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REVIEW

How to Better Screen for Blood-Borne Viruses, Specifically HIV, in Hospital Emergency Departments: French and European Perspectives

Anthony Romain Chauvin · Bruno George Spire · Olivier Bouchaud

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ABSTRACT

Hospital emergency departments (EDs) represent an acceptable and economically viable source of data on screening for blood-borne viruses (BBVs). In EDs in France, BBV screening is not based on a universal ‘opt-out’ policy (i.e. where all patients are informed that they will be screened unless they decline). Screening for BBVs is often not systematically offered when clinically appropriate and may have several challenges when it is offered. Nonetheless, opt-out BBV screening is

useful in varied urban populations where BBV prevalence is high, although further evaluations of patient, caregiver and provider acceptability, rates of repeat versus new diagnoses, linkage to care (LTC) and cost benefits are warranted. Timely LTC and the retention of patients within care are important for enhancing clinical outcomes and preventing BBV transmission. However, timely LTC may be adversely affected by social deprivation, stigma associated with a BBV diagnosis and poor healthcare organisation. Consistent political commitment and relevant resource allocation are required to target any inequalities in healthcare access. Overall, in France and Europe, universal ED opt-out BBV screening strategies are appropriate for reducing missed opportunities for the early diagnosis of BBV infections. These strategies should be more widely implemented in EDs with high BBV prevalence, together with targeted community-based BBV screening in high-risk and vulnerable populations, so that overall BBV screening remains cost-effective. Reducing BBV-related stigma and discrimination and other barriers to healthcare access is imperative, as is the ongoing need to reinforce and evaluate timely LTC after positive opt-out BBV screening in EDs.

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Key Summary Points

Emergency departments (EDs) are a feasible and cost-effective setting for blood-borne virus (BBV) screening, particularly in urban populations with high BBV prevalence.

Universal opt-out BBV screening is not routinely implemented in French EDs, leading to missed opportunities for early diagnosis and timely intervention.

Timely linkage to care (LTC) is essential for improving clinical outcomes and reducing BBV transmission, but is often compromised by social deprivation, stigma, and fragmented healthcare systems.

Political commitment and strategic resource allocation are critical to overcoming healthcare access disparities and supporting sustainable BBV screening programmes.

Broader implementation of ED-based opt-out screening, complemented by targeted community screening, is recommended to enhance cost-effectiveness and ensure equitable access to BBV diagnosis and care.

INTRODUCTION

The most common blood-borne viruses (BBVs) are hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV). In 2022, approximately 254 million people were living with HBV and approximately 50 million with HCV worldwide [1] and in 2023, almost 40 million people globally were living with HIV [2]. Globally, major efforts are needed to advance progress toward Joint United Nations Programme on HIV/AIDS (UNAIDS) and World Health Organization (WHO) goals for reducing BBV transmission [3, 4].

In the wider European Union/European Economic Area in 2023, 24,731 HIV diagnoses were reported, corresponding to a crude rate of 5.3 HIV diagnoses per 100,000 population [5]. In 2022, case numbers (and crude incidence rates) were 28,420 (8.5 cases per 100,000

population) for HBV infection and 23,249 (6.2 per 100,000) for HCV infection [6, 7].

In France, the number of new HIV-positive cases decreased from 2012 to 2022, particularly among French-born men who have sex with men (MSM), probably due to the increased use of pre-exposure prophylaxis [8]. However, new HIV cases remain disproportionately high among people born outside France, accounting for 70% of people infected by heterosexual intercourse and 14% of MSM [8]. Among MSM born outside France, the median time to HIV diagnosis post-arrival was 3 years, and 37% had a concurrent bacterial sexually transmitted infection [9]. Among people who inject drugs, new HIV infections have become rare following the introduction of harm reduction policies [10].

The prevalence of HBV is approximately 55% among people recently arriving in France from other countries [11]. Regarding HCV incidence, there has been a downward trend over the past two decades in France, as evident from haemovigilance data from blood donors, among whom the incidence of HCV infection decreased from 0.59 to 0.19 per 100,000 person-years between 2000 and 2020 [12].

Hospital EDs represent an acceptable and economically viable setting for BBV screening and provide many benefits, such as normalisation of screening, reduced patient anxiety and stigma, and encouraging people to re-engage with care [13, 14]. ED screening has high patient and caregiver acceptability, can permit the earlier identification and treatment of BBV infections, and a reduction in preventable BBV-related deaths, and can more easily reach minority ethnic groups (e.g. migrants) and potentially marginalised groups, such as people living in vulnerable or precarious situations [13, 15–18]. However, barriers to the provision of HIV testing in the ED are frequently expressed by staff, especially in primary care settings, often due to a lack of training on HIV; the reasons given generally include the feeling that HIV testing is not a staff role, lack of time, discomfort in discussing sexuality, and fear of announcing a positive test result [19–21]. In some regions, other major barriers to ED screening for BBVs may exist, such as staffing shortfalls and payor costs [22].

Adoption of targeted ED ‘opt-in’ HIV screening was based on the DICI-VIH study which demonstrated the cost-effectiveness of targeted opt-in HIV screening in French EDs [23]. In France, ED screening for BBVs is not based on a universal ‘opt-out’ policy (i.e. the situation in which all patients are informed that they will be screened unless they decline or defer testing) [24]. Moreover, BBV screening is often not systematically offered when clinically appropriate, representing significant missed opportunities.

In contrast, London (UK) EDs have successfully implemented opt-out BBV screening [25], which generally occurs by the following sequence (Fig. 1): (1) patients arrive at the ED and provide their telephone contact details; (2) information posters on opt-out screening are available in the ED for patients to read; (3) during patient–doctor consultations, doctors (being aware of the benefits of systematic screening) order an additional blood test for BBVs in anyone requiring a routine blood test; (4) blood

sampling (an additional tube) is performed by nurses trained in the usefulness of systematic screening; (5) blood tubes are transferred to a laboratory for analysis and, if a positive test result is identified for one of the three BBVs, the patient is informed by an infectious disease specialist (for HIV) or hepatologist (for HBV or HCV) and immediately started on treatment; and (6) if negative results are obtained for all three BBVs, patients are not informed of the results.

Given the epidemiology of BBVs in France and the features of French emergency services, this narrative review discusses the value of ED-based BBV screening and addresses ways in which the implementation of opt-out screening might be enhanced, with an emphasis on target populations for HIV screening, the potential clinical situations for systematic BBV screening, the feasibility of opt-out screening, and the cost-effectiveness of BBV screening and linkage to care (LTC).

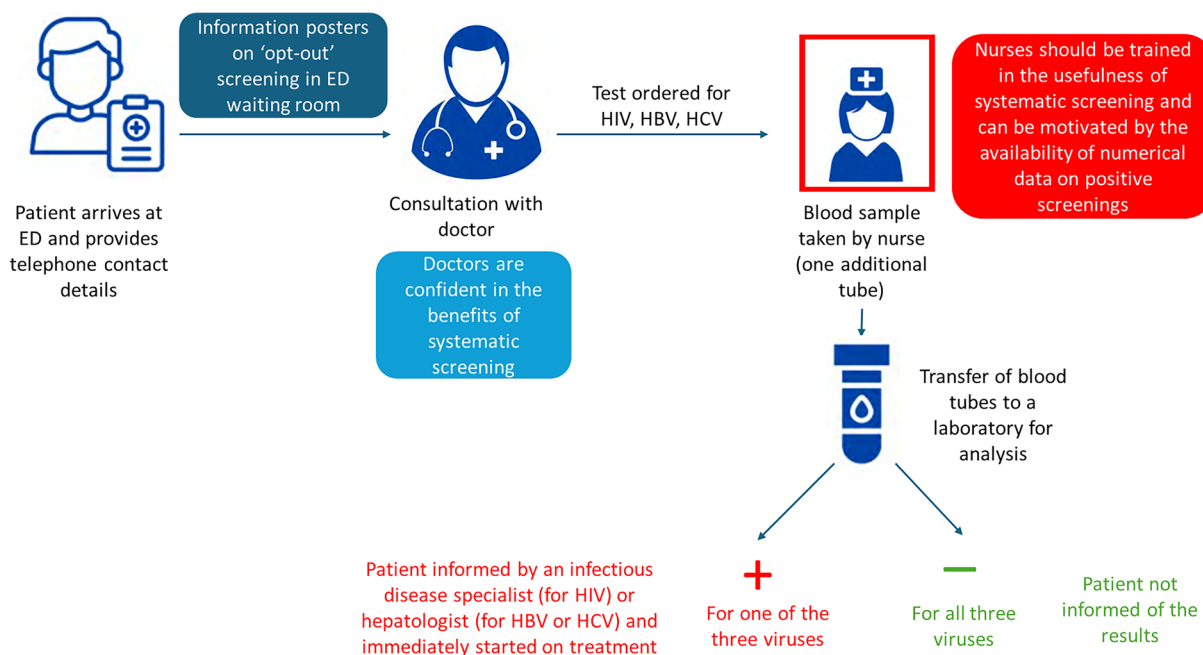


Fig. 1 Suggested opt-out pathway for patients screened for HIV, HBV and HCV in emergency departments in France (based on the UK experience). *ED* emergency department,

HBC hepatitis B virus, *HCV* hepatitis C virus, *HIV* human immunodeficiency virus

LITERATURE SEARCH

A PubMed search was conducted on 19 November 2024 for relevant articles published in English in the last 10 years. The initial search strategy used was (“HIV” or “HBV” or “HCV”) and “emergency department” and “screening”. The aim of the search was to identify articles reporting on trends in ED screening for BBVs, with a particular focus on France and Europe. Other content for this article was based on ad hoc searches for relevant literature and guidelines, and the authors’ experience in this area and knowledge of other appropriate data sources, regardless of the year. Our search predominantly identified studies focused on HIV, which is expected given that HIV testing in EDs has a longer-established history compared with testing for other BBVs [26]. Further, it should be noted that some patients who already know their viral status may use ED screening to monitor their infection. This practice can introduce bias in studies evaluating BBV screening in EDs.

Ethical Approval

This article is based on previously conducted studies and does not contain any new studies with human participants or animals performed by any of the authors.

TARGETED HIV SCREENING

Hospital EDs are an obvious entry point for HIV screening, but previous research designed to generalise screening services led to the recommendation of targeted screening for key populations or based on clinical and/or biological indicators suggestive of a primary infection or a more advanced stage of HIV infection [16, 23, 27–31]. In France, HIV screening is recommended at least once a year for MSM and more frequently (every 3 months) for groups at high risk of exposure and in the most affected geographic regions. In practice, every opportunity for screening should be

encouraged in these groups, regardless of the screening technique used, and by combining HIV, HBV and HCV screening, where possible [32, 33]. On the basis of cost-effectiveness studies, screening for viral hepatitis (HBV, HCV and delta) has been recommended in French EDs since 2023 [34].

In the DICI-VIH study, targeted HIV screening at eight EDs using a nurse-driven strategy with rapid diagnostic testing (RDT), together with a physician-directed strategy of standard diagnostic testing, was cost-effective when compared with standard diagnostic testing alone [23]. The incremental cost of €1324 for each additional new HIV case was considerably less than the mean cost per new HIV case (€20,400) previously reported at voluntary testing centres in the same French region [23]. The nurse-driven strategy also identified a rate of undiagnosed HIV infections of 0.46%; therefore, the strategy was considered cost-effective, as the undiagnosed rate was less than a previously reported threshold undiagnosed rate of 0.10% associated with cost-effectiveness [23, 35].

People Born Outside France

Overall, 32% of new HIV cases in France occur in cisgender women; 80% of these women with new HIV diagnoses are born outside France [36]. MSM born outside France also comprise a substantial proportion (12%) of annual new HIV diagnoses [9], and therefore also represent an appropriate target population for HIV screening.

The Ganymede cross-sectional study was conducted at 14 centres in the Île-de-France region in a total of 1159 migrant cisgender MSM aged ≥ 18 years who were being monitored for HIV treatment [37]. Overall, 831 MSM who immigrated at age > 15 years completed a self-administered electronic questionnaire on: migration and socioeconomic status; health before, after and on arrival in France; and sexual activity. When the questionnaire was completed, the teenage-or-older immigrants had been living in France for a median of 15 years [37]. In 1159 study participants, median age at study

entry was 43 years and almost two-thirds (61.7%) of study participants acquired HIV after arriving in France [37]. In 550 individuals who immigrated after age 15 years and who contracted HIV after immigration, 13.1% contracted HIV within 1 year of arrival in France. Factors independently associated with HIV infection during the first year post-migration, as indicated by multivariable logistic regression analysis, were: older age at arrival (adjusted odds ratio [aOR] 1.12 for each year; 95% CI 1.06–1.18); geographic region of origin compared with Europe (sub-Saharan Africa, aOR 9.90; 95% CI 3.07–35.90; Asia or Oceania, aOR 4.92; 95% CI 1.59–16.66); having >10 versus ≤10 sexual partners during the first year after arrival (aOR 7.63; 95% CI 3.44–17.31); and a social disadvantage score of ≥9 versus <9 (aOR 2.44; 95% CI 1.17–5.05) [37].

Overall, marked variation was evident in rates of post-migration HIV infection based on geographic region of origin and younger age at arrival (Fig. 2) [37]. For example, 85.4% of North African participants acquired HIV in France compared with 40.5% of Latin American participants, and 89.7% of participants aged 15–20 years at the time of arrival in France became infected compared with 32.6% of participants aged >30 years at the time of arrival. In men with definite HIV acquisition before migration to France ($n=250$), 26% were not receiving antiretroviral therapy at arrival [37].

Other European studies confirmed the benefits of targeted ED HIV screening [16, 31]. For example, the URDEP study was conducted over 12 months at six EDs in the Paris region [31]. From 183,957 people aged 15–70 years who consented to participate (opted in), 7215 underwent HIV testing by RDT (overall screening rate 3.9%), such that targeted HIV screening was possible without additional, dedicated staff; 1857 noneligible individuals were also tested. Altogether, the estimated rate of new HIV diagnoses was 0.61%, which far exceeded a previously reported cost-effectiveness cut-off of 0.10%. Among the 55 new cases, 48 (87%) had successful LTC and 36 (65%) had

not been lost to follow-up at 6 months. Of the 48 new cases with LTC, 19 (40%) were MSM, 22 (46%) were from sub-Saharan Africa and 17 (35%) were aged ≤30 years; 26 cases (54%) were non-advanced HIV with a median CD4 count of 241 cells/μL [31].

A literature review of 12 studies suggested that, irrespective of local HIV prevalence rates, targeted ED HIV screening should be offered to all individuals without a previous HIV diagnosis, but who are in a high-risk group and have not been tested recently, or who have a high-risk (indicator) condition (e.g. pneumonia) [16]. The review also recommended that all individuals aged <60 years with pneumonia should be offered ED HIV screening, as should all individuals with indicator conditions, such as cerebral abscess, lymphadenopathy, mononucleosis-like illness, oral candidiasis, multidermatomal or severe shingles, suspected meningitis, unexplained febrile illness or unexplained persistent blood dyscrasias [16]. The HIV prevalence associated with some of these clinical indicator conditions in Europe is listed in Table 1.

Use of Rapid Diagnostic Tests

In France, the use of RDTs for BBV screening supplements the use of existing conventional screening in populations and individuals most exposed to transmission risk. These groups include individuals with difficulty accessing healthcare or prevention services for any reason (e.g. geographic, social) and unscreened or insufficiently screened populations, who may readily uptake immediate screening through a RDT [38]. Currently, the populations targeted by HIV screening with RDTs comprise MSM, people with multiple sexual partners, people who inject drugs, people from high-prevalence areas, sex workers and people in vulnerable situations, and people incarcerated or formerly incarcerated [38]. HIV screening with RDTs, after medical prescription, is performed only by trained personnel and is subject to the availability of such personnel in EDs.

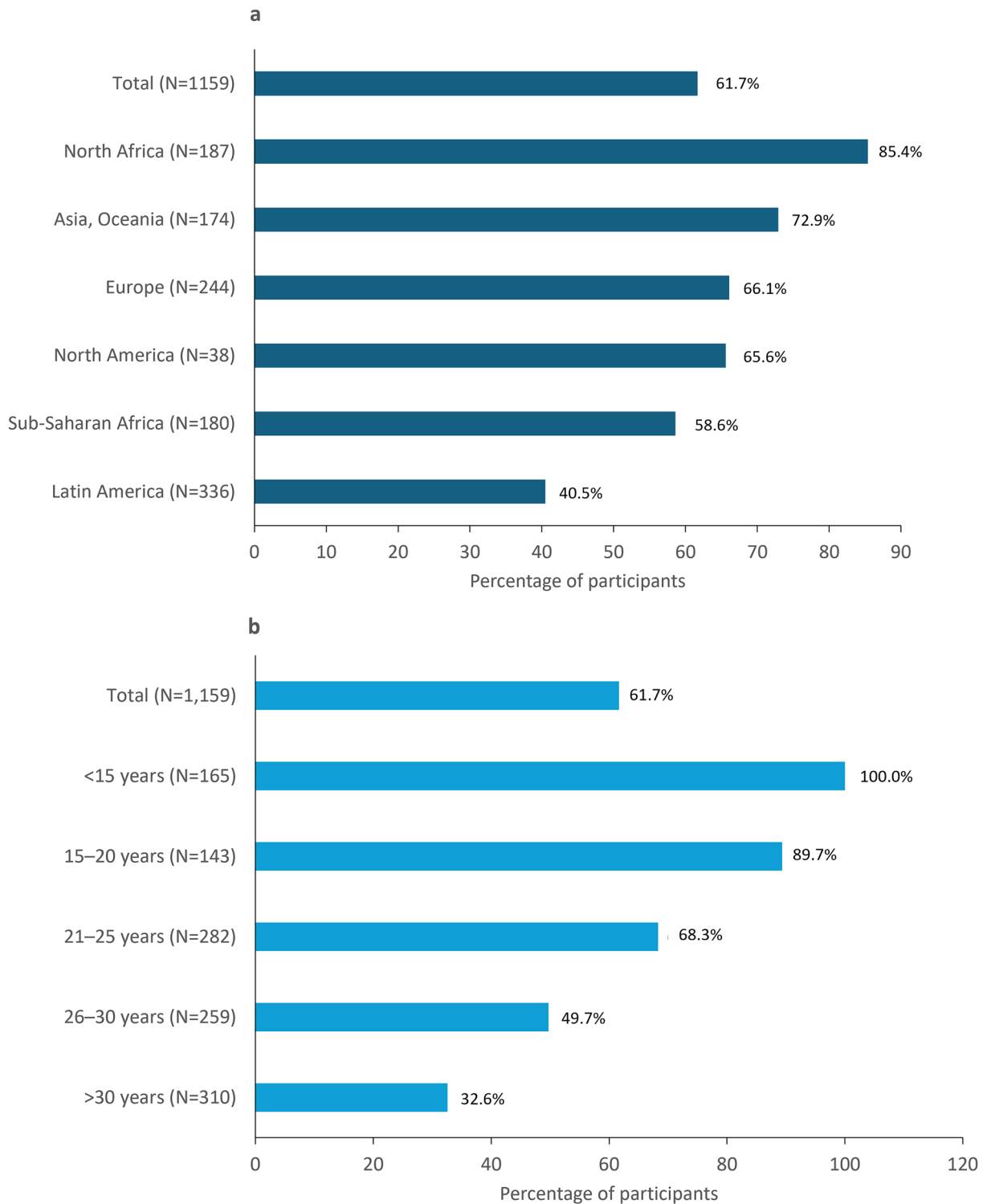


Fig. 2 Proportion of foreign-born MSM who acquired HIV after migration to France, based on **a** region of birth, and **b** age at arrival in France, in the Ganymede study in

Île-de-France, May 2021–June 2022 ($N = 1159$) [37]. *HIV* human immunodeficiency virus, *MSM* men who have sex with men

Table 1 HIV prevalence in patients with clinical indicator conditions in Europe [16]

Indicator conditions for routine HIV testing	HIV prevalence (%)
Sexually transmitted infections	4.06
Malignant lymphoma	0.29–2.90
Anal/cervical cancer/dysplasia	0.37–1.60
Herpes zoster	2.89
Hepatitis B or C (acute or chronic)	0.36–5.70
Hepatitis C	8–59
Mononucleosis-like illness	3.85–7.00
Unexplained leucocytopenia/thrombocytopenia for > 4 weeks	3.19
Seborrhoeic dermatitis/exanthema	2.06
Invasive pneumococcal disease	2.40–4.00
Community-acquired pneumonia	0.76
Candidaemia	6–23
Unexplained fever	3

HIV human immunodeficiency virus

NONTARGETED HIV SCREENING

From the European perspective, only a modest public health impact was reported for a nontargeted HIV screening strategy using fingerstick RDTs over a 6-week period in 29 EDs in the Paris metropolitan area; therefore, such a nontargeted strategy could not be recommended for implementation in the general ED population [39]. From 138,691 ED visits, 78,411 patients (56.5%) aged 18–64 years who consented to a RDT were eligible for the study [39]. Of these patients, 12,754 (16.3%) were tested and 18 new HIV diagnoses were identified (0.14%): 17 patients were in a high-risk group (MSM, $n=7$; heterosexuals from sub-Saharan Africa, $n=10$), 12 patients had previously been tested for HIV, and eight had a CD4 count < 350 cells/ μL (i.e. a late diagnosis) [39].

In a multicentre, cross-sectional study conducted in EDs in the Netherlands in 2017, nontargeted HIV screening identified only a low rate of new HIV diagnoses and was not cost-effective [40]. This indicated that targeted HIV screening

strategies for individuals with identifiable risk factors would likely be more effective. In total, 7577 patients who underwent phlebotomy were also given the option to receive an HIV test, of whom 3233 patients were tested and two new HIV cases were diagnosed (0.06%): HIV risk factors were present in both cases. The incremental cost-effectiveness ratio (ICER) per quality-adjusted life-year (QALY) gained was €77,050, which was almost four times greater than the Dutch threshold for cost-effectiveness of €20,000 at that time [40].

OPT-OUT HIV SCREENING

The goal of targeted HIV screening in EDs is to offer screening to patients with high-risk conditions (e.g. individuals aged < 60 years with pneumonia). Conversely, opt-out screening was first introduced by the US Centers for Disease Control and Prevention in 2006 to identify HIV in the early, asymptomatic stage in people aged 13–64 years in all clinical situations throughout

24-h periods, unless there was evidence of clinical deterioration, and in regions where the HIV prevalence was greater than 0.1% [15, 16].

In the UK, both the British HIV Association (BHIVA; 2008) and the National Institute for Health and Care Excellence (NICE; 2016) released guidelines recommending HIV screening for all patients attending EDs in areas with high (>2 per 1000) or extremely high (>5 per 1000) HIV prevalence [16, 41, 42]. With a total HIV prevalence of 5.4 per 1000, compared with the national average prevalence in the UK of 1.9 per 1000, London became the first UK city to implement nontargeted HIV screening in EDs. Subsequent empirical data showed that nontargeted screening was both practical and well received by staff and patients, with no negative impact on ED duration of stay when integrated with routine blood testing [16].

In the UK in April 2022, data were reported from 33 EDs that adopted opt-out testing for HIV, but also for HBV and HCV [13]. During the first 9 months of the programme, 57% of ED attendees who had a blood test were also tested for HIV, and 282 new diagnoses (7.7% of positive results) were identified. Opt-out testing was markedly effective in identifying groups disproportionately affected by a late HIV diagnosis (CD4 cell count <350 cells/ μ L within 91 days of diagnosis; i.e. people from black African communities, older people and women). Although the estimated annual number of HIV tests increased approximately eightfold after the introduction of opt-out testing, and the first 100 days of opt-out testing produced National Health Service (NHS) costs of £2 million, the estimated minimum healthcare cost savings to the NHS were £6–8 million [13].

Other European studies confirmed the clinical effectiveness of opt-out ED testing for BBVs in high prevalence areas (discussed in detail below) [17, 43, 44]. For example, for opt-out testing for HIV during a 3-year screening programme at a Portuguese ED (total ED visits 252,153), 69 new HIV diagnoses were discovered [17]. The proportion of people with a late HIV diagnosis was markedly reduced after introduction of the screening programme (39.1% after programme introduction vs 78.4% before; $p=0.03$), as was the mean number of missed opportunities for HIV diagnosis per patient (1.5 vs 2.6; $p=0.1$) [17].

OPT-OUT BBV SCREENING

In England, opt-out BBV screening supports the target of the national HIV Action Plan to eradicate new cases of HIV and acquired immunodeficiency syndrome (AIDS) and HIV-related deaths by 2030 [14, 45]. Such screening is also in line with WHO and UNAIDS strategies for HIV eradication [3, 4], and with WHO elimination targets for viral hepatitis [3], and is recommended in some EU countries by organisations such as the French National Authority for Health (HAS) and national expert group (CNS and ANRS 2023 expert report [32]).

In England, routine opt-out screening for BBVs in EDs was introduced in participating centres in April 2022 and was modelled on the experience of ED opt-out HIV testing, which had previously been successfully introduced in several EDs in the UK and Ireland [14]. Principal aspects of recent guidance from NHS England, and joint guidance from BHIVA, the British Association for Sexual Health and HIV, the British Infection Association and the Royal College of Emergency Medicine, on opt-out BBV testing in EDs in areas of high (>2 per 1000) and extremely high (>5 per 1000) HIV prevalence include the following [14, 46]: opt-out BBV testing should be normalised as a part of routine care for all patients undergoing blood tests in EDs; testing should have a minimal influence on staff efficiency and patient flow and should ideally be integrated into the workflow of existing ED staff; all ED staff should be trained to effectively conduct routine testing, understand the purpose behind it and direct patients to additional information; and training should emphasise clear, straightforward messages such as “All adults are now routinely tested for HIV, HBV and HCV, unless they opt-out”.

Furthermore, major efforts should be made in EDs to obtain accurate patient and general practitioner contact details, so that any patients with positive BBV test results can be contacted [14, 46]. All ED attendees should be informed about opt-out testing (and how to opt-out, if desired) via highly visible, accessible and translated written information widely displayed in EDs (especially in waiting

rooms and phlebotomy areas). Information should be provided, via banners, electronic and paper options (including large-print versions), flyers, leaflets, posters and videos, in at least five of the most frequently spoken languages. Communications should also emphasise the confidentiality of BBV testing and test results and that care and treatment for BBV infections are free, effective and safe. Patient information should also highlight how test results will be provided (i.e. “no news is good news”), and patients will only be contacted (within 14 days) if a result is reactive or unclear or, in some cases, if a sampling issue occurred. All positive test results should be automatically referred to an appropriate specialist, who will inform the patient, arrange confirmatory testing and ensure LTC and support [14, 46].

Factors Influencing BBV Test Implementation

In London, the acceptability and economic viability of BBV testing was assessed in 2019 at two inner-city EDs, although only 3.7% of ED attendees had residual blood samples available for testing [47]. Nonetheless, seroprevalence at the two EDs, calculated from a total of 2833 residual blood samples, was 1.3–2.2% for HIV, 1.0–1.1% for HBV surface antigen (HBsAg), 1.6–2.3% for anti-HCV antibodies and 0.9–1.6% for HCV RNA. At one of the EDs, people with HIV were more likely to be of black than white ethnicity (odds ratio [OR] 4.51; 95% CI 1.63–12.45), and less likely to be female than male (OR 0.12; 95% CI 0.04–0.42) or to have had only one versus multiple ED attendances during the 6-month study period (OR 0.39; 95% CI 0.17–0.88). The authors concluded that universal BBV testing in EDs can identify new BBV diagnoses in varied urban populations where BBV prevalence is high [47]. However, further assessments of patient and provider acceptability, rates of repeat versus new diagnoses, LTC and cost–benefit are warranted. In addition, several potential barriers to BBV test implementation, such as staff workload, differences in RDT reading times and staff forgetfulness, warrant consideration.

In 2022, the VirA+EmiC project confirmed the real-world effectiveness and sustainability of an integrated, opt-out ED screening strategy for HBV and HCV in patients aged ≥ 16 years in London [48]. From 81,088 ED visits over 11 months, 36,865 patients (45.5%) had a blood test, and the overall acceptance rate of HBV and HCV testing was 75%. In total, 235 patients tested HBsAg-positive (seroprevalence 0.9%) and 261 were HCV-positive (seroprevalence 0.9%); of the 110 and 99 patients who required LTC, 87% and 52%, respectively, were successfully engaged [48].

A similar real-world study in northern England also confirmed the effectiveness and sustainability of universal opt-out ED-based BBV screening in adults aged 16–65 years undergoing routine blood tests for urea and electrolytes [44]. Over 9 months, the testing rate for ≥ 1 BBV was 60.4%, and seroprevalence rates for HIV, HBV and HCV were 0.41%, 0.44% and 0.95%, respectively; the rates of successful LTC for new HIV, HBV and HCV diagnoses were 94.1%, 69.2% and 39.2%, respectively [44]. A smaller study in Ireland reported similar findings, with a target BBV test rate of greater than 50%, and seroprevalence rates of 0.08% (HIV), 0.22% (HBV) and 0.66% (HCV) [49].

COST-EFFECTIVENESS

Currently, HIV testing in Italy is opt-in and requires signed consent; EDs primarily use targeted HIV testing based on indicator conditions [50, 51]. However, innovative strategies are needed to meet UNAIDS targets for HIV diagnosis, LTC and virological suppression [4, 51, 52]. Recently, an Italian modelling study was conducted to inform regional and national dialogue on opt-out ED testing for HIV [52]. Such testing was triggered by the electronic patient record system for all adults presenting to an ED who required a routine blood test. The opt-out data for the model were obtained from a study in a medium- to high-prevalence (0.52%) area described earlier [17], and data were compared with the current Italian standard of

care (SoC; i.e. targeted HIV testing based on indicator conditions). Compared with SoC, universal opt-out ED HIV testing improved rates (per 10,000 ED attendees) of HIV diagnosis (new diagnoses 16.0 vs 0.2) and LTC (14.7 vs 0.2 people). Moreover, opt-out HIV testing (vs SoC) was cost-effective, with an ICER of €24,680 per QALY gained (HIV prevalence 0.52%), and remained cost-effective at an HIV prevalence of $\geq 0.25\%$ (willingness-to-pay [WTP] threshold €30,000 per QALY gained) [52].

In Barcelona, Spain, screening of 17,560 ED attendees for HBV and HCV, whenever a blood test was needed, was cost saving for HBV and cost-effective for HCV [53]. Detection rates were 0.5% for HBsAg and 0.7% for HCV RNA, and these rates were approximately three times greater than in the general Spanish population. Among the new diagnoses, more than 40% of patients had been unaware of their existing viral infection. Successful LTC was achieved for 89.4% of patients with a new HBV diagnosis and 65.2% of patients with a new HCV diagnosis.

Compared with no screening, HBV and HCV testing produced an extra 0.42 and 1.06 QALYs, respectively; corresponding incremental cost-utility ratios were –€147 and €7629 per QALY gained [53].

A Markov modelling study using data from UK EDs on opt-out HBV and HCV testing concluded that such testing and LTC were considerably likely to be cost-effective in many UK regions, depending on the underlying regional prevalence of HBV and HCV [54]. In the base-case scenario (HBsAg prevalence, 0.84%; HCV RNA, 1.40%), ED viral testing was markedly cost-effective: the ICER for HBV testing (vs no ED screening) was £9858 per QALY gained, and that for HCV testing was £8019 per QALY gained; rates of successful LTC were 85.7% (patients with HBV) and 62.5% (HCV). Given that the base-case prevalence of HBV and HCV in this study was similar to that across Europe (HBV 0.9%; HCV 1.1%), the researchers suggested that ED opt-out HBV and HCV testing might be cost-effective in European regions other than the UK,

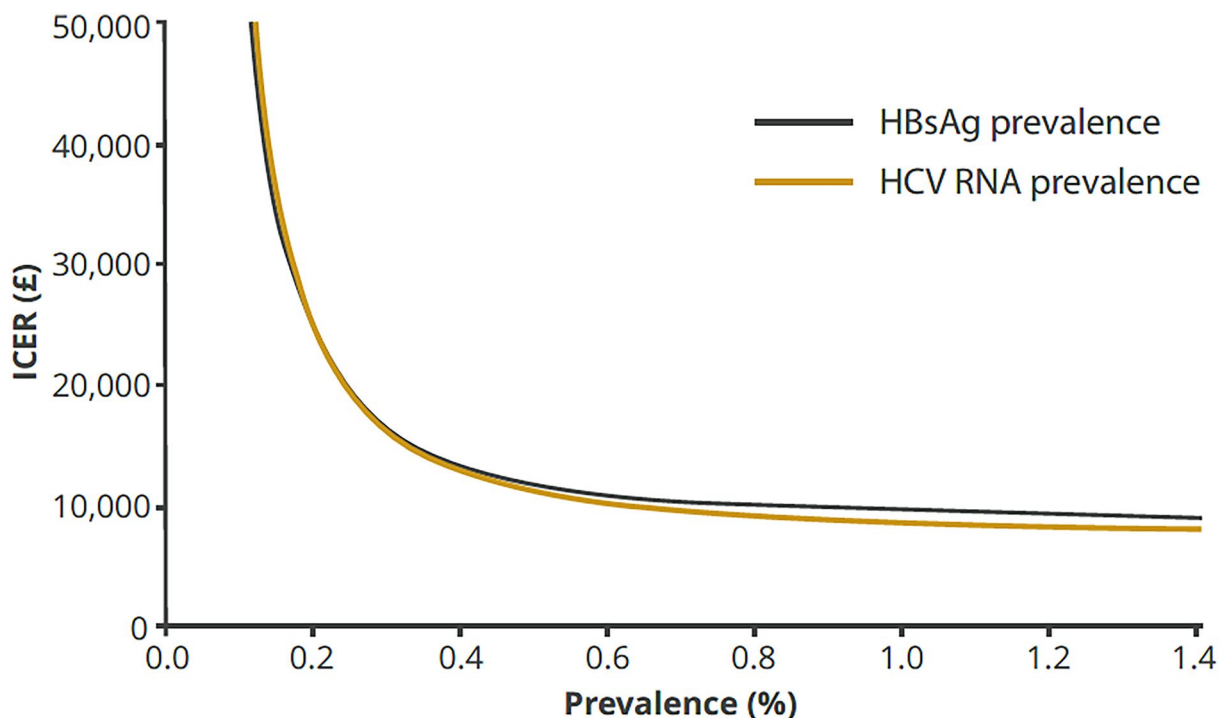


Fig. 3 Incremental cost-effectiveness ratios (ICERs) for HBV and HCV testing, in line with the local prevalence of viral hepatitis, at emergency departments in the UK [54].

HBsAg hepatitis B surface antigen, *HBV* hepatitis B virus, *HCV* hepatitis C virus

and in other high-income nations with a similar hepatitis prevalence. Cost-effectiveness for such testing was also considered likely, based on prevalence-threshold analysis (WTP £20,000 per QALY), down to a low ED prevalence of HBsAg and HCV RNA ($\geq 0.25\%$ for both) (Fig. 3); this prevalence is similar to the NICE recommendation for HIV screening in EDs in the UK ($\geq 0.2\%$) [54].

Another factor to consider when evaluating the cost-effectiveness of BBV screening strategies is the risk of acquiring a nosocomial infection following hospital admission, most commonly HCV [55, 56]. In such cases, a systematic screening policy in the ED clearly establishes the patient's initial BBV status prior to any LTC. This approach helps prevent insurance litigation. Particularly in regions with high HCV prevalence, this strategy offers strong protection for both healthcare staff and hospital administration against legal complaints—further supporting the implementation of BBV screening in the ED.

COST CONSIDERATIONS IN FRANCE

Healthcare costs for migrants in France, depending on administrative situation, are mainly financed by the state through various aid and medical coverage schemes, with additional support from non-government organisations (e.g. Médecins du Monde, Red Cross), especially for migrants without residence permits or in very precarious situations. AME, funded by the French state, allows migrants residing in France for more than 3 months, and who do not have a residence permit, to receive free access to care, including medical consultations, hospitalisations, medications, laboratory tests and dental care [57, 58]. However, AME beneficiaries account for only 1% of ED visits in France [59].

Most ED visits in France are made by individuals with national health insurance (71%) [59]. Universal health protection (Protection Universelle Maladie, PUMA), financed by social security contributions, provides health

coverage for all French citizens, including migrants with a residence permit. PUMA covers basic medical expenses, hospitalisations, dental care, consultations and medications, although supplementary health insurance may be required for excess fees and some care is not reimbursed by social security. Complémentaire Santé Solidaire (CSS), a complementary health insurance scheme for people in precarious situations, including migrants living in a regular situation, who cannot afford private health insurance, is financed by national solidarity and covers spectacles and dental prostheses (i.e. healthcare costs not covered by social security) [60, 61].

French hospitals must provide emergency care to any person, irrespective of administrative status. Costs may be covered by AME, PUMA, or directly by the state in the case of life-threatening emergencies. Patients are charged supplementary fees for laboratory testing, or for receiving care at night, weekends or on public holidays [62].

ETHICAL CONSIDERATIONS INCLUDING LINKAGE TO CARE AND CONTINUATION OF CARE AFTER BBV SCREENING

For patients with newly diagnosed BBV infections, timely LTC and retention within appropriate treatment programmes are important factors in enhancing clinical outcomes and preventing BBV transmission. However, timely LTC may be adversely affected by patient factors, such as social deprivation and stigma associated with a BBV diagnosis and, in some settings, by poor organisation of healthcare networks or restricted access to healthcare services [14, 26, 63–66]. Other major considerations are the methods of partner notification (e.g. patient referral, provider referral or expedited partner treatment) and the means of evaluating the effectiveness of partner notification [67, 68]. Indeed, BBV-related stigma and discrimination present major barriers to effectively addressing and improving factors

such as timely LTC, patient retention and partner notification [69].

Many new discoveries of BBV infection are in patients with advanced disease. For example, in the 'Going Viral' campaign in the UK, opt-out ED testing for BBVs in a high-prevalence region revealed that one-third of the BBV cases identified required LTC; one-third of these cases were patients with advanced disease or serious BBV-related complications [43]. Moreover, although opt-out ED testing for BBVs is generally associated with good LTC rates, enhancement of healthcare services is needed, especially for some high-risk populations (e.g. people who test positive for HCV RNA and who inject drugs) [44].

In France, the Dat'AIDS Study Group reported major decreases in transition times through the healthcare system (i.e. times from LTC to first prescription for antiretroviral therapy and controlled viral load [HIV RNA < 200 copies/mL]) for people living with HIV in 2009–2019 [70]. Such decreases permit a reduction in the transmission period after each new HIV case; however, the delayed diagnosis of HIV infection remains a considerable problem regarding potential attainment of UNAIDS targets for ending AIDS by 2030 [4, 70]. In Europe, enhanced collaboration is needed between governments and healthcare agencies that direct BBV testing and LTC [69]. For populations at high risk of BBV infection, who are often marginalised or overlooked, consistent political commitment and relevant resource allocation are required to target any inequalities in healthcare access [69].

FUTURE DIRECTIONS

As exemplified in France, approximately 55% of all new HIV diagnoses are attributed to people recently arriving in the country from other communities, and approximately 55% of recently arriving migrants are infected with HBV [11]. Hospital EDs represent an acceptable and economically viable source of BBV screening [13, 14].

Targeted Versus Nontargeted HIV Screening

In France, Légifrance [38] and the National Council for AIDS and Viral Hepatitis (CNS) and the French National Research Agency for HIV, Viral Hepatitis, and Emerging Infectious Diseases (ANRS) 2023 expert report [32] emphasise targeted HIV screening, which is also supported by the Ganymede study of MSM born outside France [37]. The Ganymede study revealed that a considerable proportion of migrant MSM living in the Île-de-France region acquire HIV after migration, with many cases occurring within the first few years of arrival in France. This heightened risk appears to stem from various vulnerability factors and alterations in sexual behaviour due to the non-judgemental environment for MSM relationships. The Ganymede findings can also inform HIV prevention strategies in France, supporting efforts to engage with the most at-risk migrants upon their arrival and addressing specific vulnerability factors. Furthermore, rates of post-migration HIV acquisition should be continuously scrutinised to evaluate and refine prevention policies as needed [37].

Other European studies confirmed the benefits of targeted ED screening for HIV [16, 31], whereas a large randomised controlled trial in the USA reported no superiority for targeted versus nontargeted ED HIV screening [71]. Thus, some authors contend that to reveal the concealed HIV epidemic in industrialised regions, diversification of screening methods and locations is required [16, 31]. Nontargeted screening strategies for the general population can serve as a valuable complement to targeted, community-focused strategies. Nontargeted HIV screening in EDs, given its high impact, cost-effectiveness and acceptability, could be recommended not only in French regions with high HIV prevalence but also in regions with low HIV prevalence [16, 31]. Conversely, the long-term use of targeted ED HIV screening necessitates extra funding and increased staffing, thereby limiting its applicability in resource-restricted settings [16].

Before the COVID-19 pandemic, some emergency services in France used RDTs for

nontargeted screening for BBVs, but screening goals were not reached [23]. Today, nontargeted RDT screening strategies are no longer used, as a result of a lack of staff and differences in test-reading times (i.e. HIV, 5 min; HBV and HCV, 25–30 min), such that healthcare professionals may forget to read test results.

Although HIV RDTs in EDs are practical and can reach large patient populations, one French study revealed that such nontargeted screening identified few new HIV diagnoses: most of the patients were from high-risk groups and had undergone previous HIV testing and many already had advanced-stage disease [39]. Thus, the study authors concluded that the routine implementation of nontargeted HIV screening with RDTs in general ED populations cannot be recommended [39].

Opt-Out HIV Screening

In the UK, both BHIVA and NICE recommend HIV screening for all patients attending EDs in areas with high (>2 per 1000) or extremely high (>5 per 1000) HIV prevalence [16, 41, 42]. Such a screening strategy also significantly reduced the number of late HIV diagnoses, and the number of missed opportunities for HIV diagnosis, in a Portuguese ED [17]. Compared with the current Italian SoC (i.e. targeted HIV testing based on indicator conditions), the opt-out HIV screening strategy was cost-effective when HIV prevalence was 0.52% and remained cost-effective at an HIV prevalence threshold of $\geq 0.25\%$ [52]. Importantly, this modelling study may have underestimated the true benefit of the screening programme, as the study did not consider previously disengaged HIV diagnoses or the number of HIV transmissions averted (i.e. on an ‘undetectable=untransmissible’ basis) [52].

In the UK, major advances have been made towards attaining the UNAIDS ‘95–95–95’ goals for HIV testing: 95% of individuals are diagnosed, 99% are linked to care and 98% have viral suppression [13]. The authors of an editorial in *The Lancet HIV* concluded that opt-out testing for HIV is “... not just a good public health strategy but ... is ... cost-effective ... helps to destigmatise and normalise HIV testing and

address inequalities in access to HIV care ... and should be expanded now to other areas in the next tier of HIV prevalence, and perhaps to all emergency departments” [13].

Opt-Out BBV Screening

Clearly, opt-out screening in EDs is an effective strategy to identify undiagnosed HIV, HBV and HCV infections and re-engage patients in care [14]. Major progress has been made towards achieving elimination targets for BBVs, including reducing preventable BBV-related deaths and combating stigma [25, 72, 73]. Despite this progress, many individuals with one or more BBVs remain undiagnosed or are diagnosed in the later stages of infection, even though treatments for BBVs are widely accessible, safe, effective and free. Further, older populations continue to exhibit a higher HCV prevalence compared with younger age groups [74]. To address these gaps, efforts must be intensified to expand testing and enable earlier diagnosis, and EDs have a crucial role to play in these efforts [14].

Several European studies have confirmed the patient, caregiver and provider acceptability and the cost-effectiveness of opt-out BBV screening in EDs [44, 47–49, 53, 54], and it is not unrealistic to extrapolate findings from these studies to regions of similar BBV prevalence in France. Timely LTC and appropriate continuation of care are also essential to ensure the effectiveness of such a screening strategy.

France: Current ED BBV Screening and Potential Improvements

Currently, in France, several professional organisations, associations and health authorities (e.g. the Ministry of Health and its agencies) recommend an opt-out strategy for BBV screening in EDs. However, current law contradicts these professional recommendations, as it has not yet evolved sufficiently and continues to advocate the opt-in principle. Legally, current law takes precedence over the

recommendations from professional bodies and, unfortunately, this contradiction is sometimes used as an argument for not implementing the opt-out strategy in French EDs.

Thus, currently in France, opt-out BBV screening in EDs is not widely used (Fig. 1). Therefore, considerable opportunities exist: to extend the use of such screening; to integrate such screening into appropriate clinical settings and with targeted strategies in high-risk populations in community settings; and to collate new data on the real-world effectiveness and cost-effectiveness of integrated screening, particularly in areas of low prevalence for BBV infections and in specific population groups (e.g. migrants, MSM). An opt-out strategy can also overcome barriers related to staff training and availability, such that HIV testing can be provided in EDs at any time (day and night). Ultimately, mirroring real-world data and guidance on the marked feasibility, effectiveness and cost-effectiveness of ED opt-out BBV screening in the UK and other European countries, by conducting similar studies and applying similar guidance to the wider use of ED opt-out screening in France, would likely enhance the early diagnosis of BBV infections and LTC, and further reduce BBV transmission and BBV-related deaths.

CONCLUSIONS

In Europe and France, as in the UK, universal ED opt-out screening strategies for BBVs are appropriate for reducing missed opportunities for the early diagnosis of HIV and other BBV infections. Such opt-out screening strategies should now be more widely implemented in high BBV prevalence hospital EDs, together with targeted community-based BBV screening in high-risk and vulnerable populations, so that overall screening for BBVs remains cost-effective. To facilitate faster movement towards the stringent UNAIDS and WHO targets for BBV eradication, reducing BBV-related stigma and discrimination and other barriers to healthcare access are imperative, as is the ongoing need to

reinforce and evaluate timely LTC after positive opt-out BBV screening in hospital EDs.

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Declarations

Conflict of Interest. Anthony Chauvin, Bruno Spire and Olivier Bouchaud declare that they have no conflicts of interest.

Ethical Approval. This article is based on previously conducted studies and does not contain any new studies with human participants or animals performed by any of the authors.

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