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HIV testing in termination of pregnancy and colposcopy services: a scoping review

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► Additional supplemental material is published online only. To view, please visit the journal online (http://dx.doi.org/10.1136/sextrans-2021-055111).

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Received 13 April 2021
Accepted 3 September 2021
Published Online First 20 September 2021

To cite: Filippidis P, Francini K, Jacot-Guillarmod M, *et al*. *Sex Transm Infect* 2022;**98**:143–149.

ABSTRACT

Background Women and girls are relatively under-represented across the HIV treatment cascade. Two conditions unique to women, pregnancy and cervical cancer/dysplasia, share a common acquisition mode with HIV. This scoping review aimed to explore HIV testing practices in voluntary termination of pregnancy (TOP) and colposcopy services.

Methods The scoping review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews. We searched articles published up to 20 December 2020 using three electronic databases (PubMed/Medline, Embase, Google Scholar) and including the keywords "HIV Testing", "Abortion, Induced", "Colposcopy", "HIV screen*" and "termination of pregnancy".

Results A total of 1496 articles were identified, of which 55 met the inclusion criteria. We included studies providing background HIV prevalence in addition to prevalence in the study population and studies of women seeking TOP rather than presenting with TOP complications. This limited our review to high-income, low HIV prevalence settings. We observed two study phases: studies pre-antiretroviral therapy (ART) using unlinked anonymous testing data and examining HIV risk factors associated with positive HIV tests and studies post-ART using routine testing data and exploring HIV testing uptake. HIV prevalence was estimated at >0.2% in most TOP settings and >1% (range 1.7%–11.4%) in colposcopy services. Many TOP providers did not have local HIV testing policies and HIV testing was not mentioned in many specialist guidelines. Testing uptake was 49%–96% in TOP and 23%–75% in colposcopy services.

Conclusion Given the estimated HIV prevalence of >0.1% among women attending TOP and colposcopy services, HIV testing would be economically feasible to perform in high-income settings. Explicit testing policies are frequently lacking in these two settings, both at the local level and in specialist guidelines. Offering HIV testing regardless of risk factors could normalise testing, reduce late HIV presentation and create an opportunity for preventive counselling.

INTRODUCTION

In the past four decades, thanks to antiretroviral therapy (ART), HIV infection has shifted from being a fatal disease to a chronic condition with an excellent life expectancy.[1] Over this period, the epidemiology of people living with HIV (PWH) has changed. Globally, women and girls now make up over half of the 38 million PWH.[2]

Despite the growing number of women with HIV (WWH), women and girls are relatively under-represented across the HIV treatment cascade.[3] In Switzerland, women are more likely to be diagnosed as late presenters (having <350 CD4 cells/mL or an AIDS-defining condition at HIV diagnosis), suggesting insufficient access to testing or inadequate testing policies.[4] Among people aged 35–44 years old with new HIV diagnoses in Switzerland in 2019, over a third were heterosexual women.[5] Two frequently encountered conditions unique to women, pregnancy and cervical cancer/dysplasia, share a common acquisition mode with HIV. It is surprising therefore that, while numerous studies have examined these two conditions among WWH,[6 7] there is scant information on HIV detection or prevention measures among women of negative or unknown HIV status.

HIV testing is the only means of diagnosing PWH who are unaware of their HIV status, enabling treatment and prevention of onward transmission. Current HIV testing recommendations differ in the degree to which pregnancy and cervical pathology are mentioned. In the UK, the British HIV Association (BHIVA) has explicitly recommended HIV testing of all pregnant women since 2008, whether they present for antenatal care (ANC) or voluntary termination of pregnancy (TOP).[8] The National Institute for Health and Care Excellence endorsed testing in TOP in 2011 (online supplemental table 1). The guidelines of the British Royal College of Obstetricians and Gynaecologists delegate HIV testing protocols to local care providers.[9] The Swiss Federal Office of Public Health HIV testing recommendations advise testing of pregnant women but make no explicit mention of TOP (online supplemental table 1). Cervical dysplasia has been identified as an HIV indicator condition and yet few specialist (gynaecology or gynaecological oncology) guidelines recommend HIV testing.[10 11]

For some reproductive-age women, particularly those in vulnerable groups, TOP and colposcopy visits may be their first, if not their only, interaction with a healthcare system.[12] The aim of this scoping review was therefore to explore HIV testing practices in voluntary TOP and colposcopy services, examining HIV prevalence, HIV testing policies and testing uptake in these two settings.

METHODS

Design

Scoping reviews aim to map the key concepts within a specific research area by collating literature from related disciplines. This scoping review was conducted according to the Preferred Reporting

Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews[13] (online supplemental material 2). We performed a search of published studies and conference abstracts using three electronic databases (PubMed/Medline, Embase, Google Scholar). Our keywords included the medical subject heading (MeSH) terms "HIV Testing", "Abortion, Induced" and "Colposcopy", and the free terms "HIV screen*", "HIV test*", "HIV opt in", "HIV opt out", "termination of pregnancy", "post abortion", "colposcopy service", "HPV service" or similar non-MeSH terms. The search ran from 23 November to 20 December 2020.

Articles were eligible for inclusion if they were published in English or French, regardless of geography, and presented (1) HIV prevalence, (2) HIV testing strategies, (3) HIV testing offer, (4) HIV testing uptake, (5) barriers to HIV testing or (6) other relevant information related to HIV testing in TOP and colposcopy services. Articles were screened initially by title with a bias towards inclusion and then evaluated by abstract. The main text of retained articles was reviewed. When multiple articles referred to the same study population, we included either the most comprehensive or the original article published. Reference lists were examined for relevant articles not identified in the original search.

Analysis

Publication year and type, study period, number of participants, geographical location, study objective, and contribution to the scoping review were extracted from included articles and tabulated separately for TOP and colposcopy services. HIV prevalence and testing offer/uptake rates were expressed as percentages. We did not appraise the methodological quality or risk of bias of included articles, consistent with guidance on scoping review conduct.[14] All authors contributed to the discussion of the scoping review and to the bibliographic search.

Definitions

Diagnostic HIV testing refers to testing based on clinical signs or symptoms believed to be due to HIV infection. Targeted HIV screening refers to the selection of patients for testing who are believed to be at risk of infection. Non-targeted HIV screening refers to the selection of patients for testing without respect to risk. The terms 'opt-in' and 'opt-out' refer to the default assumption of patient willingness to undergo testing: not testing unless the patient agrees and testing unless the patient declines, respectively. For studies not using these terms, HIV testing offered to all patients attending a specific service (TOP, ANC or colposcopy) is referred to as *routine* testing. The term 'opt-out' is used in table 1 (routine HIV testing in TOP) and when describing HIV testing policy. We found no instances of opt-out testing in colposcopy settings.

RESULTS

Of 1496 articles identified through database searches and reference tracing, 949 articles were screened after removing duplicates. Fifty-five articles were selected as potentially relevant based on titles and abstracts, comprising articles and letters published in peer-reviewed journals and abstracts presented at specialist conferences. Twenty-five articles were excluded (related to existing articles or examining populations out with the scope of this review), leaving 30 articles for analysis (figure 1). Of the 25 articles rejected, 10 (conducted in South America, Africa and Asia) reported high HIV prevalence without always providing the HIV prevalence in the local population. Some of these studies were conducted among women presenting

Table 1 HIV prevalence among women attending termination of pregnancy (TOP) services

Authors, publication year	Publication type	Geographical location	Study period	Total participants, n (TOP/delivery)	Overall HIV prevalence in TOP (%)	Prevalence of new HIV infections in TOP (%)	HIV prevalence in women delivering (%)	HIV prevalence in general population* (%)
Unlinked anonymous testing studies								
Goldberg *et al*, 1992[21]	Article	Dundee, Scotland	1988–1990	6228 (1535/4693)	0.85	–	0.13	–
Couturier *et al*, 1992[17]	Article	Paris, France	1990–1991	11 593 (2718/7261)	0.7	–	0.28	–
Obadia *et al*, 1994[18]	Article	France (Southeast)	1991–1992	11 056 (2298/7301)	0.56	–	0.22	–
Remis *et al*, 1995[23]	Article	Montreal, Canada	1989–1993	12 017	–	0.18	–	0.21
Abeni *et al*, 1997[19]	Article	Rome, Italy	1989–1994	218 357 (61 777/138 359)	0.49	–	0.18	–
Goldberg *et al*, 2000[34]	Article	Dundee, Scotland	1993–1997	17 899 (4650/13 249)	0.15	–	0.11	–
Drey *et al*, 2005[24]	Article	San Francisco, USA	2002–2003	1992	0.55	–	–	–
Thornton *et al*, 2007[22]	Abstract	London, UK	2005	Not available	1.01	–	0.44	–
Carnicer-Pont *et al*, 2011[20]	Article	Catalonia, Spain	1999–2006	581 593 (31 904/549 689)	0.13	–	0.18	–
Routine testing studies†								
Crowe, 2008[26]	Abstract	London, UK	2003–2007	1618	0.77	0.45	–	–
Creighton *et al*, 2009[25]	Abstract	London, UK	2008	699‡	0.6	–	–	–
Garrard *et al*, 2010[28]	Abstract	London, UK	2008–2009	2831‡	–	0.52	–	–
Rosenvinge *et al*, 2010[27]	Abstract	London, UK	2009	844	0.56	–	–	–
Creighton *et al*, 2012[31]	Letter	London, UK	2008–2011	4326	0.82	0.3	–	0.8

Articles are listed in chronological order of publication.
Created by the authors.
*Measured in the same geographical region and period.
†For routine testing studies, the number of participants refers to the number of women offered HIV testing in TOP settings whether they accepted or declined testing; prevalence refers to the proportion of participants who tested positive for HIV infection out of the participants who accepted HIV testing.
‡Opt-out testing.

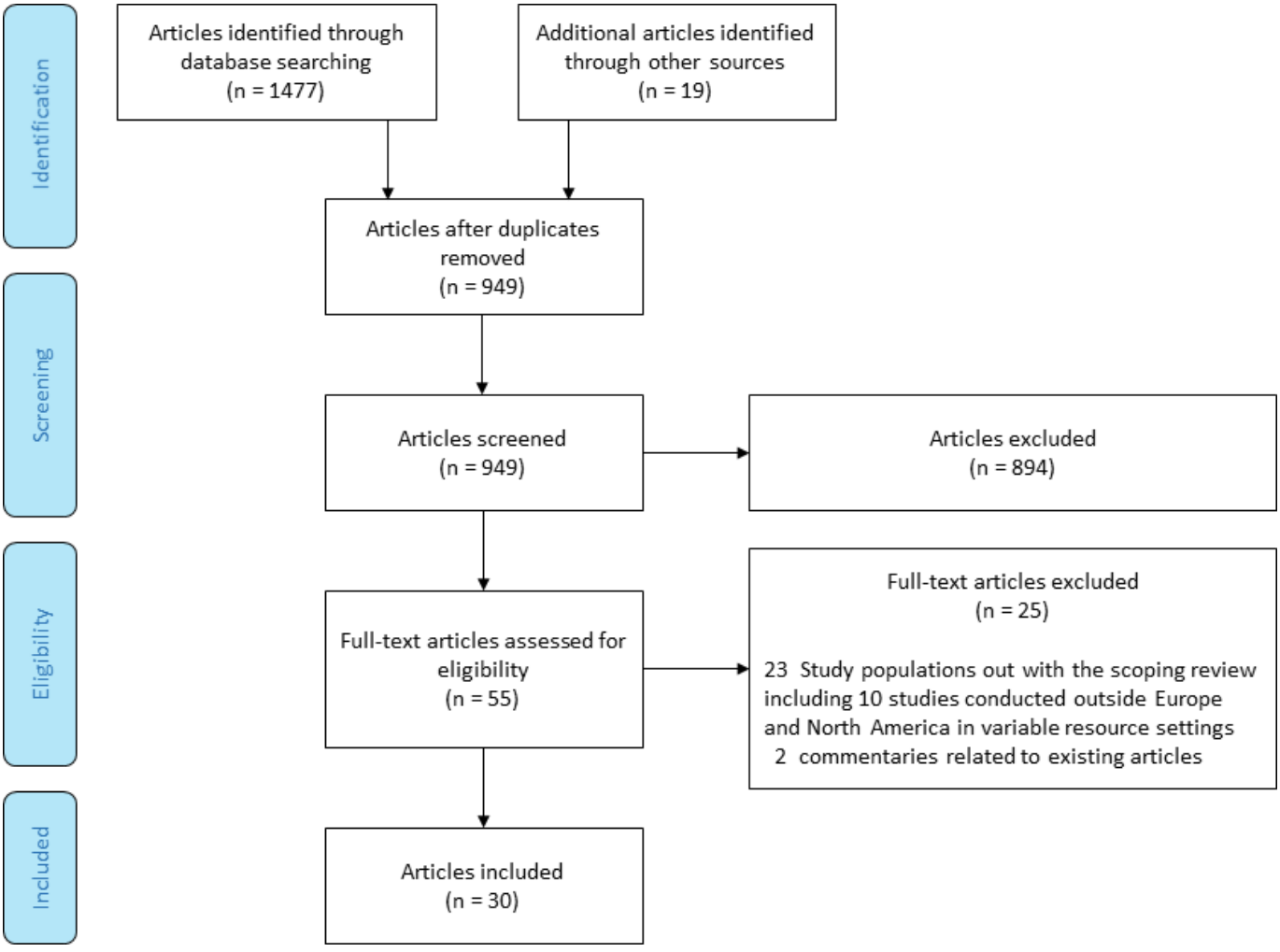

Figure 1 PRISMA flow diagram of the article selection process (created by the authors). PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

with TOP complications rather than presenting for voluntary TOP. As these studies varied widely in terms of geography and healthcare setting (urban vs rural), we excluded them in order to focus on studies that were comparable between populations and over time. The retained studies were conducted in high-income, lower HIV prevalence settings in Europe and North America. Among these, we included nine unlinked anonymous testing (UAT) studies and five routine testing studies (table 1). Finally, although we searched the terms 'termination of pregnancy' and 'abortion', we use the former term in our review in keeping with the position statement of the British Royal College of Nursing.[15]

TOP services

We observed two phases of TOP studies: a first phase from the early 1990s to the early 2000s, presenting data from UAT studies, taking blood samples drawn for other purposes after they had been permanently stripped of identifying information,[16] and a second phase from the early 2000s onwards, presenting data from routine testing (table 1).

HIV prevalence

While HIV prevalence in TOP services will be influenced by that in the general population, several studies reported higher prevalence in women seeking TOP than those in ANC. In France in 1990–1991, a UAT study of 11 593 blood samples from Paris and surrounding districts taken at the end of pregnancy reported that HIV prevalence among women seeking TOP was over twice that among women in ANC (0.7% vs 0.28%; relative risk: 2.54, 95% CI 1.36 to 4.75, p<0.05).[17] A similar ratio was reported in Southeast France during the same period: 0.56% in TOP vs 0.22% among women in ANC.[18] In Italy, in 1989–1994, HIV prevalence was 0.49% in TOP vs 0.18% among women in ANC (OR: 2.72, 95% CI 2.29 to 3.22).[19] A later study in Catalonia, conducted between 1999 and 2006, found no significant difference in HIV prevalence between women seeking TOP (0.13%) and those in ANC (0.18%) (p=0.06), but rates of tests offered and performed were lower in TOP than in ANC.[20] In the UK, HIV prevalence among women seeking TOP in Dundee in 1988–1990 was 0.85% compared with 0.13% of women in ANC (p<0.001).[21] In London, HIV prevalence in TOP services was over double that among women in ANC and increased with time up to 1.01% in 2005.[22] In North America, HIV prevalence from UAT studies in TOP ranged from 0.18% to 0.55% during two different time periods (1989–1993 and 2002–2003).[23 24]

Most studies examining HIV prevalence in TOP services from routine testing were conducted at London teaching hospitals and North America. Overall HIV prevalence was estimated to be 0.56%–0.82%[25–27]; the prevalence of new HIV infections was 0.3%–0.52%.[26 28] As with UAT studies, one routine testing study reported higher prevalence in TOP versus ANC

Table 2 HIV testing performed among women attending termination of pregnancy (TOP) services

Authors, publication year	Publication type	Geographical location	Study period	Participants (n)	Rate of HIV tests offered (%)	Rate of HIV tests performed (%)
Garrard *et al*, 2020[28]	Abstract	London, UK	2008–2009	2831	100	36.9
Creighton *et al*, 2012[31]	Letter	London, UK	2008–2011	4326	100	60
Steedman *et al*, 2015[30]	Abstract	Scotland	2013	Not available*	Not specified	0–10

Articles are listed in chronological order of publication.
Created by the authors.
*This study examined testing policy among TOP providers; 17 provider organisations participated.

and genitourinary medicine services (0.6% vs 0.2% and 0.5%, respectively)[25] (table 1).

Testing policy, offer and uptake

In the UK in 2013, 5 years after the 2008 BHIVA testing guidelines,[8] only 38% of TOP services had an HIV testing policy.[29] In terms of testing practice, 41% of TOP services stated that HIV testing was offered to all women and 18% stated testing was offered to selected women[29] (table 2). In Scotland in 2015, 59% of TOP services had an existing HIV testing policy or one in development, the policy being opt-out testing in 70% of cases.[30] In centres with HIV testing policies, perceived barriers to testing included lack of time or staff resources, insufficient training of clinical staff and patient knowledge.[30] In centres within London, uptake of HIV testing offered varied from 49% to 96.4%[25–27 31 32] (table 3). The most frequent reason for women declining testing was having recently been tested.[32]

One study examined differences in HIV testing rates between women seeking TOP and those in ANC. In Southeast France in 1992, 61.7% of 2825 women in ANC reported being tested during their pregnancy compared with 24.1% of 764 women seeking TOP (p<0.001).[33] Women seeking TOP also reported less prior testing (45.8% vs 58.8%, p<0.001). The two groups of women were similar in terms of the low refusal rate of testing offered (<2% in both groups) and of knowledge about HIV transmission, but risky behaviours were more frequent among women seeking TOP (38.9% vs 17.7%, p<0.001).[33]

HIV prevalence over time in TOP services (UAT data)

In Dundee, Scotland, a decrease in HIV prevalence was described among women seeking TOP from 1988–1990 to 1993–1997, from 0.85% to 0.15% (p<0.05), related to community interventions among people who inject drugs.[34] In London, HIV prevalence at sentinel TOP clinics increased from 0.64% to 1.01% between 1996 and 2005.[22] In Catalonia, HIV prevalence decreased in TOP services from 0.23% to 0.1% between 1999 and 2006, although increased among women born outside Spain (from 0.22% to 0.3%).[20] In Montreal, Canada, overall HIV prevalence among 12 017 women attending a TOP service between 1989 and 1993 was 0.18% (95% CI 0.11% to 0.28%) and did not vary significantly by study year. However, HIV prevalence was 147 times higher among women born in Haiti than among those born in Canada (0.016% vs 2.35%, p<0.0001).[23]

TOP history among WWH and missed opportunities for earlier HIV diagnosis

Several studies described the proportion of WWH who reported TOP occurring prior to their HIV diagnosis. Among 463 WWH enrolled in the European Study on the Natural History of HIV Infection in Women (including participants since 1993), who had been at risk of pregnancy in the 4 years before their HIV diagnosis, 115 reported 179 pregnancies, of which 75 (42%) had been terminated.[6] Among 161 women enrolled in the cohort in the Spanish AIDS Research Network between 2011 and 2012, 29.3% reported TOP prior to HIV diagnosis.[35] In an Italian multicentre study conducted among 585 WWH between 2010 and 2011, 57.9% reported TOP prior to HIV diagnosis.[36]

Regarding missed opportunities, a British case notes review of 60 women diagnosed with HIV between 2006 and 2009 reported that HIV testing at the time of TOP may have resulted in earlier HIV diagnosis in 5% of cases.[37] In Lausanne, Switzerland, among 75 women newly diagnosed with HIV between 2011 and 2015, 34 had presented at least one missed opportunity for earlier HIV diagnosis, of whom 5 (14.7%) had not been tested when seeking TOP (Lhopitallier L, personal communication, 2021).[38]

Colposcopy services

We observed fewer studies examining HIV prevalence and testing among women attending colposcopy services compared with women seeking TOP (table 4).

HIV prevalence

In North America, HIV prevalence in women attending colposcopy services with any grade of dysplasia ranged from 6% to 11.4% between 1988 and 1991.[39–41] Among women accepting HIV testing, the prevalence of new HIV infections ranged from 3.3% to 6.1%[41 42] (table 4).

Table 3 HIV testing uptake among women attending termination of pregnancy services

Author, publication year	Publication type	Geographical location	Study period	Participants (n)	Uptake of HIV testing (%)
Crowe, 2008[26]	Abstract	London, UK	2003–2007	1618	96.4
Creighton *et al*, 2009[25]	Abstract	London, UK	2008	699	49
Rosenvinge *et al*, 2010[27]	Abstract	London, UK	2009	844	87
Madge *et al*, 2011[32]	Abstract	London, UK	2010	202	84.2
Creighton *et al*, 2012[31]	Letter	London, UK	2008–2011	4326	60

Articles are listed in chronological order of publication.
Created by the authors.

Table 4 HIV prevalence among women attending colposcopy services

Authors, publication year	Publication type	Geographical location	Study period	Participants (n)	Overall HIV prevalence (measured) %)	Overall prevalence of HIV infection (patient-reported and measured) (%)	Prevalence of new HIV infections (among women accepting testing) (%)	CD4+ <200/mm^3 on HIV diagnosis (%)	No or low-grade dysplasia* on HIV diagnosis (%)
Testing in any grade of cervical dysplasia (no dysplasia, LSIL, HSIL)									
Maiman *et al*, 1988[40]	Letter	New York, USA	1988	66	10.6	–	–	–	–
Dottino *et al*, 1991[39]	Abstract	New York, USA	1991	116	6	–	–	NA	NA
Spitzer *et al*, 1993[41]	Article	New York, USA	1990–1991	208	11.4	–	6.1	–	68.8
Jennings *et al*, 1996[42]	Article	New York, USA	1990–1994	1908	–	–	3.3	11.8	74.3
Creighton *et al*, 2012[43]	Letter	London, UK	2010–2011	687	–	2.2	0.19	0	100
Testing in patients with HSIL									
Rosenvinge *et al*, 2011[44]	Abstract	London, UK	2011	829	–	1.7	0	NA	NA
Mosimann *et al*, 2014[45]	Article	Lausanne, Switzerland	2002–2012	58	1.7	–	0	–	–

Articles are listed in chronological order of publication.
Created by the authors.
*Cervical intraepithelial neoplasia stage 1 or LSIL.
HSIL, high-grade squamous intraepithelial lesion; LSIL, low-grade squamous intraepithelial lesion; NA, not applicable.

The first report we identified on HIV prevalence in colposcopy services was a letter by Maiman *et al*[40] published in 1988: UAT of 66 women attending a colposcopy clinic at a public hospital in New York demonstrated an HIV prevalence of 10.6%. This prevalence compared with 2.0% in the hospital's ANC and 3.0% at a sexual health clinic in Baltimore.[40]

Subsequent studies can broadly be grouped into those published pre-ART, which provide evidence that cervical dysplasia is a marker of HIV infection, and those published post-ART, which focus on HIV testing offer and uptake. In the pre-ART era in New York (1991), Dottino *et al*[39] offered screening for chlamydia, gonorrhoea, syphilis and HIV over a 4-month period to 116 primarily black and Hispanic women with condyloma (21%) or abnormal Papanicolaou (Pap) smears (79%) and identified 7 WWH (6.4%), of whom 3 had cervical intraepithelial neoplasia (CIN) stage 1–3. During the same time period, Spitzer *et al*[41] offered testing to 140 women attending colposcopy services for condyloma or CIN and identified 8 women with undiagnosed HIV (6.1%), of whom 6 had no definable HIV risk factors; comparable HIV prevalence in the ANC population from UAT data was 1.6%. Among the WWH, 68.8% had low-grade squamous intraepithelial lesions (SIL); the others had high-grade lesions.[41] Between 1990 and 1994, Jennings *et al*[42] offered HIV testing to 1908 women referred to colposcopy services for abnormal Pap smears, 50.4% of whom accepted. Of women screened, 3.3% tested positive. The authors noted that the final histological diagnosis in WWH did not differ from women testing HIV-negative. In the post-ART era (2010–2011), studies from London teaching hospitals showed an overall prevalence of 2.2%–3% in women with cervical dysplasia of any grade[43] and of 1.7% in women with high-grade SIL[44] (table 4).

HIV testing

In Lausanne, Switzerland, we reported an HIV testing rate of 11% among 58 women undergoing treatment for invasive cervical carcinoma between 2002 and 2012.[45] As with TOP, having recently been tested was one of the most frequent reasons for declining HIV testing in colposcopy services.[43 44] Testing uptake rates are shown in table 5.

Concerning barriers to testing, a small qualitative study in Liverpool in 2015 reported that willingness and acceptance of testing among patients were high, but that service providers' unfamiliarity with HIV testing discussions and time constraints presented significant barriers.[46]

Concerning missed opportunities for earlier HIV diagnosis, the British case notes review mentioned above reported at least one missed opportunity in women diagnosed with CIN ≥2 prior to HIV diagnosis.[37] In Lausanne, Switzerland, among 34 WWH with at least one missed opportunity for earlier HIV diagnosis, 3 (8.8%) had undergone treatment for cervical dysplasia prior to HIV diagnosis (Lhopitallier L, personal communication, 2021).[38]

DISCUSSION

While TOP and colposcopy services may receive different women at different periods of their lives, this scoping review reveals parallels between the two settings. We observed two distinct article categories: those reporting epidemiological risk factors for having a positive HIV test (mostly pre-ART) and those reporting HIV testing offer and uptake rates (mostly post-ART). The former category served to justify HIV testing at a time when HIV infection held a poor prognosis. Among pregnant women, the focus of care was on fetal well-being, with higher rates of HIV tests being offered and performed in ANC compared with

Table 5 HIV testing uptake among women attending colposcopy services

Authors, publication year	Publication type	Geographical location	Study period	Participants (n)	Uptake of HIV testing (%)	Previous testing given as reason for declining testing (%)
Spitzer *et al*, 1993[41]	Article	New York, USA	1990–1991	208	67.3	–
Jennings *et al*, 1996[42]	Article	New York, USA	1990–1994	1908	50.4	–
Rosenvinge *et al*, 2011[44]	Abstract	London, UK	2010	829	23.4	90
Creighton *et al*, 2012[43]	Letter	London, UK	2010–2011	687	75	55

Articles are listed in chronological order of publication.
Created by the authors.

TOP, even if HIV prevalence was higher among women seeking TOP.[17 18 21 22 25] HIV prevalence rates in TOP services were above the threshold of 0.1% for routine testing to be cost-effective in high-income settings in the era of ART[47 48] (table 1). HIV prevalence in colposcopy settings was also above this threshold, and yet mention of HIV testing in specialty guidelines is lacking.

We made an active choice to include articles from the pre-ART era to provide a historical context. The language used at this time reflects how HIV medicine has evolved: women were described as 'admitting' to having HIV risk factors or undergoing 'therapeutic abortion' when diagnosed with HIV during pregnancy. While ART has changed HIV management and prognosis, HIV testing recommendations have lagged behind. The BHIVA guidelines explicitly recommend testing in both TOP and ANC. Other guidelines are more ambiguous. The European Centre for Disease Prevention and Control public health guidance on HIV, hepatitis B and hepatitis C testing recommends testing in pregnant women in the context of ANC; there is no mention of TOP in the main text (online supplemental table 1). The EuroTEST panel on Guidance on Indicator Condition-Guided HIV Testing in Adults lists 'pregnancy' as an indication for HIV testing but puts in brackets 'implications for the unborn child', suggesting ANC settings only (online supplemental table 1). The Swiss Society of Gynaecology and Obstetrics manual on counselling before TOP does not mention HIV (online supplemental table 1).

Given the high rates of TOP among women subsequently diagnosed as HIV-positive[6 35 36] and missed opportunities for earlier HIV diagnosis in this group of women,[37 38] we would argue that offering HIV testing to all women seeking TOP as routine could normalise testing and avoid the sense of stigma or discrimination that comes with testing based on risk factors.[49] Indeed, since the advent of ART, it makes no sense to offer testing to pregnant women in ANC but not to pregnant women seeking TOP when HIV prevalence is the same or potentially higher in the latter population. Barriers of time and lack of healthcare professional training can be addressed by embedding testing into the standard package of care and training staff, but HIV testing and specialty guidelines need to be explicit. Even if the majority of women tested at TOP will be negative, HIV testing provides an opportunity to examine options for HIV prevention; women with negative HIV tests at TOP but ongoing HIV risk could be candidates for pre-exposure prophylaxis.

Key messages

- Women and girls are relatively under-represented across the HIV treatment cascade, although they are at higher risk for late presentation.
- While the British HIV Association recommends HIV testing explicitly in voluntary termination of pregnancy (TOP) as well as antenatal care (ANC), other national and international HIV testing guidelines recommend HIV testing in pregnancy for fetal well-being without mentioning TOP.
- HIV prevalence in many TOP and colposcopy services is higher than that in ANC or the general population and >0.1%, the threshold for HIV testing to be economically feasible in high-income settings.
- Recommending HIV testing explicitly in TOP and colposcopy services, regardless of risk factors or cervical pathology, could normalise testing and facilitate conversations on HIV prevention.

While much has been published on cervical pathology in WWH, data on HIV risk in women attending colposcopy services are sparse. Despite the heterogeneity of the populations in the articles we reviewed, several trends were observed. As with TOP, older studies reported HIV risk factors, while subsequent studies described testing uptake. HIV prevalence among women attending colposcopy services was high compared with ANC services and the general population.[40 41] The non-association between HIV and cervical pathology stage[41–43] suggests that routine testing could be adopted in colposcopy services regardless of the ultimate cervical diagnosis, especially as the latter is usually available only after the colposcopy visit. As with TOP, attending colposcopy services is in itself an indication for testing. As with TOP, explicit mention of HIV testing in colposcopy services in specialist guidelines is absent.[10] The European Society of Gynaecological Oncology guidelines on cervical carcinoma do not mention HIV testing, nor does the expert opinion on cervical screening published by the Swiss Society of Gynaecology and Obstetrics (online supplemental table 1).

This study has limitations. First, as described in the Results section, this review presents data from high-income, low HIV prevalence settings in Europe and North America and does not therefore represent women attending TOP and colposcopy services globally. Second, studies conducted in urban settings where HIV prevalence in the local population is >0.2% may report higher prevalence rates than would be observed elsewhere in the same country. Third, TOP study data came from accredited TOP services or obstetric hospitals; we did not include data from women undergoing TOP at illegal establishments and this may have introduced bias in the prevalence figures we have presented. Finally, despite a wide and inclusive literature search, all but one of the articles and abstracts we identified for this scoping review were published before 2016. These are the data available at the time of writing, and while they provide a historical perspective on testing in TOP and colposcopy services, they do not provide insight into how testing practices may have changed since the recommendation of ART regardless of CD4 count or since the concept of U=U (undetectable=untransmittable).

CONCLUSION

This scoping review confirms that, among women attending for TOP or colposcopy services, HIV prevalence is higher than that of the general population and above the 0.1% threshold for HIV testing to be economically feasible in high-income settings. In the current post-ART era, identifying HIV risk factors in women should be to prevent future HIV acquisition and not to justify testing; pregnancy is the indication, whether carried to term or not. If specialist guidelines state explicitly that HIV testing is indicated in *all* pregnant women, whether attending for TOP or ANC, and in women undergoing colposcopy, HIV testing could be optimised and missed opportunities which impact on women's health could be reduced. TOP or colposcopy services provide not only an opportunity for HIV testing but for conversations on HIV prevention.

Handling editor Laith J Abu-Raddad

Contributors PF conceptualised and designed the study, performed the systematic literature search, and prepared the initial draft. KEAD reviewed the literature search and prepared the manuscript for publication. All authors reviewed and approved the final version of the manuscript.

Funding KEAD received support from Gilead Sciences to examine HIV testing practices within Switzerland.

Disclaimer The opinions expressed in this review are those of the authors and do not necessarily represent those of Gilead Sciences. Gilead Sciences had no role in the review design, data analysis, preparation of the manuscript or decision to publish.

Competing interests PF has received travel grant for medical conference from Gilead, outside of the scope of this work. KF, MJ-G, LL and PM report no potential conflict of interest. MC's institution has received a research grant from ViiV and Gilead and offered expert testimony for AbbVie, MSD, Gilead and Sandoz, outside of the scope of this work. KEAD's institution has received sponsorship to specialist meetings from MSD, outside the scope of this work, and additional research funding unrelated to this publication from Gilead.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; externally peer reviewed.

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HIV testing guidance by society or organisation	Region	HIV testing explicitly proposed	Comment
Termination of pregnancy			
British HIV Association (BHIVA)[1,2]	United Kingdom	Yes	First published 2008 (Last update: 2020)
National Institute for Clinical Excellence (NICE)[3,4]	United Kingdom	Yes	First published 2011 (Last update: 2016)
British Royal College of Obstetricians and Gynaecologists (RCOG)[5]	United Kingdom	No	HIV testing protocols delegated to local providers (Last update: 2011)
Swiss Federal Office of Public Health (FOPH)[6]	Switzerland	No	Last update: 2015
European Centre for Disease Prevention and Control (ECDC)[7]	Europe	No	Last update: 2018
EuroTEST Guidance (HIV Indicator Conditions)[8]	Europe	No	Accessed 2021
Cervical cancer / dysplasia			
Swiss Society of Gynaecology and Obstetrics[9]	Switzerland	No	Last update: 2009
European Society of Gynaecological Oncology[10]	Europe	No	Last update: 2020

Supplementary Table 1. HIV testing guidance in termination of pregnancy services by society or organisation.
Created by the authors

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Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	2-3
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	
INTRODUCTION			4
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	5
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	5
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	5
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	5
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	5
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	5-6
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	5-6
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	5-6 Not done (6)
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	5-6

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SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	7
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	Not done (6)
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	6-12
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	6-11
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	12-14
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	14
Limitations	20	Discuss the limitations of the scoping review process.	14
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	15

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.
* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.
† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).
‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.
§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMAScR): Checklist and Explanation. Ann Intern Med. 2018;169:467–473. doi: 10.7326/M18-0850.