

**UNSTABLE HOUSING AMONG PERSONS LIVING WITH HIV/AIDS (PLWHA): A  
REVIEW OF THE LITERATURE AND COST COMPARISON OF ORGANIZATIONS  
THAT MAY PROVIDE SHELTER AND RELATED SERVICES**

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**ABSTRACT**

Stable housing is imperative for the health and well-being of persons living with HIV/AIDS (PLWHA). However, housing instability remains prevalent among this population due to a range of socioecological factors. This paper provides a review of the relevant literature and a cost comparison of organizations that provide shelter and related services in Pittsburgh, PA. It was hypothesized that the comparator organization, The Open Door, Inc., provides housing services for PLWHA at a lower per-night, per-person cost when compared to alternative organizations that provide non-permanent housing. Organizations targeted for data collection were shelters, temporary/transitional housing programs, correctional facilities, hospitals/medical facilities, psychological/behavioral health facilities, and substance use rehabilitation facilities within the city of Pittsburgh. Data collection was completed through website searches, review of non-profit profiles on [www.guidestar.org](http://www.guidestar.org), and contact with staff members of participating organizations. Data sets were gathered and/or confirmed for 33 organizations. Findings indicate that residential programs charge served individuals no or nominal per-night, per-person fees, with annual implementation costs reported separately. The \$12.50 nightly rate charged to the client by The Open Door is comparable to other transitional housing programs. Hospitals and correctional facilities report substantially higher per-night, per-person room and board rates that are inclusive of implementation costs; these fees involve direct charges to the individual as well as systems-level coverage such as health insurance and tax dollars. The comparator organization likely alleviates costs to the system by limiting stays at non-residential and emergency facilities and

supporting the securing of permanent residencies. This research involves several issues of public health significance: expansion of the academic literature, HIV/AIDS, housing instability, sheltering approaches, social justice issues, housing as healthcare, and related costs. Results offer a pilot cost comparison that demonstrates housing needs of PLWHA, opportunities for improving efforts to alleviate the issue, and recommendations for future cost comparisons and service provision.

*Keywords:* unstable housing among PLWHA, HIV/AIDS housing

## TABLE OF CONTENTS

|            |  |           |
|------------|--|-----------|
| <b>1.0</b> | <b>INTRODUCTION.....</b>   | <b>1</b>  |
| <b>1.1</b> | <b>PURPOSE OF THE RESEARCH .....</b>                                       | <b>1</b>  |
| <b>1.2</b> | <b>DESCRIPTION OF AGENCY AND ENVIRONMENT OF DATA<br/>COLLECTION.....</b>   | <b>2</b>  |
| <b>1.3</b> | <b>PUBLIC HEALTH SIGNIFICANCE.....</b>                                     | <b>3</b>  |
| <b>1.4</b> | <b>FOCUS OF THE RESEARCH AND HYPOTHESIS TO BE TESTED .....</b>             | <b>5</b>  |
| <b>1.5</b> | <b>SUMMARY OF THE PAPER.....</b>   | <b>6</b>  |
| <b>2.0</b> | <b>METHODS .....</b>   | <b>7</b>  |
| <b>2.1</b> | <b>LITERATURE REVIEW .....</b>   | <b>7</b>  |
| <b>2.2</b> | <b>COST COMPARISON.....</b>  | <b>7</b>  |
| <b>3.0</b> | <b>LITERATURE REVIEW FINDINGS .....</b>                                    | <b>13</b> |
| <b>3.1</b> | <b>HOUSING AS A DETERMINING FACTOR AND MODIFIABLE STATUS<br/>.....</b>     | <b>13</b> |
| <b>3.2</b> | <b>PREVALENCE AND TRENDS OF HOUSING INSTABILITY AMONG<br/>PLWHA .....</b>  | <b>14</b> |
| <b>3.3</b> | <b>CONTRIBUTING AND UNDERLYING FACTORS OF HOUSING<br/>INSTABILITY.....</b> | <b>17</b> |

|            |  |           |
|------------|--|-----------|
| <b>3.4</b> | <b>OUTCOMES AND CONSEQUENCES OF UNSTABLE HOUSING FOR PLWHA .....</b> | <b>22</b> |
| <b>3.5</b> | <b>PRIMARY APPROACHES TO ADDRESSING HOUSING INSTABILITY .....</b>    | <b>23</b> |
| <b>3.6</b> | <b>ALTERNATIVES TO HOUSING PROGRAMS AND THEIR IMPLICATIONS.....</b>  | <b>28</b> |
| <b>3.7</b> | <b>HOUSING AS HEALTHCARE AND PREVENTION.....</b>                     | <b>30</b> |
| <b>3.8</b> | <b>EXTANT COST ANALYSES RELEVANT TO THE RESEARCH.....</b>            | <b>32</b> |
| <b>4.0</b> | <b>COST COMPARISON FINDINGS .....</b>                                | <b>35</b> |
| <b>5.0</b> | <b>DISCUSSION .....</b>  | <b>39</b> |
| <b>6.0</b> | <b>CONCLUSIONS .....</b>   | <b>44</b> |
|            | <b>APPENDIX: TABLES AND FIGURES .....</b>                            | <b>48</b> |
|            | <b>BIBLIOGRAPHY.....</b>   | <b>60</b> |

## LIST OF TABLES

|   |    |
|---|----|
| Table 1. Organizations and Programs Assessed for Potential Inclusion in the Research..... | 50 |
| Table 2. Summary of Extant Cost Analyses Relevant to the Research. ....                   | 53 |
| Table 3. Accumulated Data for Hospitals.....  | 54 |
| Table 4. Accumulated Data for Housing and Residential Recovery Organizations.....         | 56 |
| Table 5. Accumulated Data for Correctional Facilities. ....                               | 59 |



## **LIST OF FIGURES**

|   |    |
|---|----|
| Figure 1. Study flow chart of cost comparison data collection.....          | 49 |
| Figure 2. Socioecological factors involved with unstably housed PLWHA. .... | 52 |

## **1.0 INTRODUCTION**

### **1.1 PURPOSE OF THE RESEARCH**

Stable housing is imperative for persons living with HIV/AIDS (PLWHA). Housing stability protects this population's health, disrupts the link between illness and an unstable residence, and fosters socially just opportunities (Morcelle, 2014). Consideration of effective housing options is "a critical public health responsibility, for the control of communicable disease and for efficient and effective health care planning and spending" (p. 4, Lozier, 2010). Given the critical link between housing and health, the current study aims to explore relevant literature and the costs associated with the provision of non-permanent shelter and related housing services to unstably housed PLWHA. Specifically, this paper will: 1) Review current literature to provide an overview of housing instability among PLWHA, existing housing approaches, and associated cost factors and 2) Explore costs associated with housing programs and other organizations in Pittsburgh, PA that provide nightly shelter and related services to unstably housed PLWHA. Findings will demonstrate the gaps existing in housing options for the vulnerable target population, as well as highlight affordability and implementation factors pertinent for future cost-based evaluations, cost analyses, and systematic decision-making.

## **1.2 DESCRIPTION OF AGENCY AND ENVIRONMENT OF DATA COLLECTION**

The Open Door, Inc. is the central agency in the proposed research. This harm reduction-based nonprofit organization has provided transitional supportive housing for chronically homeless PLWHA since 2006 (The Open Door, Inc., 2016a). The 14-unit apartment building supports clients who are often excluded from traditional housing programs due to factors such as substance use, mental health issues, and criminal histories (The Open Door, Inc., 2016a). The Open Door offers additional services related to housing, including representative payee services, individual and group-based peer support, medication monitoring, educational classes, referrals to home health aide services and substance use treatment, transportation assistance, and social/recreational events and outings (The Open Door, Inc., 2016b).

For this study, The Open Door provided data regarding the costs paid by an individual nightly and annually for housing and these data serve as the comparator for other organizations discussed herein. These data included the number of individuals housed nightly and annually, as well as annual program implementation costs and categorized sources of funding. Comparable data was collected from other organizations that purposefully or secondarily shelter unstably housed people in Pittsburgh, PA. To clarify, a shelter provides housing purposefully, while a hospital's primary purpose is to provide needed healthcare and its sheltering feature is secondary to that care. Thus, a central aim of the study is to compare costs at The Open Door with costs at other organizations that purposefully or secondarily shelter unstably housed PLWHA in Pittsburgh.

Comparison organizations of both sheltering types were included regardless of the confirmed HIV/AIDS status of persons served to maximize the accumulated data and to account for situations where HIV status is unknown. Participating organizations included shelters,

temporary/transitional housing programs, correctional facilities, hospitals/medical facilities, psychological/behavioral health facilities, and substance use treatment facilities. In total, 71 organizations were initially reviewed, with 19 organizations not meeting inclusion criteria and data collection not being completed for 19 organizations. Data sets were gathered and/or confirmed for 33 organizations.

### **1.3 PUBLIC HEALTH SIGNIFICANCE**

The proposed research focuses on issues related to HIV/AIDS, housing instability, sheltering approaches, individual and collective well-being, and related costs. These domains are significant to the public health field for several reasons. First, there is a strong link between housing instability and HIV/AIDS. Homelessness is a barrier to the effective management of HIV (Buchanan, Sadowski, & Garcia, 2009) and supportive housing buffers the harmful effects of housing instability on the survival of persons with AIDS (Schwarcz et al., 2009). These implications are significant when considering statistics on those affected. According to The National AIDS Housing Coalition (NAHC) (2013), The U. S. Department of Housing and Urban Development (HUD) estimates that 500,000 individuals living with HIV will require some type of housing support during their illness. Additionally, several studies (as cited by the National Health Care for the Homeless (HCH) Council, 2012) have demonstrated homeless individuals are infected with HIV/AIDS at a rate three to nine times greater than persons who have stable residences.

Second, the research involves a vulnerable population and social justice. A lack of a stable residence may “exacerbate health issues and interfere with disease management and self-

care” (p. 1612, Parashar et al., 2011). Therefore, housing is healthcare (Morcelle, 2014; Mackelprang, Collins, & Clifasefi, 2014; Fullilove, 2010) and “there should be no need to further justify the provision of housing services...as long as the need for these services exist” (p. 1627, Holtgrave et al., 2013). These points are well-supported by research demonstrating better health and survival rates in stably housed PLWHA (Aidala et al., 2016; Schwarcz et al., 2009) and poorer outcomes in PLWHA without a consistent home (Riley et al., 2012; Buchanan, et al., 2009). Stable housing and associated benefits (such as safety and greater access to resources) are necessary for any person’s overall well-being. As a result, housing is an essential part of HIV care (Khanijow et al., 2015) and such instability among PLWHA is a matter of social justice.

Third, the organizations and programs studied herein represent a range of existing options for addressing housing instability and related needs of PLWHA. Assessments of organizations for strengths and opportunities for improved meeting of the vulnerable target population’s needs are essential. Further, housing resources are the best means to granting access to the established, cost-containing public health intervention of a safe and stable residence (NY State Department of Health, 2011). An understanding of how housing programs compare to organizations sheltering PLWHA secondarily has important macro level implications. These could include benefits such as informed service providers planning for further housing resources, as well as highlighting areas in need of greater attention (i.e. strategies for implementing cost-effective funding streams and money saving practices).

The final reason why this topic is a critical public health exploration is that The Open Door serves individuals often excluded by traditional housing programs. By focusing on this agency, this paper is exploring how a harm-reduction, housing first (HF) program meets housing and relevant needs of PLWHA in a non-traditional, low cost way. Such an approach is

significant as its evidenced-based methods (Woodhall-Melnik & Dunn, 2015) reduce barriers and increase access to healthcare and other services for a vastly marginalized population (Shepard, 2007). This has translated to meaningful outcomes for diverse populations, including clinical engagement, improved quality of life, reduced involvement with the criminal justice system, improved housing stability, and decreased substance use (Bean, Shafer, & Glennon, 2013; Palepu, Patterson, Moniruzzaman, Frankish, & Somers, 2013; Collins et al., 2012). Outcomes that have been demonstrated by The Open Door include improvements in medication adherence (Hawk, McLaughlin, Farmartino, King, & Davis, 2015), viral suppression rates (Hawk & Davis, 2011), and overall HIV clinical adherence (Davis, Hawk, Marx, & Hunsaker, 2014). Thus, both in theory and practice PLWHA exhibit personal benefits of HF programs that could also result in decreased HIV transmission and other community benefits.

#### **1.4 FOCUS OF THE RESEARCH AND HYPOTHESIS TO BE TESTED**

This paper has two primary components. It presents a review of relevant extant literature and an exploration of housing costs of local sheltering organizations in Pittsburgh, PA, using The Open Door as a comparator organization. The specific research question posed is “*Does The Open Door, Inc. provide housing and related services to PLWHA at a lower per-night, per-person cost than alternative programs and organizations in Pittsburgh, PA?*”. It is hypothesized that this will be answered positively.

## **1.5 SUMMARY OF THE PAPER**

This paper describes the inclusion criteria and methods applied to the review of the literature and the cost comparison. An overview of academic and gray literature addressing housing instability among PLWHA is then provided. Next, the cost comparison includes findings for housing programs and other organizations in Pittsburgh, PA that may provide nightly shelter and related services to unstably housed PLWHA. A synthesized discussion of the literature review, collected data, observed trends, and implications of the findings then occurs. Finally, conclusions present an overall summary of the paper, limitations of the research, and recommendations for next steps of research and implementation.

## **2.0 METHODS**

### **2.1 LITERATURE REVIEW**

A search of the academic literature was conducted utilizing the following search terms alone and in various combinations: “PLWHA”, “HIV”, “AIDS”, “housing instability”, “clinical outcomes”, “housing”, “sheltering options”, “costs”, “HIV treatment for unstable housing”, “HIV housing discrimination”, “preventative programming”, and “housing as prevention.” Studies with both national and local foci were included. The search strategy and selection process of reputable, relevant sources yielded ninety-seven articles. Analysis of the literature and its review highlighted the following topics: Concepts of housing stability; statistics demonstrating the scope of the problem; underlying causes of housing instability; consequences of unstable housing; sheltering approaches; non-housing locations where the target population may reside temporarily and implications of these short-term stays; housing as healthcare and prevention; and extant cost analyses related to the research.

### **2.2 COST COMPARISON**

The review of the literature, collaborative discussions with members of the thesis committee, and standard cost analysis guidelines were used to develop the framework for data



collection and cost comparison procedures. Specifically, utilized recommendations were from the U.S. Panel on Cost-Effectiveness in Health and Medicine (Gold, Siegel, Russel, & Weinstein, 1996), and were adapted for economic evaluations of HIV prevention and service programs (Holtgrave, 1998; Maulsby et al., in press; Gorsky, 1996). As a result, the five overarching areas for data collection (as specified by Maulsby et al., in press) in this research were: Step 1. The time period for the analysis; Step 2. A description of the services provided by the organization; Step 3. Participant data (including number of individuals served and costs to the individual for participating in the program); Step 4. Implementation costs including staff members, materials, and other consumables; and (optional) Step 5. The overhead rate (e.g. other costs, not included in Step 4).

The recommended data collection areas were modified to address housing and sheltering services. Specifically, data collection was focused on: 1) Organization/facility type; 2) Number of individuals housed nightly and annually; 3) The costs paid by said individual for nightly and annual shelter and relevant housing services; 4) Annual implementation costs of housing and/or broader services (paid by the organization); and 5) Categorized sources of funding (such as grants, sales, or investments). Domains were kept general to account for variability in how organizations define services and calculate implementation costs, as well as how the costs of residential stays may be covered by serviced individuals or other financial arrangements.

Organizations targeted for data collection were broadly defined as programs or facilities in which unstably housed PLWHA may receive non-permanent housing or shelter services within the city of Pittsburgh. These services could occur as a result of housing being provided purposefully (i.e. through a transitional housing program), or secondary to other non-housing services (i.e. residing at a hospital for one night during medical treatment). Potential organization

categories were determined to be: Shelters, temporary/transitional housing programs, correctional facilities, hospitals/medical facilities, psychological/behavioral health facilities, and substance use rehabilitation facilities. Clients' confirmed HIV/AIDS statuses were not required as inclusionary criteria for the organizations, as such information may not be collected and/or confirmed by all providers of non-permanent housing.

Website searches of organizations and programs within Pittsburgh, PA that aligned with the above-mentioned categories led to the initial list of organizations in this study. These website searches utilized an Allegheny County homeless services directory (Allegheny County DHS, Office of Behavioral Health, 2016), a list of housing organizations provided by a county representative (C. Keenan, personal communication, July 1, 2016), data from the PA Department of Health, Division of Health Informatics (2015a, 2015b, 2015c), and a general search engine (e.g. Google). Location parameters were set to Pittsburgh, PA using listed addresses and zip codes. Non-Pittsburgh facilities were excluded in an attempt to standardize populations served and account for potential cost differences within and outside of city limits. The created list was then discussed with members of the thesis committee for finalization.

Data collection for non-hospital and non-correctional facilities was completed through a multistep process. First, organization, program, and facility websites were reviewed to gather any applicable information, including accessible annual reports. Second, non-profit profiles available on [www.guidestar.org](http://www.guidestar.org) were reviewed for data. This source was utilized due to the extensive availability of relevant information in the areas of offered housing services and finances. Third, identified organizations and associated staff members were contacted directly by email to explain this author's role and the purpose of the research, give a brief overview of the thesis project, and request confirmation of located data and/or request missing data. Websites utilized in the first

two steps of data collection were also used to identify appropriate points of contact, which included financial and development directors, administrators, and directors of housing, programs, or admissions. When such contacts were not identifiable via websites, informational email addresses (i.e. [info@naomisplace.org](mailto:info@naomisplace.org)) and general email contact forms were utilized. Email and/or phone contacts were attempted up to four times per organization. The number and method of contact attempts depended on responses received (or lack thereof) and indicated communication preferences of responding representatives.

In the case of hospitals, available data was identified through the Annual Hospital Questionnaire of the PA Department of Health, Division of Informatics (2015a, 2015b, 2015c). This report provided an array of data, including Allegheny County hospital specialties, maximum number of beds per-night, average length of patient stays, number of annual inpatient admissions, and nightly rates per-person for room and board. After reviewing this report, 11 facilities' specialties were confirmed by viewing the hospitals' websites directly. Data was then shared with two thesis committee members. During this consultation, it was also discussed how hospitals differ significantly from housing and other organizations (e.g. the short nature of inpatient hospital stays today and the likelihood of hospitals not isolating room/board costs from larger operation funding streams). Due to these reasons, and the wealth of data provided by the Annual Hospital Questionnaire, a consensus was reached that the acquired data regarding hospitals was sufficient.

In the case of correctional facilities, the Allegheny County Jail and the PA Department of Corrections community corrections centers and community contract facilities within Allegheny County were the only facilities of their type that met inclusion criteria. Data collection areas for these organizations were adapted due to minimal online information regarding costs spent, the

potentially multi-year stays of inmates, and (like hospitals) the likelihood of these facilities not isolating room/board funding. Specifically, requested data included maximum number of beds per-night, average length of stay, number of individuals housed per year, and nightly cost per-person for room and board. An online information form was sent to the Allegheny County Jail and an email was sent to two PA Department of Corrections general email addresses to explain this author's role, give a brief summary of the research being done, and request desired information.

Seventy-one total organizations and programs were assessed for potential inclusion in the research. Please see Figure 1 for a study flow chart of cost comparison data collection. Forty-nine housing or residential recovery programs, 17 hospitals, and 5 correctional facilities were initially assessed. Nineteen of these housing or residential programs did not meet some inclusion criteria, including services being provided to only family units with children, services falling outside of non-permanent housing, online information being insufficient for data collection/contact (i.e. due to possible closure), and a mental illness diagnosis requirement for services. Please see Table 1 for a complete list of assessed housing and residential programs, as well as their status in the research.

Data collection was attempted for 52 organizations, programs, and facilities. These included 5 correctional facilities, 17 hospitals, and 30 housing or residential recovery organizations. The correctional facilities consisted of the Allegheny County Jail and 4 community corrections centers and community contract facilities. Hospitals fell into 5 specialty areas: 11 general; 4 long-term acute care; 2 woman's care; 1 physical rehabilitation; and 1 psychiatric (with 2 hospitals offering more than one specialty). The breakdown of the housing or residential recovery organizations sought for data collection was as follows: 12 shelters, 16

transitional housing programs, and 7 residential drug and alcohol recovery programs (with 8 organizations offering services in more than one category). Additionally, target populations were identified for 5 shelters (e.g. 2 men's shelters, 2 women's shelters, and 1 veterans' shelter); 7 transitional housing programs (e.g. 3 men's programs, 2 women's programs, 2 veterans' programs); and 6 residential drug and alcohol recovery programs (e.g. 3 men's programs and 3 women's programs).

Data collection for 1 hospital and 18 of the housing or residential recovery organizations initially targeted could not be completed. Data for the VA Pittsburgh Healthcare System, University Drive location was not provided in the Annual Hospital Questionnaire and was not located elsewhere. Housing services for three of these organizations are provided by other entities. Specifically, Mercy Behavioral Health and Smithfield United Church of Christ are provided by the Operation Safety Net program, while Action Housing transitional residential programming falls under the umbrella of Supportive Housing Management Services. The Pittsburgh AIDS Task Force confirmed that they no longer provide non-permanent housing services. The Center for Victims confirmed that their emergency shelter and transitional housing program is located outside of the city of Pittsburgh. Twelve of the contacted housing or residential recovery organizations were not included in the research due to lack of response. In addition, one such organization declined participating in the research.

### **3.0 LITERATURE REVIEW FINDINGS**

#### **3.1 HOUSING AS A DETERMINING FACTOR AND MODIFIABLE STATUS**

Housing status is a primary determining factor of health and well-being, as well as a mediator between higher order determinants (i.e. social factors) and daily living elements (i.e. physical space) (Rourke et al., 2012; Aidala et al., 2016). Multiple, potentially changeable factors impact housing security. These may include financial difficulties, unemployment, minimal or no social support, incarceration, and/or substance use or abuse (German & Latkin, 2012; Palepu et al., 2013). Housing stability is a complex part of housing programming, policies, and research; it is defined as “the extent to which an individual’s customary access to housing of reasonable quality is secure” (p. 964) and can be assessed using dimensions such as type of housing, housing history, finances, and perceived satisfaction and security (Frederick, Chwalek, Hughes, Karabanow, & Kidd, 2014). People who are unstably housed have non-permanent residence status including living on the streets, staying in a shelter, staying with a sequence of friends or family members (e.g. “doubled up”), or staying in a vehicle, abandoned building, or other communal space (National HCH Council, 2016).

Housing stability is a “modifiable contextual factor” (p. e1, Aidala et al., 2016) that can improve population health. Research demonstrates this in three primary ways. First, differing levels of housing stability are associated with varying health and social outcomes. Not having a

secure place to live often precedes poor health outcomes and ineffective medical management of HIV/AIDS (Buchanan et al., 2009; Aidala et al., 2016; Schwarcz et al., 2009; Riley et al., 2012), while stable housing is associated with improved clinical outcomes (Thakarar, Morgan, Gaeta, Hohl, & Drainoni, 2016; Marshall et al., 2016; Hawk & Davis, 2011). Second, individuals' perceptions of the home environment are important. Perceived affordability, satisfaction, positive neighborhood variables, safety, low stigma, and minimal to no social isolation are associated with mental and physical well-being (Rourke et al., 2012; Chambers et al., 2014). Third, accessibility of housing and the structure of such options matter. Availability of supportive housing has been associated with improved survival rates among homeless PLWHA (Khanijow et al., 2015). Housing programs with flexible policies, including minimal admissions standards, eviction prevention, and separation of residential services from other services have demonstrated success (i.e. lower client stress associated with housing access and permanence) (Watson, Wagner, & Rivers, 2013). These contextual factors are important when considering how unstably housed members of the target population compare to those with stable residences.

### **3.2 PREVALENCE AND TRENDS OF HOUSING INSTABILITY AMONG PLWHA**

More than 1.2 million individuals in the United States are living with HIV, with an estimated 44,073 new people testing positive for HIV infection and 20,896 people being newly diagnosed with AIDS in 2014 (Centers for Disease Control (CDC), 2016a). Unstable housing is a disturbing trend among these populations. A study by Rourke et al. (as cited by NAHC, 2012) found that more than 50% of PLWHA experience unstable housing at some point in time.

Furthermore, HUD (2011) estimates that more than 145,000 American homes that include PLWHA currently have an unmet housing need.

The CDC (2016a) identifies African American gay and bisexual men under the age of 24 as the subgroup of Americans most affected by HIV. Similar demographic trends among unstably housed PLWHA have been documented by community based studies in several regions. Such studies have found that males are the majority gender (Schwarcz et al., 2009; Parashar et al., 2011; Palar et al., 2015) and that men who have sex with men (MSM) make up the most frequently reported risk group (Wolitski et al., 2010; Khanijow et al., 2015; Schwarcz et al., 2009) among the target population. African Americans may be the most impacted racial group, with estimates of 38 to 93% of unstably housed PLWHA self-identifying here in community based studies (Riley et al., 2012; Wolitski et al., 2010; Parker & Dykema, 2014; Buchanan et al., 2009; Palar et al., 2015). In contrast to the subgroup identified by the CDC, studies of the target population have demonstrated a mean age range of 40-49 years old (Riley et al., 2012; Parashar et al., 2011; Wolitski et al., 2010; Parker & Dykema, 2014). Thus, African American MSM in their 40s may be the largest subgroup among unstably housed PLWHA in the United States.

Between 1980 and 2015, nearly 59,000 people were diagnosed with HIV in the state of Pennsylvania, with 1,160 of those cases occurring in 2015 (Bureau of Epidemiology, PA Department of Health, 2015). State level trends are comparable to those seen at the national level. Individuals who are African American, MSM, and between the ages of 20 and 29 comprise the majority of new HIV diagnoses in PA (Bureau of Epidemiology, PA Department of Health, 2015).

Demographic trends among unstably housed PLWHA in and around the city of Pittsburgh mirror national findings. Males are the more affected gender, the majority is older



than 40 years of age, and non-white racial groups and MSM are the most impacted sub-populations within Allegheny County (Muthambi, Geyer, Iskandarani, Witmer, & Krepets, 2013). Similar trends were demonstrated by one local study on The Open Door in which the majority of the target population was male, over 40 years of age, and African American (Hawk & Davis, 2011). Additionally, it is likely that unstable housing is occurring at higher rates within the city of Pittsburgh, as 76% of PLWHA have a Pittsburgh zip code and 24% have a zip code external to city limits (Muthambi et al., 2013).

At the local level, more than 2,500 individuals were newly diagnosed with or already living with HIV/AIDS in Allegheny County in 2011 (Muthambi et al., 2013). That same year, over 3,000 county residents utilized transitional housing, emergency shelters, and/or housing case management services (Kurta, Torso, Monroe, & Brink, 2015). Exact statistics surrounding unstably housed PLWHA within Allegheny County could not be confirmed, likely due to organizations not universally confirming HIV/AIDS status and anti-discriminatory regulations such as The Fair Housing Act and Section 504 of the Rehabilitation Act of 1973 (HUD, 2015). While the CDC (2016b) estimates the national average of HIV prevalence to be 0.45%, the National Alliance to End Homelessness (2006) estimates HIV prevalence to be 3.4% in homeless populations. Additionally, the White House Office of National AIDS Policy (2016) reports that 9% of Americans receiving HIV care were homeless in 2014. With these statistics in mind, an estimated 102 (e.g. 3.4% of the 3,000 residents receiving housing services) to 225 (e.g. 9% of the 2,500 PLWHA within the county) Allegheny County residents may be unstably housed PLWHA. However, this actual number is likely higher as these estimates do not capture those who are not utilizing housing assistance services and it does not account for the 13% of Americans who are living with HIV, but have not yet been diagnosed (CDC, 2016a).

### **3.3 CONTRIBUTING AND UNDERLYING FACTORS OF HOUSING INSTABILITY**

Several underlying factors contribute to housing instability for PLWHA. The socioecological model described by McLeroy, Bibeau, Steckler, & Glanz (1988), despite being relatively early and simplistic, provides a useful framework for understanding how health promotion interventions affect individual, social/community, organizational, and policy factors. They theorize that changes in the social environment (i.e. interpersonal relationships, public policies) foster changes in individuals (i.e. unhealthy behaviors), and that support of individuals is imperative for environmental changes to occur. For example, a person might continue to smoke cigarettes without supportive environmental factors. However, that same person could quit this habit as a result of nicotine replacement strategies, medical provider and familial encouragement, as well as employer's non-smoking policies. This one individual's success with stopping smoking may then reinforce environmental changes such as peer support to others trying to quit and decreased smoking rates.

These concepts have been applied to domains within the public health field, including risk modifiers associated with HIV (Bowen, 2016; Baral, Logie, Grosso, Wirtz, & Beyrer, 2013; Hawk, 2012). A socioecological approach is valuable in assessing multi-level factors that play a role in housing instability among PLWHA. It is also helpful to consider how these factors persist despite protective regulations such as the Americans with Disabilities Act (United States Department of Justice Civil Rights Division, 2016), the Fair Housing Act, and Section 504 of the Rehabilitation Act (HUD, 2015). Thus, multi-level situations are contributing to unstable housing among PLWHA and existing regulations are not sufficiently addressing or resolving them. Please see Figure 2 (modified from Hawk, 2012) for a depiction of the potential socioecological factors involved at the individual, relationship, community, and structural levels.

Individual-level factors that impact housing instability include several life circumstances. Studies demonstrate employment rates as low as 5 to 19% (Riley et al., 2012; Parashar et al., 2011; Wolitski et al., 2010) and low rates of insurance coverage (Khanijow et al., 2015; Parker & Dykema, 2014; Schwarcz et al., 2009) for unstably housed PLWHA. Incarceration rates are estimated at 8% for the target population in the last 90 days (Riley et al., 2012) and at 69% for any time previously (Wolitski et al., 2010). Substance use may be common, with estimates between 33 and 89% of unstably housed PLWHA reporting recent illicit drug use (Palar et al., 2015; Schwarcz et al., 2009; Riley et al., 2012; Parashar et al., 2011; Hawk & Davis, 2011). Current or previous mental health diagnoses might also affect the majority (e.g. 60 to 100% of participants in descriptive studies) (Riley et al., 2012; Parashar et al., 2011; Hawk & Davis, 2011). All of these individual-level factors could separately influence housing security. However, they also may overlap and interact, creating a magnified effect. For example, one individual may not be able to pay their rent due to job loss, while another person may not be able to fulfill their rent payment due to substance abuse and related job loss. Alone or in conjunction, personal factors and the constant stress of unstable housing interact with “broader...social exclusion and inequality” (p. e1, Aidala et al., 2016).

Relationship factors also impact housing. Perceived social support is associated with improved physical and mental health in PLWHA (Bekele et al., 2013) and positive findings suggest that most PLWHA have some form of identified social support during periods of housing instability (Riley et al., 2012; Rourke et al., 2012). Unfortunately, other findings indicate “no instrumental support” (p. 3, Riley et al., 2012) or low perceived social support (Rourke et al., 2012) for this population, with two studies finding that a majority do not have a frequent source of support via a spouse (Buchanan, et al., 2009; Wolitski et al., 2010). Qualitative reports by

Chambers et al. (2014) provide a context for relationship factors; while unstably housed PLWHA reported a desire for social inclusion, social isolation was also seen as having protective benefits from stigma, discrimination, or other potential dangers. Therefore, individuals may be cautious to engage with people and organizations around them, further complicating the connections between illness, housing status, and/or limited social opportunities.

The absence of a supportive network can mean that a person does not have anyone to turn to during housing crises. It also might result in social workers, counselors, and physicians being the most reliable sources of support for some members of this vulnerable population (Parashar et al., 2011). Minimal or non-existent social support can lead to greater risk behaviors, such as drug use and exchanging sex for gains, which could further damage one's potential or actual housing status (German & Latkin, 2012). In turn, the target population qualitatively reports social support as an important part of perceptions of healthy and safe housing (Chambers et al., 2014). Adequate support such as a "sense of community" (p. 166) with peers and "supportive assistance" (p. 167) from readily available staff members could also have clinical implications as important mechanisms of success for medication adherence among unstably housed PLWHA (Davis et al., 2014).

Stigma and the experience of little or no social support are likely related (Chambers et al., 2014; Hatzenbuehler, Phelan, & Link, 2013). Stigma could be associated not only with an HIV/AIDS diagnosis and/or with housing instability, but also with race, sexual behaviors, and the other aforementioned individual-level factors. The stigma surrounding any of these single issues may be challenging; however, having multi-level experiences of stigma can be debilitating (M. Hawk, personal communication, March 3, 2016). Stigma may result in consequences of residential segregation, discrimination, and internalized shame among subpopulations like

African American MSM (Wohl et al., 2013; Earnshaw, Bogart, Dovidio, & Williams, 2013). Emlet et al. (2013) found that increased stigma is associated with insufficient coping skills, insufficient support, younger age, and shorter time since HIV diagnosis. Perceived stigma could result in potentially negative effects of treatment non-adherence, feelings of shame, and avoidance of HIV-related supports, people, and activities (Katz, et al., 2013; Jeffries et al., 2015). Stigma may therefore prevent the seeking of resources designed for unstably housed PLWHA.

At the community level, unstably housed PLWHA struggle to consistently connect with and maintain supportive housing. O'Rourke, Ruiz, & Allen (2015) found that housing was the most frequently identified service need for this population, and both qualitative (Chambers et al., 2014) and quantitative studies (as cited by NAHC, 2013) support these findings. Such need may be related not only to HIV/AIDS status, but also to personal factors of co-occurring mental and physical illnesses, related symptoms (Dobbins et al., 2016), basic unmet needs (Riley et al., 2012), and lower education levels (Wolitski et al., 2010; Buchanan et al., 2009) that make it difficult to engage with community resources. These challenges may limit someone's ability to be aware of and remain connected to appropriate housing services, as well as in cooperation with their policies. For example, one person's inability to read could prevent completion of an apartment application, while another's anxiety might result in missing recurring case management appointments. Both situations may result in missed housing opportunities and/or dismissal from services.

Structural determinants of housing instability lead to systemic exclusion of PLWHA. Discrimination of individuals and families affected by HIV/AIDS is illegal (HUD, 2015). The Office of Fair Housing and Equal Opportunity investigates reports of HIV/AIDS discrimination related to outright biases and more subtle threats, coercions, and intimidation practices (HUD,

2016). Housing exclusions operate not just at the individual level, but also include policies and resources that might alienate those in need of stable residences. Rental subsidies, emergency housing, and more permanent housing options are often not inclusive of those with substance use or abuse issues, histories of chronic housing instability, debilitating mental illnesses, and criminal histories (Hawk & Davis, 2011; Malone, 2009). These programs are based on abstinence and other requirements “shaped by notions of moral worthiness and a perceived need for change at an individual level” (p. 71), and thus are not likely aligned well with inclusive social policies or vulnerable populations’ daily realities (Tiderington, Stanhope, & Henwood, 2013). As a result, individuals vulnerable to exclusionary factors “are the least likely subgroup of the homeless population to gain access to housing programs” (Tsemberis & Eisenberg, 2000, p. 487).

A universal approach cannot effectively meet the diverse needs of all PLWHA, especially those experiencing other complicating factors. A review of interventions promoting engagement with and utilization of HIV care by Liao et al. (2013) shows that individual-level factors are almost universally targeted; more research is needed on structural barriers to housing and other services. This is why it is essential that programs and policies addressing housing instability be flexible, inclusive, and considerate of extenuating circumstances experienced by unstably housed PLWHA. HF models provide such a framework and have demonstrated significant benefits for diverse populations facing challenges such as chronic homelessness, HIV/AIDS, substance dependence, and mental illness (DeSilva, Manworren, & Targonski, 2011; Dobbins et al., 2016; Palepu et al., 2013; Larimer et al., 2009).

### **3.4 OUTCOMES AND CONSEQUENCES OF UNSTABLE HOUSING FOR PLWHA**

Research has shown that unstable housing has significant consequences for PLWHA. Rates of HIV among those who are unstably housed are estimated to be five to ten times higher than that of stably housed peers (Milloy, Marshall, Montaner, & Wood, 2012). This is likely due to “social, behavioral, and structural determinants of the disease” (p. 7) such as delayed, interrupted, or inadequate access to necessary care and services (Simmonds & Oru, 2013). Specifically, a “lack of stable, secure, adequate housing is a significant barrier to consistent and appropriate HIV medical care” (p. e1) and associated medication adherence, reduced viral presence, and lower transmission risk (Aidala et al., 2016). As a result, housing instability is associated with reduced treatment engagement (Terzian et al., 2015), higher viral loads (Thakarar et al., 2016), lower CD4 counts (Kidder, Wolitski, Campsmith, & Nakamura, 2007), and lower survival rates (Khanijow et al., 2015; Schwarcz et al., 2009) in PLWHA.

In the pursuit of improved services and outcomes for the target population, providers and policy makers must consider how unstable housing influences treatment access, medication adherence, and various life stressors or behaviors (Surratt, O’Grady, Levi-Minzi, & Kurtz, 2015). Stability in one area of life can improve stability in other areas. Having basic needs such as food, self-care, and housing fulfilled is a primary determinant of physical and mental well-being in unstably housed PLWHA (Palar et al., 2015; Kalichman et al., 2014). Stable housing is also positively associated with quality of life factors such as perceptions of stress (Holtgrave et al., 2013), economic security, and fewer experiences of stigma or social isolation (Chambers et al., 2014). Stably housed PLWHA have demonstrated better clinical outcomes (including lower viral counts) (Thakarar et al., 2016; Marshall et al., 2016), overall greater quality of life (Rourke et al.,

2012), reduced need for social and medical services (Kidder et al., 2007), and lower risk of death (Lim, Harris, Nash, Lennon, & Thorpe, 2015) as compared to their unstably housed peers.

### **3.5 PRIMARY APPROACHES TO ADDRESSING HOUSING INSTABILITY**

Traditionally, interventions for PLWHA have promoted utilization of HIV care and have focused on individual-level factors (i.e. motivation) and strategies for targeting these factors (i.e. motivational counseling) (Liau et al., 2013). As previously noted in this paper, housing status is determined by multi-level factors and has been associated with meaningful health outcomes. Thus, supportive housing is healthcare (Morcelle, 2014) and housing interventions should therefore take into account a complex range of personal, community, and structural aspects.

Historically, there have been three main approaches (e.g. one policy-based program and two conceptual models) for addressing unstable housing among PLWHA. First is the Housing Opportunities for Persons with AIDS (HOPWA) program. HOPWA is a policy-based federal program that provides financial and supportive assistance to PLWHA and their families through grants administered through nonprofit organizations (Office of HIV/AIDS Housing, 2013). The program offers case management, rental subsidies, shared housing to eligible low-income clients, and other supportive resources (Office of HIV/AIDS Housing, 2013). While data indicate that HOPWA improves housing stability, treatment linkage and retention, and overall health, it does not necessarily result in optimal clinical outcomes such as low viral counts (Wolitski et al., 2010; Terzian et al., 2015). Additionally, HUD (2011) estimates that approximately 60,000 of the 1.2 million PLWHA receive HOPWA services. This contrasts the fact that nearly half of PLWHA are chronically homeless (Parker & Dykema, 2014). As a result, two conceptual models have



attempted to fill these gaps through housing programming. Sobriety-based (SB) housing requires abstinence from drug or alcohol use, while HF programs are more tolerant of substance use and other issues and do not provide housing that is predicated on other treatment goals.

SB programs are substance-free housing environments that provide social support and treatment-based resources for individuals in recovery from alcohol or drug addiction (Wittman & Polcin, 2014). They may include peer-based services, monitoring by house managers, multidisciplinary staff (i.e. coaching, therapy), and clinical services (Mericle, Miles, Cacciola, & Howell, 2014). Research has shown that SB housing programs can lead to a range of positive outcomes, including recovery from substance abuse, compliance with the legal system, employment, engagement with services and treatment, and management of challenges such as loss of work or relapse (Korcha, Polcin, Mericle, & Bond, 2014; Wittman & Polcin, 2014; Polcin, Korcha, Bond, & Galloway, 2010; Jason, Salina, & Ram, 2015). In addition, some participants who at first opposed such housing achieved abstinence and expressed how their recovery aims aligned to sobriety expectations over time (Farquhar, Ryder, Henderlong, Lowe, & Amann, 2014).

While it has been argued that SB housing is an “under recognized and underutilized recovery resource” (p. 157, Wittman & Polcin, 2014), findings have demonstrated that abstinence requirements do not necessarily result in improved housing outcomes (Tsai, Rosenheck, Kaspro, & McGuire, 2012; Schinka, Casey, Kaspro, & Rosenheck, 2011) and there is no absolute association between substance dependence and residential stability (Palepu et al., 2013). Additional criticisms of SB programs highlight the potential shortcomings of SB supportive services. Given that homeless individuals experience higher rates of substance use disorders, mental illness, and dual diagnoses than their stably housed peers (Linton, Celentano,

Kirk, & Mehta, 2013; Viron, Bello, Freudenreich, & Shtasel, 2014), one could argue that it is unjust for these populations to have services withheld due to overlapping vulnerabilities. In addition, housing challenges and the use of substances often exacerbate one another, so “responding to the twin problems...is an important aspect of strategies to end homelessness” (p. 284, Pauly, Reist, Belle-Isle, & Schactman, 2013). Liao et al. (2013) demonstrated that interventions for utilization of HIV care services among PLWHA focus almost entirely on individual-level factors, creating a need for approaches that take structural barriers into account. A systems solution in which housing programs are less stringent with sobriety requirements or other exclusionary factors could result in more people being assisted despite addiction, life choices, or other possible obstacles to a secure residence.

HF programs have attempted to be more inclusive than SB programs. Based on philosophies that are congruent with harm reduction principles, the HF approach prioritizes housing over other treatment goals and is driven by the individuals receiving services (Padgett, Stanhope, Henwood, & Stefanic, 2011). Watson et al. (2013) found that HF programs “demonstrated six...ingredients to be essential: 1) A low threshold admissions policy, 2) Harm reduction, 3) Eviction prevention, 4) Reduced service requirements, 5) Separation of housing and services, and 6) Consumer education” (p. 169). Additional approaches that are consistent with HF policies involve social inclusion, sufficient/suitable housing options, and executive infrastructure (such as organizational policies and staff training) (Pauly et al., 2013).

Advocates emphasize four main points in favor of HF programs. First, housing is a health care-based intervention that could meet the societal responsibility to address housing challenges of PLWHA (Morcelle, 2014). Therefore, offered housing should ideally be without stringent stipulations that limit access. Second, the end goal of the HF approach is to reduce homeless

instability, not resolve other areas of possible need better met by other means (Stanhope & Dunn, 2011). Third, achieved housing stability can translate later to benefits in physical, mental, and quality of life domains (Parashar et al., 2014; Chambers et al., 2014). However, stability in other domains may not necessarily result in a stable residence. For example, mental health or employment does not guarantee housing security, but housing stability likely improves mental well-being and employment opportunities. Finally, traditional housing programs could exclude those truly in need with morally based policies and assumptions of personal shortcomings (Tiderington et al., 2013). One could argue that this is a punishment of vulnerable individuals or families rather than a just means of assisting them.

Critics of HF programs point to a failure to resolve substance abuse, legal issues, and other risky behaviors (Kertesz & Weiner, 2009) that could jeopardize housing and result in premature departures from supportive housing programs (Gabrielian et al., 2015). While SB program requirements may foster motivation and goal setting aligned with treatment adherence (Polcin & Korcha, 2015), clients' self-defined areas for change instead guide HF programs (Padgett et al., 2011). Individuals' hesitation, unwillingness, or inability to make difficult changes or address problems could result in obstacles to treatment or success with goals. Additional shortcomings might include a lack of fidelity with vital components of the seminal New York Pathways to Housing model and the use of selective findings to make HF programs seem more successful than they truly are (Pleace & Bretherton, 2013).

Many studies report the positive effects of HF programs. Utah's Homeless Task Force, for example, reports that use of the model reduced their population of chronically homeless by 91% (McEvers, 2015). Clients have expressed how HF involvement fosters hope, dimensions of recovery (Kirst, Zerger, Harris, Plenert, & Stergiopoulos, 2014), positive changes, and

mechanisms of clinical success including those leading to viral suppression (Davis et al., 2014). It has been demonstrated that HF interventions may result in several beneficial outcomes in high-risk populations. These include: reduced time until permanent housing is secured, improved housing retention, (Montgomery, Hill, Kane, & Culhane, 2013), improved housing stability (Palepu et al., 2013), reduced criminal activity (DeSilva et al., 2011), alignment of personal and program goals (Collins et al., 2012; Weinstein, Henwood, Matejkowski, & Santana, 2011), increased employment/income, greater outpatient service use (Parker, 2010), and significant reductions in drinking despite no sobriety requirements being in place (Larimer et al., 2009). The HF model is associated with medication adherence and viral suppression (Dobbins et al., 2016), with one study (e.g. Hawk & Davis, 2011) finding that 69% of participants achieved this success. Overall, HF interventions suggest promising outcomes, but additional research is needed to identify the exact benefits of such programs for diverse populations (Woodhall-Melnik & Dunn, 2015), including PLWHA.

Several vulnerable populations are targeted by the housing approaches described above, including subgroups based on gender, veteran status, individual or family units, mental health challenges, or substance use disorders (i.e. Montgomery et al., 2013; Lynn et al., 2014; Palepu et al., 2013). Homeless services are specified by Allegheny County (2016a) for individuals and families in need of emergency accommodations, unaccompanied youth, victims of domestic violence, the LGBTQ population, and the chronically homeless. Additional subpopulations served by the Allegheny County DHS, Office of Behavioral Health (2016) include women, men, individuals dually-diagnosed with mental health and substance use issues, persons with disabilities, families with children, veterans, and those who are unable to live independently. While preferential housing services are attempting to serve vulnerable subpopulations in this

region, they have limitations. Namely, interventions focused on personal factors (i.e. veteran status) do not address systemic factors of housing instability and do not impact homelessness at the population-level (Parsell & Marston, 2012). By considering the associations between individual and “broader economic, political, and legal structural determinants of health” (p. e1, Aidala et al., 2016), programs and policy makers may better meet the housing challenges of all groups, including PLWHA.

The literature outlines general strategies for engagement with unstably housed PLWHA. The on-site presence of medical staff (Dobbins et al., 2016) and clients’ perceptions of affordable, satisfactory housing (Rourke et al., 2012) can lead to improved health and quality of life. Intensive case management and stable social networks (i.e. work, relationships) are also associated with better clinical outcomes, resource connections, and enhanced housing stability (Buchanan et al., 2009; German & Latkin, 2012). Thus, the target population’s housing status, their perceptions of available housing resources, and an overall sense of housing security are likely important parts of all interventions.

### **3.6 ALTERNATIVES TO HOUSING PROGRAMS AND THEIR IMPLICATIONS**

As previously noted, many causal factors can result in unstable housing, and when supportive housing services are not available people resort to a number of short-term solutions. These are often temporary or unpredictable and include staying on the streets, going to an emergency shelter, or staying with consecutive friends or family members (National HCH Council, 2016). Chronically homeless and unstably housed people often end up in communal spaces (i.e. under a bridge, in a park), detox facilities, hospitals, shelters, motels/hotels, and in

jails/prisons rather than in housing or housing programs (DeSilva et al., 2011; Larimer et al., 2009; Buchanan et al., 2009). Unstable housing and/or homelessness is also associated with increased use of emergency departments (Parker & Dykema, 2014; Parashar et al., 2014; Kidder et al., 2007). However, it has been found that emergency department visits decreased significantly among veterans (Montgomery et al., 2013) and chronically homeless individuals with disabilities (Parker, 2010) engaged with HF programs, which suggests that these programs can produce positive outcomes (such as reduced healthcare costs) for PLWHA.

Temporary stays by PLWHA in non-housing facilities have several undesirable implications for individuals, their community, and their engagement with healthcare and other services. First, the target population may be taking bed space from others who require not just housing but also the medical, rehabilitative, or other services provided by a facility. In this way, the unmet needs of PLWHA could be negatively affecting community needs. Second, there could be high cost differentials between housing programs and non-housing organizations that provide shelter secondarily. Chronically homeless people may use the healthcare system for emergencies/crises and are involved in the criminal justice system at higher rates (Larimer et al., 2009; Basu, Kee, Buchanan, & Sadowski, 2012). It has been demonstrated that supportive housing programs are associated with decreased use of costly services (DeSilva et al., 2011; Montgomery et al., 2013; Basu, et al., 2012; Mackelprang et al., 2014), and that such programs are also comparable in cost-effectiveness to other public health interventions (i.e. mammography) (Holtgrave et al., 2013) and as a form of HIV prevention (Holtgrave et al. 2007).

Third, stagnant housing resources are a temporary and insufficient “Band-Aid” on the problem of unstably housed PLWHA. There are still thousands of individuals and families with current or potential unmet needs (NAHC, 2013), and housing options must be expanded for

society to fulfill its responsibility to address the housing instability-HIV link (Morcelle, 2014). Finally, “shelter” and “housing” are not the same thing. While admission to a detox facility or a prison term could temporarily fulfill one’s need for a place to stay, these are not long-term solutions for stable residences. For example, one study by Yamatani (2008) found that former Allegheny County Jail inmates identified housing as a top priority and that the majority of arrestees and released inmates did not have their own residences before/after their time served. Stable housing involves personal meanings of healthy housing and the interconnected links between a residence and economic stability; illness, health, and the precarious nature of housing; and perceived safety, stigma, and social exclusion (Chambers et al., 2014).

### **3.7 HOUSING AS HEALTHCARE AND PREVENTION**

Housing is essential not only to the general well-being of PLWHA, but also to management of their health and illness (Wolitski et al., 2010; Aidala et al., 2016). Stable housing has been associated with decreased use of acute health care and improved access to ongoing support services (Poulin, Maguire, Metraux, & Culhane, 2010; Terzian et al., 2015; DeSilva et al., 2011; Parker, 2010), as well as better survival rates (Khanijow et al., 2015; Schwarcz et al., 2009). Supportive housing programs and related services may therefore be thought of not just as elements of healthcare, but more specifically preventative healthcare.

There is a “critical need for public health programs to develop strategies that address the fundamental causes of HIV risk among...unstably housed persons and, for those living with HIV, contribute to their risk of disease progression” (p. S167, Wolitski, Kidder, & Fenton, 2007). Supportive housing prevention efforts provide a means to do just this. Such care and

resources can translate to success both for unique “lived experiences” (p. 329, Chambers et al., 2014) of PLWHA, as well as the larger population. Consider, for example, a modeling approach utilized by Marshall et al. (2016) that projected how community-level viral suppression could occur if homeless, HIV-positive individuals who use drugs were housed. An association between housing services and the possible prevention of new HIV cases simply cannot be ignored.

In addition to the clinical and social justice consequences of housing as healthcare (Fullilove, 2010; Morcelle, 2014), economic implications must be considered. One such exploration compares funding processes and potential outcomes for proactive versus more reactive care efforts. It is estimated that only about 10 to 15% of preventable death in the United States might be avoided by improving access to and the quality of medical treatment; yet, funding streams are often directed to treatment rather than prevention efforts (McGinnis, Williams-Russo, & Knickman, 2002). This lack of “mid-stream and upstream” (p. S167, Wolitski et al., 2007) funding for prevention and social factors of health can contribute to excessive spending on later, necessary medical services (Doran, Misa, & Shah, 2013). If a person with diabetes receives appropriate medications and nutrition counseling early on, costly medical treatments could be avoided down the road. In similar fashion, securing safe and stable housing can promote positive health outcomes and limit health care spending (Viveiros, 2015). One study demonstrates that HIV-related housing interventions “compare favorably in economic terms with services such as screening mammography, kidney dialysis, and even the effects of early HIV treatment” (p. 1629, Holtgrave et al., 2013). Thus, housing PLWHA sooner can both yield improved clinical outcomes and prevent later disease complications in cost-effective ways.



### **3.8 EXTANT COST ANALYSES RELEVANT TO THE RESEARCH**

Few cost studies of housing services specifically for PLWHA have been published. Cost analyses have explored two primary types of interventions relevant to the research: 1) Programs promoting treatment linkage/retention and non-housing HIV prevention efforts; and 2) Residential services for vulnerable populations. Please see Table 2 for a summary of these extant studies and their findings.

Overall, non-residential and treatment linkage/retention programs have been found to be cost beneficial. Two studies (e.g. Kim et al., 2015; Jain et al., 2016) demonstrated that the Positive Charge HIV linkage to treatment programs were an effective use of public health funding in New York, Chicago, North Carolina, Louisiana, and San Francisco sites; this initiative aims to reduce barriers to care and increase access to healthcare services for individuals not engaged in regular treatment. Findings included low costs per individual treated (e.g. \$502.00 for three months), realistic cost savings and cost-effectiveness thresholds (Kim et al., 2015), and investment returns between \$0.26 and \$0.92 for every \$1.00 spent (Jain et al., 2016). Spaulding et al. (2013) found that the nationwide EnhanceLink interventions (which connect HIV positive former inmates with outpatient treatment) resulted in cost per additional quality-adjusted-life-year (QALY) savings of \$77,285. Similarly, Maulsby et al. (in press) demonstrated that the national Retention in Care (RiC) initiative achieved realistic cost-saving thresholds across a range of program models (including The Open Door). Finally, Johnson-Masotti, Pinkerton, Sikkema, Kelly, & Wagstaff (2005) used a modeling approach to show that an HIV prevention initiative for women living in low-income housing could result in a cost per QALY savings of \$37,433 and cost per case of averted HIV infection of \$732,072. As housing is associated with greater treatment access and engagement, and since HIV linkage programs have

demonstrated cost benefits, it is reasonable to project that HIV housing programs yield cost-effective tendencies.

The second type of cost studies relevant to this paper involves residential services for vulnerable subpopulations. This research examines services for people with mental illness and/or substance use issues, the chronically homeless, and PLWHA and supports the concepts of housing as cost-effective healthcare. Stable housing and continued supportive services through Philadelphia's Office of Supportive Housing were associated with reduced use of acute care/services and substantial cost reductions in people with severe mental illness (Poulin et al., 2010). In a group of chronically homeless persons with alcohol use disorders, participants of the 1811 Eastlake HF program showed decreased service use and cost offsets of \$2,449 per-person, per-month after six months and greater cost savings over longer durations (Larimer et al., 2009). A third study by Basu et al. (2012) found that housing and related case management for homeless, chronically ill adults resulted in annual cost savings of \$9,809 for the chronically homeless and \$6,622 for individuals with HIV. These figures accounted for costs such as inpatient stays, visits to the emergency room, and outpatient treatment.

Two additional cost analyses focused specifically on the Housing and Health Study Intervention for PLWHA. First, Holtgrave et al. (2007) considered societal and payer costs of housing as HIV prevention (through mechanisms such as housing advocacy and case management); it was found that an avoided case of HIV resulted in over \$221,000 in treatment cost savings and that cost savings result if 1 out of 19 clients avoid HIV transmission. Therefore, it was demonstrated how a residence might improve quality of life factors, a sense of stability, and the likelihood of access to and engagement with HIV care. Second, Holtgrave et al. (2013) concluded that this and other HF programs "meet generally accepted standards for determining

cost-effectiveness of medical and public health services” (p. 1630), with the cost per QALY “saved by HIV-related housing services to be \$62,493” (p. 1626).

While research on housing instability and relevant supportive interventions has expanded, specific economic assessments of housing services for PLWHA have not grown in the same way (Holtgrave, 2013). Additionally, the generalizability of completed studies tends to be limited due to study participants often being comprised of specific subgroups (such as persons with serious mental illness and veterans) (Basu et al., 2012). The intent and outcomes of this project are efforts to expand the literature on cost variables associated with housing services for the diverse population of PLWHA.

#### **4.0 COST COMPARISON FINDINGS**

Data was accumulated for 33 total organizations, facilities, and programs. This includes 16 hospitals (Table 3), 12 housing or residential recovery organizations (Table 4), and 5 correctional facilities (Table 5). Due to the way different types of organizations track costs, direct comparisons are not possible, but findings will be discussed within the category of facility (e.g. hospitals, correctional facilities, housing organizations). For the hospitals, beds per-night ranged from 32 to 1,592. Reported costs per-night, per-person for room and board ranged from \$792 to \$2,810 and involve fixed costs (i.e. utilities, supplies) of the operating facility. Payment of these charges could be fulfilled by a combination of health insurance coverage, government assistance, costs to the patient, and financial assistance from the organization providing care (University of Pittsburgh Medical Center (UPMC), 2016a). Average length of stays was between 4.26 days and 33.46 days. Annual number of admissions was the area with greatest variation, with between 293 and 59,860 people receiving inpatient treatment.

Overall, long-term acute care facilities and a psychiatric hospital had fewer available beds than hospitals providing generalized medical services. Both the least and most expensive per-night, per-person room and board costs were associated with general specialty hospitals; costs for physical rehabilitation, long-term acute care, psychiatric, and women's care specialty facilities fell between these low and high points. Not surprisingly, long-term acute care facilities were associated with longer stays when compared to other hospital specialty types. UPMC

Presbyterian Shadyside Hospital, which is comprised of locations in the Oakland and Shadyside neighborhoods of Pittsburgh, had 30,000 more annual admissions than any other hospital.

Housing and residential recovery organizations indicated a variety of housing services. These included meals, access to a food pantry, housing case management, housing referrals, and other supportive services. Beds per-night ranged from 8 to 104. Several programs reported no nightly charge to the serviced individual, while a maximum nightly charge to the client was estimated at \$14.17 per-night or 30% of one's adjusted income. Several programs also indicated no annual charge to the serviced individual and a maximum of \$5,100 annual cost to the client or 30% of a person's adjusted income. Two organizations (Genesis of Pittsburgh and Northside Common Ministries) reported that annual stays/costs were not applicable due to limits being placed on length of stays. The number of individuals served annually across the housing and residential organizations ranged from 8 to 1,030, with one program not providing this data. Annual implementation costs were reported separately from charges to serviced clients, varying significantly from \$38,354 for program services only to total organizational fees in excess of \$5,000,000; a standard method of reporting costs by the organizations serving clients on a per-night, per-person basis was not available. Identified funding source categories were as follows: Contributions, grants, investments, special events, sales, program services, and unspecified other. Five organizations also specified funding streams associated with mental health, HUD, veterans, religious organizations, county-level funds, and housing subsidies.

All of the housing and residential programs indicated that supportive services were provided in addition to housing, including benefits such as practical conveniences (i.e. personal storage space at the Light of Life Rescue Mission), assistance with daily living skills (at Community Human Services), and financial management support (i.e. representative payee

services at The Open Door). Programs targeting subpopulations such as pregnant women, veterans, and PLWHA tended to have fewer available bed spots, while organizations that provide a range of shelter and transitional housing services to the wider population had a larger number served both nightly and annually. Overall, organizations that provided more short-term or emergency housing services did not charge served individuals, while transitional housing programs required monthly, annual, and/or subsidized fees based on a person's income.

The greatest variation between housing and residential programs, both numerically and qualitatively, was specific to annual implementation costs and funding sources. Programs and organizations often did not provide this information uniformly or readily on their websites. Financial data typically listed total annual spending (rather than breaking down specific cost areas), utilized broad section headings such as "program services" which could encompass resources beyond housing, did not separate non-permanent from other housing types, or was indicated to be more than a year old. However, when these figures were sent to representatives for confirmation, 7 of the 12 analyzed organizations confirmed all or some of the data. Four programs provided cost figures specific to non-permanent housing and two organizations did not provide financial information. Similar results occurred with funding sources. Categories were pulled from GuideStar online profiles and the vast majority was confirmed by contacted representatives. Two exceptions to this involved Shepherd's Heart Veteran's Home and Supportive Housing Management Services; both representatives for these organizations indicated unique funding sources (i.e. VA funding, housing subsidies). Three additional organizations (e.g. Community Human Services, New Beginnings Foundation, Inc., and Northside Common Ministries) specified funding sources in addition to previously listed categories.

Correctional facilities had a range of 50 to 282 bed spaces per-night for the non-jail facilities and 3,156 bed spaces per-night for the Allegheny County Jail. Reported costs per-night, per-person for room and board were \$80.00 for the jail and \$89.77 for the non-jail facilities. These rates include facilities' implementation costs (i.e. staffing, utilities) and coverage of costs is provided by tax dollars, funds for housing federal prisoners, and nominal charges to inmates for non-vital services (Allegheny County, 2016b). Average length of stay was 35 days for the jail and between 74.1 and 169.4 days for the non-jail facilities. As could be expected, the non-jail facilities housed a smaller number of individuals per year (e.g. 136 to 1,025) and the Allegheny County Jail housed substantially more annually (e.g. 15,000). The jail and one of the group homes accommodated both genders, while the other facilities housed gender-specific populations.

## 5.0 DISCUSSION

Everyone, regardless of their HIV/AIDS status, requires stable housing to ensure their health and well-being. A stable residence can be impacted by several individual, relationship, community, and structural factors. Thus, housing is a determining factor and modifiable status. Stable housing should not be a privilege for some but instead a right for all. PLWHA are vulnerable to the risks of unstable housing and the challenges related to their diagnosis. The research presented in this paper demonstrates the prevalence of unstable housing among the target population and the multiple socioecological factors/levels underlying this social injustice.

Five primary themes emerged from the literature review. First, demographic trends within the population of unstably housed PLWHA exist, with non-white males and MSM over the age of 40 potentially being the most vulnerable subgroup. Second, an unstable residence is a barrier to HIV/AIDS care and is associated with poorer clinical outcomes (i.e. higher viral load). Third, traditional approaches to address the target problem and population are not sufficient. Exclusion of PLWHA and specific subgroups from residential programs results in people living on the streets or seeking shelter and related resources from organizations whose primary purpose is something other than providing housing. Fourth, housing is both healthcare and prevention. A stable residence leads to better clinical and quality of life outcomes, less utilization of emergency services, greater utilization of ongoing care services, and improved survival rates. Finally, extant research has demonstrated the cost benefits associated with HIV linkage/prevention efforts,



residential programs for vulnerable populations, and housing specifically for PLWHA. Therefore, innovative and inclusive housing programs for PLWHA have great potential to purposefully aid at-risk individuals, increasing their chances of stable residences and improved clinical outcomes in cost-effective ways.

The cost comparison findings assess a range of Pittsburgh, PA organizations and programs that could provide nightly housing purposefully or secondarily to PLWHA. Notable (and not surprising) trends were observed in assessing data across facility types. Hospitals have vastly more bed spaces than residential or correctional facilities. Hospitals and correctional facilities have a wide-range of average length of stays, with hospitals having shorter stays of less than 34 days and correctional facilities having longer stays of more than 35 days. In contrast, some housing programs may provide a residence for a single night or longer than a year. Housing and residential programs charge serviced clients a per-night, per-person fee of \$14.17 and under, with annual implementation fees reported separately from these rates. In contrast, fixed implementation costs were accounted for by per-night, per-person rates of correctional facilities (at a minimum of \$80.00) and hospitals (at a minimum of \$792.00). These charges, rather than solely being paid by the serviced individual, were covered by systems payors such as tax revenue and health insurance coverage.

The Open Door was specifically highlighted in the cost comparison to assess how a harm-reduction, HF program meets housing and relevant needs of PLWHA in an innovative and low cost way. Central to the research was the question “*Does The Open Door, Inc. provide housing and related services to PLWHA at a lower per-night, per-person cost than alternative programs and organizations in Pittsburgh, PA?*” and the hypothesis that this would be answered positively. This is answered positively, with some qualifications.

In comparing transitional housing programs only, The Open Door's charges to clients are in the middle of the range of set fees or determining income percentages. The \$12.50 rate charged to the client by The Open Door appears significantly cheaper than the per-night, per-person rates of hospitals' and correctional facilities' room and board; this also appears costlier to the consumer than emergency shelters that do not charge served clients. However, such comparisons do not reflect two primary factors. First, implementation costs were accounted for separately by the central agency and other residential organizations, while hospitals and correctional facilities had these fixed costs built into their reported per-night, per-person room and board rates. Therefore, a direct comparison of these fees across organization types is not possible in this project. Second, the mechanisms by which per-night, per-person sheltering rates are covered must be considered. Implementation costs of The Open Door are fulfilled by direct client rental charges, grants, donations, and government contracts. In contrast, emergency shelters, correctional facilities, and hospitals that do not have such complete funding streams utilize expensive, systems-level solutions (i.e. government assistance) to cover their costs.

Costs to the system should be considered in three primary ways. First, the literature demonstrates that if the unstably housed are not engaged with transitional housing and are not sick enough to be in the hospital, they may be more likely to end up in a correctional facility. This is problematic for social, ethical, and economical reasons (including the overcrowding of prisons and high per-night, per-person costs of stays). Second, providing housing as a primary service could involve lower fixed costs than those associated with facilities that shelter secondarily. Hospitals and correctional facilities continue to stay open when their occupancy drops and/or served individuals are not directly charged. Therefore, they are dependent on health insurance, taxes, and other macro solutions for stable costs of operations. In contrast, The Open

Door does not utilize such solutions and charges clients nominal fees for rent, decreasing the financial burden on the system while simultaneously empowering and supporting a given individual. Third, an emergency shelter is designed to provide vital temporary relief and not a long-term solution to the problem of unstable housing. Individuals who utilize crisis services could struggle to engage with more permanent housing resources for a multitude of previously discussed reasons and may use emergency services repeatedly. Transitional housing programs can alleviate this cycle by helping a person achieve a consistent residence, financial stability, treatment engagement, and an ultimate goal of permanent housing. In these ways, The Open Door likely reduces system utilization and costs less than hospitals, correctional facilities, and emergency shelters over the long-term.

In comparing residential programs, similarities were evident in the wide range of services offered, the minimal or no costs charged to the served individual, several broad categories of funding sources, and a lack of specificity regarding financial information. Observed differences were noted with implementation fees. A wide range here could be accounted for by size of the organization or scope of its service. However, this vast range is likely also related to programs not uniformly presenting financial data, their use of broad or unique funding categories, staff simply confirming (dated) numbers, and an inability to separate housing from other funding. These observations represent potential opportunities for improved financial management, data collection, and/or disclosure, particularly by organizations that are dependent on grant funding or are applying for such funds. Other differences between residential programs were noted for the types and numbers of individuals served. The number of persons housed annually by residential programs ranged dramatically, with organizations serving target subpopulations (i.e. pregnant women) typically having fewer bed spaces. Interestingly, The Open Door was the only program

in Pittsburgh, PA to identify PLWHA as a target group for services. This may speak to the unique nature of The Open Door, as well as to the stigma surrounding HIV/AIDS, overlapping vulnerabilities of the target population, and/or exclusionary policies of traditional housing services.

The process of assessing housing and residential programs in itself provided some interesting anecdotal findings. First, exclusionary factors and the targeting of special populations (i.e. only families served) were significant determinants in shaping the list of included organizations and resulting individuals served. Second, systemic issues were presented. Allegheny County is in the process of moving to a permanent, rapid rehousing approach and doing away with transitional terminology. Additionally, it was not always clear whether a given program or facility was under an umbrella of a larger organization or was a separate entity. Third, two organizations that were contacted responded that their housing programs may not be applicable to the research being done because they did not target PLWHA for services. These responses occurred despite the request for data explaining that this project was looking at a variety of organizations that may provide non-permanent housing/shelter to individuals, regardless of HIV/AIDS status being known.

## 6.0 CONCLUSIONS

Improved housing services for PLWHA is a matter of social justice. All individuals, regardless of their health status, have a need for and a right to a stable, safe residence. Secure housing enables those facing challenges related to HIV/AIDS opportunities to focus not on housing stressors but instead on accessing treatment, remaining engaged in vital services, practicing health-related self-care, and achieving an overall improved quality of life. Housing removes barriers to these outcomes and demonstrates beneficial outcomes to the individual (i.e. medication adherence), the community (i.e. lower transmission rates), and at the macro level (i.e. decreased use of costly urgent medical care). For these reasons, housing is more than a physical space to reside in. Housing is healthcare and cost-saving prevention; a stable residence results in improved health for the target population and beneficial savings to the service system.

The research presented here is an expansion of the academic literature surrounding housing instability among PLWHA. It also offers results from a pilot cost comparison project for organizations within Pittsburgh, PA that may provide housing services to PLWHA. Findings demonstrate that housing and residential programs charge clients no or low per-night, per-person rates, with annual implementation fees reported separately. Hospitals and correctional facilities report significantly higher per-night, per-person room and board rates that include implementation costs and involve systems-level coverage such as tax dollars. Charges to the clients applied by The Open Door are comparable to those of other transitional housing

programs. Services provided by the central agency could also alleviate costs to the system by limiting persons' stays at non-housing facilities and supporting the securing of permanent residences.

There are evident limitations to the research. First, this study, as most studies relevant to unstably housed PLWHA, involved a limited scope. Findings reflect a small number of sheltering organizations within one city. Second, the paper was focused on non-permanent housing and other organizations that provide temporary shelter and related services. As Allegheny County continues to move towards a rapid rehousing approach, and multiple housing programs only identified their services as permanent or for family units, several organizations were not included in the cost comparison. Third, availability and comparison of data was limited by what information was accessible/obtainable, organizations not responding to data requests, organizations not knowing specific financial information, and inconsistencies between what programs offer in terms of relevant housing services. Fourth, differences in how facilities (do not) incorporate their implementation costs into per-night, per-person costs and sources of coverage of these costs reduced the comparisons that could be made across organization type. Finally, this paper does not replace a complete cost analysis. The research is one step towards better understanding economic factors, as well as informing service providers and policy makers on the issue of unstable housing among PLWHA. To achieve social justice, adequate resources must be dedicated to detailed cost analyses of non-permanent and other housing programs. This involves support for staffing, expert consultation or oversight, organizational/community partnerships, interviewing program staff and clients, and review of financial records.

Specific next steps for a cost analysis could focus on The Open Door and other transitional HF programs for PLWHA. Organizations in cities similar in size and demographic

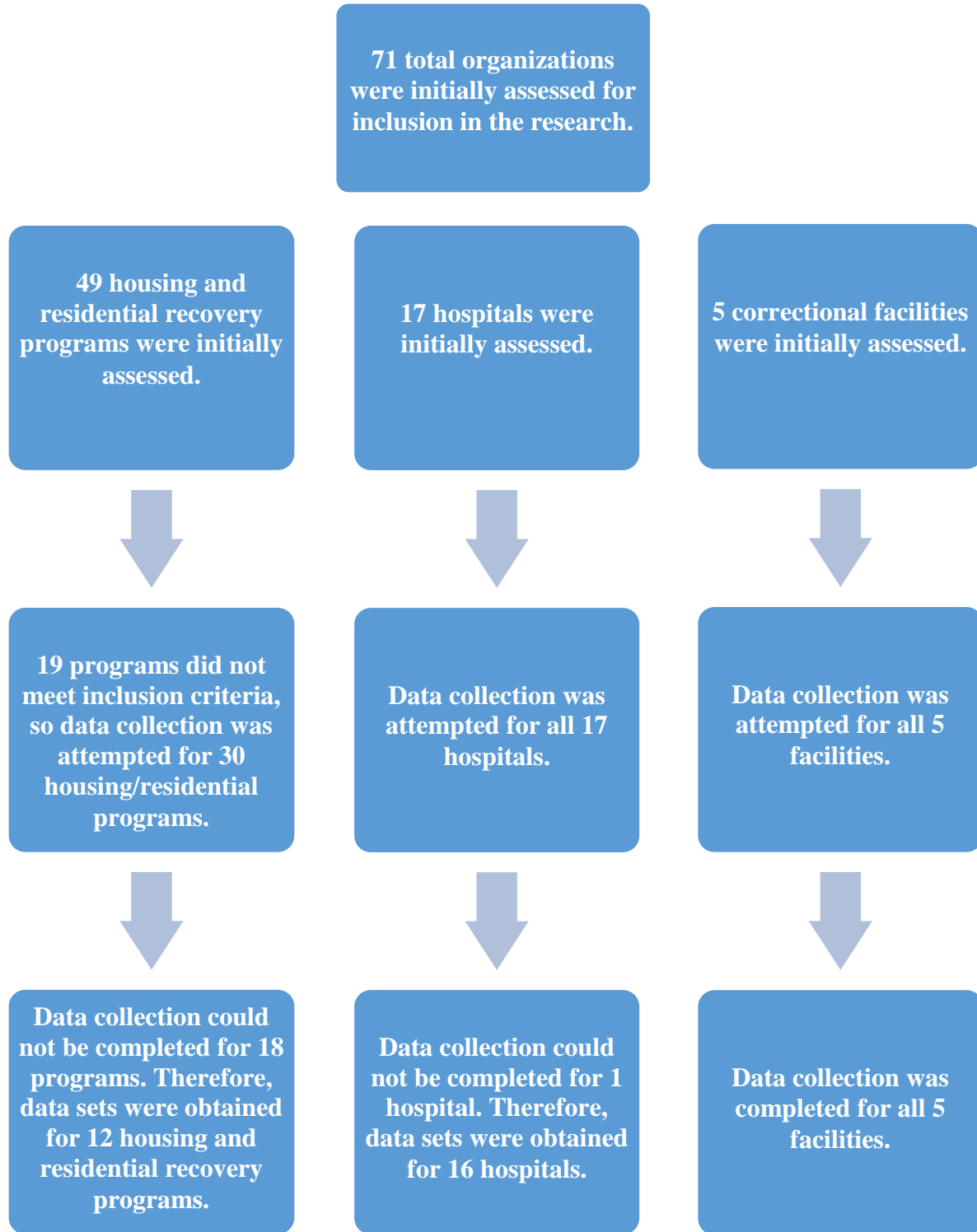
make-up to Pittsburgh should be sought for meaningful comparisons. Data collection could focus on: 1) What is the cost per client for nightly housing and related services?; 2) What is the cost per client for annual housing and related services?; 3) What are the annual implementation costs, and what does this cover?; 4) Does stable housing yield a reduction in emergency medical consumption by residents?; 5) Does stable housing lead to increased engagement with outpatient treatment?; and 6) Is stable housing associated with improved clinical and quality of life measures?. Obtaining these data and completion of a comparative cost analysis would expand the limited existing literature on economic evaluations of housing services for PLWHA. It also would highlight how comparable programs use client fees and funding streams, and how housing produces specific benefits to individuals served and the overarching care system. For providers and policy makers, this information is valuable as innovative, more effective services can be implemented in cost-effective ways. For PLWHA, the findings could highlight their personal experiences and help ensure access to stable residences and related benefits of housing.

There is vital work to be done to address unstable housing among PLWHA. Implementing safe, effective, and cost conscious housing now is the challenge, particularly in times of imminent needs of PLWHA, Allegheny County's transition to rapid rehousing services, and tightening funding streams. This study demonstrates contributing factors of housing instability, existing (insufficient) efforts to alleviate the issue, and opportunities for further research and improved practices and policies. Three primary recommendations can be made. First, the potential bias indicated by organizations not responding to a research request dealing with PLWHA and programs indicating that they do not serve the target population should be explored further. An ethnographic study focused on clients' encounters with sheltering services and/or providers' perspectives on serving PLWHA could provide valuable qualitative data on the

lingering stigma surrounding HIV/AIDS. Second, organizations need to effectively collect, interpret, and disseminate their financial data. The lack of responses and clarity surrounding this project's cost/funding inquiries may highlight major areas for improvement in grant-driven programs and facilities who must demonstrate cost-effective tendencies. Third, a detailed cost comparison across organization types in Pittsburgh, PA is still needed. Efforts will need to standardize the inclusion of implementation costs in per-night, per-person fees and/or separate direct charges to the sheltered individual from fixed operating costs. These efforts will help better inform providers about unstable housing among PLWHA, stimulate conversation and action steps regarding cost-saving strategies for residential services, and provide meaningful data on per-night, per-person sheltering costs at the local level.



## **APPENDIX: TABLES AND FIGURES**

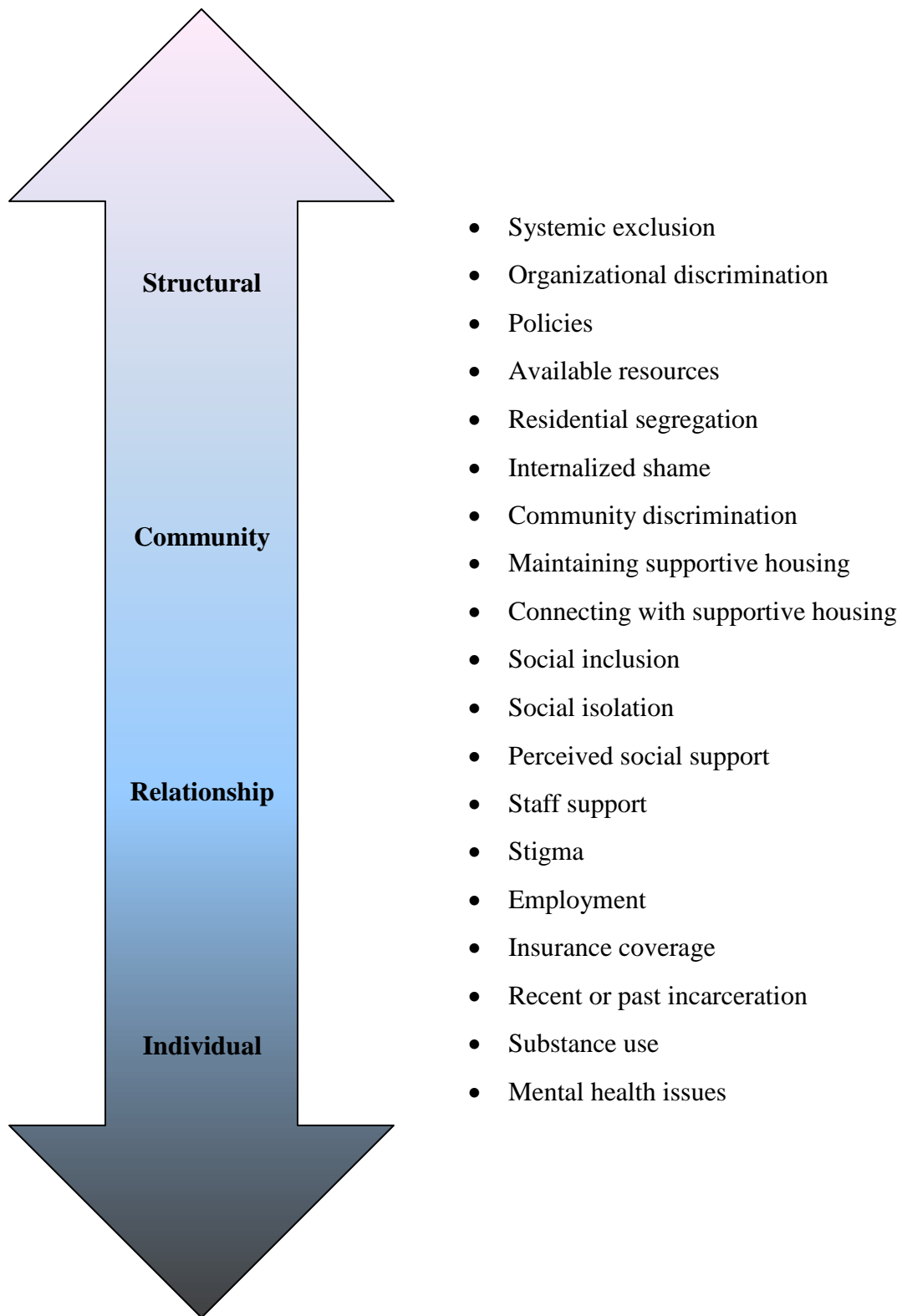


**Figure 1. Study flow chart of cost comparison data collection.**

**Table 1. Organizations and Programs Assessed for Potential Inclusion in the Research.**

| <u>Organization Name</u>                           | <u>Type of Housing Program</u>            | <u>Status in the Research (Reason not Included)</u> |
|--|---|---|
| Action Housing                                     | N/A                                       | Not included (services under another organization)  |
| Auberle  | Youth housing                             | Not included (did not meet criteria)                |
| Bethlehem Haven Women's Shelter                    | Shelter, transitional housing             | Included  |
| Catholic Charities St. Joseph House of Hospitality | Transitional housing                      | Not included (lack of response)                     |
| Center for Victims                                 | Shelter, transitional housing             | Not included (housing external to Pittsburgh)       |
| Community Human Services                           | Shelter, transitional housing             | Included  |
| East End Cooperative Ministry                      | Shelter, transitional housing             | Included  |
| Family Links                                       | Shelter, transitional housing             | Not included (lack of response)                     |
| Gaudenzia  | Transitional housing, substance recovery  | Not included (lack of response)                     |
| Genesis of Pittsburgh                              | Transitional housing                      | Included  |
| Goodwill Healthy Start House                       | Family units                              | Not included (did not meet criteria)                |
| Goodwill of Southwestern PA                        | Transitional housing                      | Included  |
| HEART House Program                                | Family units                              | Not included (did not meet criteria)                |
| HEARTH   | Family units                              | Not included (did not meet criteria)                |
| Hill House   | Housing referrals                         | Not included (did not meet criteria)                |
| Hosanna House                                      | Permanent housing                         | Not included (did not meet criteria)                |
| Housing Alliance of PA                             | Research, advocacy, education, training   | Not included (did not meet criteria)                |
| Light of Life Rescue Mission                       | Shelter                                   | Included  |
| Living Ministry Incorporated                       | Outreach                                  | Not included (did not meet criteria)                |
| Mercy Behavioral Health                            | N/A (services under another organization) | Not included (services under another organization)  |
| Naomi's Place Transitional Housing                 | Transitional housing                      | Not included (lack of response)                     |
| Neighborhood Centers Association                   | Housing referrals                         | Not included (did not meet criteria)                |
| New Beginnings Foundation, Inc.                    | Transitional housing, substance recovery  | Included  |
| Northside Common Ministries                        | Shelter                                   | Included  |
| The Open Door, Inc.                                | Transitional housing                      | Included  |
| Operation Safety Net                               | Shelter                                   | Not included (lack of response)                     |
| Pittsburgh Catholic Educational Programs           | Employment, training                      | Not included (did not meet criteria)                |
| Pittsburgh AIDS Task Force                         | Permanent housing                         | Not included (no transitional housing)              |
| Pittsburgh Sober Living                            | Substance recovery                        | Not included (lack of response)                     |
| Primary Care Health Services, Inc.                 | Family units, financial support           | Not included (did not meet criteria)                |

| <b>Table 1 Continued</b>                               |  |  |
|--|--|--|
| Primary Purpose Recovery House                         | Substance recovery                         | Not included (lack of response)                    |
| Pyramid Healthcare, Inc. – Delaware House for Women    | Substance recovery                         | Not included (lack of response)                    |
| Pyramid Healthcare, Inc. – Lafayette Square for Men    | Substance recovery                         | Not included (lack of response)                    |
| Pyramid Healthcare, Inc. – Detox Treatment Center      | Substance recovery                         | Not included (lack of response)                    |
| Salvation Army Family Caring Center and Crisis Shelter | Family units                               | Not included (did not meet criteria)               |
| Shepherd’s Heart Veteran’s Home                        | Transitional housing                       | Included   |
| Smithfield United Church of Christ                     | Shelter                                    | Not included (services under another organization) |
| Sojourner House  | Family units                               | Not included (did not meet criteria)               |
| St. Vincent de Paul Michael’s Place                    | Transitional housing                       | Declined participating                             |
| Stayton Recovery House                                 | Transitional housing, substance recovery   | Not included (did not meet criteria)               |
| Supportive Housing Management Services                 | Shelter, transitional housing              | Included   |
| Transitional Services, Inc.                            | Resources for people with a mental illness | Not included (did not meet criteria)               |
| UPMC Programs  | Unknown                                    | Not included (did not meet criteria)               |
| Veteran’s Leadership Program of Western PA             | Shelter                                    | Not included (lack of response)                    |
| Veteran’s Place  | Transitional housing                       | Included   |
| Womanspace East, Inc.                                  | Family units                               | Not included (did not meet criteria)               |
| Women’s Center and Shelter of Greater Pittsburgh       | Shelter                                    | Not included (lack of response)                    |
| YWCA East Side Community Collaborative                 | Permanent housing                          | Not included (did not meet criteria)               |
| YWCA Homewood-Brushton Community Center                | Permanent housing                          | Not included (did not meet criteria)               |



**Figure 2. Socioecological factors involved with unstably housed PLWHA.**

**Table 2. Summary of Extant Cost Analyses Relevant to the Research.**

| <u>Study</u>                 | <u>Reviewed Program</u>                              | <u>Intervention Type</u>    | <u>Findings of Cost Analyses</u>  |
|------------------------------|--|-----------------------------|---|
| Kim et al., 2015             | Positive Charge                                      | Linkage to HIV treatment    | Low costs per individual treated (e.g. \$502 for 3 months); realistic cost savings and cost-effectiveness thresholds  |
| Jain et al., 2016            | Positive Charge                                      | Linkage to HIV treatment    | Investment returns of \$0.26-\$0.92 for every \$1.00 spent; linkage programs are an efficient use of public health funds  |
| Spaulding et al., 2013       | EnhanceLink  | Linkage to HIV treatment    | Cost per additional QALY savings of \$77,285; the intervention is cost effective from a societal perspective  |
| Maulsby et al., in press     | RiC programs   | HIV retention in care       | Realistic cost-saving thresholds across a range of program models (including The Open Door)   |
| Johnson-Masotti et al., 2005 | Activities with Women's Health Councils              | HIV prevention              | Demonstrated cost per QALY savings of \$37,433; cost per case of averted HIV infection was \$732,072; the intervention is moderately cost effective when compared to other HIV prevention efforts               |
| Poulin et al., 2010          | City of Philadelphia's Office of Supportive Housing  | Shelter and street outreach | Supportive housing and related services can lead to substantial cost savings (due to reduced use of acute services by people with severe mental illness)  |
| Larimer et al., 2009         | 1811 Eastlake  | HF program                  | Among chronically homeless individuals with severe alcohol problems, decreased service use and cost offsets of \$2,449 per-person, per-month after 6 months (and greater cost savings over longer time periods) |
| Basu et al., 2012            | Interim housing, stable housing, and case management | HF program                  | Among homeless, chronically ill adults, annual cost savings of \$9,809 for the chronically homeless and \$6,622 for individuals with HIV  |
| Holtgrave et al., 2007       | Housing and Health Study Intervention                | HIV prevention              | An avoided case of HIV infection resulted in over \$221,000 in treatment cost savings; cost savings result if 1 out of 19 intervention clients avoid HIV transmission   |
| Holtgrave et al., 2013       | Housing and Health Study Intervention                | HF program                  | HF programs meet standards for determining cost-effectiveness; cost per QALY savings of \$62,493  |

**Table 3. Accumulated Data for Hospitals.**

| <u>Name of Hospital</u>                         | <u>Licensed approved hospital specialty</u> | <u>Beds per-night</u> | <u>Minimum cost per-night, per-person for room and board</u> | <u>Average length of stay (in days)</u> | <u>Number of annual inpatient admissions</u> |
|---|---|-----------------------|--|---|--|
| Allegheny General Hospital                      | General <sup>a</sup>                        | 631                   | \$1,699.00   | 5.41                                    | 23,671                                       |
| Forbes Hospital                                 | General <sup>b</sup>                        | 329                   | \$792.00   | 5.25                                    | 13,014                                       |
| Healthsouth Harmorville Rehab Hospital          | Physical rehabilitation <sup>c</sup>        | 162                   | \$863.00   | 15.98                                   | 1,770  |
| Jefferson Hospital                              | General <sup>d</sup>                        | 341                   | \$847.00   | 4.64                                    | 14,791                                       |
| Kindred Hospital – Pittsburgh                   | Long-term acute care                        | 63                    | \$1,672.00   | 28.80                                   | 357  |
| Magee Women's Hospital of UPMC Health System    | General, woman's care <sup>e</sup>          | 363                   | \$1,725.00   | 4.26                                    | 29,255                                       |
| New Lifecare Hospitals of Pittsburgh – Suburban | Long-term acute care                        | 32                    | \$2,142.00   | 25.67                                   | 311  |
| New Lifecare Hospitals of Pittsburgh LLC        | Long-term acute care                        | 129                   | \$2,142.00   | 24.92                                   | 745  |
| Select Specialty Hospital of Pittsburgh/UPMC    | Long-term acute care                        | 32                    | \$1,911.00   | 33.46                                   | 293  |
| Southwood Psychiatric Hospital, Inc.            | Psychiatric                                 | 68                    | \$1,100.00   | 10.56                                   | 1,754  |
| St. Clair Memorial Hospital                     | General <sup>f</sup>                        | 328                   | \$870.00   | 4.37                                    | 16,359                                       |
| UPMC Mercy Hospital                             | General <sup>g</sup>                        | 496                   | \$1,725.00   | 6.23                                    | 20,158                                       |
| UPMC Passavant Hospital                         | General <sup>h</sup>                        | 437                   | \$1,725.00   | 5.11                                    | 16,120                                       |
| UPMC Presbyterian Shadyside Hospital            | General <sup>i</sup>                        | 1,592                 | \$2,810.00   | 7.32                                    | 59,860                                       |
| UPMC St. Margaret Hospital                      | General <sup>j</sup>                        | 249                   | \$1,525.00   | 5.04                                    | 12,784                                       |
| West Penn Hospital                              | General, woman's care <sup>k</sup>          | 317                   | \$1,319.00   | 5.28                                    | 10,495                                       |

**Table 3 Continued**

*Note.* All data is from the Annual Hospital Questionnaire by the PA Department of Health, Division of Health Informatics (2015a; 2015b; 2015c) unless otherwise noted.

<sup>a</sup> Specialty is indicated by Allegheny Health Network (AHN) (2016a).

<sup>b</sup> Specialty is indicated by AHN (2016b).

<sup>c</sup> Specialty is indicated by HealthSouth Corporation (2015).

<sup>d</sup> Specialty is indicated by AHN (2016c).

<sup>e</sup> Specialty is indicated by UPMC (2016b).

<sup>f</sup> Specialty is indicated by St. Clair Hospital (2016).

<sup>g</sup> Specialty is indicated by UPMC (2016c).

<sup>h</sup> Specialty is indicated by UPMC (2016d).

<sup>i</sup> Specialty is indicated by UPMC (2016e, 2016f).

<sup>j</sup> Specialty is indicated by UPMC (2016g).

<sup>k</sup> Specialty is indicated by AHN (2016d).



**Table 4. Accumulated Data for Housing and Residential Recovery Organizations.**

| <u>Name of facility or organization</u> | <u>Type of program(s)</u>   | <u>Housing services provided</u> <sup>a</sup>   | <u>Beds per-night</u> | <u>Cost paid by serviced individual: Nightly/annually</u>   | <u>Number of individuals served annually</u> | <u>Annual implementation costs</u>   | <u>Funding source categories</u>  |
|---|---|---|-----------------------|---|--|--|---|
| Bethlehem Haven                         | Women's emergency shelter and transitional housing <sup>b</sup>                   | 2-3 meals per day, supportive services <sup>c</sup>   | 68 <sup>c</sup>       | Shelter: \$0/\$0<br>Transitional housing: 30% of income/ <b>30% of income</b> <sup>d</sup>  | 500 <sup>d</sup>                             | Shelter = \$491,000; transitional = \$600,000 <sup>d</sup> ; Total = \$3,324,864; <sup>c</sup> | Contributions, government grants, investments, special events, sales <sup>c</sup>                   |
| Community Human Services (CHS)          | Shelter and transitional housing <sup>e</sup>                                     | Assistance with daily living, case management, 3 meals per day <sup>e</sup>                       | 47 <sup>f</sup>       | Shelter: \$0/\$0<br>Transitional housing: 30% of income/ <b>30% of income</b> <sup>f</sup>  | 430 <sup>f</sup>                             | \$759,000 <sup>f</sup>   | Contributions, grants, program services, investments, special events, other <sup>g</sup>            |
| East End Cooperative Ministry (EECM)    | Emergency shelter, care center, transitional housing <sup>h</sup>                 | Housing referrals <sup>h</sup> , 3 meals per day <sup>i</sup>                                     | 51 <sup>i</sup>       | Emergency shelter, care center: \$0/ <b>Data not found or provided</b><br>Transitional housing: 25% of monthly income/ <b>Data not found or provided</b> <sup>i</sup> | 155 <sup>i</sup>                             | Data not found/provided  | Contributions, government grants, program services, investments, special events <sup>j</sup>        |
| Genesis of Pittsburgh                   | Maternity-based transitional housing <sup>k</sup>                                 | Homemaking skills, permanent housing assistance <sup>k</sup>                                      | 8 <sup>k</sup>        | \$2.00/N/A <sup>l</sup>   | Data not found/provided                      | Housing program only = \$195,983 <sup>l</sup> ; total = \$819,501 <sup>m</sup>                 | Contributions, government grants, program services, investments, special events, other <sup>m</sup> |
| Goodwill of Southwestern PA             | Transitional housing <sup>n</sup>   | Housing case management <sup>n</sup>  | 40 <sup>o</sup>       | 30% of monthly income/ <b>30% of monthly income</b> <sup>o</sup>  | 70-75 <sup>o</sup>                           | Housing program only = \$378,285 (but this does not cover all costs) <sup>o</sup>              | Government grants, retail sales, rental income <sup>o</sup>   |
| Light of Life Rescue Mission            | Subsidized apartments, men's residential recovery, emergency shelter <sup>p</sup> | 2 meals per day, household services/training/case management, personal storage space <sup>p</sup> | 102 <sup>q</sup>      | \$0/\$0 <sup>q</sup>  | 1,030 <sup>q</sup>                           | Mission only = \$3,834,334; total = 5,405,292 <sup>r</sup>                                     | Contributions, government grants, investments <sup>r</sup>  |
| New Beginnings Foundation, Inc.         | Women's transitional residential care for addiction <sup>s</sup>                  | House manager <sup>s</sup>  | 8-14 <sup>t</sup>     | \$14.17/ <b>\$5,100</b> <sup>t,u</sup>  | 8-14 <sup>t</sup>                            | Program services are total cost = \$38,354 <sup>v</sup>  | Government grants, investments <sup>v</sup> , program services <sup>t</sup>                         |
| Northside Common Ministries (NCM)       | Men's shelter <sup>w</sup>  | 2 meals per day, housing case management <sup>x</sup>   | 25-32 <sup>x</sup>    | \$0/N/A <sup>x</sup>  | 250 <sup>x</sup>                             | Program services only = \$399,168; total = \$598,017 <sup>y</sup>                              | Contributions, grants, program services, investments <sup>y</sup> , HUD funding <sup>x</sup>        |

**Table 4 Continued**

|  |   |   |                      |   |                       |  |   |
|--|---|---|----------------------|---|-----------------------|--|---|
| The Open Door, Inc.                    | Transitional housing <sup>z</sup>                     | Housing case management referrals, homemaker services, group meals, representative payee <sup>z</sup> | 14 <sup>z</sup>      | \$12.50/ <del>\$4,562.50</del><br><sup>aa, ab</sup>   | 14-20 <sup>aa</sup>   | Total = \$240,867 <sup>ac</sup>                                    | Contributions, government grants, program services, investments <sup>ac</sup>               |
| Shepherd's Heart Veteran's Home        | Veterans' transitional housing <sup>ad</sup>          | 3 meals per day <sup>ad</sup>   | 15 <sup>ad</sup>     | If veteran has no income: \$0/ <del>\$0</del><br>If veteran has income: \$2.67-\$4.00/ <del>\$960-\$1,440</del> <sup>ad, ae</sup> | 40 <sup>af</sup>      | Transitional housing program only = \$262,300 <sup>af</sup>        | VA funding; Contributions from individuals, churches, and other organizations <sup>af</sup> |
| Supportive Housing Management Services | Emergency shelter, transitional housing <sup>ag</sup> | Social services consultation; nightly hot meal for shelter <sup>ah</sup>                              | 84-104 <sup>ah</sup> | Shelters: \$0/N/A<br>Transitional housing: \$3.70 <sup>ai</sup> / <del>25% of income</del> <sup>ah</sup>                          | 1,000 <sup>ah</sup>   | Data not found/ provided   | County funding, housing subsidies <sup>ah</sup>   |
| Veterans Place                         | Veterans' transitional housing <sup>aj</sup>          | Housing case management, on-site food pantry <sup>aj</sup>  | 48 <sup>aj</sup>     | If veteran has no income: \$0/ <del>\$0</del><br>If veteran has income: 20% of income/ <del>20% of income</del> <sup>ak</sup>     | 105-110 <sup>al</sup> | Program services only = \$812,250; total = \$887,322 <sup>ak</sup> | Contributions, government grants, program services, investments, other <sup>ak</sup>        |

<sup>a</sup> Listed housing services are in addition to bed space and utilities.  
<sup>b</sup> Program type is specified by Bethlehem Haven (2016).  
<sup>c</sup> Data is indicated by GuideStar USA, Inc. (2016a).  
<sup>d</sup> Data was provided by a program representative (C. Woodward, personal communication, September 29, 2016).  
<sup>e</sup> Data is specified by CHS (2016).  
<sup>f</sup> Data was provided by the Chief Executive Officer (A. Walnoha, personal communication, October 3, 2016).  
<sup>g</sup> Funding sources are indicated by GuideStar USA, Inc. (2016b).  
<sup>h</sup> Data is specified by the EECM (2016).  
<sup>i</sup> Data was provided by a program representative (J. Flowers, personal communication, October 14, 2016).  
<sup>j</sup> Funding sources are indicated by GuideStar USA, Inc. (2016c).  
<sup>k</sup> Data is specified by Genesis of Pittsburgh (2016).  
<sup>l</sup> Data was provided by the Assistant Director (N. Egbert, personal communication, October 19, 2016).  
<sup>m</sup> Data is indicated by GuideStar USA, Inc. (2016d).  
<sup>n</sup> Data is specified by Goodwill of Southwestern PA (2016).  
<sup>o</sup> Data was provided by the Director of Supportive Housing (D. Reichenbach, personal communication, November 7, 2016).  
<sup>p</sup> Data is specified by Light of Life Rescue Mission (2016).  
<sup>q</sup> Data was provided by the Director of Administration (L. Salgado, personal communication, October 7, 2016).  
<sup>r</sup> Data is indicated by GuideStar USA, Inc. (2016e).  
<sup>s</sup> Data is specified by New Beginnings Foundation (2015).  
<sup>t</sup> Data was provided by the Vice President (S. Vogt, personal communication, September 19, 2016).  
<sup>u</sup> Nightly and annual fees are based on a \$425 monthly client charge.  
<sup>v</sup> Data is indicated by GuideStar USA, Inc. (2016f).  
<sup>w</sup> Program type is specified by NCM (2016).  
<sup>x</sup> Data was provided by the Executive Director (J. Poliziani, personal communication, September 14, 2016).  
<sup>y</sup> Data is indicated by GuideStar USA, Inc. (2016g).  
<sup>z</sup> Data is specified by The Open Door, Inc. (2016b).  
<sup>aa</sup> Data was provided by the Executive Director (C. Farmartino, personal communication, September 13, 2016).

**Table 4 Continued**

<sup>ab</sup> Nightly and annual fees are based on a \$375 monthly client charge.

<sup>ac</sup> Data is indicated by GuideStar USA, Inc. (2016h).

<sup>ad</sup> Data is specified by Shepherd's Heart Fellowship (2016).

<sup>ae</sup> Nightly and annual fees are based on a \$80-120 monthly client charge (if veteran has income).

<sup>af</sup> Data was provided by the Building Administrator (C. Pickering, personal communication, September 13, 2016).

<sup>ag</sup> Data was provided by an Allegheny County representative (C. Keenan, personal communication, July 1, 2016).

<sup>ah</sup> Data was provided by a program representative (A. Messner, personal communication, October 21, 2016).

<sup>ai</sup> Nightly fee is based on a \$111 monthly client charge.

<sup>aj</sup> Data is specified by Veteran's Place of Washington Boulevard, Inc. (2013).

<sup>ak</sup> Data is indicated by GuideStar USA, Inc. (2016i).

<sup>al</sup> Data was provided by The Director of Operations (R. Hamilton, personal communication, October 14, 2016).

**Table 5. Accumulated Data for Correctional Facilities.**

| <u>Name of facility</u>   | <u>Type of facility</u>                                     | <u>Beds per-night</u>   | <u>Estimated cost per-night, per-person for room and board</u> | <u>Average length of stay (in days)</u> | <u>Number of individuals housed per year</u> |
|---|---|-------------------------|--|---|--|
| Allegheny County Jail <sup>a</sup>  | Jail  | 3,156 males and females | \$80   | 35 <sup>b</sup>                         | Approximately 15,000                         |
| Pittsburgh CCC <sup>c</sup>   | Community corrections center                                | 50 females              | \$89.77  | 169.4                                   | 136  |
| Renewal #1 <sup>c</sup>   | Group home  | 150 males and females   | \$89.77  | 79                                      | 700  |
| Gateway Braddock <sup>c</sup>   | Rehabilitation group home                                   | 126 males               | \$89.77  | 74.1                                    | 586  |
| Renewal #2 <sup>c</sup>   | Recovery from alcohol and other drugs, mental health issues | 282 males and females   | \$89.77  | 93.9                                    | 1,025  |
| <sup>a</sup> Data was provided by a Deputy Warden (M. Long, personal communication, September 23, 2016).<br><sup>b</sup> Average length of stay is for females; information was not provided for males.<br><sup>c</sup> Data for the PA Department of Corrections facilities was provided by a Research Manager (J. Tomkiel, personal communication, October 17, 2016). |   |                         |  |   |  |

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