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Health system barriers to HIV and STI diagnostics uptake in the United States: A comprehensive review

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Abstract

Public health efforts spanning several decades have failed to increase testing rates for HIV and sexually transmitted infections (STIs) throughout the United States, resulting in ongoing transmission and delayed diagnosis of these diseases. Testing rates have declined substantially due to multiple barriers within health systems, including structural, institutional, provider, and patient-level factors. Primary care and emergency department facilities face operational difficulties, including insufficient staff, limited appointment durations, and the absence of organized testing procedures. Implementing screening guidelines is hindered by provider knowledge gaps, discomfort with sexual health histories, and clinical inertia. Existing policies and reimbursement limitations restrict testing service capacity, creating financial disparities and complicated billing systems. Patient-related barriers, such as concerns about confidentiality, stigma, and accessibility, disproportionately affect marginalized populations, including racial and sexual minorities, adolescents, and residents of rural or underserved regions. The current healthcare system fails to provide integrated HIV and STI testing services, creating a significant gap in service delivery. Emerging strategies such as self-testing, at-home STI kits, nurse-initiated screening, electronic health record prompts, and enhanced reimbursement models demonstrate potential to increase uptake but require broader implementation to be effective. Addressing these obstacles requires a combination of policy changes, institutional backing, educational programs for healthcare providers, and patient-focused advancements. Expanding HIV and STI testing services is an essential first step for early disease identification, patient treatment initiation, and transmission control efforts that support national health objectives.

Keywords: HIV Testing; STI Screening; Health System Barriers; Diagnostic Uptake; Public Health

1. Introduction

Human immunodeficiency virus (HIV) and sexually transmitted infections (STIs) pose significant public health threats in the United States despite years of prevention efforts, scientific advancements, and established clinical protocols [1]. HIV, once a fatal diagnosis, has become a manageable chronic disease when detected at early stages and begins antiretroviral treatment. The United States reports chlamydia, gonorrhea, and syphilis as its most common infectious diseases, which cause severe reproductive and systemic health problems if undiagnosed and untreated [2]. Successful control of both HIV and STIs depends heavily on timely and widespread diagnostic testing, yet the uptake of these services remains uneven and suboptimal. This situation creates problems because undiagnosed or late diagnoses of infections worsen individual health while they continue to spread the disease throughout their communities [3]. Effective health systems should therefore facilitate high rates of HIV and STI diagnostic uptake; however, current systemic barriers continue to obstruct the achievement of this objective.

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The essential role of HIV and STI testing must be recognized as a fundamental health requirement. HIV testing enables early identification, leading to antiretroviral therapy that halts viral transmission, preserves immune health, and prevents future infections. The Centers for Disease Control and Prevention (CDC) recommends routine HIV testing by healthcare providers, allowing patients ages 13 to 64 to decline testing while requiring annual tests for individuals at higher risk [4]. Integrated STI screening is essential because STIs such as chlamydia, gonorrhea, and syphilis frequently co-occur, and untreated STIs increase vulnerability to acquiring and transmitting HIV [5]. Healthcare systems in the United States need to conduct simultaneous testing for HIV and all other STIs because of the fundamental connection between these two tests. Diagnostic testing continues to fall short of recommended levels because these guidelines fail to reach young adults, sexual and gender minorities, and racial and ethnic minority communities, which represent the most vulnerable groups [6].

Missed opportunities indicate health system barriers that go beyond basic statistical differences. Screening process suffers from institutional limitations such as insufficient staffing, a lack of efficient clinical workflows, and insufficient testing integration into standard procedures [7]. Limited appointment availability and the absence of electronic health records prompt providers to conduct tests according to established procedures. The ability of clinicians to provide sexual health assessments depends on their comfort with taking sexual histories, their knowledge of updated testing guidelines, and their understanding of screening's importance compared with other clinical tasks. Systematic reviews document healthcare provider barriers, which show that time constraints, lack of training, and competing workload demands prevent healthcare providers from performing routine HIV tests at optimal levels [8–10].

Patient-centered barriers intersect with institutional and provider challenges. Concerns about confidentiality and stigma remain significant deterrents to testing [11]. Patients avoid diagnosis because they worry about their test results being shared with others and judgment from healthcare providers. Stigma associated with HIV, in particular, persists as a powerful barrier, reflecting broader societal attitudes that attach moral judgments to HIV and other sexually transmitted infections [12,13]. For some populations, including adolescents and young adults, privacy issues create more serious problems because young people may worry that revealing their sexual experience will result in their parents knowing about it. Residents of rural areas face logistical challenges such as transportation and clinic availability, which prevent them from receiving routine screenings [14]. Such barriers to testing in underserved areas lead to increased rates of undiagnosed infections.

The intersection of health system barriers with social determinants of health creates greater disparities. Minoritized racial and ethnic groups, as well as sexual and gender minorities, experience disproportionate rates of HIV and STIs, yet these populations often confront compounded obstacles to testing access [15]. Discrimination, historical healthcare system mistrust, and insufficient culturally appropriate medical services result in reduced usage of diagnostic services. Research from diverse community settings indicates that mistrust, past negative healthcare encounters, and a lack of culturally responsive outreach reduce both the offer and uptake of testing [16]. Systemic racism and social marginalization operate as a fundamental force that determines health habits and health service use. Overcoming these challenges requires health care facilities to implement both treatment methods and organizational changes that establish equitable systems for providing health care services.

The persistence of systemic barriers creates a significant research gap that needs to be addressed. Individual-level factors that affect HIV and STI testing have been studied extensively, but research on how health system structures, policies, and institutional practices affect diagnostic testing in US clinical settings remains limited [9]. A recent scoping review on STD/HIV self-testing among U.S. college students shows the need for research and policy that address specific barriers unique to that population, while broader system-level factors do not provide clear information in the literature [6]. Similarly, existing studies on examining incentives investigate testing uptake but mainly focus on how people behave rather than the systemic framework that supports these testing incentives [17].

This comprehensive review examines multiple health system barriers that hinder successful HIV and STI diagnostic uptake, shows how these barriers lead to ongoing testing coverage shortages, and provides a complete synthesis that guides future policy development, institutional planning, and clinical practice implementation. The review aims to deliver practical recommendations that help improve diagnostic methods, promote equal test access, and advance national efforts to reduce HIV and STI spread through early detection and patient treatment access.

2. Defining Health System Barriers

Health system barriers that prevent individuals from getting HIV and STI diagnostic tests stem from organizational structures, policy frameworks, operational processes, and healthcare provider activities [18]. Public policy shapes how reimbursement systems, testing requirements, and regulatory standards affect healthcare systems' ability to conduct

routine screening. When financial incentives are weak or policies are inconsistently enforced, testing is more likely to be treated as optional rather than integral to care. The internal operations of healthcare facilities create institutional barriers through limited clinic space, a lack of qualified personnel, limited scheduling options, and failure to implement testing procedures in electronic health record systems [19]. Provider-level barriers impede testing because providers lack knowledge of current screening guidelines, feel uncomfortable conducting sexual history assessments, and display stigmatizing attitudes toward sexual behaviour and HIV risk [20]. These system and provider limitations, combined with patient interface barriers, result in patients experiencing a need for confidentiality, fear of social judgment, actual testing costs, and difficulties accessing clinics. These health system barriers together function as an interconnected system, creating multiple obstacles that prevent diagnostic testing despite the availability of effective testing technologies and clinical guidelines [21].

3. Institutional and Operational Barriers

3.1. Resource and Staff Constraints

The United States healthcare system encounters a major institutional barrier to HIV and STI diagnostic testing because of limited resources and staff shortages. Short visit times and high patient volumes create clinical constraints in primary care and emergency department settings, which prevent providers from delivering preventive services [22]. In these environments, medical staff must address immediate medical needs before proceeding with screening procedures. Clinics experience operational difficulties because they do not have enough trained employees to perform sexual health assessments and testing procedures. The health system needs trained personnel such as nurses, counselors, and medical assistants who can manage testing procedures. The need for additional time, private space, and special communication skills to discuss sexual health information makes providers less likely to start screening procedures [23]. As a result, resource and staffing constraints directly contribute to missed opportunities for early diagnosis.

3.2. Logistics and Integration Challenges

Healthcare institutions experience logistical and integration challenges that prevent them from conducting continuous HIV and STI tests. Many clinics lack established procedures that include testing as part of their standard medical practices, resulting in healthcare providers failing to use electronic health record systems for age- and risk-based screening recommendations [24]. Without automated reminders or structured protocols, testing depends on the capacity of individual provider initiative, resulting in inconsistent implementation. Emergency departments illustrate this challenge acutely, as their primary mission is the management of acute illness and injury rather than preventive care [25]. HIV and STI testing programs face operational problems because medical staff members have different levels of participation, screening programs lack institutional backing, and clinical duties compete with each other. The absence of connected operational systems prevents screening guidelines from becoming part of standard medical procedures.

4. Provider Knowledge, Attitudes, and Practices

4.1. Provider Discomfort and Lack of Training

Provider discomfort and limited training are major barriers to the implementation of HIV and STI diagnostic testing procedures [26]. The majority of clinicians experience discomfort when obtaining detailed sexual histories, including inquiries about sexual activities, same-sex encounters, and extragenital exposure sites used to identify STIs. The discomfort arises from insufficient medical and nursing training and a lack of sexual health continuing education [27,28]. Clinical guidelines for HIV care facilities establish routine screening for syphilis, extragenital gonorrhea, and chlamydia testing, yet providers often do not follow these guidelines. Insufficient knowledge of specimen collection procedures, vague testing requirements, and a limited understanding of updated guidelines result in incomplete compliance with testing protocols [29]. Providing complete diagnostic services requires resolving both professional discomfort and training deficiencies.

4.2. Provider Beliefs and Clinical Inertia

Provider beliefs and clinical inertia constrain diagnostic testing [30]. Some clinicians perceive HIV and STI screening as a lower priority compared with other medical issues addressed during patient visits, particularly in settings where patients present with multiple comorbidities or acute concerns. These established practices persist because this perception creates clinical inertia that prevents the adoption of updated evidence and guidelines that recommend routine screening. Complete testing availability at primary care sites suffers because providers either misinterpret or lack a full understanding of Centre for Disease Control and Prevention (CDC) recommendations, such as opt-out HIV

testing [30]. Providers who rely on perceived risk assessment rather than universal screening procedures may unintentionally exclude individuals who either do not disclose their risk behaviors or are incorrectly assessed to be at low risk. Health system responses to HIV and STI prevention efforts become less effective because these belief- and cognition-based barriers guide how providers make their decisions.

5. Public Policy and Reimbursement Barriers

5.1. Cost and Reimbursement Issues

Although Medicare, Medicaid, and most private insurance programs provide reimbursement for routine HIV testing, existing financial and reimbursement systems remain inconsistent in supporting widespread testing [31]. Most healthcare systems handle screening reimbursement by including it in their standard visit fees, which decreases awareness that screening should be treated as an essential task. The complicated process of test coding and billing presents a challenge for institutions, resulting in decreased focus on screening programs [32]. Broader evidence indicates that socioeconomic disadvantage, such as income instability and educational disparities, leads to reduced healthcare utilization because financial constraints prevent individuals from obtaining diagnostic tests [33]. Clinics operating with minimal financial resources may not allocate staff time or clinic resources to preventive services that do not provide them with direct financial benefits. As a result, reimbursement systems influence institutional behaviour, creating an indirect obstacle that prevents facilities from implementing HIV and STI testing programs [31].

6. Confidentiality, Stigma, and Patient–Provider Interactions

6.1. Stigma in Clinical Settings

Stigma within healthcare environments continues to function as a major deterrent to HIV and STI testing [34]. Patients avoid diagnostic services because they believe medical staff may judge them when they share their sexual history and request diagnostic tests. Stigmatizing attitudes may manifest through uncomfortable body language, contemptuous speech, and assumptions, creating trust issues that prevent patients from getting medical assistance. Marginalized groups, which include racial and ethnic minorities and sexual and gender minorities, face these challenges of discrimination and culturally insensitive care treatment [35]. The negative experiences patients have during clinical interactions create a cycle of mistrust that results in decreased testing rates and persistent disparities in medical diagnosis and treatment.

6.2. Privacy and Confidentiality Concerns

The patient–provider relationship faces a critical challenge due to existing privacy and confidentiality concerns [36]. Patients may fear that their test results or sexual health information could be disclosed to family members, employers, or community members, particularly in small or close-knit communities. These fears can discourage individuals from seeking testing even when services are available. Young adults and adolescents show the greatest sensitivity to confidentiality risks because they fear their parents will be informed, and their insurance billing information will reveal their secret activities [36]. When healthcare systems fail to clearly communicate privacy protections or provide discreet testing options, patients are less likely to accept screening offers which limit diagnostic testing.

7. Missed Opportunities and Gaps in Integrated Services

7.1. Failure to Integrate HIV and STI Testing

A substantial gap in diagnostic practice exists due to the failure to combine HIV and STI testing into a unified service model [37]. Evidence indicates that only about 61% of individuals tested for STIs also undergo HIV testing, and this percentage drops to about 35% for people who test positive for an STI [38]. The statistics demonstrate that clinical assessments, which should have included co-testing procedures, failed to meet their essential requirements. Combined screening methods show implementation issues that affect both non-hospital environments and specific demographic segments. Service fragmentation leads to incomplete diagnostic testing for patients, delaying the detection of co-infections and the spread of infectious diseases. The implementation of community-based support models has proven successful in enhancing healthcare access for underserved communities, which demonstrates that locally anchored programs can improve integrated HIV and STI testing services [39]. Similarly, the absence of integrated systems demonstrates institutional deficiencies that require unified solutions from multiple organizations. Models based on sustained community partnerships have improved engagement and equity in health communication, underscoring the need for local health organizations to develop targeted methods to enhance their diagnostic services [40].

8. Special Populations and Underserved Communities

8.1. Rural and Southern U.S. Barriers

The Southern United States and rural areas demonstrate geographic differences in diagnostic testing because their opt-out HIV testing rates show lower adoption compared to other regions [40]. Patients in these regions commonly report barriers related to perception of health care expenses, limited availability of specialized medical services, and testing centers [41]. Transportation challenges and fewer healthcare providers per capita further restrict access. Telehealth and digital delivery platforms enable rural communities to access medical services that extend beyond standard clinic hours. This improvement in healthcare accessibility serves as an effective solution to enhance HIV and STI testing services for people living in remote areas [42]. The decreased perceived danger of HIV and STIs leads people to avoid testing because they lack access to public health information in their communities. The regional barriers combine with larger structural inequalities create a situation where people experience delays in diagnosis and show higher rates of undiagnosed infections [41]. Comparative assessments of urban and rural populations reveal that the challenges in accessing services are strongly contingent on the location, calling for diagnostically situated service-enhancing strategies [43].

8.2. College Students and Young Adults

The combination of psychological barriers and systemic barriers establishes limitations on diagnostic testing among college students and young adults [44]. People in this age group tend to underestimate testing requirements because they believe they have a low risk of contracting HIV and STIs. The combination of sexual health service stigma and social judgment fear drives people away from seeking medical assistance. Students in campus health facilities face major privacy issues because they fear their testing activities will become known to their peers and family members. Evidence shows that even when self-testing options are available, these underlying concerns persist, which shows that technological access fails to resolve the systemic obstacles that healthcare delivery systems and social norms create [44].

9. Emerging Models and Solutions to Overcome Barriers

9.1. Self-Testing and At-Home Testing Models

Self-testing and at-home testing models have emerged as promising strategies to increase diagnostic uptake among individuals who face barriers to traditional healthcare settings [18]. HIV self-testing allows people who avoid visiting clinics because of stigma, confidentiality issues, and logistical challenges to access diagnosis. These approaches offer privacy and convenience, which can reduce psychological and structural barriers. The process of linking positive results to confirmatory testing and treatment remains a challenging task [18]. Pilot programs that distribute at-home STI testing kits show potential to reach people who have not tested before, yet the programs need additional support because they experience lower rates of kit return and follow-up.

9.2. System Interventions

System-level interventions provide effective solutions that enable institutions and healthcare providers to overcome existing challenges. Nurse-initiated screening programs reduce physician testing authority by establishing routine testing practices as standard procedure [45]. Electronic health record prompts improve consistency by reminding providers to offer screening based on guideline criteria. Routine opt-out testing methods increase testing rates by assigning testing duties to healthcare systems as a standard treatment practice [46]. Provider education programs help healthcare professionals learn about sexual health information while they become more comfortable with sexual health discussion, improving compliance with medical guidelines. Reimbursement frameworks that support screening programs and quality metrics tied to HIV and STI testing rates incentivize healthcare institutions to focus on diagnostic services. Early detection and enhanced surveillance systems are essential for effective management of infectious diseases, creating the need for public health systems to adopt integrated diagnostic testing facilities [47]. Digital and community-based communication platforms have demonstrated the ability to enhance health information distribution and user interaction, indicating their potential to raise awareness about HIV and STI testing while providing access to health care services [48]. All these interventions together show that system changes can significantly enhance diagnostic uptake when implemented in a structured manner.

10. Conclusion

This comprehensive review shows that health system barriers account for the low HIV and STI diagnostic testing rates in the United States, along with individual behaviour patterns. Institutional constraints, such as inadequate staff resources, time pressures, and insufficient testing integration into standard work processes, restrict uninterrupted screening activities. The impediment of implementation of guideline-recommended practices is a result of provider-related factors. The policy and reimbursement frameworks that guide institutional operations create unintentional effects that lead to a reduction in preventive screening activities, while patient-facing barriers, including stigma, confidentiality concerns, and fear of discrimination, prevent testing uptake, especially among marginalized and underserved groups. Failure to integrate HIV and STI testing demonstrates that service delivery systems continue to operate in disconnected ways. New self-testing method, electronic health record prompts, nurse-initiated screening, and routine opt-out approaches show potential for success, but their actual performance depends on their total system implementation and patient care connections. The improvement of diagnostic testing requires multiple organizations to implement specific solutions, which address challenges found at different levels while making HIV and STI testing an essential part of fair healthcare access and national disease prevention strategies.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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