Published in final edited form as:

J Assoc Nurses AIDS Care. 2018 ; 29(3): 357–370. doi:10.1016/j.jana.2017.12.006.

A systematic review of healthcare provider perceived barriers and facilitators to routine HIV testing in primary care settings in the Southeastern United States

Kelly Tan, BSN, RN* [PhD student] and

School of Nursing, University of North Carolina, Chapel Hill, North Carolina, USA

(krtan@email.unc.edu)

Beth Perry Black, PhD, RN, FAAN [Associate Professor]

School of Nursing, University of North Carolina, Chapel Hill, North Carolina, USA

Abstract

Despite efforts to improve HIV screening and testing, many primary care settings do not follow established guidelines. The purpose of our systematic review was to describe health care providers' perceived barriers and facilitators to testing for HIV at poorly used/novel testing sites in the Southeastern United States. Pub-Med, CINAHL, and Embase databases were searched for peer-reviewed studies of providers' perceived barriers and facilitators to routine HIV testing from January 2016 to April 2017 according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement. Of 708 papers retrieved, 12 met inclusion criteria and were analyzed. Barriers to HIV testing in primary care existed at the societal, organizational, and individual levels. Providers need continuing sexual health education, including HIV and federal guideline updates, and students should have clinical experiences to supplement knowledge about sexual health. Clinic protocols should be updated to meet current policy guidelines.

Keywords

barriers; facilitators; HIV screening; HIV testing; provider perception; Southeastern United States

HIV infections continue to be a national and regional issue in the United States; an estimated 14% to 19% of people in the United States infected with HIV are unaware of their positive status (Bradley et al., 2014; Skarbinski et al., 2015). Regionally, HIV disproportionately affects the Southeastern United States (the Deep South). In 2015, 56.9% of new cases of HIV in the United States occurred in the Deep South (Krueger, Dietz, Van Handel, Belcher, & Johnson, 2016). The Deep South typically includes 12 states: Alabama, Arkansas, Florida,

*Corresponding Author: Kelly Tan: krtan@email.unc.edu.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Disclosures

The authors report no real or perceived vested interests that relate to this article that could be construed as a conflict of interest.

Georgia, Louisiana, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia. Eight of the nine states leading the United States in new HIV diagnoses, prevalence, death rates, and racial disparities between 2008 and 2013 were in the Southeast (Reif et al., 2015).

In several studies, researchers indicated that the spread of HIV in the Southeast was and continues to be perpetuated by a variety of profound social constraints on health: racism (Arnold, Rebchook, & Kegeles, 2014; Baunach, & Burgess, 2013; Thomas, 2006), poor health care access (Dorell et al., 2011), poor education (Adimora, Schoenbach, & Doherty, 2006; Painter, Winood, DiClemente, Depadilla, & Simpson-Robinson, 2012), poverty (Reif et al., 2014; Schroeder, 2016; Thomas & Thomas, 1999), stigma (Baunach, & Burgess, 2013; Kerr et al., 2014; Stringer et al., 2016), and public policy (Adimora, Ramirez, Schoenbach, & Cohen, 2014). Racism, poor health care access, and poor education contribute to an individual's perception of low HIV risk as a function of limited knowledge about HIV, and lack of resources to be tested and linked to care (Cook, Lutz, Young, Hall, & Stacciarini, 2015). People living in the U.S. South perceive HIV as stigmatizing (National Alliance of State and Territorial AIDS Directors, 2012), which leads to further delays in seeking HIV testing (Fortenberry et al., 2002), and is associated with decreased willingness to test among health care providers (Wong et al., 2013). These findings suggest that agencies and policy-makers should consider the historical and socio-geographic characteristics unique to the Deep South when developing strategies to address HIV in this region.

Despite federal guidelines from the Centers for Disease Control and Prevention (CDC) and White House Office of National AIDS Policy (ONAP) *National HIV/AIDS Strategy* (NHAS), implementation of universal testing has varied in primary care testing locations. The 2006 CDC guidelines recommended universal testing for all individuals ages 13 to 64, regardless of risk behavior profiles (Branson et al., 2006). The latest CDC guidelines indicated the need for ongoing support for universal testing for individuals ages 13 to 64, as well as annual testing for gay, bisexual, and other men who have sex with men (DiNenno et al., 2017). By following these guidelines, providers can identify individuals with undiagnosed HIV sooner, reduce transmission rates, and initiate antiretroviral therapy earlier (Cohen et al., 2016). Certain settings are poorly used in terms of HIV testing: hospital emergency departments/urgent care clinics, substance use treatment clinics, public health clinics, community health clinics, and other primary care settings. Providers in primary care settings typically offer testing to individuals with perceived high risk, although some providers do not offer testing at all (McNaghten et al., 2013).

The purpose of our systematic review and our proximal goal was to identify and then address barriers and facilitators related to implementation of CDC guidelines for HIV testing, specifically focusing on Deep South states, where implementation has been slow and HIV has spread disproportionately. Our distal goal was to increase HIV testing in primary care settings in the U.S. South.

Framework

A framework provides structure and explicates perspectives taken in an analytic endeavor such as a systematic review. For our review, we found the Ecological Model for Health Promotion (EMHP; McLeroy, Bibeau, Steckler, & Glanz, 1988) to be a robust framework by which to examine barriers and facilitators related to implementation of HIV guidelines. Central to the EMHP is the assumption that health promotion activities (e.g., HIV testing) occur in complex contexts of social and environmental structures. For example, public health officials have used the EMHP to organize implementation efforts such as health promotion activities to prevent obesity, a health problem deeply embedded in social (e.g., family) and environmental (e.g., poor access to healthy food) structures (Richard, Gauvin, & Raine, 2011). Furthermore, health promotion activities associated with behavior changes (providers' implementation of HIV testing guidelines in this case) are influenced by five multilevel factors explained by the EMHP: (a) public policy, (b) community factors, (c) institutional factors, (d) interpersonal processes and primary groups, and (e) intrapersonal factors (McLeroy et al., 1988). Providers recognize the difficult challenges facing patients when changing health behaviors; however, providers' own professional behaviors may be similarly incalitrant. The use of up-to-date, evidence-based guidelines such as those of the CDC would ensure best practices with regard to HIV testing. The EMHP provides a means to understand the complexities of behavior change, which appear to be difficult even for primary care practitioners with vested interests in protecting and promoting health.

Methods

Our review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, a well-established and widely-used protocol to guide the process of conducting systematic reviews (Moher, Liberati, Tetzlaff, & Altman, 2009).

Search Methods

A research librarian was consulted to develop the search strategy. Using the databases Embase, Medline, and Cumulative Index to Nursing and Allied Health Literature (CINAHL), the literature was searched for empirical research about perceived barriers and facilitators to HIV testing among health care providers. The search was limited to studies conducted in the Southeastern United States and published between January 2006 (year of CDC guideline publication) and April 2017. The search strategy included variations of HIV or AIDS, routine HIV testing, health care provider, and geographic terms (Table 1).

Study Selection: Inclusion and Exclusion Criteria

Publications were reviewed from the search by title and abstract. Articles were included for full text review if they (a) were empirical qualitative or quantitative studies; (b) focused on routine/universal testing in primary care locations (e.g., substance use clinics, primary care practices, community health clinics); (c) included health care provider perspectives on interventions or routine/universal HIV testing in their practices; and (d) included at least one Deep South state. Studies were excluded if they were (a) conducted in HIV/sexually

transmitted disease (STD) clinics, health departments, or jails/prisons; (b) solely focused on HIV specialist health care provider perspectives; or (c) were about testing for other STDs in addition to HIV.

Analysis

The EMHP was used to analyze multilevel barriers and facilitators to routine HIV testing. We noted that the EMHP factors (public policy, community factors, institutional factors, interpersonal processes and primary groups, intrapersonal factors) could be compressed into three discrete ecological levels: (a) societal (public policy/community factors), (b) organizational (institutional), and (c) individual (interpersonal processes and primary groups), while still maintaining usefulness of the model. We extracted any mentions of barriers or facilitators to HIV testing. Because the study designs were heterogeneous, we did not assign weights to findings (Walsh & Downe, 2005).

Results

The search returned 708 unique articles, 505 of which were screened by title and abstract. This yielded 38 full text articles for review; 12 met all inclusion criteria (Figure 1). Of these 12, 2 were survey studies; 5 were qualitative studies; and 5 were program or implementation studies (Table 2). Findings from these studies are organized by ecological levels (societal, organizational, individual) with perceived barriers and facilitators noted at each level. Table 3 contains a summary of the key findings.

Societal Factors: State/System/Policy

Perceived barriers—Ten of the 12 studies identified societal barriers to testing. Among these, six barriers were most frequently described: financial factors ($n = 6$), HIV-related stigma ($n = 5$), policy ($n = 4$), availability of state/federal resources for organizations/patients/providers ($n = 4$), population characteristics ($n = 4$), and health care networks ($n = 2$).

Financial factors were the most cited barrier in six articles and included lack of reimbursement from third party insurance providers (Lanier et al., 2014; Sison et al., 2013; White et al., 2015); lack of financial support to conduct testing (Simmons et al., 2011; Wright et al., 2013); and the cost of rapid testing (Weis et al., 2009).

HIV-related stigma was the second most cited barrier. Five studies reported that providers located in rural areas perceived stigma and stereotypes regarding HIV (Davis et al., 2015; Minniear et al., 2009; Sison et al., 2013; Sullivan et al., 2015; White et al., 2015). Providers believed that HIV-related stigma was still present among physicians and identified ageism as a factor that caused providers to overlook older adult risk for HIV (Davis et al., 2015).

Policy barriers identified in four articles included requirements for parental consent (White et al., 2015) and too many state requirements (Bogart et al., 2008; Haynes et al., 2011). A lack of strong political advocates to heighten awareness about testing inhibited the creation of pro-HIV testing policies and amendment of existing HIV testing policies (Wright et al., 2013).

Resource barriers identified in four studies included a lack of dissemination about successful implementation of testing programs in primary care, substance use clinics, and emergency rooms (Simmons et al., 2011; Sullivan et al., 2015). In addition, a lack of patient-friendly literature (Simmons et al., 2011) and rapid test supply shortages (Weis et al., 2009) were barriers to testing.

Population characteristics of southeastern states made implementation of routine testing difficult. These characteristics included lack of public acceptance (White et al., 2015), perceptions of low HIV prevalence (Davis et al., 2015), and competing health needs (e.g., chronic diseases, substance abuse; Wright et al., 2013). Providers in North Carolina and Arkansas believed their communities were socially and politically conservative, thus impeding routine testing (White et al., 2015; Wright et al., 2013).

Health care network characteristics (i.e., factors that determined support networks for providers and access to care for populations) were identified in two studies as barriers to testing. These characteristics included lack of feedback from hospitals about patients diagnosed with HIV (Sullivan et al., 2015), and limited access to health care services in rural areas (Sison et al., 2013).

Perceived facilitators—Six of the 12 articles identified three perceived facilitators at the societal level for routine HIV testing: financial factors ($n = 4$), policy ($n = 3$), and resources ($n = 2$).

Financial facilitators identified in four articles were federal funding availability for full time staff for HIV testing (e.g., Ryan White funds; Haynes et al., 2011; Wright et al., 2013); third party reimbursement (White et al., 2015); and additional education regarding billing for HIV tests and screening (Sison et al., 2013).

Policy facilitators identified in three articles included congruency between CDC and U.S. Preventive Services Task Force guidelines (Davis et al., 2015), U.S. Preventive Services Task Force guidelines assigned a grade A for routine testing of patients between the ages of 15 and 65 (White et al., 2015), and lack of regulatory barriers on rapid HIV testing in Arkansas (Wright et al., 2013).

Potential resource facilitators mentioned in one study included more HIV literature and HIV specific training (Simmons et al., 2011). In addition, HIV providers believed that state/county health department engagement with community based organizations and clinics was a facilitator to testing (Sullivan et al., 2015). This involvement would include provision of rapid test kits, support of non-traditional testing, and rapid results from the state laboratory (Sullivan et al., 2015). Additionally, some health care providers believed that testing would be facilitated through decreased provider stigma toward HIV, streamlined HIV counseling, and public campaigns to encourage patient acceptance of testing (White et al., 2015).

Organization Factors: Clinic/Program/Organization

Perceived barriers—Eight of the 12 studies identified four perceived barriers at the organizational level for routine HIV testing: clinic characteristics ($n = 6$), protocol

characteristics ($n = 4$), referral barriers ($n = 4$), and clinic staff and administrative factors ($n = 4$).

Clinic and clinic visit characteristics identified as barriers included the fast pace of office visits leading to lack of time to complete rapid test counseling (Bogart et al., 2008; Davis et al., 2015; Lanier et al., 2014; Simmons et al., 2011; White et al., 2015); lack of personnel to conduct testing (Bogart et al., 2008); lack of privacy and space to do adequate testing (Bogart et al., 2008; Minniear et al., 2009); and additional financial burden on the clinic (Simmons et al., 2011).

Clinic protocol characteristics noted as barriers included a lack of guidelines for providing information to patients (Davis et al., 2015; Sullivan et al., 2015; guidelines that were inconsistent with CDC recommendations (Davis et al., 2015; White et al., 2015); complex quality assurance procedures for rapid tests (Bogart et al., 2008); and rapid testing protocols that were too difficult to design for their organizations (Bogart et al., 2008).

Referral barriers between primary care services, hospitals, and infectious disease services were noted in four studies. These barriers included HIV testing conducted at a different location from primary care services (Davis et al., 2015; White et al., 2015) and silos within programs and hospitals preventing coordination of services (Minniear et al., 2009; Wright et al., 2013).

Staff barriers included resistance and limited compliance with guidelines (Lanier et al., 2014; Simmons et al., 2011; White et al., 2015). Administrative barriers were non-clinical organizational factors limiting or making testing more difficult. Administrative barriers cited in two studies included numerous administrative hassles associated with rapid HIV test use (Bogart et al., 2008) and a lack of administrative support (Lanier et al., 2014);

Perceived facilitators—Six of 12 studies identified four perceived facilitators at the organizational level: clinic characteristics ($n = 4$), clinic protocol characteristics ($n = 4$), referral factors ($n = 2$), and clinic staff characteristics ($n = 2$).

Clinic characteristics facilitating testing included more time during initial visits (Gongidi, Sierakowski, Bowen, Jacobs, & Fernandez, 2010; Weis et al., 2009) and dedicated time to screen (Weis et al., 2009). Two evaluations of successful programs found that staff thought there was sufficient time for routine screening and that screening did not interfere with delivery of health care services (Minniear et al., 2009; Weis et al., 2009).

Clinic protocol characteristics facilitating testing included protocols regarding sexual history taking (Lanier et al., 2014), protocols that integrated testing into clinic workflow (Haynes et al., 2011; Weis et al., 2009; White et al., 2015); and gender-neutral sexual history tools (Lanier et al., 2014) that could be implemented at every clinic visit and normalized sexual health conversations.

Referral factors identified in two studies as facilitators included having on-site or easily accessible testing and treatment (Simmons et al., 2011), strong support networks for providers (Wright et al., 2013), and programs dedicated to testing (Wright et al., 2013).

Clinic staff characteristics noted in two articles included the use of nurse/staff initiated testing; educating medical directors, nurses, and office staff about testing recommendations; decreasing stigma within clinics (White et al., 2015); and a leadership/change champion to drive implementation of testing programs (Haynes et al., 2011). A successful program evaluation found that nurse involvement and voluntary involvement of staff enabled routine screening (Weis et al., 2009).

Individual Factors: provider/patient

Perceived provider barriers—Eleven of 12 studies identified provider level barriers including provider attitudes ($n = 7$), discomfort ($n = 7$), and lack of knowledge ($n = 4$).

Negative provider attitudes identified as barriers in seven articles included beliefs that there were too many competing clinical priorities (White et al., 2015); testing was a low priority (Davis et al., 2015; Gongidi et al., 2010); only high risk patients should be tested (Sison et al., 2013; Gongidi et al., 2010); it was the health department's responsibility to test (Sison et al., 2013; Sullivan et al., 2015); the patient population was at low risk for STDs (Simmons et al., 2011; Sison et al., 2013; Sullivan et al., 2015; White et al., 2015); testing was cost ineffective (White et al., 2015); ordering an HIV test was too complicated (Davis et al., 2015); and rapid testing did not allow more people to know their status (Bogart et al., 2008).

Provider discomfort factors cited in seven articles included discomfort having sexual history discussions (Davis et al., 2015; Lanier et al., 2014; Simmons et al., 2011; Sullivan et al., 2015); answering questions and communicating about testing (Davis et al., 2015; White et al., 2015; Wright et al., 2013); offering HIV tests (Minniear et al., 2009); informing patients they were infected and linking those patients to care (Wright et al., 2013); and concern about the possibility of false positives (Bogart et al., 2008).

Specific gaps in provider knowledge that created barriers included lack of knowledge about CDC guidelines (Minniear et al., 2009); varying definitions of routine testing (Simmons et al., 2011); lack of understanding of laws governing informed consent (Sison et al., 2013); lack of knowledge about HIV (Minniear et al., 2009; Simmons et al., 2011; Sullivan et al., 2015); and lack of knowledge regarding reimbursement rates and how to be reimbursed (Sison et al., 2013).

Perceived patient barriers—Seven of 12 studies identified perceived patient level barriers including patient perception of risk ($n = 4$), attitudes ($n = 5$), and lack of education ($n = 2$).

Four studies found that providers believed their patients perceived low personal risk for HIV (Davis et al., 2015; Simmons et al., 2011; Sison et al., 2013; White et al., 2015). In addition to perceptions of low risk for HIV, providers believed that patient fear of results (Davis et al., 2015; Simmons et al., 2011) and fear of needles (White et al., 2015) were barriers to testing. Providers in two studies believed patient concerns about confidentiality and stigma were significant barriers to testing (Lanier et al., 2014; Minniear et al., 2009). In addition, lack of education about HIV and low literacy/health literacy also contributed to low testing rates (Davis et al., 2015; White et al., 2015).

Perceived provider facilitators—Six of 12 studies identified provider level facilitators including positive provider attitudes toward testing ($n = 4$), HIV-specific training/education ($n = 3$), and personal experience ($n = 1$).

Attributes of providers facilitating testing included positive attitudes toward programs and guidelines. Clinician acceptance of the implemented testing program was associated with its success in a pediatric emergency department (Minnear et al., 2009). Additional facilitators were provider beliefs that guidelines should be instituted (Gongidi et al., 2010; Minnear et al., 2009), and willingness to test if testing was reimbursable (Sison et al., 2013). In a successfully implemented testing program, nurses perceived time was not a barrier and felt well trained in many aspects of HIV care (Weis et al., 2009).

Facilitators of testing included physician training during residency (Davis et al., 2015), education regarding recommendations, and increased awareness of HIV prevalence in communities (Sison et al., 2013; White et al., 2015). Furthermore, personal experience with a patient living with HIV led to more vigilance for testing (Davis et al., 2015).

Perceived patient facilitators—Three of 12 studies identified perceived patient facilitators: patient interest in testing ($n = 3$); patient characteristics ($n = 2$); and provider-patient relationships ($n = 1$).

Patient concern about STDs and interest in testing were facilitators to testing (Davis et al., 2015; Simmons et al., 2011; White et al., 2015). Providers identified specific patient characteristics that would facilitate testing, including gender, sexual orientation, and age. Providers believed that female patients were more receptive to testing, that a patient's sexual orientation indicated risk behaviors (Davis et al., 2015), and that younger patients were more likely to accept testing (White et al., 2015).

Providers believed patients who were more comfortable with a provider would be more likely to agree to test (Davis et al., 2015). Potential patient facilitators included educating patients about HIV risk, and increasing patient acceptance of testing (White et al., 2015).

Discussion

We identified numerous barriers and facilitators in our literature review of findings from 12 research studies related to HIV testing in the Deep South region of the United States published between 2006 and 2017. Using the EMHP as a framework and compressing 5 factors of the EMHP into 3 ecological levels (societal, organizational, individual), we found that barriers and facilitators were consistent on all three ecological levels across the literature (Leblanc, Flores, & Barroso, 2016). Moreover, the use of the EMHP model allowed for the systematic analysis of interacting ecological levels and factors determining behavior at the individual level. The key theme we noted across the review was that improving implementation of routine testing in poorly utilized settings would require confronting barriers that crossed ecological levels. Facilitators may provide a mechanism by which to confront these barriers.

Barriers overlapping societal, organizational, and individual levels included factors such as financial barriers, guideline congruence with practice, and HIV-related stigma. For example, financial factors such as availability of funding (societal), financial burden on clinics (organizational), and not knowing how to be reimbursed for testing (individual), crossed all EMHP levels. Facilitators to address financial barriers included ongoing financial support for testing at community clinics and community based organizations (Haynes et al., 2011); however, these funds were unreliable and rare. Improving health care provider knowledge of ICD-10 codes applicable to services related to HIV testing could also serve to temper a substantial barrier (Sison et al., 2013).

Guideline and policy congruence with practice at the organization and individual provider level could be facilitated by updating existing clinic protocols, educating providers about recommendations, and updating state laws and regulations related to HIV testing. Southeastern state laws do not require informed consent for HIV testing because general medical consent was acceptable (Branson et al., 2006; CDC, 2015). And, although no states required informed consent for HIV testing, many clinics still required consent as a mechanism to protect against lawsuits.

HIV-related stigma across all three levels of the EMHP was still apparent despite the 2006 policy change. Implementation of routine testing has been suggested to reduce HIV-related stigma, thereby normalizing the practice. Continued efforts should be made to improve the societal context in which HIV testing is conducted, such as repealing laws that may criminalize the spread of HIV (Lehman et al., 2014).

Key Recommendations and Existing Evidence

Facilitators to routine HIV testing in primary care settings highlighted the need for changes including financial support, education, protocol updates, and integration of reminders. Sources of financial support have historically been unsustainable and often relied on federal funding and state supplied rapid test kits. Moving toward the future, other strategies include early and ongoing HIV education regarding current policies and recommendations, sexual health counseling experiences, and practical skills related to reimbursement. Using standardized forms related to sexual health improved initiation of HIV testing in primary care settings (Lanier et al., 2014). These forms allowed providers to initiate conversations and establish a standard platform on which providers could inquire about patient sexual health. Education and experiences with HIV topics may reduce health care provider concerns and discomfort about having sensitive conversations with their patients by improving skills and knowledge. Providers working in primary care settings and their administrators should review clinic protocols related to informed consent for HIV testing in order to remove a barrier to testing that is no longer required in any state. Integration of reminders in electronic medical records (EMR) and patient intake forms may also help to ensure that all patients, regardless of risk, are offered testing for HIV (Avery, Del Toro, & Caron, 2014). EMR reminders have been effective in increasing HIV testing (Avery et al., 2014).

Limitations

Limitations of this review included the inadvertent exclusion of potentially relevant literature, methods, lack of additional researchers to verify data, and limitations of the selected literature. The review was restricted to peer-reviewed scholarly papers and excluded grey literature (e.g., provider opinion pieces, provider first hand experiences with testing, unpublished testing program reports) that may have further illuminated the complex interactions between EMHP levels.

Our literature review was limited to all relevant studies conducted in the Southeastern United States. Some barriers and facilitators mentioned in literature conducted beyond the Southeastern United States may have been applicable to testing practices in the Southeastern United States; however, epidemiological evidence has suggested that some barriers to routine testing may be unique to the Southeastern United States. The search strategy included both negative and positive connotations of perception, belief, and attitudes to address potential researcher bias. Studies were not selected for information supporting routine testing, but instead were selected for potential insight into why or why not routine testing was implemented. Most studies failed to include nurses and other providers who would likely initiate and implement testing. Furthermore, much of the development and implementation of the review was accomplished by one researcher.

A systematic review is always limited by the quality and rigor of the studies included in the review. The selected articles used a mix of survey, qualitative, and evaluation methods. Survey methods are subject to increased reporting bias. Qualitative methods were most appropriate to address the research question of perceived barriers and facilitators; however, the transferability of these studies was limited by convenience and snowball sampling methods. Five of the studies were evaluations of testing or tools implemented at the provider level or at single sites (Haynes et al., 2011; Lanier et al., 2014; Minniear et al., 2009; Weis et al., 2009; Wright et al., 2013). Although these studies provided significant insight into barriers and facilitators to implementation of testing programs at specific locations, these results may not have been directly transferable to all settings in the Southeastern United States.

Future Directions

The barriers and facilitators for routine testing in poorly used testing sites identified in this regional review were congruent with those outlined in other national literature reviews (Leblanc et al., 2016). Future research should include ongoing assessment of provider attitudes toward testing specifically in the Southeastern United States, program development addressing regionally specific barriers, program implementation/evaluation studies at poorly used testing sites, and provider level education interventions. The political context of the Southeastern United States is distinct and may be slow to respond to social change accepted in other regions of the United States. The effects of policy changes on perceived and actual HIV-related stigma should also be evaluated, because stigma remains a substantial barrier to testing in the Deep South.

Implementation science may help evaluate the feasibility of HIV testing programs in poorly utilized testing sites (Leeman & Sandelowski, 2012). Program development should consider cultural context, feasibility, and sustainability. Additionally, the existing literature failed to adequately examine perspectives of health care professionals other than physicians (specifically nurse practitioners, physician assistants, nurses, nurse aides, medical assistants, triage personnel, and substance use counselors) who may be responsible for routine testing in primary care settings, and who may have unique barriers to testing that are different from those of physicians.

Conclusion

Our paper is the first to systematically present the barriers and facilitators to routine HIV testing in the Southeastern United States using the EMHP model. These findings may help guide development of testing programs and changes to existing testing programs. Ongoing research is necessary to improve testing rates in primary care settings and other poorly used settings.

Acknowledgments

The authors would like to thank Becky White, MD, MPH, for her insight and knowledge regarding routine HIV testing in North Carolina; Sallie Allgood, MS, RN, for her editing assistance; and Elizabeth Moreton, MLS, for her assistance developing the search strategy. Some of the first author's time was supported by a Hillman Scholars Nursing Innovation Scholarship and a Carol Ann Beerstecher Nursing Scholarship. During the revising of this manuscript, the first author also received support from the National Institutes of Health, National Institutes of Nursing Research T32NR007091-22 (MPIs: S. Santacroce & J. Leeman). The content is solely the responsibility of the authors and does not necessarily represent the official views of any of the funders.

References

- Adimora AA, Ramirez C, Schoenbach VJ, Cohen MS. Policies and politics that promote HIV infection in the southern United States. *AIDS*. 2014; 28(10):1393–1397. DOI: 10.1097/QAD.0000000000000225 [PubMed: 24556871]
- Adimora AA, Schoenbach VJ, Doherty IA. HIV and African Americans in the southern United States: Sexual networks and social context. *Sexually Transmitted Diseases*. 2006; 33(Suppl. 7):S39–S45. DOI: 10.1097/01.olq.0000228298.07826.68 [PubMed: 16794554]
- Arnold EA, Rebhook GM, Kegeles SM. 'Triply cursed': Racism, homophobia and HIV-related stigma are barriers to regular HIV testing, treatment adherence and disclosure among young Black gay men. *Culture Health and Sexuality*. 2014; 16(6):10–22. DOI: 10.1080/13691058.2014.905706
- Avery AK, Del Toro M, Caron A. Increases in HIV screening in primary care clinics through an electronic reminder: an interrupted time series. *British Medical Journal Quality and Safety*. 2014; 23(3):250–256. DOI: 10.1136/bmjqs-2012-001775
- Baunach DM, Burgess EO. HIV/AIDS prejudice in the American Deep South. *Sociological Spectrum*. 2013; 33(2):175–195. DOI: 10.1080/02732173.2013.732878
- Bogart LM, Howerton D, Lange J, Setodji CM, Becker K, Klein DJ, Asch SM. Provider-related barriers to rapid HIV testing in U.S. urban non-profit community clinics, community-based organizations (CBOs) and hospitals. *AIDS and Behavior*. 2008; 14(3):1–11. DOI: 10.1007/s10461-008-9456-3
- Bradley, H., Hall, I., Wolitski, RJ., Van Handel, MM., Stone, AE., LaFalm, M., Valleroy, LA. Vital signs: HIV diagnosis, care and treatment among persons living with HIV – United States, 2011. 2014. Retrieved from <http://www.cdc.gov/libproxy.lib.unc.edu/mmwr/preview/mmwrhtml/mm6347a5.htm>

- Branson, BM., Handsfield, HH., Lampe, MA., Janssen, RS., Taylor, AW., Lyss, SB., Clark, JE. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. 2006. Retrieved from <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5514a1.htm>
- Centers for Disease Control and Prevention. State HIV testing laws: Consent and counseling requirements. 2015. Retrieved from <http://www.cdc.gov/hiv/policies/law/states/testing.html>
- Cohen MS, Chen yQ, McCauley M, Gamble T, Hosseinipour MC, Kumarasamy N, Hakim JG, Fleming TR. Antiretroviral therapy for the prevention of HIV-1 transmission. *New England Journal of Medicine*. 2016; 375(9):830–839. DOI: 10.1056/NEJMoa1600693 [PubMed: 27424812]
- Cook CL, Lutz BJ, Young ME, Hall A, Stacciarini JM. Perspectives of linkage to care among people diagnosed with HIV. *Journal of the Association of Nurses in AIDS Care*. 2015; 26(2):110–126. DOI: 10.1016/j.jana.2014.11.011 [PubMed: 25665884]
- Davis T, Teaster PB, Thornton A, Watkins JF, Alexander L, Zanjani F. Primary care providers' HIV prevention practices among older adults. *Journal of Applied Gerontology*. 2015; 35(12):1325–1342. DOI: 10.1177/0733464815574093 [PubMed: 25736425]
- DiNenno, EA., Prejean, J., Irwin, K., Delaney, KP., Bowles, K., Martin, T., Tailor, A., Lansky, A. Recommendations for HIV screening of gay, bisexual, and other men who have sex with men—United States, 2017. 2017. Retrieved from <https://www.cdc.gov/mmwr/volumes/66/wr/mm6631a3.htm>
- Dorell CG, Sutton MY, Oster AM, Hardnett F, Thomas PE, Gaul ZJ, Heffelfinger JD. Missed opportunities for HIV testing in health care settings among young African American men who have sex with men: Implications for the HIV epidemic. *AIDS Patient Care and STDS*. 2011; 25(11):657–664. DOI: 10.1089/apc.2011.0203 [PubMed: 21923415]
- Fortenberry JD, McFarlane M, Bleakley A, Bull S, Fishbein M, Grimley DM, Stoner BP. Relationships of stigma and shame to Gonorrhea and human immunodeficiency virus screening. *American Journal of Public Health*. 2002; 92(3):378–381. [PubMed: 11867314]
- Gongidi P, Sierakowski JJ, Bowen GS, Jacobs RJ, Fernandez MI. Survey of attitudes and practices of osteopathic primary care physicians regarding taking of sexual histories and HIV screening. *Journal of the American Osteopathic Association*. 2010; 110(12):712–720. [PubMed: 21178152]
- Haynes LF, Korte JE, Holmes BE, Gooden L, Matheson T, Feaster DJ, Schackman BR. HIV rapid testing in substance abuse treatment: Implementation following a clinical trial. *Evaluation and Program Planning*. 2011; 34(4):399–406. DOI: 10.1016/j.evalprogplan.2011.02.00 [PubMed: 21367457]
- Kerr JC, Valois RF, Diclemente RJ, Fletcher F, Carey MP, Romer D, Farber N. HIV-related stigma among African-American youth in the northeast and southeast US. *AIDS and Behavior*. 2014; 18(6):1063–1067. DOI: 10.1007/s10461-013-0687-6 [PubMed: 24402690]
- Krueger A, Dietz P, Van Handel M, Belcher L, Johnson AS. Estimates of CDC-funded and national HIV diagnoses: A comparison by demographic and HIV-related factors. *AIDS and Behavior*. 2016; 20(12):2961–2965. DOI: 10.1007/s10461-016-1293-1 [PubMed: 26796383]
- LANIER Y, Castellanos T, Barrow RY, Jordan WC, Caine V, Sutton MY. Brief sexual histories and routine HIV/STD testing by medical providers. *AIDS Patient Care and STDs*. 2014; 28(3):113–120. DOI: 10.1089/apc.2013.0328 [PubMed: 24564387]
- Leeman J, Sandelowski M. Practice-based evidence and qualitative inquiry. *Journal of Nursing Scholarship*. 2012; 44(2):171–179. DOI: 10.1111/j.1547-5069.2012.01449.x [PubMed: 22554300]
- Leblanc NM, Flores DD, Barroso J. Facilitators and barriers to HIV screening: A qualitative meta-synthesis. *Qualitative Health Research*. 2016; 26(3):294–306. DOI: 10.1177/1049732315616624 [PubMed: 26631679]
- Lehman JS, Carr MH, Nichol AJ, Ruisanchez A, Knight DW, Langford AE, Mermin JH. Prevalence and public health implications of state laws that criminalize potential HIV exposure in the United States. *AIDS and Behavior*. 2014; 18(6):997–1006. DOI: 10.1007/s10461-014-0724-0 [PubMed: 24633716]
- McLeroy KR, Bibeau D, Steckler A, Glanz K. An ecological perspective on health promotion programs. *Health Education Quarterly*. 1988; 15(4):351–377. DOI: 10.1177/109019818801500401 [PubMed: 3068205]

- McNaghten AD, Valverde EE, Blair JM, Johnson CH, Freedman MS, Sullivan PS. Routine HIV testing among providers of HIV care in the United States, 2009. *PloS One*. 2013; 8(1):e51231.doi: 10.1371/journal.pone.0051231 [PubMed: 23341880]
- Minnear TD, Gilmore B, Arnold SR, Flynn PM, Knapp KM, Gaur AH. Implementation of and barriers to routine HIV screening for adolescents. *Pediatrics*. 2009; 124(4):1076–1084. DOI: 10.1542/peds.2009-0237 [PubMed: 19752084]
- Moher D, Liberati AL, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: The PRISMA Statement. *Annals of Internal Medicine*. 2009; 151(4):264–269. DOI: 10.1371/journal.pmed.1000097 [PubMed: 19622511]
- National Alliance of State and Territorial AIDS Directors. Stigma and the impact on public health [Webinar]. 2012. Retrieved from <http://slideplayer.com/slide/4050035/>
- Painter JE, Winqood GM, DiClemente RJ, Depadilla LM, Simpson-Robinson L. College graduation reduces vulnerability to STIs/HIV among African-American young adult women. *Womens Health Issues*. 2012; 22(3):303–310. DOI: 10.1016/j.whi.2012.03.001
- Reif S, Pence BW, Hall I, Hu X, Whetten K, Wilson E. HIV diagnoses, prevalence and outcomes in nine southern states. *Journal of Community Health*. 2015; 40(4):642–651. DOI: 10.1007/s10900-014-9979-7 [PubMed: 25524210]
- Reif SS, Whetten K, Wilson ER, McAllaster C, Pence BW, Legrand S, Gong W. HIV/AIDS in the Southern USA: A disproportionate epidemic. *AIDS Care*. 2014; 26(3):351–359. DOI: 10.1080/09540121.2013.824535 [PubMed: 23944833]
- Richard L, Gauvin L, Raine K. Ecological models revisited: Their uses and evolution in health promotion over two decades. *Annual Review of Public Health*. 2011; 32:307–326. DOI: 10.1146/annurev-publhealth-031210-101141
- Schroeder SA. American health improvement depends upon addressing class disparities. *Preventive Medicine*. 2016; 92:6–15. DOI: 10.1016/j.ypmed.2016.02.024 [PubMed: 27018943]
- Simmons EM, Brown MJ, Sly K, Ma M, Sutton MY, McLellan-Lemal E. Barriers and facilitators to HIV testing in primary care among health care providers. *Journal of the National Medical Association*. 2011; 103(5):432–438. [PubMed: 21809793]
- Sison N, Yolken A, Poceta J, Mena L, Chan PA, Barnes A, Nunn A. Healthcare provider attitudes, practices, and recommendations for enhancing routine HIV testing and linkage to care in the Mississippi delta region. *AIDS Patient Care and STDs*. 2013; 27(9):511–517. DOI: 10.1089/apc.2013.0169 [PubMed: 23991689]
- Skarbinski J, Rosenberg E, Paz-Bailey G, Hall HI, Rose CE, Viall AH, Mermin JH. Human immunodeficiency virus transmission at each step of the care continuum in the United States. *JAMA Internal Medicine*. 2015; 175(4):588–596. DOI: 10.1001/jamainternmed.2014.8180 [PubMed: 25706928]
- Stringer KL, Turan B, McCormick L, Durojaiye M, Nyblade L, Kempf MC, Turan JM. HIV-related stigma among healthcare providers in the Deep South. *AIDS and Behavior*. 2016; 20(1):115–125. DOI: 10.1007/s10461-015-1256-y [PubMed: 26650383]
- Sullivan KA, Berger MB, Quinlivan EB, Parnell HE, Sampson LA, Clymore JM, Wilkin AM. Perspectives from the field: HIV testing and linkage to care in North Carolina. *Journal of the International Association of Providers of AIDS Care*. 2015; 15(6):477–485. DOI: 10.1177/2325957415617830 [PubMed: 26586789]
- Thomas JC. From slavery to incarceration: Social forces affecting the epidemiology of sexually transmitted diseases in the rural south. *Sexually Transmitted Diseases*. 2006; 33(Suppl. 7):S6–S10. DOI: 10.1097/01.olq.0000221025.17158.26 [PubMed: 16794556]
- Thomas JC, Thomas KK. Things ain't what they ought to be: Social forces underlying racial disparities in rates of sexually transmitted diseases in a rural North Carolina county. *Social Science & Medicine*. 1999; 49(8):1075–1084. doi:S0277953699001975. [PubMed: 10475671]
- Walsh D, Downe S. Meta-synthesis method for qualitative research: A literature review. *Methodological Issues in Nursing Research*. 2005; 50(2):204–211. DOI: 10.1111/j.1365-2648.2005.03380.x

- Weis KE, Liese AD, Hussey J, Coleman J, Powell P, Gibson JJ, Duffus WA. A routine HIV screening program in a South Carolina community health center in an area of low HIV prevalence. *AIDS Patient Care and STDs*. 2009; 23(4):251–258. DOI: 10.1089/apc.2008.0167 [PubMed: 19281345]
- White BL, Walsh J, Rayasam S, Pathman DE, Adimora AA, Golin CE. What makes me screen for HIV?: Perceived barriers and facilitators to conducting recommended routine HIV testing among primary care physicians in the southeastern United States. *Journal of the International Association of Providers of AIDS Care*. 2015; 14(2):127–135. DOI: 10.1177/2325957414524025 [PubMed: 24643412]
- Wong EY, Jordan WC, Malebranche DJ, DeLaitch LL, Abravanel R, Bermudez A, Baugh BP. HIV testing practices among Black primary care physicians in the United States. *BMC Public Health*. 2013; 13:96.doi: 10.1186/1471-2458-13-96 [PubMed: 23375193]
- Wright PB, Curran GM, Stewart KE, Booth BM. A qualitative analysis of provider barriers and solutions to HIV testing for substance users in a small, largely rural southern state. *Journal of Rural Health*. 2013; 29(4):420–431. DOI: 10.1111/jrh.12021 [PubMed: 24088216]

Key Considerations

- In order to improve HIV testing in primary care settings, several changes need to be made, including financial support, education, protocol updates, and integration of reminders.
- The Southeastern United States is uniquely at risk for HIV spread. HIV testing programs that consider the cultural context of the Southeastern United States, feasibility, and sustainability may be more effective.
- Future research is needed to assess provider attitudes toward testing in the Southeastern United States.

Figure 1.

Table 1

Methods: Search Strategy

Description	Search String
Location/geographical sites of interest	("Southeastern United States" OR Alabama OR Arkansas OR Florida OR Georgia OR Louisiana OR Kentucky OR Mississippi OR "North Carolina" OR "South Carolina" OR Tennessee OR Virginia OR "West Virginia" OR (southeastern united states[MeSH Terms]) <i>**Southeastern United States [MeSH Terms] only applied to MEDLINE search</i>
Perception	AND (Facilitator* OR barrier* OR problem* OR engag* OR accept* OR reluctan* OR concern* OR stigma* OR perspective* OR perception* OR attitude* OR belief*)
HIV	AND (HIV OR HIV/AIDS OR "human immunodeficiency virus" OR "acquired immune deficiency syndrome") <i>** HIV/AIDS Excluded from EMBASE search due to database search requirements.</i>
Routine HIV Screening/Testing	AND (Screen* OR teste* OR testi* OR diagnose* OR diagnosi* OR "point-ofcare" OR "rapid testing" OR "mass screening" OR "mass testing" OR "routine screen*" OR "universal screen*" OR "routine test*" OR "universal test*")
Health care provider perspective	AND (Nurse* OR provider* OR practitioner* OR worker* OR personnel OR RN OR Physician OR "health providers" OR "health care providers" OR "Medical Assistant*")

Table 2

Included Studies and Study Characteristics

	Citation	State(s)	Sample Size/ Characteristics	Design/Description of Methods
1	Bogart et al., 2008	CA, NY, FL, IL, GA, MA, IN, NJ, MO	<i>n</i> = 158 (hospital lab staff) <i>n</i> = 136 (hospital staff) <i>n</i> = 118 (community clinic staff)	Survey: Telephone survey on translational and staffing barriers.
2	Davis et al., 2015	KY	<i>n</i> = 24 (6 NPs, 2 PAs, 16 MDs)	Qualitative: Semi-structured interviews with PCP of adults older than 50 years, exploring factors that influence HIV prevention practices
3	Gongidi et al., 2010	FL	<i>n</i> = 160 (osteopathic PCPs)	Survey: Cross-sectional survey of osteopathic physicians about physician attitudes and HIV testing/sexual history taking practices.
4	Haynes et al., 2011	SC	<i>n</i> = 1 (substance abuse clinic)	Implementation Evaluation: Evaluation of a rapid testing program. Informal interviews with providers and statistical analysis of testing rates.
5	Lanier et al., 2014	GA, FL, MD, NY, IL, TX, MO, CA, LA, PA	<i>n</i> = 26 (MDs: 15 implemented tool; 11 did not)	Implementation Evaluation: Evaluation of a sexual history tool training program. Open ended feedback forum on changes in behavior and provider attitudes.
6	Minniear et al., 2009	TN	<i>n</i> = 118 (49 MD, 17 SW, 52 RN) <i>n</i> = 49 (RNs, focus groups)	Implementation Evaluation: Evaluation of a routine HIV screening program in a pediatric ED. Survey of provider attitudes and knowledge. Nurse focus groups to assess implementation challenges
7	Simmons et al., 2011	MS & RI	<i>n</i> = 24 (PCPs & administrators)	Qualitative: Semi-structured interviews conducted with PCP and administrators exploring views of barriers and facilitators to routine HIV testing.
8	Sison et al., 2013	MS	<i>n</i> = 25 (NPs, & MDs)	Qualitative: Semi-structured interviews with HCP from the Mississippi Delta exploring attitudes about HIV epidemic/testing.
9	Sullivan et al., 2015	NC	<i>n</i> = 21 health care professionals	Qualitative: Semi-structured interviews with professionals in the HIV prevention and care systems in NC exploring barriers and facilitators to HIV testing, linkage to care, and retention/reengagement in NC.
10	Weis et al., 2009	SC	<i>n</i> = 505 (RNs) <i>n</i> = 4 (MDs) <i>n</i> = 5 (other)	Implementation Evaluation: Evaluation of implementation of a routine screening program at all locations of Margaret J. Weston Community Health Center; descriptive statistics of staff involvement.
11	White et al., 2015	NC	<i>n</i> = 18 (MDs)	Qualitative: Semi-structured interviews with North Carolina PCPs. Self-administered 1-page questionnaire assessing their awareness, agreement, and adherence to routine HIV testing recommendations.
12	Wright et al., 2013	AR	<i>n</i> = 28	Implementation Evaluation: Exploratory study of providers from state, organization, and individual levels. Semi-structured interviews, transcribed verbatim, ATLAS.ti software used.

Note. PCP = primary care provider; NP = Nurse Practitioner; MD = Physician; PA = Physician Assistant; RN = Registered Nurse; SW = social worker; HCP = health care provider(s); AR = Arkansas; CA = California; FL = Florida; GA = Georgia; IL = Illinois; IN = Indiana; KY = Kentucky; LA = Louisiana; MA = Massachusetts; MD = Maryland; MS = Mississippi; MO = Missouri; NC = North Carolina; NJ = New Jersey; NY = New York; PA = Pennsylvania; RI = Rhode Island; SC = South Carolina; TN = Tennessee; TX = Texas

Table 3**Key Findings**

Barrier	Facilitator
SOCIETAL FACTORS	
FINANCIAL FACTORS	
<ul style="list-style-type: none"> Lack of reimbursement/costs of rapid testing (5, 8, 11) Lack of financial support for HIV testing programs (7, 12) Costs of rapid testing (10) 	<ul style="list-style-type: none"> Funding for HIV testing programs (4, 12) Increased education regarding billing for HIV test and screening (8) Third-party reimbursement (11)
STIGMA	
<ul style="list-style-type: none"> Greater HIV-related stigma and stereotyping (2, 6, 8, 9, 11) 	<ul style="list-style-type: none"> Decrease stigma (11) Social Marketing to reduce stigma associated with HIV testing. (12)
POLICY:	
<ul style="list-style-type: none"> Too many state and federal regulations for rapid test and consent (1, 4, 11, 12) Requirements for parental consent (11) Requirements for testing site quality assurance/policies (4) 	<ul style="list-style-type: none"> Congruent federal guidelines (2, 11) Elimination of written HIV consent (11, 12) Require HIV testing for college enrollment (11) Require providers to routinely test (11)
RESOURCES	
<ul style="list-style-type: none"> Lack of dissemination and implementation strategies for HIV testing programs (4, 7, 9) Lack of education materials for implementation of HIV testing (7) Absence of patient-friendly literature (7) Rapid test supply shortages (10) 	<ul style="list-style-type: none"> More HIV literature and HIV specific training for clinic staff (7) Health department involvement with community based organizations (9)
POPULATION CHARACTERISTICS	
<ul style="list-style-type: none"> Conservative communities (11, 12) Low perceived prevalence of HIV in state (2, 12) Competing health needs and priorities (12) Hard to reach diverse populations (2, 9,11) 	<ul style="list-style-type: none"> Public campaigns to encourage patient acceptance (11)
LIMITED HEALTH CARE NETWORKS	
<ul style="list-style-type: none"> Limited access to health care services (8) Lack of feedback from hospitals about patients who test positive for HIV (9) 	<ul style="list-style-type: none"> Streamline HIV counseling (11)
ORGANIZATIONAL FACTORS	
CLINIC CHARACTERISTICS	
<ul style="list-style-type: none"> Organization does not have enough space to confidentially conduct rapid HIV tests (1, 6) Difficult to fit counseling into one session (1) Lack of time - rapid pace of primary care office visits (1, 2, 5, 7, 11) 	<ul style="list-style-type: none"> More time spent during initial visit (3, 10) HIV screening did not interfere with delivery of medical services and there was sufficient time (6, 10)

Barrier	Facilitator
<ul style="list-style-type: none"> Additional financial burden on clinic from HIV testing and diagnosis (7) Lack of resources for prevention and testing (9) 	<ul style="list-style-type: none"> Dedicated time to screening/testing (10)
PROTOCOL/GUIDELINES	
<ul style="list-style-type: none"> Lack of or inconsistent guidelines or unaware of guidelines for providing information to patients (2, 11) Quality assurance procedures for rapid tests are too complex (1) Small practices less likely to be up-to-date on new recommendations (11) Difficult to design a rapid testing protocol for organization (1) 	<ul style="list-style-type: none"> General consent that included HIV testing (3) Availability of sexual history tool (5) Integration into routine clinic activities (4, 10, 11) Normalization of sexual history taking (5) Clinic assurance of confidentiality of test results and testing (7)
REFERRAL	
<ul style="list-style-type: none"> Inconvenient off-site/referral HIV testing/health system silos (2, 11, 12) Lack of follow-up care (6, 12) 	<ul style="list-style-type: none"> On-site or easily accessible testing and treatment (7) Strong Internal and External Referral Network (12) Dedicated HIV testing program (12)
STAFF/ADMINISTRATIVE	
<ul style="list-style-type: none"> Intermittent staff compliance with guidelines/ resistance (5, 7, 11) Too many administrative hassles associated with rapid HIV tests (1) Justification of sexual history taking and HIV/STD testing efforts to administrators (5) Hospital Administration does not support use of rapid HIV tests (1, 5) 	<ul style="list-style-type: none"> Leadership: Change champion that drives the implementation/intervention (4) Voluntary involvement of staff/support of staff (4, 10, 12) Acceptance of program among staff members (6)
INDIVIDUAL – PROVIDER FACTORS	
ATTITUDE/ PRIORITIZATION	
<ul style="list-style-type: none"> Low prioritization of HIV screening in competition with other clinical priorities (1, 2, 3, 11) Staff thought of HIV as a stigma (6, 11) Misperception that patients are low risk (7, 8, 9, 11) Belief that routine HIV testing should be conducted outside of primary care settings (6, 8, 9) Belief that routine HIV testing is not cost effective (11) Procedures for running or ordering rapid tests are difficult to learn (1, 2) 	<ul style="list-style-type: none"> Believe there is a need for sexual history training (3, 5) Believe guidelines should be instituted (3, 10) Personal experience with patients with HIV leads to more vigilance for HIV testing (2) Providers willing to provide routine testing for all patients if reimbursed (8) Most providers are aware of the high HIV rates in Mississippi Delta (8) More proactive primary care providers that offer testing to their patients (7)
DISCOMFORT	
<ul style="list-style-type: none"> Discomfort talking about sexual practices and offering HIV tests (2, 5, 7, 9, 11) Worry about possibility of false positive and responsibility (1, 12) 	<ul style="list-style-type: none"> Good rapport with patient (2)
LACK OF KNOWLEDGE	

Barrier	Facilitator
<ul style="list-style-type: none"> Lack of HIV-specific training during professional training (2, 6, 7, 9) Confusion/unaware of laws and federal guidelines 6, (8) Different definitions of routine testing (7) Nurses forgetting to implement the HIV screening program (6) Lack of knowledge regarding reimbursement rates, costs, and how to be reimbursed (2, 8) Provider cultural/linguistic competency (7) 	<ul style="list-style-type: none"> HIV-related care training: “the majority [of nurses] felt well trained in many aspects of HIV-related care” (6) Physician education (patient experiences, HIV prevalence, HIV screening recommendations) (2, 11) Increase physician awareness of HIV prevalence in the communities where they practice (11)
INDIVIDUAL - PATIENT	
PERCEPTION OF RISK	
<ul style="list-style-type: none"> Misconceptions about risks for HIV. Do not believe they are at risk despite risk behaviors (2, 7, 8, 11) 	<ul style="list-style-type: none"> Patient concerned about STDs (2) Sexual orientation – indication of risk behaviors (2)
ATTITUDES	
<ul style="list-style-type: none"> Fear of positive results (2, 7, 11) Fear of needles/bloodwork (7, 11) Concerns about confidentiality (5, 7, 11) Concerns about stigma (5, 6, 11) Patient refusal (6, 11) HIV testing too expensive for patients (11) 	<ul style="list-style-type: none"> Comfort with provider (2) Patient interest and willingness to be tested (female and younger more receptive) (2, 7, 11) Patient requesting medication for sexual dysfunction prompts conversations (2) Relief after sharing sexual history (5)
LACK OF EDUCATION	
<ul style="list-style-type: none"> Low literacy and health literacy levels (2) Lack of education about HIV/AIDS (11) 	<ul style="list-style-type: none"> Educate patients about HIV risk (11)

Note. STD = sexually transmitted disease; numbers in parentheses correspond to the studies that demonstrated the finding (see Table 2).