**A LITERATURE REVIEW AND ANALYSIS OF ORGANIZATIONAL FRAMEWORKS AND SYSTEMS-LEVEL OUTCOMES OF HIV PRIMARY CARE INTEGRATION**

by

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Submitted to the Graduate Faculty of

the Department Infectious Diseases and Microbiology

Graduate School of Public Health in partial fulfillment

of the requirements for the degree of

Master of Public Health

University of Pittsburgh

2017

UNIVERSITY OF PITTSBURGH

GRADUATE SCHOOL OF PUBLIC HEALTH

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**ABSTRACT**

**Background:** Human Immunodeficiency Virus (HIV) continues to be a major public health concern in the United States. The Health Resources and Service Administration has identified HIV care integration including screening, prevention, treatment, support services, and linkage to care, as an area of priority interest. HIV Primary Care Integration (HPCI) focuses on the integration of HIV primary, specialty, and ancillary care services into a single setting to improve health system efficiency and health outcomes. HPCI is of great public health significance in the treatment and care of PLWHA, but also for preventing future infections by improving adherence, linkage to care, and retention in care and reducing community viral load. HPCI also promotes HIV prevention and testing among those at-risk for HIV. Evidence and evaluation of service integration at a health systems level is sparse, particularly for HPCI. This essay aimed to review the current evidence-base for 1) frameworks and models of integration and how these may best be applied and 2) systems-level outcomes as a direct result of HPCI.

**Methods:** A comprehensive literature review was conducted in databases: Google Scholar, Medline, Embase, and PubMed to compile and analyze current literature for frameworks, models, and outcomes of HIV primary care integration.

**Results:** A tiered framework of HIV primary care integration is described. Findings from the literature review were organized into four domains of models of care and case studies presented as examples. Five systems-level outcomes were consistent across the literature: 1) provider knowledge 2) patient satisfaction 3) linkage to care 4) retention in care 5) HIV-related stigma. All five outcomes presented a strong argument for HPCI.

**Conclusions:** Primary care has an important role in the care of the diagnosis, treatment, and management of people living with HIV and those at-risk for HIV. With paradigms and politics ever changing, health care must evolve and adapt. An integrated, multidisciplinary approach to care should be considered to improve quality of care for patients and to improve health outcomes for communities and populations.

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**ABBREVIATIONS**

**AETC……………………………...…………………….AIDS Education and Training Center**

**AIDS.………………………………………………......Acquired Immunodeficiency Syndrome**

**ART.………………………………………………..............……………Antiretroviral Therapy**

**CHC.……………………………………………………………........Community Health Center**

**CMS.……………………………………………….Centers for Medicare & Medicaid Services**

**EHR.………………………………………………...……………......Electronic Health Records**

**HIV.…………………………………………………….…......Human Immunodeficiency Virus**

**HPCI.……………………………………………………..…......HIV Primary Care Integration**

**HRSA.…………………………………………Health Resources and Services Administration**

**ID.…………………………………………………………………………......Infectious Diseases**

**LVP.………………………………………………………………..…......Low-Volume Provider**

**MAAETC.……………………………..…MidAtlantic AIDS Education and Training Center**

**NCQA.……………………………………….……National Committee for Quality Assurance**

**NP.……………………………………………….............……………………Nurse Practitioner**

**PA.……………………………....……………………………………………Physician Assistant**

**PCMH………………………....………………………………Patient-Centered Medical Home**

**PCP………………………....…………………………………………..Primary Care Physician**

**PHAST………………………....…………..Positive Health Access to Services and Treatment**

**PLWHA………………………....………………………………People Living with HIV/AIDS**

**SAMHSA……………………..Substance Abuse and Mental Health Services Administration**

**SVMS………………………....…………………………...Shenandoah Valley Medical Systems**

**VA………………………....…………………………………………………….Veterans Affairs**

**1.0 INTRODUCTION**

Human Immunodeficiency Virus (HIV) infection continues to be a national health concern, causing significant morbidity and mortality. The United States Centers for Disease Control and Prevention (CDC) estimates that at least 1.2 million people in the US are living with HIV. Additionally, CDC estimates that 1 in 8 people are unaware of their HIV-positive status, even with the increase in HIV screening initiatives ([Centers for Disease Control and Prevention, 2016](#_ENREF_4)).

HIV does not affect all groups equally. Men who have sex with men (MSM) are at the highest risk of infection, accounting for 82% of male diagnoses and 67% of all reported diagnoses in 2015. Other health disparities exist when stratified by age and race/ethnicity ([Centers for Disease Control and Prevention, 2016](#_ENREF_4)). Young people, age 13-29, accounted for 41% of diagnoses and were the least likely to be aware of their HIV status at the time of diagnosis. By race/ethnicity, African Americans experience the largest burden of HIV infection. Composing 12% of the population, African Americans constituted 45% of all HIV diagnoses in 2015 ([Centers for Disease Control and Prevention, 2016](#_ENREF_4)). The unequal burden of HIV risk and infection impacts the prevention, testing, and care needs of specific populations based on access to care, quality of care, and population served.

Contextual factors such as regionality, populations, access to care, and workforce capacity call for several models of HIV care to engage as many people living with HIV/AIDS (PLWHA) in care as possible. It is estimated that among the 1.2 million PLWHA, only one-third are actively engaged in care and two-thirds (approximately 800,000 people) are receiving inconsistent care or no care at all ([Bradley et al., 2014](#_ENREF_3)). It is essential to engage and retain HIV-positive patients in regular HIV care not only to improve patient health outcomes, but also to minimize disease transmission. Those that are virally suppressed using antiretrovirals eliminate the risk of transmitting the virus to others via sexual transmission. This is referred to as treatment as prevention and is of great public health significance ([Centers for Disease Control and Prevention, 2016](#_ENREF_4)). Behavioral prevention, pre-exposure prophylaxis, and treatment as prevention are all key tools to decrease HIV transmission and lower community viral load and overall risk for new infections. Primary care providers can play a key role in prevention and testing by integrating US Preventive Services Task Force universal testing guidelines into workflows and by providing with and/or linking clients to culturally appropriate care.

**1.1 Evolution of HIV Care**

The diagnosis, treatment, and management of HIV/AIDS has changed drastically since the beginning of the epidemic. During the early HIV/AIDS epidemic, most medical care consisted of crisis management and palliative care. The advent of AZT, the first major treatment breakthrough for HIV, caused a paradigm shift toward HIV infectious disease specialty care, which has continued to predominate HIV care models ([Chu & Selwyn, 2011](#_ENREF_7)). Since then, there have been major research and development breakthroughs in HIV/AIDS drug development.

The discovery and advances of antiretroviral therapy (ART) has dramatically increased the life expectancy of those diagnosed with HIV/AIDS. The Health Resources and Services Administration (HRSA) ([Health Resources & Service Administration, 2016](#_ENREF_21)), now classifies HIV as a chronic disease and states it must be managed as such. The increase in testing initiatives, care engagement programs, other medical advances have contributed to the improved life expectancy for PLWHA and therefore increased the demand for HIV care and management ([Deeks, Lewin, & Havlir, 2013](#_ENREF_13); [Kimmel et al., 2016](#_ENREF_25)). Specifically, ART treatment initiation and adherence is shown to improve survival, delay disease progression, and significantly reduce the risk of AIDS-related events ([Panel on Antiretroviral Guidelines for Adults and Adolescents, 2016](#_ENREF_37)). Aging of PLWHA has also created a larger demand for primary care due to the morbidity shift from opportunistic infections to more chronic conditions such as non-HIV/AIDS associated malignancies, cardiovascular disease, and stroke ([Chu & Selwyn, 2011](#_ENREF_7)).

The current paradigm of HIV care is fragmented, siloed care connected via referral network and is graphically depicted in Figure 1A. The current paradigm cannot continue to support the needs of PLWHA or those at-risk. Fortunately, the landscape of HIV treatment is dynamic and the means of care can adapt to meet the demand of the expanding population. One such way to meet this demand is by integrating HIV care management services and primary care. This integration is referred to throughout this essay as “HIV Primary Care Integration (HPCI)”. Several models of HPCI have been suggested to meet this supply and demand problem for HIV care and are presented and discussed. A general depiction of HPCI is shown in Figure 1B.

Integrated service models have been proposed and implemented at a time of US healthcare reform and redesign focused on effectiveness, efficiency, interprofessional practice, and patient-centered care. This may be to the benefit or demise of these models. This has yet to be determined as many of the models have yet to be evaluated for their cost-effectiveness and various outcomes. The aim of this essay is to review the literature and evidence base for HPCI frameworks and models and analyze HPCI impact on health care systems.

**HIV+**

**Patient**

**PCP**

**Insurance**

**provider**

**HIV**

**Specialist**

**Case**

**Manager**

**Pharmacist**

**Laboratory**

**Community**

**Resources**

**A**

**B**

**Figure 1**. **Comparison of fragmentation and integration of HIV primary care services.** (**A**) Represents the current standard for HIV care: a fragmented health system based on referrals. (**B**) Depicts multidisciplinary care of a single patient contained in an integrated model of HIV Primary Care Integration.

**1.2 Primary Care Integration**

A definition of primary care integration has not yet been agreed upon within the literature or by clinical experts. Several definitions have been proposed and many sources use working definitions. The Substance Abuse and Mental Health Services Administration (SAMHSA) defines integrated care as “…the systematic coordination of general and behavioral health. Integrating services produces the best outcomes and proves the most effective approach to caring for people with multiple healthcare needs” ([Substance Abuse and Mental Health Services Administration, 2013](#_ENREF_50)). SAMSHA’s definition is derived from the agency’s project focused on behavioral health integration into both primary and specialty care settings ([Substance Abuse and Mental Health Services Administration, 2013](#_ENREF_50)).

Another federal agency, the Health Resources and Services Administration, has a definition for HIV primary care integration that was defined for their project “Partnerships 4 Care”. HRSA’s definition for HPCI is “the integration of HIV services into primary care for building strong primary care-public health partnerships to expand the provision of HIV prevention, testing, care and treatment services, especially among racial/ethnic minorities” ([Health Resources & Service Administration, 2016](#_ENREF_21)).

A comprehensive review of peer-reviewed literature revealed several working definitions of primary care integration. Some definitions were based on the collocation of services ([Hoang et al., 2009](#_ENREF_22); [Smit, Church, Milford, Harrison, & Beksinska, 2012](#_ENREF_43)), others were defined by the multidisciplinary collaboration and team-based care ([Gallant et al., 2011](#_ENREF_17); [Kimmel et al., 2016](#_ENREF_25); [Mapp, Hutchinson, & Estcourt, 2015](#_ENREF_29)), and still more were denoted by the setting in which services were provided ([Peck et al., 2003](#_ENREF_38)).

For the purpose of this essay, a combination of definitions is adapted from two sources ([Health Resources & Service Administration, 2016](#_ENREF_21); [Hoang et al., 2009](#_ENREF_22)). HPCI is defined as:

The integration of HIV services including, but not limited to, screening, prevention, care, management, and ancillary support services into primary care. All services should be collocated and include a collaboratory effort among the care team.

**1.3 Specific Aims**

1. To organize and present frameworks and models of HIV Primary Care Integration in current literature using case studies as examples
2. To analyze systems-level outcomes of HIV Primary Care Integration on health care systems

**2.0 METHODS**

A comprehensive literature review was conducted in databases Google Scholar, PubMed, EMBASE, and Medline. Several search terms were used including: HIV care integration, primary care, shared care, general medicine, family medicine, integrated care, integrated services, and HIV service integration. To expand literature base, citations of reviewed literature were browsed as a form of snowball sampling. Only studies available in English were included. This was not a systematic literature review as predetermined, methodological eligibility criteria were not set, a Public Health librarian was not consulted, and a secondary analyst or coder was not used. Given their role in HIV service provision and current projects, grey literature from HRSA, AIDS Education and Training Centers, SAMHSA, and Centers for Medicare & Medicaid Services (CMS) was also used.

Systems-level outcomes is defined using an adaptation from the Institute for Healthcare Improvement and Institute of Medicine. The definition used is:

Systems-level outcomes are those that occur at the intersection of organizations, health systems, power structures and the complex interactions between these and outside agents that impact delivery of care and overall quality of care. Each participating unit of the system is interdependent and influential upon the outcomes and other participating units. An outcome is considered at a systems-level if it can be measured and institutionalized to impact an entire systems dynamic and the aforementioned complex interactions ([Martin, Nelson, Lloyd, & Nolan, 2007](#_ENREF_30); [National Academy of Engineering (US) and Institute of Medicine (US) Committee on Engineering and the Health Care System, 2005](#_ENREF_33)).

The specific systems-level outcomes were selected using outcomes from similar projects in the grey literature including HRSA, SAMHSA, CMS, and Institute for Healthcare Improvement. The outcomes were then quantified by number of times mentioned in the literature search and five emerged as the most frequently discussed: 1) provider knowledge 2) patient satisfaction 3) linkage to care 4) retention in care 5) HIV-related stigma.

**3.0 RESULTS**

**3.1 Organizational Frameworks of HIV Primary Care Integration**

Service integration can be depicted on a continuum, ranging from fragmented, standalone clinics to fully integrated systems and everything in between (Figure 1). A health system may integrate all services to completely serve the population in need, or that system may only integrate some essential services, rendering an incomplete integration. An evaluation performed in 2010 designated 3 levels of integration: macro, meso, and micro ([Curry & Ham, 2010](#_ENREF_12)). The designation was based on the provider’s placement on an adapted “Fulop’s Typology of Integrated Care” map which can be referenced elsewhere ([Lewis, Rosen, Goodwin, & Dixon, 2010](#_ENREF_28)).

The criteria for integration consider organizational integration, functional integration, provider service integration, clinical integration, normative integration, and systemic integration. Organizational integration refers to vertical versus horizontal integration. Vertical integration is the top-to-bottom tiered approach to health services, based in referrals and health networks. Horizontal integration is linking of similar levels of care to form a collaborative care group. Functional integration is non-clinical support and infrastructure, such as electronic health records and workflow. Provider service integration is a multidisciplinary and collaborative clinical approach at an organizational level, not by referral systems. Clinical integration references the complete integration of shared protocols, guidelines, and processes across all professions and staff. Normative integration is the shared mission, values, and commitment to patient care and satisfaction in a culturally competent and sensitive manner. Systemic integration refers to the coherence of regulation and policy at all levels and maintenance at the systems-level to ensure a routinized, integrated care delivery system ([Curry & Ham, 2010](#_ENREF_12); [Lewis et al., 2010](#_ENREF_28)).

When all six integration criteria are met, macro-integration services are provided. If four to five criteria are met, meso-integration occurs and if less than four criteria are met then micro-integration happens ([Curry & Ham, 2010](#_ENREF_12)). These conditions provide a roadmap for frameworks and models to be used in all manners of service integration, but are specifically applied to HIV Primary Care Integration for the purposes of this essay.

The lack of agreed upon definition may be because of the many models of HIV care integration that exist globally. There are 4 domains in which the numerous models of integration fit:

1. *Polyclinic Model*. Derived from the United Kingdom National Health Services. Polyclinics include community-based primary care services contained in a referral-based network that includes specialty services such as dentistry, laboratory, and pharmacy. It is tier-based, vertical integration; patients must first start at basic generalist care and be referred to specialty care and outpatient services ([Stange & Hess, 2008](#_ENREF_46)).
2. *Collaborative Care Model*. Referral-based model where primary care clinicians handle general services and consult or refer to specialists for most HIV specialty care. All services are collocated for convenience and optimization in continuum. Service options vary by context, such as population, resources, regionality, and need. Many low-resource and/or low-volume settings use this for multiple comorbid conditions such as tuberculosis, antenatal care, family planning, HIV, sexual health, etc. This differs from polyclinics because referrals are warm handoffs and patients are (usually) seen within the same day in the same building ([Topp et al., 2013](#_ENREF_52)).
3. *Reverse Primary Care Model*. HIV specialists provide routine primary care to HIV-positive patients. Many PLWHA receive services from Ryan White Care Act providers. Ryan White funds do not cover general primary care visits and therefore, PLWHA wish to see their HIV specialist as their primary care doctor for economic and convenience reasons. Ryan White providers often have collocated associated services depending on setting and program funding arm ([Cheng, Engelage, Grogan, Currier, & Hoffman, 2014](#_ENREF_5)).
4. *Primary Care Integrated Service Model*. Primary care practitioners provide routine primary care and HIV care management services. Ancillary support services, such as case management, are also considered and provided in the primary care setting. Specialty consults and referrals are used only when necessary. This model considers HIV as a chronic condition that can be diagnosed and managed in a primary care setting ([Deeks et al., 2013](#_ENREF_13)).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Services Offered** | **Polyclinic** | **Collaborative Care** | **Reverse Primary Care** | **Integrated Primary Care Services** |
| **Primary Care** |  |  |  |  |
| **HIV Specialty Care** |  |  |  |  |
| **Pharmacy** |  |  |  |  |
| **Laboratory Services** |  |  |  |  |
| **Behavioral Health/ Mental Health** |  |  |  |  |
| **Substance Use** |  |  |  |  |
| **Case Management** |  |  |  |  |
| **Social Support Services (Housing, Food Pantry, Transportation, etc)** |  |  |  |  |

Service not offered in model

Service offered by referral network, not directly at setting

Service may or may not be offered, varies by context and setting

Service required at setting

**Figure 2.** **Services offered by models of HPCI**. Presents models of HPCI and services that may or may not be available within those models. Key shown below.

Figure 2 reflects services offered and available in each model of HPCI discussed. Models and services can be overlaid with the micro, meso, and macro-level framework. This is graphically depicted in Figure 3.

**Micro**

**Meso**

**Macro**

Primary Care Integrated Service

Polyclinic

**Figure 3**. **Continuum of HIV Primary Care Integration**.

Collaborative Care

Reverse Primary Care

**3.2 HPCI Case Studies**

A comprehensive literature review has revealed several case studies for HIV Primary Care Integration and the plethora of services that can be included. These case studies can be mapped on the continuum of macro, meso, and micro services defined previously ([Curry & Ham, 2010](#_ENREF_12)) and also categorized by one of the four models above. This is depicted graphically in Figure 4.

Veterans Affairs (VA) is the largest provider of integrated services in the United States and by the definitions above is a macro-level integrated services provider. It operates as a fully integrated primary care service model, having a comprehensive system of collocated services. A recent evaluation of VA HIV integrated services provided a ranking system based on the number and type of services provided. The study conducted a retrospective cohort study to evaluate patient utilization of integrated HIV services and patient outcomes, such as viral suppression and mortality ([Hoang et al., 2009](#_ENREF_22)).

Levels of integrated HIV care provided by the VA were based on services and ranked I-IV. Level I provided a primary care clinician (NP, PA, or physician) to provide primary care services and HIV treatment and a clinical coordinator to link patients to community resources (dental care, food programs, and housing assistance). Level II included level I services, plus HIV physician specialty support and a dedicated pharmacist collocated to provide consultations for both clinicians and patients. Level III included levels I and II services as well as a social worker to assist patients with case management needs, social support programs, and behavioral health. Level III also included psychiatric care collocated for diagnosis and treatment of substance use and mental illness. Level IV is considered the ultimate integration of HIV care of all collocated services and is comprised of on-site services to HIV-infected patients of levels I-III in addition to a psychologist for counseling for mental and behavioral health issues. Levels III and IV have the highest proportions of virally suppressed patients, varying from 3 to 5 times higher than Levels I and II ([Hoang et al., 2009](#_ENREF_22)).

The Patient-Centered Medical Home (PCMH) model has been a focus of many, as the health care paradigm shifts from physician-centered to population and patient-centered care. Evaluations have focused on the shift of community health centers (CHCs) to the National Committee Quality Assurance (NCQA) official designation of PCMH. The HIV ACCESS PCMH Demonstration Project conducted by the University of California, HIV/AIDS Research Program sought to explore best practices for systematic care integration at an infrastructure and organizational level ([Friedman, Crowley, Howard, & Pavel, 2015](#_ENREF_16)).

HIV ACCESS PCMH Project evaluated six CHCs in Alameda County, California, as they transitioned to accredited HIV PCMH status. Throughout transition, most of the sites offered primary care, specialty care, pharmacy services, limited case management, and health educators. The study found that a strong referral and coordination of care network was necessary, as all services were not able to be provided in all six project sites. Additionally, organizational workflow and key process management tools were essential to success. These tools included project management software, IT support, and adaptation of electronic health records systems. Leadership, staff, and community engagement were noted among the successes. Standardization of testing, treatment, and other related patient protocols and policies was necessary for service integration ([Friedman et al., 2015](#_ENREF_16)).

HIV ACCESS is unique because it serves patients both covered and not covered by the Ryan White Program. The HIV ACCESS Project had to adopt two models of HCPI to best serve its population: Collaborative Care Model and Reverse Primary Care Model. A multidisciplinary care team served the needs of PLWHA, but due to funding restrictions of the Ryan White Program, uninsured or underinsured HIV-positive patients were not able to see primary care providers for general visits and had to see their HIV specialty physicians for primary care services.

Shenandoah Valley Medical Systems (SVMS) is a non-profit community/migrant health center with 10 locations serving rural, medically underserved areas of West Virginia. SVMS uses the PCMH model and is accredited by the NCQA. It provides care to HIV-positive patients via a sub-contract of Ryan White Part C, focused on early intervention and capacity building in community health clinics and rural populations ([Southerly, 2017](#_ENREF_45)).

In 2003, SVMS was providing primary care to approximately 10 HIV-infected patients. In coordination with the MidAtlantic AIDS Education Training Center (MAAETC) West Virginia Regional Partner, the HIV Care Program began in 2004. HIV specialist consultations were incorporated into monthly Patient Care Conference Calls to review charts of HIV-infected individuals and discuss care and treatment plans. Since 2004, primary care of HIV-infected individuals has been integrated into the systematic and organizational plan of SVMS by weekly teleconference consultations with infectious disease specialists as arranged by the MAAETC West Virginia Regional Partner. The consultations have expanded to include a collaborative team of nurses, nurse practitioners, ID specialists, and social workers ([Southerly, 2017](#_ENREF_45)).

This integration of collaborative care at an organizational level has expanded the capacity and capability of SVMS to provide competent services to its HIV-infected patients. Thirteen years after inception, the HIV Care Program now serves 240 HIV-positive patients and continues to train new clinicians ([Southerly, 2017](#_ENREF_45)). SVMS is an example of micro-level integration that evolved as a need emerged. The health system used the existing PCMH infrastructure to support the HPCI collaborative care model and allow successful expansion of services.

**Micro**

**Meso**

**Macro**

Primary Care Integrated Service

Polyclinic

**Figure 4**. **Case studies on the HPCI framework continuum.** Overlays the three presented case studies (SVMS, HIV ACCESS, and VA) over models and frameworks previously discussed.

Veterans Affairs

HIV ACCESS PCMH

SVMS

Collaborative Care

Reverse Primary Care

**3.3 Systems-level Outcomes**

Systems-level outcomes are those that occur at the intersection of organizations, health systems, and power structures. Systems-level outcomes do not only focus directly on the patient nor the provider, but focus instead on health systems, organizational infrastructure, and the complex interactions with populations, community, and other outside agents and how these interactions impact health. Often, systems-level indicators and outcomes span across levels of care, affecting patient, provider, and health system. Though the studies may be context-specific, a comprehensive literature review revealed common systems-level outcomes of HPCI across the broad literature base. These are:

1. Increased provider knowledge
2. Improved patient satisfaction
3. Increased linkage to care
4. Improved retention in care
5. Decreased HIV-related stigma

**3.3.1. Increased Provider Knowledge**

The quality of HIV care is not based on whether the clinician is a generalist or specialist, but instead the knowledge and experience of the provider ([Goldschmidt & Chu, 2016](#_ENREF_18); [Landovitz, Desmond, Gildner, & Leibowitz, 2016](#_ENREF_27)). Knowledge and experience was not only based on formal medical training, but also volume of HIV-positive patients and awareness and adherence to testing and treatment guidelines ([Landovitz et al., 2016](#_ENREF_27)). Primary care physician experience with HIV-positive patients was strongly associated with early prescription of ART and patient adherence to medication ([Kendall et al., 2015](#_ENREF_24); [Landon, Wilson, McInnes, & et al., 2005](#_ENREF_26)). Additionally, PCPs in integrated care models were shown to have non-inferior ART management outcomes when compared to HIV/infectious disease specialists ([Kendall et al., 2015](#_ENREF_24)).

Conversely, there is concern with the continuous changes of guidelines and the advent of new ART drugs. It may not be that primary care physicians cannot manage HIV care, but are unable to accurately and correctly prescribe ART at first diagnosis ([Stone, Mansourati, Poses, & Mayer, 2001](#_ENREF_49)). Using case studies and physician surveys, it was found that generalists were less likely to prescribe ART per updated guidelines compared to infectious disease specialists. When experience was considered, greater experience was associated with adherence to prescribing guidelines, regardless of specialty ([Stone et al., 2001](#_ENREF_49)).

A study conducted in New York state sought to quantify the number of patients necessary to provide generalists with the experience needed to improve quality of care for PLWHA ([O'Neill et al., 2015](#_ENREF_34)). The study designated low-volume providers (LVPs) as generalists that treat less than 20 unique HIV-positive patients. Compared to the NY Department of Health HIV Quality of Care providers, that provide specialty HIV care, LVPs underperformed on all indicators. This concluded that more than 20 unique HIV-positive patients are necessary for one provider to have improved HIV patient outcomes and LVPs should seek outside expert consultation ([O'Neill et al., 2015](#_ENREF_34)).

A meta-analysis assessed similar indicators, including the number of HIV-positive patients necessary to provide a higher level of quality care and prescription of ART by provider and clinic. The analysis showed that integrated clinics with greater than 100 HIV-positive patients and providers with greater than 49 HIV-positive patients were associated were improved outcomes and superior care. Outcomes measured included early diagnosis of opportunistic infection and decreased mortality associated with HIV/AIDS. Also shown were mixed results with ART prescribing. Several studies in the meta-analysis showed higher volume integrated primary care clinics and generalist providers prescribed ART earlier, but that higher caseloads in specialized settings had the strictest adherence and highest prescription rates ([Handford, Rackal, Tynan, Rzeznikiewiz, & Glazier, 2012](#_ENREF_20)).

Primary care physicians not only provide HIV care, but also routine health and wellness services. A study conducted comparing screening practices of providers treating PLWHA showed that generalists with larger caseloads in an HIV integrated service setting had 4 times the odds of PCPs in non-integrated practices of conducting breast cancer screenings and 1.5 times the odds of PCPs in non-integrated practices of screening for colorectal cancer. When compared to HIV specialists in integrated settings, both generalists in integrated and non-integrated settings had greater odds of screening for cancers ([Kendall et al., 2015](#_ENREF_24)). Other studies have found non-inferiority between specialists and primary care physicians when stratified by specialty and experience comparing primary care screenings and immunizations ([Landon et al., 2005](#_ENREF_26)).

**3.3.2. Increased Patient Satisfaction**

Patient satisfaction is a systems-level outcome used by health systems and organizations to better tailor services and improve health service delivery. Increased care has been shown to be more efficient because of collocated services. This efficiency has saved patients time and effort, providing convenience and economic value, thus raising patient satisfaction ([Church et al., 2012](#_ENREF_8); [Sweeney et al., 2012](#_ENREF_51)).

A patient survey showed satisfaction scores were statistically significantly higher among PLWHA seen in integrated service settings and primary care settings compared to a specialty infectious disease setting ([Page et al., 2003](#_ENREF_36)). Specific answers from the patient satisfaction survey were compared between treatment groups in primary care settings and ID specialist settings at time point 0 months and 12 months. Fourteen of twenty-seven questions had statistically significant higher patient satisfaction scores for PCPs compared to specialists. No questions had statistically significant patient satisfaction sores for specialists compared to PCPs. It is worth noting patients thought that specialists had better equipped facilities and patients felt they waited less in specialty settings, but the results were not significant ([Page et al., 2003](#_ENREF_36)).

Odeny, et al, conducted a patient survey as a HIV care clinic underwent transition into an integrated service provider ([Odeny et al., 2013](#_ENREF_35)). The researchers surveyed 343 participants at baseline, 3-month, 6-month, and 12-month post integration for patient satisfaction with the integrated services being provided. On 8 out of 9 indicators, all odds ratios showed positive improvement, apart from “office courtesy and helpfulness.” By 12 months post-integration, HIV-positive patients had 2.7 times greater odds being very satisfied with reception and billing staff, 3.3 times greater odds being very satisfied with HIV education and counseling obtained at appointment, and 2 times greater odds being very satisfied with the wait time when compared to pre-integration baseline data ([Odeny et al., 2013](#_ENREF_35)).

A qualitative study was conducted in an HPCI setting, specifically questioning mental health and substance use services and the integration of these into HIV and primary care. Patients described the convenience and efficiency of collocated services, especially the importance of case management support. Several interviewees noted the ease of access to all provider services and how this kept them engaged in care. Other interviewees spoke of how the integration addressed all aspects of care and not just one problem they had, increasing their overall satisfaction with services and needs addressed ([Drainoni et al., 2014](#_ENREF_14)).

**3.3.3. Increased Linkage to Care**

Linkage to care is an important systems-level outcome because persons not linked to care after HIV diagnosis or who do not establish regular primary care are at an increased risk for premature mortality. They are less likely to receive ART, and those who are prescribed ART, but are not enrolled in primary care with ancillary case management services, have worse adherence ([Hall, Frazier, Rhodes, & et al., 2013](#_ENREF_19)). Additionally, linkage to care is dependent upon many players within the complex, dynamic system of health, including case managers, systems navigators, insurance providers, and care providers.

Ancillary services, such as housing assistance, medical case management, and mental health services, were associated with an increased linkage to care. Integration of these services into primary care settings were synergistic in effect. Specifically, social service planning incorporated into case management services offered in the primary care settings was found to be associated with better linkages to care and also retention and continuity in care ([Messeri, Abramson, Aidala, Lee, & Lee, 2002](#_ENREF_31)).

Integrated services improved linkage to care not only to HIV treatment and/or primary care, but to the other services offered. Clients utilizing collocated case management services were shown to be 2.3 times more likely to receive appropriate behavioral health and substance use services ([Ashman, Conviser, & Pounds, 2002](#_ENREF_1)).

Ancillary services were not the only way to improve linkage to care. Positive Health Access to Services and Treatment (PHAST) exemplified that the use of rapid, collocated test and treat services ensure linkage to care. Results from a PHAST evaluation showed of those tested, confirmed positive, and linked to care within 24 hours, 98% kept their first HIV care visit at an integrated setting and 95% were maintained in care for 6 months after initial testing ([Christopoulos, Das, & Colfax, 2011](#_ENREF_6)).

**3.3.4. Improved Retention in Care**

Improved retention in care is shown to be a systems-level outcome of HPCI because of its dynamic nature and the collaborative effort required among all players. Also, organizational infrastructure and capacity are required for retention in care to be successful. This is an extremely important outcome because improved retention in care impacts patient level outcomes including lower viral loads and increased likelihood of adherence to pre-exposure prophylaxis and ART ([Sherer et al., 2002](#_ENREF_41)).

Primary care is often the first and only face of health care that many encounter. Those regularly engaged in primary care have a better 5-year mortality than those who only seek specialty care ([Starfield, Shi, Grover, & Macinko, 2005](#_ENREF_47)). Additionally, PLWHA who regularly missed their 6-month appointments when compared with those actively engaged in primary care had a 2.3 times greater mortality rate ([Mugavero, 2008](#_ENREF_32)).

Similar to linkage to care, improved retention and continuity in care was found to be associated with integrated service models ([Messeri et al., 2002](#_ENREF_31); [Sherer et al., 2002](#_ENREF_41)). HPCI was associated with higher retention in care due to its collocated ancillary services, including case management, behavioral health, and substance use services. It was found that PLWHA that engaged with at least 1 social support service had a higher likelihood of maintaining regular primary care ([Sherer et al., 2002](#_ENREF_41)).

Patients who engaged in necessary, related medical and non-medical services in the same place utilized primary care services more often and remain engaged in stable HIV care management ([Soto, Bell, & Pillen, 2004](#_ENREF_44)). Similarly, when these ancillary services are available, HIV-positive patients reported a statistically significant increased likelihood of retention in a single HIV integrated service setting ([Messeri et al., 2002](#_ENREF_31)).

 Marginalized and hard-to-reach populations are those hardest to retain in care for numerous reasons. Though not included in some models of care discussed, patient navigators and community outreach workers engage and retain these populations in care. In one evaluation of the Special Projects of National Significance Outreach Initiative, Bradford, et al, found that HIV-infected patients previously considered “lost to care” were more likely to initiate and maintain regular primary care and HIV management appointments in integrated care settings with the assistance of patient navigators ([Bradford, Coleman, & Cunningham, 2007](#_ENREF_2)). The 4 sites statistically significantly improved the utilization of integrated primary care services. The proportion of HIV-positive patients utilizing two of more primary care services increased from 57% at baseline to 87% at 6 months and 80% at 12 months ([Bradford et al., 2007](#_ENREF_2)).

**3.3.5. Decreased HIV-related Stigma**

Literature review revealed decreased institutional HIV-related stigma as a systems-level outcome. Stigma is often thought of as a societal constraint, but the sources that evaluated HPCI focused on HIV stigma and its impact on access and quality of care within a health system. When evaluated, HPCI was shown to decrease HIV-related stigma among clinic staff by taking several steps to destigmatize the disease. These steps included universal HIV screening, combining primary care and HIV care waiting rooms, and merging staff and staff responsibilities ([Odeny et al., 2013](#_ENREF_35)).

 When surveyed, patients and staff of HPCI settings expressed positive views of service integration. One qualitative study examined patients and staff at 2 clinics, one transitioning through HPCI and another that did not. The results showed that 55% of patients of both clinics 1 and 2 believed that separated services contributed directly to HIV-related stigma among patients and staff. Patients surveyed in the fragmented clinic were split on opinion, with 50% preferring HPCI and 50% preferring fragmentation of services. Interviews revealed that the patients of the fragmented clinic preferred their own privacy, freedom of expression, and devoted staff ([Topp et al., 2010](#_ENREF_53)).

 Integration may further perceived stigma. Using surveys and in-depth interviews, 602 patients of 4 clinics were questioned. The four clinics varied in integration, ranging from fully integrated, partially integrated, mostly outpatient, and completely stand alone, outpatient. When surveyed, patients of the two integrated clinics feared other patients and staff finding out their HIV-status, rating the question an average of 2 out of 5 on a Likert scale. Patients of the two standalone clinics reported a feeling comfort and less perceived stigma, rating the question an average >4 out of 5 ([Church et al., 2013](#_ENREF_9))

 Church et al also found that perceived stigma and exposure status statistically significantly varied between the clinics. No difference in odds ratios was found between fully integrated and no integration of services. Patients perceived a nearly 12 times odds of exposure and stigmatization in the partially standalone clinic in comparison to the completely standalone and fully integrated. Patients perceived a nearly 3.5 odds of exposure and stigmatization in the partially integrated clinic ([Church et al., 2013](#_ENREF_9))

 HIV-related stigma does not only impact the HIV-infected community, but also the HIV care team. Since the early epidemic those involved in the diagnosis and treatment of HIV/AIDS patients have suffered from social stigmas related to their profession. One study surveyed multidisciplinary HIV-care teams and found that the health professionals perceived statistically significant social stigma based on perceptions of sexuality, HIV-status, populations worked with, drug use, and sexual habits. This study focused on meso-level integrated services, combining social support services, HIV specialty care, and primary care in an outpatient setting.

**4.0 DISCUSSION**

I found that HPCI is contextual. The services provided, framework used, and outcomes gathered varied largely based on the studies’ regionality, funding stream, population served, and many other components. The context impacts the frameworks and models that are adopted by specific systems. Sorting these frameworks into domains serves to organize available resources, data, and best practices.

This review found that in the five systems-level outcomes observed, HPCI is context-specific and may or may not be better than fragmented care when treating certain populations or in response to specific needs. Specialty HIV care providers see greater number of HIV-positive patients, resulting in greater experiential knowledge, which has a significant association with positive patient health outcomes. However, in rural or medically-underserved areas, a primary care provider may come to see more and more HIV-positive cases and gain the same amount of experience. This may be an effect of provider knowledge and experience, but may also be due to circumstance and conditions such as resource availability.

The ability of a clinic or health system to adapt an organizational framework or model of HPCI is contingent on the capacity to meet integration needs. Macro-level integration requires an extensive infrastructure able to support systematic changes and adaptations to workflow, processes, and staffing. The two largest providers of integrated HIV services, the VA and Kaiser Permanente, have utilized a central electronic health records system (EHR) as the keystone of their model. The centralized system standardizes adherence to policy and protocol in attempt to guarantee the highest quality of care for the HIV-infected patient.

Meso- and micro-level integration may require the same amount of resources depending on the size and capacity of the clinic or health system. Often, micro-level HPCI occurs as a response to dire need, such as the case at SVMS. Low-volume, isolated, rural, or underserved communities often lack access to care. Integrated services at all levels may have the ability to expand this access. SVMS expanded access to HIV specialty care by integrating telehealth and specialty clinical consultations into primary care services ([Southerly, 2017](#_ENREF_45)).

Debate does not only surround what definition and model best fits HPCI, but also what services are necessary and which are not. This may depend on the definition and model used, but the literature review has shown five key services that must be offered via co-located services or direct referrals. The five service areas are: generalist primary care, HIV testing and counseling, HIV treatment and management, behavioral health, and social support services ([Hoang et al., 2009](#_ENREF_22); [Soto et al., 2004](#_ENREF_44)). Other mentioned services included substance use treatment services ([Soto et al., 2004](#_ENREF_44); [Zaller, Gillani, & Rich, 2007](#_ENREF_54)), laboratory services, primary prevention (i.e., pre-exposure prophylaxis for serodiscordant couples), HIV/sexual health education ([Soto et al., 2004](#_ENREF_44)), and related comorbidity screening and treatment (i.e., HCV and STIs).

Services available is one way to sort models of HPCI and is depicted in Figure 3. The 4 domains of HPCI models was compiled by: the services available, collocation of services, multidisciplinary team, and the number of referral connections needed. Polyclinics were the most fragmented form of HPCI. They represent a tier-based system where providers depend on a strong referral network to move the patient along the continuum of care and to the next tier. Collaborative care spans the entirety of HPCI as its services vary (Figures 1 and 3). Collaborative care may provide all necessary services or only specialty and primary care while relying on a strong referral networks for outside resources.

Several criteria are cornerstones of all of the frameworks presented. Strong infrastructure, key staffing, and an integrated data collection and electronic health records system are all necessary to implement and sustain HIV primary care integration of all levels. All cases described relied on centralized EHR systems and process management structures to systematically integrate appropriate HIV and primary care services. These key pieces help with adherence to protocols and guidelines, streamlining billing and reimbursement processes, minimizing and realizing errors, and many other potential issues and difficulties all practices and community-based organizations face.

Ancillary services such as case management and social support services were shown to have the greatest effect on PLWHA seen in HPCI settings ([Ashman et al., 2002](#_ENREF_1); [Christopoulos et al., 2011](#_ENREF_6); [Hoang et al., 2009](#_ENREF_22); [Messeri et al., 2002](#_ENREF_31); [Sherer et al., 2002](#_ENREF_41)). This collaboratory effort is most noticed in the VA case study where HIV-infected veterans seen at HPCI clinics utilizing social support services were 3 times more likely to be virally suppressed than those that only sought HIV and primary care services ([Hoang et al., 2009](#_ENREF_22)).

Social support services greatly impacted rates of linkage to and retention in care. Along the HIV Care Continuum, the greatest drop in the cascade occurs between linkage and retention, resulting in a loss-to-care of almost 50% of patients ([Skarbinski, Rosenberg, Paz-Bailey, & et al., 2015](#_ENREF_42)). These “lost-to-care” patients account for a majority of reported transmission events ([Skarbinski et al., 2015](#_ENREF_42)). Collocating and integrating case management and social support with primary care services for PLWHA will push clients further along the continuum to the ultimate goal of viral suppression and prevent future transmission events.

Reduction of health inequities and disparities by increasing access to care was a common theme throughout the literature review. It was excluded from the results and systems-level outcomes because although mentioned, no data or evidence was put forth that HPCI expanded access to care or reduced HIV-related health disparities. CHCs and community-based primary care is known to increase access to care, showing improved community health outcomes in communities served by CHCs than those that are not ([Starfield, Shi, & Macinko, 2005](#_ENREF_48)). Even so, no evidence was found to support claims that HPCI reduced HIV-related health disparities. In future studies, this may be difficult to demonstrate due to the contextual nature of HCPI.

**4.1 BARRIERS**

HPCI requires several processes to happen before complete integration occurs. As noted previously, six criteria are defined for total service integration and barriers to success are likely to occur at any step in this process or workflow ([Curry & Ham, 2010](#_ENREF_12)). It is a resource intensive process that requires a detail-oriented and organized health care delivery system to be in place.

Organizational overhaul is a major barrier to HPCI. Several of the required criteria, such as functional integration and clinical integration, require specific infrastructure to be in place for integration. This includes organizational policy and protocol that may pertain to testing, treating, partner notification, or it may include a new EHR and the integration of a clinic’s EHR with state reporting platforms ([Perkins, Meyerson, Klinkenberg, & Laffoon, 2008](#_ENREF_39)).

In addition to EHR and organizational issues, combining services may mean combining grant money and reporting requirements. This could lead to confusion and staffing difficulties. For instance, one integrated clinic found that they had to report to 8 various databases and meet those 8 different reporting requirements ([Perkins et al., 2008](#_ENREF_39)).

Resource scarcity is a commonplace issue. In low-resource settings such as Sub-Saharan Africa, models of HPCI are currently being implemented in hopes to show cost-effectiveness and efficiency for treatment of not only HIV, but other comorbidities ([Renaud, Basenya, de Borman, Greindl, & Meyer-Rath, 2009](#_ENREF_40)). It is the hope that the siloed funding previously available for tuberculosis, malaria, HIV, etc. can be combined to expand services by integration. In the US, as health care paradigms shift and reimbursement schemes change, resources can be difficult to come by. This may include funding for HIV services, especially for social support and behavioral health services.

Resources are not limited to physical material needs, but also workforce capacity. Medical school graduates entering primary care has been declining ([Ferrer, 2007](#_ENREF_15)). Though several initiatives have attempted to pique interest, few seemed to have motivated any change ([Ferrer, 2007](#_ENREF_15)). If properly trained generalists are not able to practice, patients, especially those in rural, medically underserved, and marginalized communities, will suffer. HRSA, Ryan White’s TARGET Center, and the AETCs focus on clinical trainings and capacity building ([Health Resources & Service Administration, 2016](#_ENREF_21)), but these initiatives can only be effective if physicians and care teams are aware and seek out their assistance.

One other major barrier to integration is reimbursement. HPCI settings vary in size and services offered, so they will also vary in billing practices. For the VA, reimbursement is rarely an issue. PCMHs such as the HIV ACCESS Project and SVMS receive several funding streams. Both examples receive Ryan White funds, which only reimburse for HIV provisional services. Primary care provided by a generalist is rarely covered and may be difficult to cover under Ryan White funds. The same is true with behavioral health and mental health services ([Cordes, 2017](#_ENREF_10)).

Medicaid is another barrier to reimbursement. Medicaid has strict reimbursement rules regarding same day services. In an integrated setting, a patient may receive several collocated services in one day. If Medicaid will not pay, this causes concern for both patient and provider ([Cordes, 2017](#_ENREF_10)).

**4.2 RECOMMENDATIONS AND FUTURE DIRECTIONS**

Based upon the systems-level outcomes found in this analysis, several recommendations can be made at various socioecological levels. There are many models and programmatic initiatives focused on HIV primary care integration, but there is no agreed upon definition or indicators. It is difficult to evaluate and compare models of HPCI between and within communities, geographic regions, and various health care systems when measures are not systematically collected. The federal government must have a standard definition of HPCI so models can be monitored and evaluated for efficacy, effectiveness, and cost-effectiveness. Additionally, this standardized definition would aid in insurance reimbursement. The Ryan White Program will cover “HIV Primary Care,” but not general primary care services. How this is delineated is not clear and causes difficulty for providers and patients alike.

At the national level, transparency and evaluation of federal initiatives must be made available. SAMSHA, HRSA, and CMS all fund integrated care projects. Very little data has been published from these programs. Additionally, the expansion of valid, reliable indicators to include non-clinical outcomes associated with ancillary services must be incorporated. A larger evidence based will propel HPCI through the formative stage and encourage a more robust analysis and the development of recognized guidelines and protocols. With the current administration’s projected budget cuts, these initiatives may not see completion and data may never be compiled. Yearly reports should be made public so impacted groups may develop and share best practices accordingly.

Additionally, more funds and programs should be targeted to HPCI and primary care. As more PWLHA live longer, chronic disease prevention and management become the major concern. PCMHs, CHCs, and primary care clinics must be best equipped with evidence-based practices, proper funding, and adequate governmental support to best succeed and provide the highest quality of care. Capacity-building, workforce development, and targeted support by HRSA Ryan White HIV/AIDS Program, specifically Part F funds can propel HPCI forward.

At the state level, the role of primary care providers could be expanded to advance practice clinicians, including nurse practitioners (NPs) and physician assistants (PAs). Eighteen states already allow full prescriptive authority and scope of practice without physician oversight by both NPs and PAs. The Institute of Medicine has released statements in support of full prescriptive authority of advance practice clinicians, especially in medically underserved areas ([Institute of Medicine, 2010](#_ENREF_23)). Increasing workforce capacity at a lower cost increases access and coverage in a time of health care uncertainty. It would also fill the impending workforce gap in both primary care and HIV specialty care that threatens both fragmented and integrated care models.

State medical accreditation boards can start requiring continuing education credits in HIV/AIDS education for general practitioners and clinical staff. It was found that it was not generalist versus specialist care that mattered, but the education and experience of the provider that impacted systems and patient outcomes ([Goldschmidt & Chu, 2016](#_ENREF_18); [Landovitz et al., 2016](#_ENREF_27)).

An additional way to increase provider knowledge is to educate nursing, physician assistant, and medical students during the students’ pre-clinical and clinical years. This may help to develop healthy attitudes surrounding HIV and affected populations, increase knowledge about HIV and care opportunities, and serve to expand the HIV workforce. Interprofessional education has emerged as a model of multidisciplinary training in the health care field to better train professionals for enhanced team-based care at a patient, clinic, and systems-level ([Cox, Cuff, Brandt, Reeves, & Zierler, 2016](#_ENREF_11)). HPCI greatly benefits from this initiative as disciplines such as medicine, nursing, dentistry, social work, public health, pharmacy, and law are brought together to train emerging professionals to best serve PLWHA.

Capacity-building and workforce development are key to overcoming previously mentioned barriers. Friedman recognized that for integration to occur, key leadership and stakeholders must be engaged, educated, and empowered via capacity-building and educational development. Friedman goes further in saying that once integration is successful in a system, that clinic has a responsibility to share best practices and data with others and to even coach and offer technical assistance as needed to other organizations and health systems ([Friedman et al., 2015](#_ENREF_16)). In the case of HPCI, HRSA, CMS, and AETCs do offer some technical assistance with the development and implementation of integration activities. However, identifying key HPCI “success stories” such as the VA, HIV ACCESS, SVMS, and others to share ideas, best practices, guidelines, and workflow plans, with potential HPCI clinics is unequaled.

Systems-level outcomes are only one fragment of HPCI’s larger impact. Future studies must delve into the complex interactions between health systems and communities and how HPCI impacts community and population health. Additionally, more patient-level outcomes must be examined and compared within and between models of HIV and primary care. These data in addition to cost-benefit or cost-effectiveness will shape the future delivery systems of health care for PLWHA and those at-risk for HIV.

**4.3 LIMITATIONS**

 Limitations to the comprehensive literature review are recognized. As it was not systematic, exact findings cannot be replicated. Only findings in English were included, which may cause a bias. This may be diminished by the fact that this analysis focused largely on HCPI’s impact on the US health care system.

 Other limitations include the overall lack of evidence base surrounding patient-, clinical-, and systems-level outcomes of HPCI. Drawing conclusions between studies is difficult as indicators and measures are not standardized and demographic and quality of care differences are difficult to account for. Systems-level outcomes and systems-thinking do not have agreed upon definitions across health literature making comparisons difficult to draw from study to study. Additionally, each study was contextual and as health systems vary in services, infrastructure, funding, and other key points, this was not able to be described or discussed as this information was not readily available.

Even so, the compilation of this data is valuable. It is a relatively new model that is currently being evaluated and with the current changes in health policy and health care coverage, transparency and outcomes become even more important.

**5.0 CONCLUSION**

The health care system must adapt to enhance service capacity to best serve and improve quality of life for PLWHA. Currently, the United States is on an uncertain path toward tremendous changes in health care. The demands to control and reduce costs are unquestionable, but quality of care cannot be sacrificed. The organizational frameworks and models presented in this analysis have proposed that HIV primary care integration can solve some of these issues if implemented correctly. While these models are a pragmatic approach, the integration process requires support, resources, technical assistance, and capacity building to guarantee success and positive outcomes.

 HPCI is contextual and varies by services offered, setting, population, and resources available. Systems-level outcomes may vary based on any or all of these variables. Regardless, this essay has presented five systems-level outcomes that presented an argument for HPCI when compared to fragmented HIV care networks. These findings have important implications for HPCI and its success in the healthcare field. Barriers to integrating HIV services into primary care settings have been duly reported on. Recommendations to further evaluate HPCI and begin institutionalizing integrated HIV services have also been proposed to better serve the health needs of PLWHA. These findings and recommendations have been put forward in hopes that HIV care can be vastly improved for those living with HIV/AIDS.

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