

Hepatitis B and C Prevention, Screening and Diagnostic Services at HIV Treatment Sites: International epidemiology Databases to Evaluate AIDS

Mark H. Kuniholm, PhD¹ Gad Murenzi, MD, MPH^{2,3} Niharika Samala, MD⁴ Evy Yuniastuti,
MD, PhD⁵ Gilles Wandeler, MD^{6,7} H. Nina Kim, MD, MSc⁸ Marie K. Plaisy, MD⁹ Hugo Perazzo,
MD¹⁰ Christella Twizere, MD¹¹ Francesca Odhiambo, MD¹² Rohan Bopage, MD¹³ Guy Muula,
MD¹⁴ Vincent Lo Re III, MD, MSCE¹⁵ Albert Minga, MD¹⁶ Alvaro López-Iñiguez, MD¹⁷
Dominique M. Nsonde, MD¹⁸ Charles Kasozi, MD¹⁹ Dewi K. Wati²⁰ Matthew P. Fox^{21,22} Gregory
D. Kirk, MD, PhD²³ Eugene Messou,²⁴ Carina Cesar, MD²⁵ Peter V. Ebasone, MD²⁶ Helen
Byakwaga, MD²⁷ Jeremy Ross, MBBS²⁸ Cleophas Chimbetete²⁹ George A. Yendewa, MD,
MPH³⁰ Antoine Jaquet, MD, PhD⁹ Regina C. M. Succi, MD³¹ Fernanda Maruri, MPH³² Ellen
Brazier, PhD³³ on behalf of IeDEA

¹Department of Epidemiology and Biostatistics, University at Albany, State University of New
York, Albany, NY, United States of America; ²Research for Development (RD Rwanda) and
³Rwanda Military Referral and Teaching Hospital, Kigali, Rwanda; ⁴Division of
Gastroenterology and Hepatology, Department of Medicine, Indiana University, Indianapolis, IN,

United States of America; ⁵Faculty of Medicine Universitas Indonesia - Dr. Cipto Mangunkusumo General Hospital, Jakarta, Indonesia; ⁶Department of Infectious Diseases, Inselspital, Bern University Hospital, University of Bern, Switzerland ⁷Institute of Social and Preventive Medicine, University of Bern, Bern, Switzerland; ⁸Department of Medicine, University of Washington, Seattle, WA, United States of America; ⁹National Institute for Health and Medical Research (INSERM) UMR 1219, Research Institute for Sustainable Development (IRD) EMR 271, University of Bordeaux, Bordeaux Population Health Centre, Bordeaux, France; ¹⁰Evandro Chagas National Institute of Infectious Diseases -Oswaldo Cruz Foundation (INI/FIOCRUZ), Rio de Janeiro, Brazil; ¹¹Centre National de Référence en matière de VIH/SIDA (CNR), Bujumbura, Burundi; ¹²Kenya Medical Research Institute, Centre for Microbiology Research, Research Care and Training Program, Nairobi, Kenya; ¹³Western Sydney Sexual Health Centre, Western Sydney Local Health District, Australia; ¹⁴Centre for Infectious Disease Research in Zambia, Lusaka, Zambia; ¹⁵Division of Infectious Diseases, Department of Medicine, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, United States of America; ¹⁶Centre Médical de Suivi des Donneurs de Sang (CNTS-CI), Abidjan, Côte D'Ivoire; ¹⁷Instituto Nacional de Ciencias Médicas y Nutrición, Salvador Zubirán, Mexico City, Mexico; ¹⁸Centre de Traitement Ambulatoire, Brazzaville, Republic of Congo; ¹⁹Masaka Regional Referral Hospital, Masaka City, Uganda; ²⁰Department of Pediatrics, Faculty of Medicine, Universitas Udayana, Prof. Dr. I.G.N.G Ngoerah General Hospital, Bali, Indonesia; ²¹Department of Epidemiology, Boston University, Boston, MA, United States of America; ²²Health Economics and Epidemiology Research Office, University of the Witwatersrand, Johannesburg, South Africa; ²³Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, United States of America; ²⁴Centre de Prise

en charge, de Recherche et de Formation (CePreF) Yopougon-Attié, Abidjan, Côte d'Ivoire;

²⁵Investigaciones Clínicas, Fundación Huésped, Buenos Aires, Argentina; ²⁶Clinical Research Education Networking and Consultancy (CRENC), Yaounde, Cameroon; ²⁷Mbarara ISS Clinic, Mbarara, Uganda; ²⁸TREAT Asia, amfAR - The Foundation for AIDS Research, Bangkok, Thailand; ²⁹Newlands Clinic, Harare, Zimbabwe; ³⁰Division of Infectious Diseases and HIV Medicine, Department of Medicine, Case Western Reserve University, Cleveland, OH, United States of America; ³¹Universidade Federal de São Paulo (UNIFESP), Escola Paulista de Medicina, Centro de Atendimento da Disciplina de Infectologia Pediátrica (CEADIPE), São Paulo, SP, Brazil; ³²Division of Infectious Diseases, Department of Medicine, Vanderbilt University Medical Center, Nashville, TN, United States of America; ³³Institute for Implementation Science in Population Health, City University of New York, New York, NY, United States of America

CORRESPONDING AUTHOR: Mark H. Kuniholm, PhD, Department of Epidemiology & Biostatistics, University at Albany, State University of New York, 1400 Washington Ave, Albany, NY 12222. Phone: 518-442-2493. E-mail: mkuniholm@albany.edu

KEY WORDS: hepatitis B virus, hepatitis C virus, HIV, prevention, screening, diagnostic, services

RUNNING HEAD: Hepatitis services at HIV treatment sites

CONFLICTS OF INTEREST: All authors declare no conflicts.

SOURCES OF SUPPORT: The International epidemiology Databases to Evaluate AIDS (IeDEA) is supported by the U.S. National Institutes of Health's (NIH) National Institute of Allergy and Infectious Diseases, the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development, the National Cancer Institute, the National Institute of Mental Health, the National Institute on Drug Abuse, the National Heart, Lung, and Blood Institute, the National Institute on Alcohol Abuse and Alcoholism, the National Institute of Diabetes and Digestive and Kidney Diseases, and the Fogarty International Center: Asia-Pacific, U01AI069907; CCASAnet, U01AI069923; Central Africa, U01AI096299; East Africa, U01AI069911; NA-ACCORD, U01AI069918; Southern Africa, U01AI069924; West Africa, U01AI069919. Informatics resources are supported by the Harmonist project, R24AI24872. This work is solely the responsibility of the authors and does not necessarily represent the official views of any of the institutions mentioned above. This manuscript is the result of funding in whole or in part by the NIH. It is subject to the NIH Public Access Policy. Through acceptance of this federal funding, NIH has been given a right to make this manuscript publicly available in PubMed Central upon the Official Date of Publication, as defined by NIH.

ABSTRACT

Background: Prevention, screening and diagnostic services for hepatitis B virus (HBV) and hepatitis C virus (HCV) can prevent morbidity and mortality in people receiving HIV care. However, there is limited information about the availability of HBV and HCV services at HIV clinics globally.

Methods: The International epidemiology Databases to Evaluate AIDS (IeDEA) conducted surveys of service delivery and practices at participating HIV treatment centers from seven regions. We used 2023 survey data to measure availability of HBV vaccination, HBV and HCV screening, HBV surface antigen (HBsAg), HBV DNA, HCV antibody, HCV RNA testing. Multivariable logistic regression models were used to test associations of site characteristics with HBV and HCV services.

Results: HBV vaccination was available on-site at 67.7% of 204 HIV treatment sites. Screening for HBV and HCV at HIV care enrollment was reported by 72.1% and 50% of sites, respectively. HBsAg, HBV DNA, HCV antibody and HCV RNA testing were available on-site at 77%, 47.6%, 61.8% and 44.6% of sites, respectively. Sites serving predominately rural (vs. urban) populations were less likely to report on-site availability of HBV DNA (odds ratio (OR):0.07; 95% confidence interval (CI):0.01-0.68; $P=0.02$), HCV antibody (OR=0.18; 95% CI:0.04-0.92; $P=0.04$) and HCV RNA (OR=0.10; 95% CI:0.01-0.90; $P=0.04$) testing.

Conclusion: Life-saving services such as HBV vaccination, HBsAg and HCV antibody testing were available on-site at most HIV treatment sites participating in the IeDEA network. Lower availability at rural sites suggests that expansion of services is important to eliminate HBV and HCV as public health problems in people receiving HIV care.

WORD COUNT: 3,004

INTRODUCTION

Human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV) are overlapping pandemics, with an estimated 2.7 million people living with HBV/HIV

and 2.3 million living with HCV/HIV worldwide.^{1,2} The majority (69%) of people living with HBV/HIV live in sub-Saharan Africa, whereas no single region contains the majority of people living with HCV/HIV.^{1,2} All three viruses spread from person to person through exposure to blood, blood products, needles, from mother to child and as sexually transmitted infections. Sexual transmission of HCV is more common between men who have sex with men (MSM) than between heterosexual partners, with HIV infection an additional risk factor in MSM.³ Deaths from HBV and HCV currently outnumber those from HIV, and by 2040, viral hepatitis will cause more deaths annually than HIV, malaria, and tuberculosis combined.^{4,5}

Most HIV care and treatment programs around the world have patients living with or at risk for HBV/HIV and HCV/HIV co-infections, but strategies to provide HBV and HCV prevention, screening and diagnostic services in the context of HIV care are not well documented and may be heterogeneous. World Health Organization (WHO) guidelines for HIV and viral hepatitis prevention, screening and diagnosis have evolved over time,^{4,6} as have HIV and viral hepatitis guidelines in individual countries. Currently, WHO recommends HBV vaccination along with HBV and HCV testing for people living with HIV (PWH),⁶ but there are not recommendations that PWH should be tested for HBV and HCV more than once. HBV treatment is recommended for PWH 12 years of age or older,⁷ while HCV treatment is recommended for everyone 3 years of age or older, regardless of HIV status.⁸ Changing guidelines for prevention, screening and diagnosis along with health system differences, heterogeneous HIV patient populations and liver society guidelines⁹ and limited clinical, laboratory or financial resources could all influence HBV and HCV service delivery models in the context of HIV care.

The objective of this study was to document current status and evolution over time of HBV and HCV prevention, screening and diagnostic services for adults and children receiving

HIV care and treatment among a globally diverse cohort of HIV care and treatment sites. Timely data on viral hepatitis service delivery informs International epidemiology Databases to Evaluate AIDS (IeDEA) research priorities¹⁰ and may also inform efforts of individual countries and regions to implement programs and policies for elimination of HBV and HCV as public health problems by 2030.¹¹ Finally, global data on viral hepatitis service delivery may also help HIV service providers and health policy makers mitigate harms from viral hepatitis and prevent onward transmission of HBV and HCV infections to people living with and without HIV.

METHODS

Survey design

The IeDEA consortium (<http://www.iedea.org>) is a global research consortium of HIV care and treatment sites in seven geographic regions: Asia-Pacific; Caribbean, Central, and South America (CCASAnet); North America (NA-ACCORD); Central Africa; East Africa; Southern Africa; and West Africa. Established in 2006, the IeDEA research consortium currently comprises close to 400 HIV care and treatment sites in 44 countries that contribute longitudinal data for more than 2 million PWH, including adults and children, ever enrolled in HIV care.¹² Beginning in 2009, IeDEA has conducted periodic surveys of participating clinics in an effort to document service availability and practices.

The content of IeDEA's consortium-wide site assessment surveys – conducted every three to five years – are designed using a consultative approach, as previously described.¹³ During July and August of 2022, IeDEA's hepatitis working group reviewed viral hepatitis-related questions (i.e., prevention, screening, diagnostic, fees) included in site assessment 4.0 (SA4.0) and made recommendations for retaining or changing questions for inclusion in site assessment 5.0

(SA5.0), including HBV vaccination, routine screening for HBV and HCV at the time of enrollment into HIV care and during follow-up, HBV surface antigen (HBsAg), HBV DNA, HCV antibody (anti-HCV), HCV RNA testing and patient fees for diagnostic testing and antiviral medications (Supplementary Table 1).

Site eligibility criteria and sampling

All sites that actively contributed longitudinal patient-level data in 2020 (through SA4.0) and 2023 (through SA5.0) were eligible for inclusion in this study. In the Southern Africa region of IeDEA, where participating sites include both stand-alone clinics and clinics that are part of large programmatic cohorts, a systematic, hybrid sampling strategy was used to determine eligibility, as previously described.¹³

Survey implementation

SA4.0 launched on September 11, 2020, and closed on March 1, 2021. While it was originally intended that the survey would explore the status of service delivery at the time of survey implementation, calendar year 2019 was selected as the reference period for SA4.0 because of disruptions related to the SARS-CoV-2 pandemic in 2020. SA5.0 launched on August 3, 2023, and closed December 31, 2023, and assessed service delivery during calendar year 2023. Both SA4.0 and SA5.0 were distributed in English and French as online questionnaires and as PDFs formatted for completion on paper. All survey data were collected and managed using Research Electronic Data Capture (REDCap) tools hosted at Vanderbilt University.^{14,15}

Ethical review

The conduct of the 2020 and 2023 IeDEA-wide site assessment surveys were reviewed and designated as "non-research" per 45 CFR §46.102(d) by the VUMC Institutional Review Board (IRB#200013 and IRB#230843, respectively).

Statistical methods

We first calculated descriptive statistics for the most recent survey data collected in 2023, overall and by IeDEA region. Secondly, we used multivariable logistic regression models – adjusting for region (reference category: East Africa) - to test whether site characteristics including population served (adults, children, both adults and children), area of residence of the population served by the health facility's HIV clinic (predominately urban, predominantly rural, mixed urban/rural) and facility level (health center, district hospital, or regional, provincial or university hospital) were associated with availability of HBV and HCV prevention, screening and diagnostic services in 2023. We included all site characteristics together in a single multivariable logistic regression model to estimate independent associations of each site characteristic. Finally, we used Fisher's exact test to test for differences in availability of HBV and HCV prevention, screening and diagnostic services and patient fees between SA4.0 (2019) versus SA5.0 (2023). Statistical analyses were conducted with SAS 9.4 software (SAS Institute, Cary, NC).

RESULTS

Characteristics of IeDEA study sites

Characteristics of sites that responded to SA4.0 (N=227), SA5.0 (N=235) or both (N=204) are shown in Supplementary Table 2. The distribution of sites characteristics was

generally similar across the two surveys, apart from a decreased proportion of clinics from IeDEA's Asia-Pacific region, and small changes in the proportion of sites serving only children and predominantly urban populations.

HBV and HCV vaccination and screening services in 2023

HBV vaccination services were available, either in the HIV clinic or in the same health facility but not in the HIV clinic (considered jointly as “on-site”), at 67.7% of sites (Table 1). However, access to HBV vaccination varied by region, shown in Figure 1. For example, 96.3% of sites in North America vs. 4.5% in East Africa offered HBV vaccination in the HIV clinic. Among IeDEA's Africa regions, the proportion of sites that reported that HBV vaccination was not available ranged from 15.4% to 26.9% (Figure 1). Routine screening for HBV at the time of enrollment into HIV care was reported by 147 (72.1%) of sites (Table 1), ranging from 13 of 27 sites (48.2%) in Southern Africa to 26 of 26 sites (100%) in North America. Half (50%) of sites reported routine screening for HCV at the time of enrollment into HIV care (Table 1), with a range between 1 of 13 (7.7%) sites in West Africa to 26 of 26 (100%) sites in North America.

HBV and HCV diagnostic services in 2023

HBsAg and HBV DNA diagnostic services were available on-site at 77% and 47.6% of sites, respectively (Table 1). However, access to HBV diagnostic services varied by region, as shown in Figure 2. For example, HBsAg diagnostic services were available in the HIV clinic at 6 of 9 (66.7%) Latin American sites vs. at 9 of 67 (13.4%) East African sites (Figure 2). HBV DNA diagnostic services were available in the HIV clinic at 14 of 26 (53.8%) North American sites vs. at 3 of 67 (4.5%) East African sites (Figure 2).

HCV antibody and HCV RNA diagnostic services were available on-site at 61.8% and 44.6% of sites, respectively (Table 1). However, HCV antibody and HCV RNA diagnostic services also differed by region. For example, availability of HCV antibody diagnostic services in the HIV clinic ranged from 6 of 9 (66.7%) Latin American sites vs. 3 of 67 (4.5%) East African sites (Figure 2). HCV RNA diagnostic services were available in the HIV clinic at 5 of 9 Latin American sites (55.6%) vs. at 1 of 67 (1.5%) East African sites (Figure 2).

Patient fees for HBV and HCV diagnostic and treatment services in 2023

Less than one quarter of sites globally reported that patients routinely paid fees other than insurance co-pays for HBV and HCV diagnostic services (Table 1). However, the proportion of sites reporting that patients paid fees for diagnostic services varied by region, with zero (0%) sites in Southern Africa reporting that patients paid fees for HBV and HCV diagnostic services vs. 36.6% of patients paid fees for HBV diagnostic services in Asia Pacific and 84.6% of patients paid fees for HCV diagnostic services in West Africa.

Less than one fifth (20%) of sites globally reported that patients routinely paid fees other than insurance co-pays for HBV and HCV antiviral medication (Table 1). However, the proportion of patients that paid fees for antiviral medications varied by region, with zero (0%) sites in Southern Africa reporting that patients paid fees for these services vs. 46.2% and 76.9% of sites in West Africa reporting that patients paid fees for HBV and HCV antiviral medications, respectively.

Site characteristics associated with availability of HBV and HCV services in 2023

IeDEA sites serving predominately rural (vs. urban) populations were less likely to report on-site availability of diagnostic services for HBV DNA (odds ratio (OR)=0.07; 95% confidence interval (CI): 0.01, 0.68; $P=0.02$), anti-HCV (OR=0.18; 95% CI: 0.04, 0.92; $P=0.04$) and HCV RNA (OR=0.10; 95% CI: 0.01, 0.90; $P=0.04$ – Table 2). Sites serving predominately rural populations were also less likely to report HCV screening for new (incident) infections (OR: 0.17; 95% CI: 0.05, 0.64; $P=0.009$). No other site characteristics were significantly associated with availability of HBV and HCV prevention, screening and diagnostic services in 2023 (Table 2).

Changes between 2019 and 2023 site assessments

The proportion of sites that reported patient fees for HCV antiviral medication (other than insurance co-pays) changed over time ($P=0.04$), with 10.8% and 18.7% of sites reporting that patients paid fees for HCV antiviral medication in 2019 and 2023, respectively. There were no other significant differences in availability of HBV and HCV prevention, screening and diagnostic services or patient fees between SA4.0 (2019) versus SA5.0 (2023) (data not shown).

DISCUSSION

Life-saving services such as HBV vaccination, HBsAg and HCV antibody testing were available on-site at most HIV treatment sites participating in the IeDEA network. Two thirds of sites in 2023 had HBV vaccination services on-site and 72% of sites reported routine screening for HBV at the time of enrollment into HIV care. In contrast, routine screening for HCV at HIV care enrollment was reported by half of sites, and availability of HCV services was generally lower than HBV services in IeDEA regions. These estimates represent benchmarks against which to measure progress in viral hepatitis elimination in HIV treatment settings and provide essential

health interventions as described in the 2022 WHO consolidated guidelines on HIV, viral hepatitis and STI prevention, diagnosis treatment and care for key populations.⁶

These estimates also reflect profound regional heterogeneity in viral hepatitis service availability at HIV treatment sites. Asia Pacific, Latin America and North America had the highest levels of HBV and HCV prevention, screening and diagnostic service availability in the HIV clinic, whereas in IeDEA's Africa regions viral hepatitis services were more commonly available elsewhere in the same health facility or offsite (referral). Further, essential services such as HBV vaccination were not available at over one quarter of sites in some African regions. These data are consistent with those collected in 2017 by our group from 35 mainly urban African IeDEA HIV treatment sites in which only 37% and 6% of sites conducted routine screening for HBV and HCV, respectively.¹⁶ It is feasible to integrate HBV and HCV prevention, screening, diagnostic and/or treatment services into HIV care in African countries, but challenges in many countries include lower training for health care personnel, technical limitations in diagnostic testing performance and sample storage, complexities around provision of HBV vaccination and lack of simplified service delivery models for HBV and HCV care and treatment.^{17,18}

Cuts to the PEPFAR program¹⁹ may disproportionately impact HBV and HCV services for people with HIV (PWH) in Africa. In response to reductions in global HIV funding, many countries in sub-Saharan Africa are moving toward integrating HIV care into routine health services. This shift brings both opportunities and challenges. On one hand, there are valid concerns that integration could dilute the specialized expertise developed in antiretroviral therapy delivery and lessen the focus on HIV-specific care. At the same time, the substantial infrastructure built for HIV programs might help support broader routine health services,

including screening, diagnosis, and management of viral hepatitis, both for persons living with and those living without HIV. Cuts to health spending in Africa and other regions may also increase the proportion of HIV treatment sites that charge fees for HBV and HCV services. Access to HBV and HCV services is important for the health of individual patients and for the health of their communities, a benefit known as ‘treatment as prevention’.²⁰

Differences in access to health services are common for many rural populations, including in high-, middle- and low-income countries. While it is possible that some rural populations face a lower burden of viral infections (particularly HCV) compared to urban populations and thus have less need for services, this is not the case in all settings.²¹⁻²³ New strategies developed in recent years to address rural-urban disparities have included testing HBV and HCV service delivery methods specifically designed for rural populations (e.g., point-of-care testing) as well as identification of policy barriers to access HBV and HCV services by rural populations.²⁴⁻²⁶

Strengths of this study include standardized site assessment protocols with 95% response rates from IeDEA HIV treatment sites with data collected and managed using REDCap. A second strength of this study is the inclusion of diverse sites in high-, middle-, and low-income countries. A third strength is that these periodic site survey data reflect real-world service delivery data because the IeDEA consortium does not dictate clinical practices or policies to participating sites. A limitation inherent in site assessment surveys is the unit of analysis is a site, rather than an individual, and thus the sample size for hypothesis testing is less than is commonly encountered in studies of individual participants. We were surprised that there were not more significant differences between 2019 and 2023 data and acknowledge the potential impact of study sample size on this conclusion. Nevertheless, our finding is that HBV and HCV

prevention, screening, diagnostic and/or treatment service availability at IeDEA HIV treatment sites was little changed over a four-year period. The fact that the unit of analysis in site assessment surveys is a site rather than an individual also precluded tracking individual patient outcomes, including disease progression and linkage to care. A second limitation is the inherent limitations of self-administered surveys. IeDEA regional and country coordinators were asked to select individual(s) at each clinic who were knowledgeable about the clinic capacity and services, but we cannot exclude the possibility of data misclassification including recall and social desirability biases. The site assessment surveys may also have imperfect ascertainment of the setting in which hepatitis services are provided, such as if an HCV antibody test was ordered by a provider in the HIV clinic but phlebotomy for the test was performed not in the HIV clinic, but elsewhere in the same health facility. We attempted to mitigate this limitation by creating a combined variable of either in the HIV clinic or in the same health facility but not in the HIV clinic (considered jointly as “on-site”). A third limitation is that site assessment surveys did not collect information on the types of HBV and HCV diagnostic kits, including diagnostic characteristics (e.g., sensitivity and specificity) and whether the kits were designed to be used as point-of care diagnostics. A fourth limitation was that no information related to hepatitis delta virus (HDV) was ascertained as a part of the site assessment surveys. HDV co-infection can lead to faster progression of liver disease and hepatocellular carcinoma in people living with HBV, but at this time there is no widely available treatment for HDV.²⁷ Finally, HBV and HCV services availability at HIV treatment sites may not be generalizable to other clinical settings that provide viral hepatitis services (e.g., antenatal care, substance abuse treatment and emergency rooms), or representative of HIV treatment sites that do not participate in the IeDEA network. Relatedly, clinics participating in IeDEA may be better resourced and provide more advanced levels of care,

meaning that our findings may over-estimate the availability of services in many of the countries reflected in our data.

In conclusion, we found that HBV prevention, screening, and diagnostic services were available on-site at most HIV treatment sites participating in the IeDEA network, with lower availability at sites in Africa and for HCV services. We also found that rural sites were less likely to have HBV and HCV diagnostic services. These disparities – both between and within regions – represent potential barriers to efforts focused on elimination of HBV and HCV as public health problems by 2030.¹¹ However, a central purpose in measuring these disparities is to provide information to health professionals at HIV treatment sites and health policy makers in different countries from which to learn and develop best practices for their own settings to reduce morbidity and mortality from HBV and HCV in PWH and in their communities.

ACKNOWLEDGEMENTS

The following individuals led the development, design and implementation of IeDEA's 2023 site assessment survey: Chad Achenbach, Ellen Brazier, Yanink Caro, Jessica Castilho Stephany Duda, Leslie A. Enane, Lukas Fenner, Esther Freeman, April D. Kimmel, Mark Kuniholm, Kathryn Lancaster, Fernanda Maruri, Denis Nash, Angela Parcesepe, and C. William Wester. Site investigators, clinicians and data managers who distributed and completed the survey are listed by IeDEA region, below. The authors are grateful to all these individuals for their substantive contributions, which made this analysis possible.

ASIA-PACIFIC

Australia: K Petoumenos, M Law, A Kariminia, A Han, N Roth, L Burton, J Shapiro, K Watson, J Duffy, D Russell, T Flitcroft, DJ Templeton, LM Garton, D Sowden, R Teague, E Chow, J Ong, M Gunathilake, S Hall, K Thompson, J Hoy, M Bryant, S Price, J McMahon, N Ryder, G Sweeney, E Leprince, A Carr, A Hawkes, M O'Reilly, A D Smith, A Martin Redmond, S Benn, I Woolley, J O'Bryan, K Cisera, T Korman, C Thng, R Bopage. **Cambodia:** B Ngauv, V Khol, V Bun, C Pov. **China (Hong Kong SAR):** S Chan, MP Lee, TS Kwong. **India:** R Borse, H Prasad, V Mave, S Nimkar, N Kumarasamy, S Poongulali, S Pujari, K Joshi, S Gaikwad, A Chitalikar. **Indonesia:** IKA Somia, MS Utama, AAAY Gayatri, NMDD Sukmawati, DK Wati, IB Ramajaya, D VedaSwari, A Alam, R Wisaksana, P Achdiat, S Iskandar, E Yuniastuti, S Sundari, A Widhani, B Wicaksana, N Kurniati, D Muktiarti. **Japan:** J Tanuma, H Gatanaga, H Uemura, Y Koizumi. **Malaysia:** YM Gani, TK Heng, NA Misnan, SK Chidambaram, I Azwa, S Basri, RX Ng.

Philippines: R Ditangco, MK Pasayan, ML Mationg, N Delgado. **Singapore:** D Loy, OT Ng, Z Ferdous. **South Korea:** JY Choi, JH Kim. **Taiwan:** HP Chen, PC Wu. **Thailand:** A Avihingsanon, HMS Lwin, C Wongvoranet, C Ruengpanyathip, S Kiertiburanakul, A Phuphuakrat, L Chumla, N Sanmeema, R Chaiwarith, J Praparattanapan, K Nuket, S Khuwuwan, P Kambua, S Pongprapass, J Limlertchareonwanit. **Vietnam:** TN Pham, DTH Nguyen, DT Nguyen, TT Nguyen, NCT Nguyen, CD Do, LT Nguyen, TT Doan, LV Nguyen, PH Nguyen, TTT Giang, TTT Huong, QT Du, TT Nguyen, TTT Trang, LAT Nguyen, QN Nguyen, VTT Duong, NDH Yen. **Regional coordination and data management centers:** AH Sohn, JL Ross, B Petersen, T Suwanlerk, MG Law, K Petoumenos, A Jiamsakul, D Rupasinghe, A Kariminia.

CARIBBEAN, CENTRAL, AND SOUTH AMERICA (CCASAnet)

Argentina: Pedro Cahn, Carina Cesar, Florencia Cahn, Valeria Fink, Nicolas Doudtchitzky. **Brazil:** Sandra Wagner Cardoso, Emilia Jalil, Brenda Hoagland, Carolina Coutinho, Flavia Gomes Faleiro Ferreira, Jorge Andrade Pinto, Daisy Maria Machado, Ana Isabel de Melo Pereira Monteiro, Paulo Abrão. **Chile:** Claudia M. Cortes. **Haiti:** Vanessa Rouzier. **Honduras:** Marco Tulio Luque, Magda Chavez, Diana Varela, Isaura Herrera. **Mexico:** Brenda Crabtree-Ramirez, Jessica Mejía Castrejon, Alvaro Lopez Iniguez, Rodrigo Ville Benavides. **Peru:** Fernando Mejía, Eduardo Gotuzzo. **Regional coordination and data management center:** Jessica L. Castilho, Stephany Duda, Fernanda Maruri, C. William Wester.

CENTRAL AFRICA IeDEA

Burundi: Pelagie Nimbona, Gakima Devote, Eliane Hatungimana, Thierry Nahimana, Olive Niyonkuru, Emerentienne Gahimbare, Ella-Ange Kazigamwa, Nadine Nisana, Jeanine Niyonzima, Christella Twizere, Annabelle Niyongabo, Jean Marie Ntibigarura, Zacharie Ndizeye. **Cameroon:** Esther N. Neba, Denis Nsame, Ajeh Bazil, Vera Veyieeneneng, Djenabou Amadou, Eric Walter Pefura, Nicoline Ndi, Eric Ngassam, Philis Fon, Annerreke Nyenti, Judith Nasah Lainsi, Adiah Mary Akama, Anastase Dzudie, Peter Vanes Ebasone, Gabriel Mabou. **Democratic Republic of the Congo:** Simon Kombela, Nzungani Jean-Paul, Patricia Vangu Matondo Lelo, Faustin Kitetele, Catherine Akele, Georgine Luzimbu, Eric Kiambi Makamba, Mpongo Makinda Thethe, Matthieu Musiku. **Republic of Congo:** Dominique Mahambou Nsonde, Arcel Christ Massamba Ndala, Rocide Moukouba, Merlin Diafouka, Adolphe Mafoua, Nadège Teke Bagamboula, Ursula Ingrid Koukha, Nadine Mahinga. **Rwanda:** Jules Onesphore Igirimbabazi, Esperance Mujawimana, Fidele Ntarambirwa, Nicole Ayinkamiye, Ernestine Igizeneza, Providence Uwineza, Yvonne Tuyishimire, Elizaphan Nzabahimana, Emmanuel Ndamijimana, Janvier Mukankubana, Jean Baptiste Habumuremyi, Françoise Mugwaneza, Marie Alice Liliane Cyuzuzo, Marie Louise Nyiraneza, Jean Claude Habanabashaka, Sr Marie Louise Nyiransabimana, Josephine Ayinkamiye, Dieudonne Niyoyita, Liliane Tuyisenge, Rose Kwitonda, Jeanne d'Arc Mukakarangwa, Sr Epiphany Mukashyaka, Fabien Gahunzire, Theophilla Niyigobaka, Christian Shyaka, Marie Victoire Uwambaje, Veneranda Mukarwego, Louis Gataha, Bonheur Uwakijijwe, Olive Uwamahoro, Jean d'Amour Niyonzima, Marie Grace Ingabire, Patrick Maniragaba, Deo Gratias Mugisha, Berthilde Uwumaliya, Viateur Haburemyi, Beatrice Uwimana, Jules Ndumuhire, Sylvie Sanaso, Ruth Nyiramahirwe, Vincent Habimana, Gerald Bunani, Gilbert Maniriho, Innocent Sangwa, Fred Muyango, Wilbrold Habiaremye, Angélique Murerwanimana, Marie Claire Uwamahoro, Olive Uwamahoro, Esperance Tuyishime, Olive Mukahirwa, Albertine Bonheur, Eugénie Mukashyaka, Florence Umugiraneza, Rosine Feza, Marie Denise Uwamahoro, Chantal Benekigeri, Jacqueline Musaninyange, Chantal

Dusabe, Rose Kagaju, Shadrack Niyibizi, Marie Rosine Umugwaneza, Alex Buteera, Eric Seruyange, Thierry Habiryayo, Gad Murenzi, Gallican Kubwimana, Ben Muhoza, Athanase Munyaneza. **Regional coordination and data management center:** Ellen Brazier, Denis Nash.

EAST AFRICA IeDEA

Kenya: Mildred Kweyu, Linda Alosa, Doris Tutu Pepela, Victoria Akinyi Amonde, Moses Obuya, Kennedy Anyira Wawire, Beatrice Mayo, Josephine Mukoya, Saumu Namiso, Chirchir Benard, Levin Zeph Juma, Hillary Kiptoo, Meshack Murto, Lydia Arusei, Ann Namae, Hosea Maritim, Wilson Kirui, Fentra Sakong, Maureen Mutiembu, Moses Delewa, Sarah Cheptoo, Titus C. Rutto, Nicholas Kosgei, Felix Ambula, Josephine Chebet, Philemon Matutu, Monica Wanza, Rose Sibweche, Judith Jepyegon Kimelil, George Wafula Oduori, Kenneth Malika, Renson Ekemesi, Sadam Odhiambo, Nobrah M. Mutuku, Lydia Oloo, Koech Canicious, Wycliffe Omondi Abwao, Sarah Obatsa, Felix Ochieng, John Moracha Ogoti, Dolphine Nyaboke, Nancy Nafula, Pamela Emukule, Lameck Diero, Edwin Sang, Cosmas Apaka, Irene Wafula, John Chirchir, Violet Kisaka, Murutu J, Margaret Birgen, Janet Borosio, Abraham Kiptum Kosgei, Paul Ouma, Seth Odero, Sarah Obatsa, William Mayamba, Gabriel Netwon Alubala, Lithy David, Bonface Omalla, Cosolata Akoth, Bonface Kibet, Nelly Owiti, Lilian Ndakalu, Derick Simiyu Njofu, Elisha Chelal, Sunyai Nancy, Ariya Patrick, Ruth Rotich, Maureen Ayieko, Joyce Jelagat, Kipruto Ednah, Valentine Chebor, Victor Wezonga, Harrison Kibet, Collins Kipsang. **Tanzania:** Denna Michael, Charles Nyaga, Elcard Nunda, Regina Alphonse, Rita Lyamuya, Paul Kazyoba, Lilian Mkombachepa, Godlovenes Rubega, Jerome Lwali, Happiness Rutakulemberwa, Ruth Kamugwawa, Nicolaus Nyendikuu. **Uganda:** Nnakakawa Cissy, Ritah Namagogwe, Ahmed Ddungu, Barbara Castelnovo, Marion Achieng, John Michael Matovu, Nanziri Allen, Nassanga Sarah J, Kyosimiire Norah, Daniel Mujunu, Nabwire Scovia, Luqman Sulaiman, Haruna, Innocent Kakeeto, Emmanuel Ssekyeru, Joseph Muleebwa, Irene Nayiga, Joan Namayanja, Brendah Nalutaaya, Sara Namembe, Esther Nakamanya, Patricia Nakato, Herbert Ssenyonga, Ruth Nazziwa Coleta, Proscovia Nantale, Joan Nayiga, Ssewanyana Tom, Namukisa Cossy, Kigozi Boniface, Rosemary Nassolo, Jane Tukashaba, Ritah Nalubega, Sandra Nabagirinya, Sylvia Nalwanga, Jumulo Nicholas, Zziwa Abiyasali, Agaba Ajaara, Julius Patrick Senoga, Kisirisa Claire, Kayovu Robert, Kamukama Brenda, Namirembe Rosemary, Nicholas Ssewankambwe, Ndagano Mercy, Semerita Muhindo, Bugembe John Nyanzi, Charles Kasozi, Phoebe Mutenyo, Matthew Ssemakadde, Winnie Muyindike, Denis Nansera, Bronia Mwiine, Patience Kusemerewa, Nakabiito Safina, Kibalama Donozio, Nalwoga Prossy, Naksaenge Cissy, Nakuya Juliet, Fred Nalugoda, Anthony Ndyanabo, Nakawooya Hadijja, Magezi Ibrahim, Orit Robert. **Regional coordination and data management center:** Kara Wools-Kaloustian, Constantin Yiannoutsos, Aggrey Semeere, Bev Musick.

IeDEA NORTH AMERICAN AIDS COHORT COLLABORATION ON RESEARCH AND DESIGN (NA-ACCORD)

Canada: John Gill, Marina Klein, Costas Pexos. **United States of America:** Michael Horberg, Cynthia S Firnhaber, Jonathan Colasanti, Julia Fleming, Ami Multani, Amanda Eldredge, Cynthia Mayer, Julie Pasternak, Mitchell Luu, Frank Palella, Ank Nijhawan, Shelly J Ramos Torres, Lymary Velazquez, Kathia Ocasio, Celestino Flores Lourdes Santiago, Angel Mayor, Jane Esteves, Rita Kelly, Jack Fuhrer, Ellen Tedaldi, Laura Bamford, Andrea Wendrow, Richard Novak, Claire Farel, Mari Kitahata, Anna Person, Theo W. Hodge Jr, Matthew B. Goetz, Greer

A. Burkholder, Graham Smith, Mona Loutfy. **Regional coordination and data management center:** Keri Althoff, Richard Moore, Aimee Freeman.

IeDEA SOUTHERN AFRICA

Lesotho: Monkoe Bereng, Richard Kenyata, Tlohang Qhobela, Matlotliso Maqhai, Masefako Liotlo, Lerato Lebakeng. **Malawi:** Jacqueline Huwa, Mwagomba Crust, Damba Douglas, Ganizani Malata, Jacqueline Huwa, Eric Mtemang'ombe. **Mozambique:** Idiovino Rafael. **South Africa:** Zakhona Ndlovu, Nosisa Sipambo, Geoffrey Fatti, Nontando Xaba, Bongile Cele, Sibongokuhle Ntombela, Jonathan Euvrard, Brian Eley, Hans Prozesky, Thalia Ferreira, Nicola Van Dongen, Cuma Koncwana, Chantel Schreuder. **Zambia:** Gerald Mungwa, Gift Chongo, Precious Kakvugu, Harriet Chabala, Fiennel Moonde, Leah Shapi, Dora Mwaba, Josephine C Sithole, Derrick Mwenda Filumba. **Zimbabwe:** Kumbirai Pise Quarter, Cleophas Chimbetete. **Regional coordination and data management center:** Morna Cornell, Per von Groote, Mary-Ann Davies, Matthias Egger.

IeDEA WEST AFRICA

Benin: Gael Ayihounton, Tounkara Lidie, Bokossa Laurelle, Zannou Marcel Djimon, Léhila Bagnan Tossa. **Burkina Faso:** Armel Poda, Gbolo Pooda, Caroline Yonaba. **Côte d'Ivoire:** Eugène Messou, N'Gbeche Marie Sylvie, Albert Kla Minga, Stéphane Kouadio N'Goran, Henri Chenal, Kouakou Kouadio, Daple Beugre N'Guessan Jacques, Amorissani Folquet, Eboua Tanoh. **Ghana:** Joycelyn Assimeng Dame, Islynn Gloria Aggrey, Vincent Ganu. **Mali:** Yacouba Aba Coulibaly. **Nigeria:** Oliver Ezechi, Agatha N. David, Abdulrasheed A. Oba, Abdulrasheed. **Togo:** Elom Takassi, Mensah Ephrem. **Regional coordination and data management center:** Thierry Tiendrebeogo, Karen Malateste, Antoine Jaquet, Valeriane Leroy.

Supplementary Material - <http://links.lww.com/QAI/C691>

REFERENCES

1. Platt L, Easterbrook P, Gower E, et al. Prevalence and burden of HCV co-infection in people living with HIV: a global systematic review and meta-analysis. *Lancet Infect Dis*. 2016;16:797-808.
2. Platt L, French CE, McGowan CR, et al. Prevalence and burden of HBV co-infection among people living with HIV: A global systematic review and meta-analysis. *J Viral Hepat*. 2020;27:294-315.

3. Nijmeijer BM, Koopsen J, Schinkel J, et al. Sexually transmitted hepatitis C virus infections: current trends, and recent advances in understanding the spread in men who have sex with men. *J Int AIDS Soc.* 2019;22 Suppl 6:e25348.
4. Beard N, Hill A. Combined "Test and Treat" Campaigns for Human Immunodeficiency Virus, Hepatitis B, and Hepatitis C: A Systematic Review to Provide Evidence to Support World Health Organization Treatment Guidelines. *Open Forum Infect Dis.* 2024;11:ofad666.
5. World Health Organization. Key messages: World Hepatitis Day 2023. 5 June, 2024. Accessed 5 June, 2024. <https://www.who.int/campaigns/world-hepatitis-day/2023/key-messages>
6. World Health Organization. Consolidated guidelines on HIV, viral hepatitis and STI prevention, diagnosis treatment and care for key populations. 2022. Geneva.
7. World Health Organization. Guidelines for the prevention, diagnosis, care and treatment for people with chronic hepatitis B infection. 2024. Geneva.
8. World Health Organization. Updated recommendations on treatment of adolescents and children with chronic HCV infection, and HCV simplified service delivery and diagnostics. 2022. Geneva.
9. Wong GL, Lemoine M. The 2024 updated WHO guidelines for the prevention and management of chronic hepatitis B: Main changes and potential implications for the next major liver society clinical practice guidelines. *J Hepatol.* 2025;82:918-925.
10. Yotebieng M, Brazier E, Addison D, et al. Research priorities to inform "Treat All" policy implementation for people living with HIV in sub-Saharan Africa: a consensus statement from the International epidemiology Databases to Evaluate AIDS (IeDEA). *J Int AIDS Soc.* 2019;22:e25218.

11. World Health Organization. Guidance for country validation of viral hepatitis elimination and path to elimination. 2023. Geneva.
12. Egger M, Ekouevi DK, Williams C, et al. Cohort Profile: the international epidemiological databases to evaluate AIDS (IeDEA) in sub-Saharan Africa. *Int J Epidemiol*. 2012;41:1256-64.
13. Brazier E, Maruri F, Wester CW, et al. Design and implementation of a global site assessment survey among HIV clinics participating in the International epidemiology Databases to Evaluate AIDS (IeDEA) research consortium. *PLoS One*. 2023;18:e0268167.
14. Harris PA, Taylor R, Minor BL, et al. The REDCap consortium: Building an international community of software platform partners. *J Biomed Inform*. 2019;95:103208.
15. Harris PA, Taylor R, Thielke R, et al. Research electronic data capture (REDCap)--a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform*. 2009;42:377-81.
16. Wandeler G, Coffie PA, Kuniholm MH, et al. Issues with measuring hepatitis prevalence in resource-limited settings. *Lancet*. 2018;391:835-836.
17. Kowo MP, Coyer L, Sini V, et al. Integrating hepatitis C testing and treatment into routine HIV care in Cameroon is feasible. *J Int AIDS Soc*. 2025;28:e26417.
18. Nankya-Mutyoba J, Ejalu D, Wandera C, et al. A training for health care workers to integrate hepatitis B care and treatment into routine HIV care in a high HBV burden, poorly resourced region of Uganda: the '2for1' project. *BMC Med Educ*. 2022;22:297.
19. Ratevosian J, Millett G, Honermann B, et al. PEPFAR under review: what's at stake for PEPFAR's future. *Lancet*. 2025;405:603-605.

20. Soriano V, Moreno-Torres V, Trevino A, et al. Prospects for Controlling Hepatitis B Globally. *Pathogens*. 2024;13
21. Barranco MA, Rosenberg ES, Flanigan C, et al. A cross-sectional study of hepatitis C prevalence and correlates among persons who inject drugs in rural and non-rural communities. *J Viral Hepat*. 2022;29:994-1003.
22. Bigna JJ, Amougou MA, Asangbeh SL, et al. Seroprevalence of hepatitis B virus infection in Cameroon: a systematic review and meta-analysis. *BMJ Open*. 2017;7:e015298.
23. Kassa GM, Walker JG, Alamneh TS, et al. Prevalence, trends, and distribution of hepatitis C virus among the general population in sub-Saharan Africa: A systematic review and meta-analysis. *Liver Int*. 2024;44:3238-3249.
24. Crudo F, Piorno P, Krupitzki H, et al. How to implement the framework for the elimination of mother-to-child transmission of HIV, syphilis, hepatitis B and Chagas (EMTCT Plus) in a disperse rural population from the Gran Chaco region: A tailor-made program focused on pregnant women. *PLoS Negl Trop Dis*. 2020;14:e0008078.
25. Stopka TJ, Whitney BM, de Gijzel D, et al. Medicaid Policy and Hepatitis C Treatment Among Rural People Who Use Drugs. *Med Care*. 2025;63:77-88.
26. Tappata M, Ford J, Kayandabila J, et al. Community-Based Point-of-Care Screening for Hepatitis B Virus and Hepatocellular Carcinoma in Rural Tanzania. *Am J Trop Med Hyg*. 2025;112:167-172.
27. Yen DW, Soriano V, Barreiro P, et al. Triple Threat: HDV, HBV, HIV Coinfection. *Clin Liver Dis*. 2023;27:955-972.

Figure 1. Hepatitis B and C virus prevention and screening service availability at HIV treatment sites included in site assessment surveys conducted by the IeDEA consortium in 2023. The diameter of each bubble corresponds to the number of sites in each region, with a larger diameter reflecting more sites. The location of each bubble along the y-axis is the percentage (%) of all sites in each region that the bubble represents.

Figure 2. Hepatitis B and C virus diagnostic service availability at HIV treatment sites included in site assessment surveys conducted by the IeDEA in 2023. The diameter of each bubble corresponds to the number of sites in each region, with a larger diameter reflecting more sites. The location of each bubble along the y-axis is the percentage (%) of all sites in each region that the bubble represents.

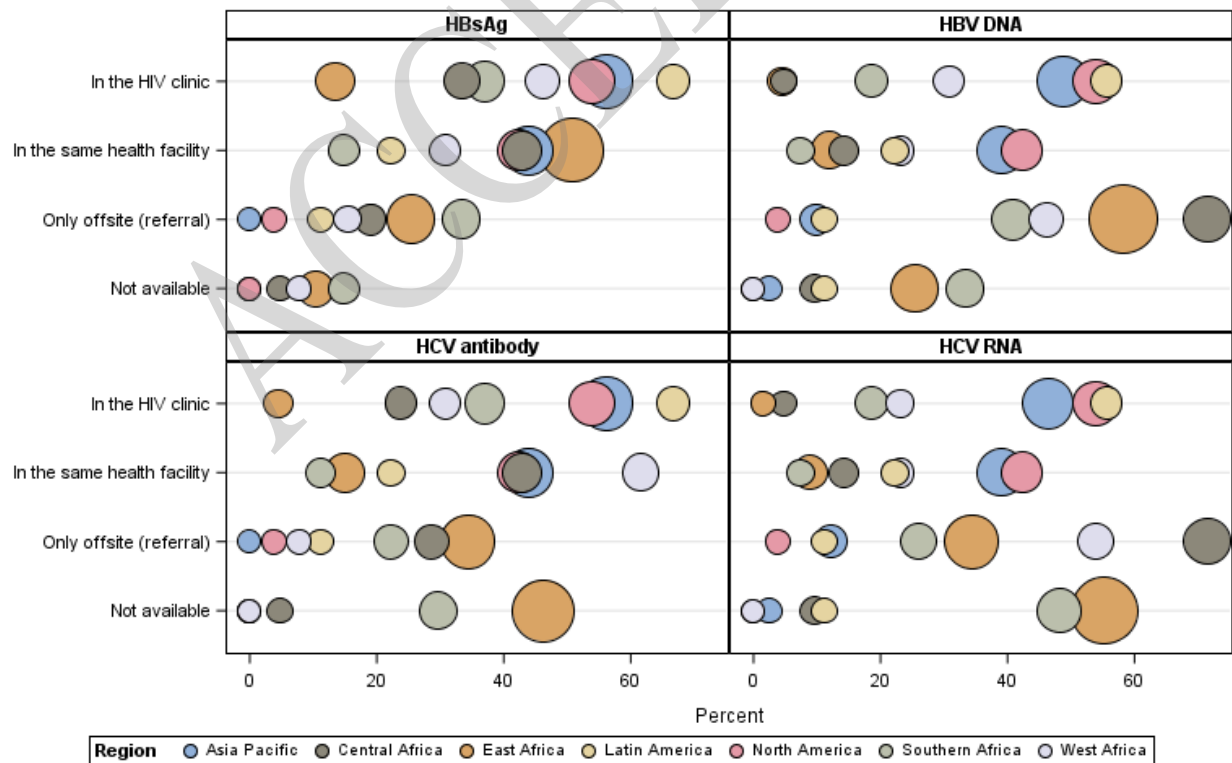
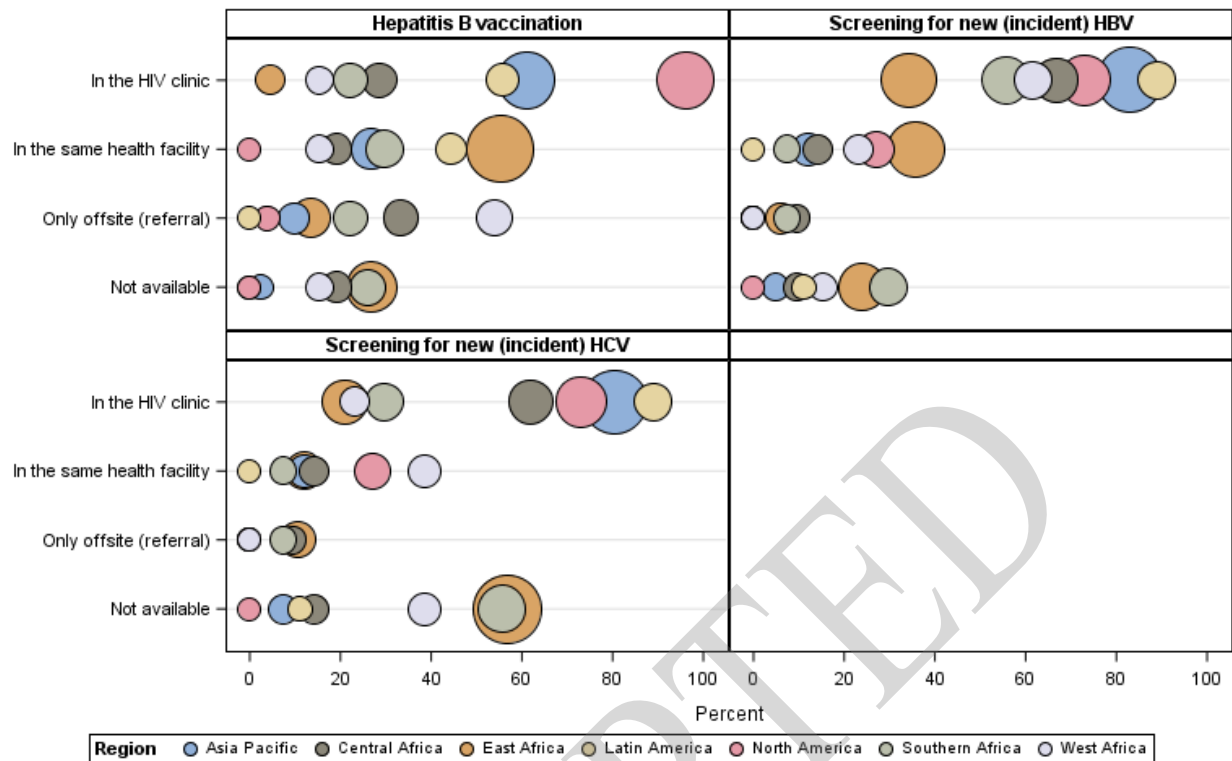


Table 1. Hepatitis B and C virus prevention, screening and diagnostic service availability and patient fees at HIV treatment sites included in site assessment surveys conducted by the IeDEA consortium in 2023 (N=204)

Prevention services	
Hepatitis B vaccination	
In the HIV clinic	72 (35.3%)
In the same health facility	66 (32.4%)
Only offsite (referral)	34 (16.7%)
Not available	32 (15.7%)
Screening services	
Routine screening for HBV at the time of enrollment into HIV care	
Yes	147 (72.1%)
No	57 (27.9%)
Routine screening for HCV at the time of enrollment into HIV care	
Yes	102 (50.0%)
No	102 (50.0%)
Routine screening during follow-up visits for new (incident) HBV	
In the HIV clinic	121 (59.3%)
In the same health facility	44 (21.6%)
Only offsite (referral)	8 (3.9%)
Not available	31 (15.2%)
Routine screening during follow-up visits for new (incident) HCV ^b	
In the HIV clinic	98 (48.0%)
In the same health facility	30 (14.7%)
Only offsite (referral)	11 (5.4%)
Not available	65 (31.9%)
Diagnostic services	
HBsAg testing	
In the HIV clinic	75 (36.8%)
In the same health facility	82 (40.2%)
Only offsite (referral)	34 (16.7%)
Not available	13 (6.4%)
HBV viral load (DNA) testing	
In the HIV clinic	52 (25.5%)
In the same health facility	45 (22.1%)
Only offsite (referral)	77 (37.8%)
Not available	30 (14.7%)
HCV antibody (anti-HCV) testing	
In the HIV clinic	65 (31.9%)
In the same health facility	61 (29.9%)
Only offsite (referral)	38 (18.6%)
Not available	40 (19.6%)
HCV viral load (RNA) testing	
In the HIV clinic	48 (23.5%)
In the same health facility	43 (21.1%)
Only offsite (referral)	59 (28.9%)
Not available	54 (26.5%)
Patient fees	
Do patients routinely pay fees for HBV testing	

No	141 (69.1%)
Yes	43 (21.1%)
Don't know	2 (1.0%)
Not applicable	18 (8.8%)
Do patients routinely pay fees for HCV testing	
No	125 (61.3%)
Yes	44 (21.6%)
Don't know	3 (1.5%)
Not applicable	32 (15.7%)
Do patients routinely pay fees for HBV antiviral medication	
No	158 (77.5%)
Yes	26 (12.8%)
Don't know	3 (1.5%)
Not applicable	17 (8.3%)
Do patients routinely pay fees for HCV antiviral medication ^{a,b}	
No	130 (64.0%)
Yes	38 (18.7%)
Don't know	3 (1.5%)
Not applicable	32 (15.8%)

DNA: deoxyribonucleic acid; HBsAg: hepatitis B virus surface antigen; HBV: hepatitis B virus; HCV: hepatitis C virus; IeDEA: International epidemiology Databases to Evaluate AIDS; RNA: ribonucleic acid;

Table 2. Site characteristics associated with availability of hepatitis B and hepatitis C prevention, screening and diagnostic services at HIV treatment sites in 2023, odds ratios (ORs) and 95% confidence intervals^{a,b,c}

	HBV vaccination	HBV screening at enrollment	HBV screening for new (incident) infections	HBsAg testing	HBV DNA testing	HCV screening at enrollment	HCV screening for new (incident) infections	HCV antibody testing	HCV RNA testing
Population the HIV center serves									
Both adults and children	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Adults	0.78 (0.16, 3.68)	3.67 (0.65, 20.68)	2.55 (0.44, 14.68)	3.50 (0.31, 38.91)	2.64 (0.63, 11.08)	0.64 (0.09, 4.61)	2.26 (0.49, 10.39)	1.67 (0.22, 12.51)	1.27 (0.26, 6.18)
Children	2.25 (0.27, 18.38)	1.14 (0.16, 8.16)	1.04 (0.14, 7.90)	15.69 (0.49, 498.87)	1.30 (0.23, 7.39)	0.37 (0.04, 3.90)	1.32 (0.21, 8.51)	1.69 (0.09, 30.78)	0.88 (0.14, 5.51)
Area of residence of the population served by this health facility's HIV clinic									
Predominantly urban	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Predominantly rural	0.65 (0.20, 2.08)	0.56 (0.16, 2.01)	0.34 (0.09, 1.33)	0.54 (0.15, 1.96)	0.07 (0.01, 0.68)	0.26 (0.04, 1.60)	0.17 (0.05, 0.64)	0.18 (0.04, 0.92)	0.10 (0.01, 0.90)
Mixed urban/rural	0.83 (0.34, 2.07)	2.06 (0.67, 6.35)	0.73 (0.23, 2.32)	0.60 (0.20, 1.84)	1.27 (0.48, 3.39)	1.51 (0.49, 4.64)	0.80 (0.30, 2.15)	1.25 (0.38, 0.92)	1.02 (0.39, 2.71)
Facility level of care									
Health center	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
District hospital	0.50 (0.15, 1.69)	0.71 (0.20, 2.51)	1.35 (0.32, 5.62)	1.53 (0.42, 5.60)	0.73 (0.13, 4.15)	1.87 (0.39, 8.94)	0.74 (0.19, 2.90)	1.20 (0.24, 5.86)	1.22 (0.20, 7.33)
Regional, provincial or university hospital	0.81 (0.32, 2.04)	0.57 (0.19, 1.78)	0.30 (0.09, 1.00)	2.39 (0.67, 8.60)	1.02 (0.39, 2.69)	1.0 (0.32, 3.10)	0.52 (0.18, 1.47)	3.04 (0.89, 10.39)	0.76 (0.28, 2.07)

DNA: deoxyribonucleic acid; HBsAg: hepatitis B virus surface antigen; HBV: hepatitis B virus; HCV: hepatitis C virus; RNA: ribonucleic acid

^a All models are adjusted for region and include all site characteristics in a single multivariable logistic regression model for each service

^b Service availability is defined as in the HIV clinic or in the same health facility (considered jointly as “on-site”) vs. only offsite (by referral) or not available or yes vs. no, as shown in Table 1

^c ORs and 95% CIs shown in **bold** text where $P < 0.05$