing rates over the previous 12 months – ranging from 3–56%. Seven studies looked at whether participants had ever had an HIV test, which ranged from 25–77%. One study investigated length of time since last test and found that of those who had reported a previous test, 70% had last tested  $>5$  years before. Several factors associated with a decision to test for HIV in older people were identified (Table 4). Patient and clinician factors were separated into perceptual and practical factors as suggested in the perceptions and practicalities approach.<sup>14</sup>

### Perceptual factors

#### *Patient-related factors associated with testing for HIV*

Three studies found HIV testing to be associated with high perceived risk of HIV.<sup>15–17</sup> Conversely, one study<sup>11</sup> reported low perceived risk as a factor associated with testing. HIV knowledge/awareness was another commonly reported factor, described in four studies: one found people with higher HIV knowledge scores were significantly more likely to have tested for HIV<sup>12</sup> and three found having greater awareness of HIV or knowing someone with AIDS or tuberculosis was associated with testing.<sup>13,15,17</sup> Two questionnaire-based studies found testing was significantly associated with reporting high-risk behaviours.<sup>18,19</sup> Similarly, testing to protect a partner or because a partner was HIV-positive or at high-risk were also reported as associated with testing for HIV in studies using qualitative interviews, survey or case note review.<sup>12,17,20</sup>

Two studies<sup>12,17</sup> reported testing because of 'curiosity' – for example to eliminate uncertainty about status.<sup>12</sup> Experiencing symptoms attributed to HIV was related to testing emerging from qualitative studies<sup>17,21</sup> and perceived

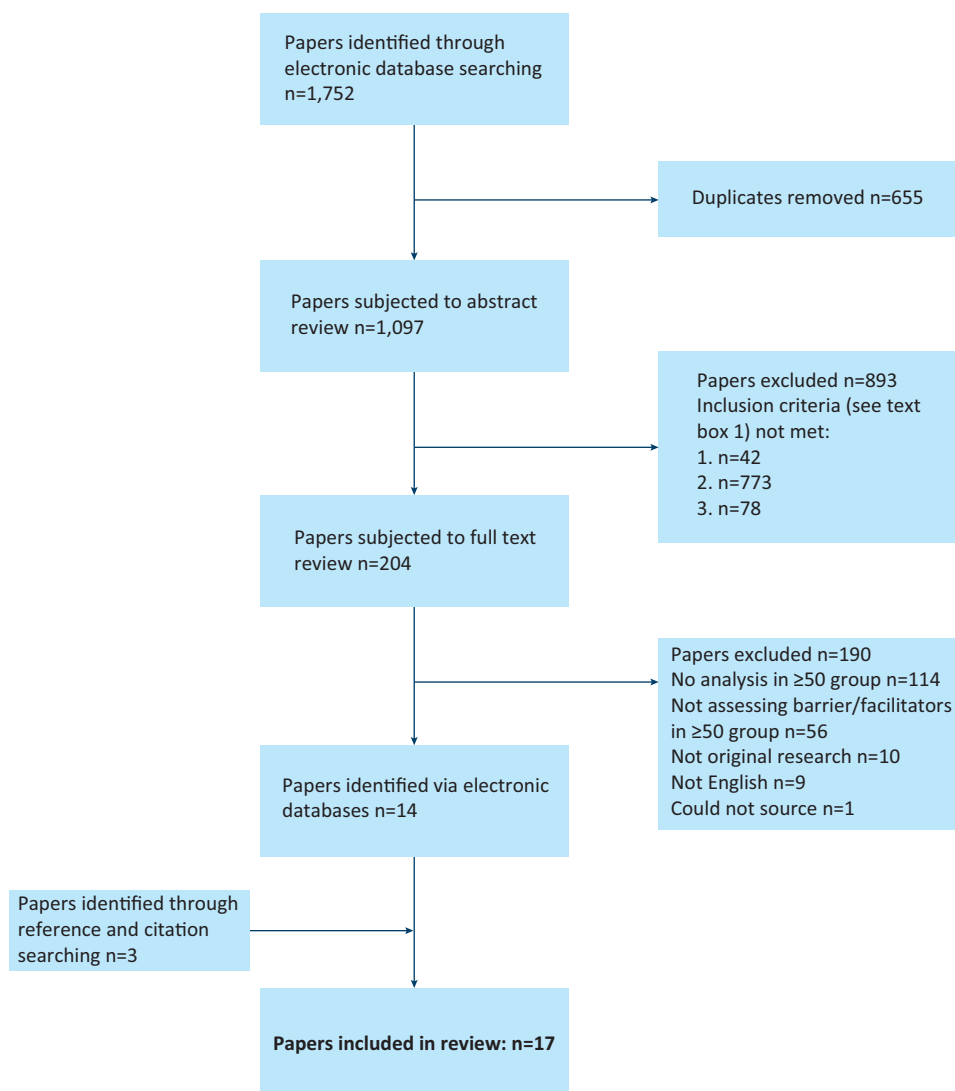


Fig 1. Study selection process.

poorer health status was also reported as a factor associated with testing.<sup>22</sup> Further, belief in AIDS-related conspiracy theories was found to be a factor associated with testing in one study from the USA.<sup>19</sup>

#### Patient-related factors associated with not testing for HIV

Five studies reported low perceived risk to be associated with not testing for HIV.<sup>12,13,15,17,23</sup> This included the perception HIV was a young person's disease or not feeling part of a high-risk group.<sup>17</sup> Two qualitative studies found not having symptoms or not attributing symptoms to HIV was associated with not testing.<sup>17,21</sup> Stigma either relating to HIV or being older with HIV was reported by two studies.<sup>17,24</sup> The same studies also reported fear of a positive result as a barrier to testing. Other factors, reported once, included government mistrust<sup>19</sup> and hopelessness associated with a lack of treatment.<sup>17</sup>

#### Clinician-related factors associated with not testing for HIV

Three studies using surveys or qualitative methods reported preconceived ideas about older people as a barrier to offering

an HIV test to an older person. This included the perception that older people lack understanding regarding HIV,<sup>25</sup> that they are at less risk<sup>16,26</sup> or that they are not comfortable discussing sexuality.<sup>16</sup> Similarly, HCPs feeling uncomfortable with risk factor questioning or addressing risk of older people was reported by two studies.<sup>25,26</sup>

#### Practical factors

##### Patient-related factors associated with testing for HIV

The most commonly reported practical factor associated with testing for HIV was regular use of healthcare services, reported by eight studies.<sup>15,16,18,20,23,26–28</sup> This included having a usual source of care,<sup>23,27</sup> having seen a clinician within the last year,<sup>18</sup> testing during hospitalisation,<sup>26–28</sup> as part of a routine health screen,<sup>16,28</sup> sexual health screen<sup>20</sup> or because of blood donation.<sup>28</sup> Further, being offered/encouraged to test by a HCP was reported by three studies using survey<sup>13,28</sup> or qualitative methodologies.<sup>17</sup> Similarly, experiencing physical symptoms was associated with a

Table 2. Study characteristics

Author, year	Study design	Country	Sample size	Sample characteristics	Testing rates	Practical factors associated with test	Perceptual factors associated with test	Practical factors associated with non-test	Perceptual factors associated with non-test
Ford, 2015 <sup>18</sup>	Cross-sectional analysis from survey data	USA	143,247	Age range 50–64 years 52% female 77% white	3% had tested for HIV in the previous 12 months	Saw doctor in the last year; high reported risk behaviours			
Ford, 2013 <sup>19</sup>	Cross-sectional analysis from survey data	USA	226	Age range 50–85 years, mean age 56.1 years (SD = 5.1) 64.6% male 46.5% Hispanic, 25.2% non-Hispanic black, 18.1% non-Hispanic white, 10.2% other	55% tested within previous 12 months; 26.5% never tested for HIV	Recent reported IVDU; having health insurance	Beliefs in AIDS-related conspiracy theories		Government mistrust
Iyer, 2011 <sup>25</sup>	Cross-sectional, questionnaire based survey of physicians	USA	47 complete questionnaires	Physicians were asked about testing in adults age > 65 years; physicians 66% male	Not reported			Lack of time; lacking information about HIV	Physicians uncomfortable with risk factor questioning; clinicians perceived patients to lack understanding
Lekas, 2005 <sup>17</sup>	Cross sectional, retrospective, qualitative, interview-based study	USA	35	Age range 52–68 years; mean age 59.8 years (SD=4.9) 71% male 40% African American, 46% white, 14% Puerto Rican	Not reported	Gay/bisexual men: encouraged to test by a HCP; having physical symptoms; awareness of HIV; wanting to protect partner	Gay/bisexual men: high perceived risk and exposure; suspicion of HIV infection; to take better care of their health; eliminate uncertainty about status		Gay/bisexual men: hopelessness associated with lack of treatments; denial of high-risk behaviour; seeing friends/partners die of AIDS; lack of awareness regarding HIV risk factors; attributing symptoms to something other than HIV.
						Heterosexual drug users: experiencing HIV-related symptoms; being offered a test by a HCP			Heterosexual drug users: lack of knowledge of HIV and risk factors in the 1980s; fear of a positive result; drug use delayed acknowledgment of risk; perceived increased stigma at being older
						Heterosexual non drug user: knowing someone with AIDS; experiencing symptoms; being offered a test by a HCP			Heterosexual non-drug user: not feeling part of a high-risk group

**Table 2. (Continued)**

Author, year	Study design	Country	Sample size	Sample characteristics	Testing rates	Practical factors associated with test	Perceptual factors associated with test	Practical factors associated with non-test	Perceptual factors associated with non-test
Adeleye, 2012 <sup>15</sup>	Cross-sectional analysis from survey data	USA	12,366	Age > 50 years 46.4% male 75.4% white, 51.9% non-Hispanic white, 25.9% Hispanic	25.4% had previously been tested for HIV. Of these, 70.1% had tested >5 years ago	Having tested for HIV before; knowing about or knowing someone with TB	Perceived high/medium risk for HIV		Perceived low/no risk for HIV
Alencar, 2015 <sup>26</sup>	Qualitative study using semi-structured interviews	Brazil	11	Age range 60–75 years, average 68 years 73% male	Not reported	Testing during hospitalisation			Perception HCP saw older people as asexual; feeling HCPs (particularly younger HCPs) were uncomfortable with addressing sexuality of older patients
Barnett, 2011 <sup>16</sup>	Mixed methods (quantitative and qualitative) survey with patients and in-depth interviews with staff	USA	Survey n=99 Interviews n=17	Age > 50 years 54.5% male 39.4% African American, 28.3% Hispanic, 24.2% European American, 6.1% Asian, 2% Other	Not reported	As part of a regular (annual) check-up; HCPs consider testing when patients present with an indicator disease or disclose risk factors during history taking	High perceived risk of HIV		HCP didn't consider HIV in older as much as younger patients; HCPs feel patients are not comfortable discussing sexuality; HCPs felt older people take precautions against HIV; HCPs felt there was a lack of information provided to older people about HIV
Ford, 2015 (AC) <sup>23</sup>	Cross-sectional analysis from survey data	USA	1,238 (≥50 n=226)	Age range 17–85 years 65% male 46% Hispanic/Latino, 25.2% black, 18.1% white, 10.6% other	77% had been tested in the past. 56% tested within last 12 months	Having a usual source of care			Lower perceived risk of HIV

Table 2. (Continued)

Author, year	Study design	Country	Sample size	Sample characteristics	Testing rates	Practical factors associated with test	Perceptual factors associated with test	Practical factors associated with non-test	Perceptual factors associated with non-test
Kuteesa, 2012 <sup>24</sup>	Descriptive design using qualitative research methods (participant observation, in-depth interviews and focus groups)	Uganda	40 (focus group discussions (n=24); individual interviews (n=16))	Age range 50–80 years, mean age 65 years 50% female	Not reported				Stigma related to HIV or being older with HIV; fear of a positive HIV result
Mensforth, 2014 <sup>20</sup>	Retrospective case notes review	UK	34	>60 years	Not reported	HCP having a reason to test; patient presenting with an opportunistic infection; patient diagnosed with another STI, patient presenting with seroconversion illness; partner with a positive HIV status; as part of an asymptomatic STI screen	Perceived fair or poor health status	HCP not identifying a clinical indicator disease	
Wigfall, 2010 <sup>22</sup>	Cross-sectional analysis from survey data	USA	3,521	Age range 50–64 years, mean age 57 years 59% female 67% non-Hispanic white, 33% non-Hispanic black	30.8% had been tested for HIV in the past	Reporting no problems with health insurance; having financial means to pay for healthcare			

Table 2. (Continued)

Author, year	Study design	Country	Sample size	Sample characteristics	Testing rates	Practical factors associated with test	Perceptual factors associated with test	Practical factors associated with non-test	Perceptual factors associated with non-test
Wigfall, 2011 <sup>11</sup>	Cross-sectional analysis from survey data	USA	2,027	Age range 50–64 years 100% Female	26% had been tested for HIV in the past (excluding blood donation); 14% had tested for HIV in post reproductive age	Low reported HIV risk			
Zingmond, 2001 <sup>27</sup>	Cross-sectional analysis from survey data	USA	Total n=2,864; ≥50 group n=286	In the ≥50 group: age range 50–77 years, mean age 55.3 years, median age 53.5 years 16% female 48% white, 41% African American, 10% Hispanic, 2% other	Not reported	Testing due to illness; testing in hospital; having a usual source of care			
Akers, 2007 <sup>12</sup>	Qualitative and quantitative cross-sectional analysis from survey data	USA	514	Age range 50–95 years, mean age 62 years (SD=8.1) 100% female 73% African American	32.9% had tested in the past. 70.6% reported being not interested in HIV testing	High HIV knowledge score	Curiosity; safety; high-risk partner; never previously tested for HIV; testing to be healthy	Having previously tested for HIV; don't like needles	Perceived low risk of HIV; not feeling a test was necessary; not feeling at risk of HIV; not wanting to test for HIV; not perceiving to have HIV
Akers, 2008 <sup>13</sup>	Cross-sectional analysis from survey data	USA	488	Age range 50–84 years, mean age 61.9 years (SD=8.1), median age 61 years 100% Female 73% African American, 17% white/non-Hispanic, 22% other	34.6% had tested previously	HCP offering an HIV test		HCP not suggesting an HIV test; poorer HIV knowledge; lower actual risk of HIV	Low perceived risk of HIV; low level of sexual activity

Table 2. (Continued)

Author, year	Study design	Country	Sample size	Sample characteristics	Testing rates	Practical factors associated with test	Perceptual factors associated with test	Practical factors associated with non-test	Perceptual factors associated with non-test
Siegel, 1999 <sup>21</sup>	Descriptive, qualitative study; in-depth interviews	USA	78	Age range 50–68 years, mean age 56 years (SD=5.5) 74% male  41% African American, 19% Puerto Rican, 40% non-Hispanic white	Not reported		Experiencing symptoms attributed to HIV		Being asymptomatic or attributing symptoms to something other than HIV
Mack, 1999 <sup>28</sup>	Cross-sectional analysis from survey data	USA	21,998	Age range 50–64 years 52.3% female 78% white, 10% black, 9% Hispanic	Ever tested: older adults (50–64 years) = 26.6%; younger adults (18–49 years) 46.8%	Part of routine check-up; due to hospitalisation; during blood donation; because of illness; because of doctor referral		Don't test because of pregnancy	Lower HIV knowledge

HCP = healthcare professional; IVDU = intravenous drug user; STI = sexually transmitted infection; TB = tuberculosis



**Table 3A. Quantitative study quality**

Quantitative studies	Ford, 2015 <sup>18</sup>	Ford, 2013 <sup>19</sup>	Iyer, 2011 <sup>25</sup>	Adekeye 2012 <sup>15</sup>	Barnett, 2011 <sup>16</sup>	Ford, 2015 <sup>23</sup>	Mensforth 2014 <sup>20</sup>	Wigfall, 2010 <sup>22</sup>	Wigfall, 2011 <sup>11</sup>	Zingmond, 2001 <sup>27</sup>	Akers, 2007 <sup>12</sup>	Akers 2008 <sup>13</sup>	Mack, 1999 <sup>28</sup>
Did the study address a clearly focused issue?	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y
Was the cohort recruited in an acceptable way to minimise selection bias?	NA	Y	Can't tell	NA	N	Y	NA	NA	NA	NA	Y	Y	NA
Was the exposure and outcome accurately measured to minimise bias?	Y	Y	Can't tell	Can't tell	N	Y	Can't tell	Y	Y	Y	Y	Can't tell	Y
Have the authors identified all important confounding factors?	Y	Can't tell	Can't tell	Y	N	Can't tell	N	Y	Y	Y	Y	Y	Y
Have the authors taken confounding factors into account in the design and/or analysis?	Y	N	Can't tell	Can't tell	N	N	Can't tell	Y	Y	Y	Y	Y	Y
Was the follow up of subjects complete and long enough? (Not relevant for all studies)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Were the results precise?	Y	Y	Can't tell	Y	Can't tell	Y	N	Y	Y	Y	Y	Y	Can't tell
Do you believe the results?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Can the results be applied to the local population?	Y	N	Y	Y	N	Y	N	Y	Y	Y	Y	Y	Y
Do the results of this study fit with other available evidence?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<b>Total score /10</b>	<b>8/10</b>	<b>6/10</b>	<b>4/10</b>	<b>6/10</b>	<b>3/10</b>	<b>7/10</b>	<b>2/10</b>	<b>8/10</b>	<b>8/10</b>	<b>8/10</b>	<b>9/10</b>	<b>8/10</b>	<b>7/10</b>

**Table 3B. Qualitative study quality**

Qualitative studies	Lekas, 2005 <sup>17</sup>	Alencar, 2015 <sup>26</sup>	Barnett, 2011 <sup>16</sup>	Kuteesa, 2012 <sup>24</sup>	Siegel, 1999 <sup>21</sup>
Was there a clear statement of the aims?	Y	Y	Y	Y	Y
Is the qualitative methodology appropriate?	Y	Y	Y	Y	Y
Was the design appropriate to address the aims?	Y	Y	Y	Y	Y
Was the recruitment strategy appropriate to address the aims?	Y	Y	N	Y	N
Was the data collected in a way that addresses the research issue?	Y	Y	N	Y	N
Has the relationship between researcher and participant been adequately considered, and has their own role been examined to reduce bias?	N	N	Y	Y	N
Have ethical issues been considered?	N	Y	Y	Y	N
Was the data analysis sufficiently rigorous?	N	N	N	Y	N
Is there a clear statement of findings?	N	N	N	Y	Y
Is the research valuable?	Y	Y	Y	Y	Y
<b>Total score /10</b>	<b>6/10</b>	<b>7/10</b>	<b>6/10</b>	<b>10/10</b>	<b>5/10</b>

decision to offer an HIV test.<sup>17,27</sup> Having health insurance or financial means to pay for healthcare was significantly associated with a decision to test for HIV in studies from the USA.<sup>19,22,23</sup>

*Patient-related factors associated with not testing for HIV*  
People who had tested for HIV previously were less likely to test again.<sup>12</sup> One study acknowledged that older, menopausal women did not attend for antenatal care resulting in a lost

**Table 4. Factors associated with test and non-test**

Patient			
Perceptual factors associated with test	Perceptual factors associated with non-test	Practical factors associated with test	Practical factors associated with non-test
High perceived (or actual) risk	Low perceived risk	Regular use of healthcare services	Having tested for HIV previously
HIV-related knowledge or awareness	No symptoms or symptoms not associated with HIV	Offered or encouraged to test by a healthcare provider	HIV test not suggested by a healthcare provider
To protect partner or because of partner's status/risk	Stigma	Physical symptoms	Dislike of needles
Curiosity	Fear of a positive result	Having health insurance or the financial means to pay for healthcare	
Symptoms attributed to HIV	Hopelessness regarding lack of treatment		
Perceived poor health status	Government mistrust		
Belief in AIDS-related conspiracy theories			
Clinician			
	Preconceptions about older people (including older people lack understanding of HIV, older people are less at risk and older people would feel uncomfortable)	Patient presenting with symptoms or disclosing risk factors	Lack of HIV information and failure to identify a clinical indicator disease
	Clinician uncomfortable addressing risk factor questioning/sexuality of older patients	Testing as part of a routine check-up	Lack of time

opportunity for HIV testing.<sup>28</sup> Not having an HIV test suggested by a HCP was significantly associated with not testing in one survey.<sup>13</sup> Finally, not liking needles was reported by one study as a barrier to testing.<sup>12</sup>

*Clinician-related factors associated with offering an HIV test*  
HCPs were more likely to offer a test when a patient presented with symptoms or disclosed high-risk behaviours, indicated in one survey<sup>16</sup> and one study that used a case notes review design.<sup>20</sup> Offering an HIV test as part of a routine check-up was reported by one survey as a facilitator.<sup>16</sup>

*Clinician-related factors associated with not offering an HIV test*  
A lack of HIV-related information, including not being able to identify an HIV clinical indicator disease and a feeling that HIV-related information was not available to older people were reported as factors associated with not offering an HIV test.<sup>16,20,25</sup> One study reported lack of time as a barrier.<sup>25</sup>

## Discussion

Several factors associated with a decision to test for HIV in older age have been identified. The most commonly reported patient-related factors associated with test were frequently using healthcare, high perceived or actual risk of HIV, having some HIV-related knowledge and being offered/encouraged to test by a HCP. Conversely, the most commonly reported patient-related factor associated with not testing was low perceived risk of HIV.

Low risk perception is a commonly cited barrier to HIV testing regardless of age, highlighted in a previous review.<sup>29</sup> However, despite disclosing HIV risk behaviours, some patients still perceive themselves to be low risk.<sup>30,12</sup> In the older population, this low perceived risk may be exacerbated by the perception HIV is a young person's disease.<sup>17</sup> Despite public opinion, evidence shows that many older people remain sexually active; one study indicated the main reason for lack of sex in this group may be physical limitations, not because of lack of desire or opportunity.<sup>31</sup> Indeed, there has been an increasing emergence of online dating sites aimed at older people.<sup>32</sup> Although this is not unique to older people, relationship transitions – common in older age – may increase the likelihood of meeting new partners after an established relationship.<sup>33</sup> Studies indicate condom use among older people is low,<sup>34</sup> which may be due to a lack of confidence in negotiating condom use when starting a new relationship, or because postmenopausal women no longer worry about pregnancy.<sup>28</sup> Additionally, availability of drugs such as sildenafil mean erectile dysfunction may no longer be a barrier to sex for older men. Physiological changes in older age, such as vaginal dryness, may actually put older women at increased risk of HIV.<sup>35</sup>

Misconceptions about older people were the most commonly identified barrier to offering an HIV test to older people; however, greater engagement with healthcare was associated with testing. It is therefore salient that HCPs' preconceptions about older people or feeling embarrassed in terms of addressing their risk may prevent them from offering older patients an HIV test. This shows a mismatch between what clinicians perceive older people feel regarding HIV testing and what they may actually feel. This phenomenon may in

part be due to fear of harming the doctor-patient relationship or a lack of training on how to initiate a conversation with a patient around HIV testing.<sup>36</sup> This is in line with evidence from one study indicating that GPs do not feel sexual health is a suitable topic to discuss with older patients.<sup>37</sup> Not having a HCP discuss HIV with this group may actually reinforce their perception that they are not at risk. However, HIV tests have been repeatedly found to be acceptable to patients; one study found >90% of patients (all ages) accepted an offer of a routine HIV test; however, older people were significantly less likely to be offered a test by a clinician.<sup>9</sup>

The themes identified in this review may be useful in designing interventions to increase testing rates in the older population. In order for intervention(s) to be successful, they will have to address patient and clinician-related barriers. Routine screening in secondary care may overcome some of the identified barriers; it would help to normalise HIV testing and expose the older population to health promotion messages, salient since a lack of HIV knowledge was also shown to be a barrier to testing in this group. This would also overcome a need for self-identifying as at-risk as everyone would be eligible to test, and may alleviate any uncomfortable feelings HCPs may have in risk factor questioning with this group. Additionally, this approach would overcome having to identify a clinical indicator disease in order to offer an HIV test, which has been suggested as one of the biggest barriers associated with non-adherence to testing guidelines in the UK.<sup>38</sup> However, HIV testing guidelines already suggest routine screening of all acute admissions in high prevalence areas<sup>7,8</sup> but increasing rates of LD among the older population suggests this is not occurring. Clinicians would therefore need adequate training and encouragement to routinely offer HIV tests.

Routine screening in primary care may also be appropriate to increase testing rates in older adults. Many interactions with healthcare services in older age occur in primary care,<sup>39</sup> for example for the management of comorbidities. Also, familiarity with the GP may make conversations regarding HIV easier although there is little evidence about how a relationship with a clinician might affect willingness to discuss sexual health in this group. Despite this, primary care may present a more appropriate venue for testing. However, because GPs don't always proactively address sexual health in older populations,<sup>37</sup> specific training or incentives may be required in order to achieve this. Potential cost implications will have to be considered.

## Limitations

Reviewed studies used diverse methods to assess different aspects of care meaning it was not possible to compare findings across studies, or between different populations. As a result, a narrative approach was undertaken to synthesise data. Although this methodology is most appropriate, there is the potential for bias in terms of over or under representation of study data.

Included studies were mostly from the USA and so findings may not be generalisable, particularly to settings where healthcare services are not privatised. Further, some included studies were conducted several years ago and it is acknowledged that ongoing advances in HIV may mean factors associated with a decision to test for HIV identified in these studies may not still be relevant. Lastly, it is also acknowledged that sexual behaviour and attitudes to HIV testing is likely to vary between

people aged  $\geq 50$  years. However, there is little research in this area and so this review is an important first step.

## Conclusions

Clinicians' beliefs that people  $\geq 50$  years are not at risk of HIV, or feel uncomfortable discussing risk were the most commonly cited barriers to offering a test. Conversely, being offered or encouraged to test by a HCP was among the most commonly cited facilitators to testing. This shows a divide between clinicians' preconceptions and patient's expectations, which may impact on testing rates. These findings suggest that it is important for clinicians not to make preconceptions about risk of HIV in older people. Further, routine test offer – regardless of patient age – would encourage more of these patients to test for HIV. A gap between patients' perceived risk and actual risk may also need to be addressed. However, there is a lack of evidence and more work is needed to verify these findings and establish which factors are relevant to the UK setting. ■

## Conflicts of interest

This work is part of EY's NIHR Doctoral Research Fellowship (Ref: DRF-2015-08-086). All other authors declare they have no competing interests.

## Author contributions

All authors were involved with study design and have reviewed the manuscript. Literature searching was performed by EY and data collection, extraction and quality analysis was performed independently by EY and VC. Data analysis was performed by EY, VC and JW and data interpretation by EY, VC, JW and KD.

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