Fall 12-2018

ASSESSMENT AND FINDINGS OF THE VULNERABILITY INDEX (VI-SPDAT) SURVEY OF INDIVIDUALS EXPERIENCING HOMELESSNESS IN TRAVIS COUNTY, TX

Benjamin T. King
UTHealth School of Public Health, Benjamin.King@uth.tmc.edu

ASSESSMENT AND FINDINGS OF THE VULNERABILITY INDEX (VI-SPDAT) SURVEY OF INDIVIDUALS EXPERIENCING HOMELESSNESS IN TRAVIS COUNTY, TX

by

BEN KING, MPH

APPROVED:

STEVEN KELDER, PHD

JENNIFER GONZALEZ, PHD

CASEY DURAND, PHD

KAYO FUJIMOTO, PHD

DEAN, THE UNIVERSITY OF TEXAS
SCHOOL OF PUBLIC HEALTH

DEDICATION

To Alicia M Foyt

ASSESSMENT AND FINDINGS OF THE VULNERABILITY INDEX (VI-SPDAT)

SURVEY OF INDIVIDUALS EXPERIENCING HOMELESSNESS

IN TRAVIS COUNTY, TX

by

BEN KING
MPH, The University of Texas School of Public Health, 2011

Presented to the Faculty of The University of Texas

School of Public Health

in Partial Fulfillment

of the Requirements

for the Degree of

DOCTOR OF PHILOSOPHY

THE UNIVERSITY OF TEXAS
SCHOOL OF PUBLIC HEALTH
Houston, Texas
December, 2018

ACKNOWLEDGEMENTS

First, I would like to acknowledge the patient and thoughtful contributions of my dissertation committee. Dr. Kelder was there from the beginning and helped me to develop the original concept and proposal. He has always challenged me to raise the bar and provide the highest quality work that I can. Dr. Gonzalez was absolutely critical to the direction and scope of the dissertation throughout the entire process. She was the one down in the weeds with me each time I hit a wall. Drs. Durand and Fujimoto were both instrumental sources in their respective fields and worked closely with me to develop the methods used in this research. Dr. Kelder also introduced me to the Pomodoro time management technique, which was a game-changer and kept the entire dissertation process moving forward.

I want to acknowledge and thank Brian Miller and the Office of Research at the UT SPH for their support of this work through the dissertation research scholarship. I am also thankful to Seton Healthcare for their support with tuition assistance.

I would also like to thank my directors and the whole team at the Dell Medical School's Stroke Institute, who have been incredibly supportive of my time spent on this project. Dr. TJ Milling has been a mentor, a director and a role model for many years. He has helped me to develop my career in so many ways, and when I made the decision to return to school for my doctorate he was the first person to support me.

Finally I want to acknowledge my friends and family for supporting and encouraging me throughout this process. I don't always respond gracefully, but the support of my community has lifted me up when the going got tough. In particular, my fiancé Ali has been patient and supportive throughout this whole process. I owe her far more than I can say.

ASSESSMENT AND FINDINGS OF THE VULNERABILITY INDEX (VI-SPDAT) SURVEY OF INDIVIDUALS EXPERIENCING HOMELESSNESS IN TRAVIS COUNTY, TX

Ben King, PhD, MPH
The University of Texas
School of Public Health, 2018

Advisor / Dissertation Chair: Steven Kelder, PhD

Dissertation Supervisor: Jennifer Gonzalez, PhD

Abstract: Homelessness is a significant barrier to the quality of an individual's health. Federal housing interventions attempt to eliminate homelessness by providing varying degrees of subsidization, but available units do not currently keep pace with the scale of the problem. Coordinated Assessment is a process requirement put in place by HUD to organize and prioritize the waiting list for housing, based on community priorities. Several tools measuring health and social vulnerability, including the Vulnerability Index-Service Prioritization Decision Assistance Tool (VI-SPDAT), have become popular options for prioritizing housing resources. Such assessments currently in use are not thoroughly researched and the effects of this new paradigm of prioritization based on vulnerability are not well understood.

Confirmatory factor analysis applied three theoretical models to the data and the model with best goodness-of-fit characteristics was further improved using modification indices (RMSEA=0.036; CFI=0.904; SRMR=0.035). Multiple group testing across

demographics and exposure to homelessness consistently demonstrated weak invariance. Comparison of the self-reported items measuring health conditions and healthcare utilization to abstracted hospital electronic medical records and data from a Health Information Exchange demonstrated superior data quality from the HIE. Generally, self-reported items tended to show higher specificity and low sensitivity for diagnostic records, although this effect varied between conditions.

Responses to several items on the VI-SPDAT were found to differ significantly by demographic groups or levels of exposure to homelessness. Demographics, homelessness exposure, and multiple individual items were shown to be associated with overall score on the measure in multivariate, negative binomial models. Finally, overall score on the VI-SPDAT was found to have no association with selection for housing placement and housing exit type. However, several items were found to be either positively or negatively associated with probability of housing entry or of negative housing exits.

There are several findings from this research which have immediate relevance and application to the practice of Coordinated Assessment. The racial, ethnic, and gender disparities in overall score and individual items are potential sources of concern. The weak invariance of the factor model may give partial explanation for these. The lack of association between assessment score intended to prioritize housing and selection for housing entry is another point of concern which needs to be clarified. Recommendations for changes to practice and policy are described and specific needs for further research to follow this is explored.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

BACKGROUND

Literature Review

Extent of the Problem

Every year in January the US Department of Housing and Urban Development (HUD) requires every community that receives funding support for housing to conduct a "*point-in-time*" count in order to estimate their population of sheltered and unsheltered homelessness on a given night. In 2017, approximately 553,742 individuals experienced homelessness on one night in the United States, including the unsheltered and those in emergency shelter or transitional housing (HUD, 2017). This translates to approximately 17 people experiencing homelessness per 10,000 people in the US population. Approximately 192,875 (34.8%) of these individuals were sleeping unsheltered (HUD, 2017). The total point-in-time count is up 0.7% from 2016 and up 13.1% since 2010 (HUD, 2017). This increase was largely attributed to increases in unsheltered homeless in the largest, west coast cities (HUD, 2017). It was reported that 1,593,150 individuals spent at least one night in an emergency shelter or transitional housing program at some point during the 2010 Federal reporting period (October 2009-September 2010; HUD, 2010). However, it is very possible that these federal reports are underestimating the total homeless population in America (Troisi et al., 2015). Over a decade ago, the National Law Center on Homelessness and Poverty projected that approximately 3.5 million people, 1.35 million of them children, experience homelessness over the course of a year (NLCHP, 2004). This puts the estimate closer to 1% of the US population experiencing homelessness over the course of a year.

Just 40,056 of those counted in the 2017 Annual Point in Time Count were veterans (down 46% since 2010), while 40,799 were unaccompanied youth or children (HUD, 2017). The count of those chronically homeless, meaning disabled individuals experiencing long term homelessness, was up 12.2% over 2016 but still down 18% since 2010 (HUD, 2017).

Definitions

The definition of homelessness has evolved over the past 3 decades. Different agencies have used different definitions at times and different implementations of definitions provided through legislative action. Originally and until 2011, the McKinney-Vento Homeless Assistance Act of 1987 defined the term 'homeless' as a person who 'lacks a fixed, regular, and adequate nighttime residence' (US Code, 1987; NCH, 2006). While this language has been retained (HUD, 2017-1), the definition was dramatically expanded during reauthorization in 1990 and updated several times (NCH, 2006). The most recent update was made by passage of the Homeless Emergency Assistance and Rapid Transition to Housing (HEARTH) Act of 2009 (HUD, 2009). HEARTH redefined seven (7) specific categories of homelessness which are grouped within 4 clusters in the Final Rule on 'Defining Homeless' published by HUD: 1) Individuals and families who lack a fixed, regular, and adequate nighttime residence, 2) Imminent risk of becoming homeless, 3) Unstably housed families or unaccompanied youth, and 4) those fleeing domestic violence with no other residence (HUD, 2011; NAEH, 2012). These were changed through the passage of the HEARTH act as described by the National Alliance to End Homelessness:

1. "*People who are living in a place not meant for human habitation, in emergency shelter, in transitional housing, or are exiting an institution where they temporarily resided. The only significant change from existing practice is that people will be considered homeless if they*

are exiting an institution where they resided for up to 90 days (it was previously 30 days), and were in shelter or a place not meant for human habitation immediately prior to entering that institution.

2. *People who are losing their primary nighttime residence, which may include a motel or hotel or a doubled up situation, within 14 days and lack resources or support networks to remain in housing. HUD had previously allowed people who were being displaced within 7 days to be considered homeless. The proposed regulation also describes specific documentation requirements for this category.*
3. *Families with children or unaccompanied youth who are unstably housed and likely to continue in that state. This is a new category of homelessness, and it applies to families with children or unaccompanied youth who have not had a lease or ownership interest in a housing unit in the last 60 or more days, have had two or more moves in the last 60 days, and who are likely to continue to be unstably housed because of disability or multiple barriers to employment.*
4. *People who are fleeing or attempting to flee domestic violence, have no other residence, and lack the resources or support networks to obtain other permanent housing. This category is similar to the current practice regarding people who are fleeing domestic violence."* (NAEH, 2012).

The US Department of Health and Human Services (DHHS) still uses the general definition as amended by the HEARTH Act (HUD, 2009) and this full, unconstrained range is still used in the health care setting for programs funded through the DHHS. HUD uses a narrower definition of homelessness based on a published Final Rule (HUD, 2011). This Final Rule lays out several time constraints and requires documentation of housing status in order to qualify for most services (HUD, 2011).

Importantly, the HUD implementation of the HEARTH definition includes those exiting institutions into homelessness and those at imminent risk of losing their residence (HUD, 2011). It does not include most individuals who are unstably housed, i.e. those staying in a hotel, at an institution, or with a family member or friend temporarily (with the exception of families/youth under category 3) (HUD, 2011). The DHHS definition implemented under HEARTH accepts such unstably housed individuals as homeless (HUD, 2009). Also critical to HUD's implementation of the HEARTH definition is that those at

imminent risk (category 2) or unstably housed (category 3) are not eligible for most housing interventions through HUD, aside from homelessness prevention services and utility or rental assistance, in limited cases (HUD, 2011). Specific programs in each community are tasked with serving domestic violence populations (category 4; HUD, 2011), which are tracked and funded separately from other HUD programs.

This variability in the implementation of the definition provided by HEARTH and from changes to the definitions used over time can cause some confusion in interpreting research. In particular, research that crosses over between housing and healthcare services may rely on one definition or another based on where the sample was originally obtained. This makes clarification of sample collection and eligibility criteria an important part of research into homelessness and health. For example, category one (1) of the HEARTH definition is the primary criterion for samples of individuals undergoing Coordinated Assessment because they must be considered literally homeless in order to access housing services funded by HUD. Similarly, any evaluation of the effects of supportive housing on health outcomes would require populations that met category one (1) criteria prior to accessing such services. However, much of the evidence of a relationship between homelessness and health is drawn from clinic or hospital-based populations which may include all four of HUD's categories of 'homelessness' and more.

Continuums of Care (CoC) are local planning bodies responsible for coordinating the full range of homelessness services in a geographic area, which may cover a city, county, metropolitan area, or an entire state (HUD, 2017-1). An Emergency Shelter (ES) is a facility with the primary purpose of providing temporary shelter for homeless people (HUD, 2017-

1). Permanent Supportive Housing (PSH) is a housing model designed to provide housing assistance (project- and tenant-based) and supportive services on a long-term basis to formerly homeless people (HUD, 2017-1). HUD's authorization of the Continuum of Care program requires that the client have a disability for eligibility (HUD, 2017-1). Rapid Rehousing (RRH) is a housing model designed to provide temporary housing assistance to people experiencing homelessness, moving them quickly out of homelessness and into permanent housing (HUD, 2017-1). The term Chronically Homeless Individual refers to an individual with 1) a disability related to physical health, mental health or substance abuse who has been 2a) continuously homeless for one year or more or 2b) has experienced at least four episodes of homelessness in the last three years where the combined length of time in those occasions is at least twelve months (HUD, 2017-1).

Public Health Significance of Homelessness

Homelessness is a significant barrier to the quality of an individual's health (NHCHC, 2013). Chronic health conditions are more prevalent, with premature onset, and exposure to risk behaviors is higher within populations of individuals experiencing homelessness (Lebrun-Harris et al., 2013). This leads to higher mortality risks, with individuals experiencing homelessness dying 30 years sooner on average than housed comparison groups (O'Connell, 2005; NHCHC, 2013). Individuals experiencing homelessness suffer from elevated rates of poly-substance use, mental health issues, and physical health conditions (Avery, 2013). They face greater than average legal and medico-legal issues which may affect their ability to find housing and employment (Avery, 2013). Lack of health insurance, legal problems, and social stigma all lead to difficulties in

accessing healthcare services (Avery, 2013). Instead, instability of housing status is inversely associated with frequency of emergency department use but no other sources of care (Moore & Rosenheck, 2016).

There are a wide range of factors influencing or mediating the relationship between housing instability and adverse health outcomes, including stress (Wong & Piliavin, 2001), mental health (Roos et al., 2013), poor nutrition (Sprake et al., 2013), environmental exposures, and other social and economic determinants (NHCHC, 2013). Although the prevalence of chronic diseases such as diabetes and hypertension are on the rise throughout the US, the rate at which these diseases are increasing in the homeless population is greater than that of the general population (Bernstein et al., 2015).

The relationships between homelessness and health also appear to be bidirectional, reinforcing, and therefore cyclical (Lippert & Lee, 2015). Health conditions, particularly behavioral health issues, and healthcare costs can increase the risk of experiencing homelessness (Quigley et al., 2001). Even short episodes of homelessness can increase individuals' exposure to environmental and behavioral risk factors, as well as the risk of communicable diseases and violence (Quigley et al., 2001). Conversely, the experience of homelessness itself has a strong, and dose-responsive, effect on poor health and risk of early mortality (Quigley et al., 2001; O'Connell, 2005). Exposure to homelessness has been associated with greater levels of psychiatric distress, greater levels of alcohol use, and lower self-rated perceptions of individuals' recovery from past mental health conditions (Castellow et al., 2015). In turn, these conditions may strengthen the barriers to exiting homelessness.

At its core, poverty and therefore homelessness can be framed as an economic condition. Downward economic pressure creates extreme poverty which the social and medical safety nets cannot fully address. The proportions of eligible individuals experiencing homelessness who participate in government welfare and social service programs are limited for many reasons. In particular, the rate of enrollment for those with serious mental health conditions shows significant underrepresentation in disability programs (Martin, 2015). A large proportion of individuals experiencing homelessness are employed to some degree (Zuvekas & Hill, 2000). However, only a small percentage of those individuals are able to obtain income above marginal levels from employment alone (Zuvekas & Hill, 2000). Therefore most still require supportive financial services (Zuvekas & Hill, 2000). Physical health problems often limit daily activities and prospects for gainful employment (Zuvekas & Hill, 2000). However, physical health conditions are also associated with greater likelihood of access to the superior support of disability welfare services than those with mental health diagnoses alone (Zuvekas & Hill, 2000). Meanwhile, substance use disorders create a significant barrier to disability program access (Baggett & Jenkins, 2013). This is primarily a result of current eligibility requirements which exclude participants with substance use histories (Zuvekas & Hill, 2000; Baggett & Jenkins, 2013).

A ‘Behavioral Model of Vulnerable Populations’ has been proposed, which focuses on the impact of complex comorbidities on utilization rates of healthcare and social services (Small, 2010). The model is intended to predict and explain a cumulative effect of health vulnerabilities resulting in elevated patterns of healthcare utilization (Small, 2010; Linton & Shafer, 2014). This basic framework is central to the approaches used by the assessment and

prioritization tools currently being utilized in the process of HUD-mandated Coordinated Assessment (CA).

Coordinated Assessment /Coordinated Entry

On May 20, 2009, the HEARTH Act was enacted into law, consolidating three independent homeless assistance programs administered by HUD under the McKinney-Vento Homeless Assistance Act into a single program. In 2012, HUD implemented Continuum of Care interim rule 24 CFR 578.7(a)(8) which, among other things, required CoCs to establish a Centralized or Coordinated Assessment (CA) System:

> *"In consultation with recipients of Emergency Solutions Grants program funds within the geographic area, establish and operate either a centralized or coordinated assessment system that provides an initial, comprehensive assessment of the needs of individuals and families for housing and services. The Continuum must develop a specific policy to guide the operation of the centralized or coordinated assessment system on how its system will address the needs of individuals and families* (HUD, 2012)."

The Interim rule further defines the requirements of such a system: "*A centralized or coordinated assessment system covers the geographic area, is easily accessed by individuals and families seeking housing or services, is well advertised, and <u>includes a comprehensive and standardized assessment tool</u>* (HUD, 2012; emphasis added)."

In 2010 (and again in 2012 and 2015), the US Interagency Council on Homelessness published recommendations for and commitments from HUD, the VA, and other federal agencies toward ending homelessness by 2015 (USICH, 2010). The process of CA,

sometimes called Coordinated Entry in federal guidance documents, was announced as an immediate priority and mandatory by January of 2018 (HUD, 2012). As one editorial described it, "Coordinated Entry supports people by bringing together multiple agencies to work in a coordinated system of services rather than expecting clients to gain access to multiple agencies on their own" (Kenney, 2017). CA has also been referred to as "the most important element toward helping the chronically homeless" in public communication from homeless service delivery providers (Goodale, 2016).

This new CA mechanism is now a central component of the pipeline for allocation of housing resources. As a consequence of this, it is crucial that the measures and scores used for assessment and prioritization of individuals are reliable and valid tools. The risk of wide dissemination of untested measurement tools to be used for this purpose has dangerous implications. Measures with poor validity risk prioritizing individuals in the wrong order because they measure something other than what the community intended. Measures with poor reliability risk inaccuracy in capturing an individual's true vulnerability status and misplacing them in the pipeline.

While some communities have developed their own prioritization tools based on local, community priorities (Spence-Almaguer et al., 2013), many CoCs have begun to adopt a handful of tools that are becoming more popular each year (Leopold & Ho, 2015; PD&R, 2015). In particular, collaboration between the designers of the Service Prioritization and Decision Assistance Tool (SPDAT) and the Vulnerability Index (VI) has yielded a very popular option in the combined VI-SPDAT screening tool. However, in spite of their popularity, claims of validity, and evidence-based methods, very few quantitative studies of

the performance of these prioritization assessments have been performed and publicly reported (Spence-Almaguer et al., 2013). The discussion of how to optimize this process and what tools ought to be used is ongoing (PD&R, 2015).

Service Prioritization and Decision Assistance Tool (SPDAT)

The SPDAT was originally designed as a tool to determine the appropriate level and type of housing intervention for a given individual experiencing homelessness (category 1). The SPDAT was an original product published by OrgCode, Inc. in 2010, before merging it with the VI to create the VI-SPDAT (OrgCode, 2014; OrgCode, 2015; Leopold & Ho, 2015). The development of the tool began with summary and assessment of multiple intake and assessment tools, validated in population samples drawn primarily from healthcare, disability and rehabilitation populations, including: clinical acuity scales, functional assessments of self-sufficiency, and needs assessments, as well as 32 unstructured interviews with practitioners familiar with these assessment tools, and a "larger" number of homeless service providers (OrgCode, 2014). This effort in reviewing available tools culminated in an expert, multi-disciplinary review panel which included review of journal articles and several more clinical assessment tools (OrgCode, 2014).

The publication, "The SPDAT and VI-SPDAT: Tools Grounded in Evidence" focuses almost exclusively on the SPDAT alone (OrgCode, 2014). This report alludes to proven validity and reliability through multiple assessments. These efforts were summarized as: "*Under the advisement of an outside panel of experts; After an extensive review of existing literature and assessment tools; Following several rounds of on-the-ground testing and*

refinement; With ongoing, comprehensive rounds of evaluation and monitoring by OrgCode; Through multiple independent, outside evaluations. (OrgCode, 2014)"

However, the only reference provided for the claim that the SPDAT is evidence-informed, "valid and reliable" (Djuricin, 2013) is a single manuscript listed as 'submitted for publication' (OrgCode, 2014). This manuscript appears to have never been published and did not show up through a systematic literature review performed, nor on internet browser searches. However, there is an additional allusion to a 2013 independent examination of inter-rater reliability of the SPDAT, using four raters and "involving 469 different subjects" (OrgCode, 2014). This analysis found, "*The interclass correlation for single measures was 0.8748, and the average measure was 0.9673. The confidence interval for single measures was 0.9551, and the average confidence interval measure was 0.9901* (OrgCode, 2014)."

Vulnerability Index (VI)

Common Ground and Community Solutions, a housing provider and an advocacy non-profit in New York developed the Vulnerability Index and included it as a housing prioritization measure at the center of the "100,000 Homes" campaign (Linton & Schaffer, 2014; Kanis, 2008). The 100,000 Homes campaign ran between July of 2010 and July 2014 as a coordinated effort across communities to aggressively house individuals in PSH based on prioritization using the VI measure. The Vulnerability Index is a 35 item tool for creating a rank-order {range = 0-8} of 'health fragility' or vulnerability within the population of individuals experiencing homelessness (Kanis, 2008). It is explicitly recommended that those with the highest counts of cumulative risk factors and longest durations of homelessness be prioritized for housing and other supports (Kanis, 2008). Common Ground produced a short

summary of the purpose and intended use of the VI to go along with the assessment tool itself, which describes the eight elements included in construction of the score:

> *"1) more than three hospitalizations or emergency room visits in a year; 2) more than three emergency room visits in the previous three months; 3) aged 60 or older; 4) cirrhosis of the liver; 5) end-stage renal disease; 6) history of frostbite, immersion foot, or hypothermia; 7) HIV+/AIDS; and, 8) tri-morbidity: co-occurring psychiatric, substance abuse, and chronic medical condition. In Boston, 40% of those with these conditions died prematurely, underscoring the need for housing and appropriate support for this group"* (Kanis, 2008).

Community Solutions often reports in their materials that the Vulnerability Index was based on the work from the Boston Health Care for the Homeless Program on causes of mortality and risk-factors for premature death (Hwang et al., 1998; O'Connell et al., 2005; Kanis, 2008) and that the tool is "rooted in solid scientific research" (Kanis, 2008). It is conjectured that the source of the 40% statistic reported in the VI publication is from a section of O'Connell's review of premature mortality focusing on analysis of a report from the Office of the Fulton County (Atlanta, GA) Medical Examiner (O'Connell et al., 2005). That analysis showed that of 40 deaths reported, 16 (40%) were attributed to "Natural causes" consisting of disease or the normal aging process, including: chronic alcohol abuse, seizures, heart disease, and lung disease (O'Connell et al., 2005). The other 24 (60%) were due to "External causes" such as injury, drug ingestion, unintentional accidents, or intentional deaths (O'Connell et al., 2005). This particular analysis did not have a control or comparison group; nor did it incorporate time or prematurity of mortality cases (O'Connell et al., 2005).

Largely as a result of its inclusion in the 100,000 Homes campaign, the VI is the tool most thoroughly evaluated by third party investigators. One independent, academic evaluation of the VIs collected in Fort Worth, Texas summarized issues brought forward by the provider community and the process, including application of Delphi technique, to develop a community-specific assessment tool to replace the VI (Spence-Almaguer et al., 2013). The Urban Institute produced a formal program evaluation report of the 100,000 Homes campaign in 2015, which included a brief review of the impact of the VI and VI-SPDAT on that initiative. The Institute's qualitative work with campaign stakeholders showed evidence that the standardization and ordinal score provided by these tools helped case managers avoid decision-paralysis about who was "deserving" of housing assistance (Leopold & Ho, 2015). They also reported that the VI had not been independently tested for test-retest reliability or validity, and that some stakeholders reported concerns about both under-reporting and over-reporting of conditions (Leopold & Ho, 2015). The intent and design of the VI as a measure of need and risk instead of evaluation for appropriate level of housing intervention was highlighted (Leopold & Ho, 2015). The report also framed the subsequent creation of the VI-SPDAT as an effort to incorporate this missing element (Leopold & Ho, 2015).

Vulnerability Index – Service Prioritization and Decision Assistance Tool (VI-SPDAT)

According to the instruction manual for the first version of the tool, the VI-SPDAT is "a pre-screening, or triage tool that is designed to be used by all providers within a community to quickly assess the health and social needs of homeless persons and match them with the most appropriate support and housing interventions that are available" (Community

Solutions & OrgCode, 2014). The tool is intended to prioritize the allocation of a limited supply of resources in the face of overwhelming demand. It is used to prioritize the 'most vulnerable' into the appropriate level of housing service and then prioritize the highest score within each range (0-3: no intervention, 4-7: rapid rehousing, 8-20: permanent supportive housing; Community Solutions & OrgCode, 2014). It is worth noting that OrgCode does not actually recommend using the VI-SPDAT in isolation but as a 'prescreen triage' tool in combination with the full (longer and more detailed) SPDAT for determining service prioritization (OrgCode, 2014; OrgCode, 2015). However, as of 2015, more than 600 communities, including Los Angeles, Washington DC, and Austin, were using the VI-SPDAT for their prioritization and housing intervention assignment steps in their CA systems (Leopold & Ho, 2015). There have also been a few independent publications providing summaries of community findings using the VI-SPDAT (BRHPC, 2015; Fritsch et al., 2017).

While some evidence has been released by OrgCode in support of the SPDAT, neither the VI, nor the VI-SPDAT have been quantitatively evaluated by OrgCode. Third party research presentations have previously confirmed this lack of psychometric testing on the VI and VI-SPDAT (Spence-Almaguer et al., 2013). Documents produced by OrgCode have described evaluations of the VI-SPDAT conducted prior to release of the first version, stating "*The VI-SPDAT was tested with various homeless populations in California, Louisiana, Michigan, and Alberta in the spring of 2013. Feedback from these sessions helped further refine the content, language, and sequence of questions*" (OrgCode, 2014). The document summarizing a release of SPDAT and VI-SPDAT data in 2015 acknowledges that

the use of the VI-SPDAT was limited in their evaluation of the SPDAT, summarizing the findings as follows:

> "*While the VI-SPDAT came into service less than two years ago, there are a good number of entries that had both the VI-SPDAT and the full SPDAT completed, and the VI-SPDAT seems to strongly compare to the full SPDAT acuity. While this does not mean a community should trust the VI-SPDAT to do everything that the SPDAT does, it is a strong indicator of overall acuity*" (OrgCode, 2015).

There was no documentation or quantification in support of either the correlation between the VI-SPDAT and full SPDAT acuity scores or the strength of its ability to indicate 'overall acuity' (OrgCode, 2015). The manual for version 2 of the VI-SPDAT included the rationale for updating the tool, which included 3 letters from independent faculty researchers with backgrounds in survey design giving their qualitative opinions on the tool, but no quantitative results from testing the VI-SPDAT (OrgCode & Community Solutions, 2015-1; OrgCode & Community Solutions, 2015-2).

A qualitative assessment of the VI-SPDAT tool and its implementation in Minneapolis was reported by a graduate student project, which made recommendations to incorporate local priorities through focus groups and local quantitative testing of any prioritization tool (Fritsch et al, 2017). According to the Urban Institute evaluation of the 100,000 Homes campaign, in regard to the VI-SPDAT: "*The tool helps identify the best type of support and housing intervention for an individual, including Permanent Supportive Housing, Rapid Re-Housing, and Affordable Housing, based on a scoring algorithm that*

combines housing history, health risks, socialization and daily functioning, and wellbeing" (Leopold & Ho, 2015). Again, there was no documentation or quantification in support of whether the VI-SPDAT was able to predict the 'best type of support and housing intervention for an individual' (Leopold & Ho, 2015).

In summary, the aim of the 'full' SPDAT is to assign a recommendation of housing intervention type, and shows some evidence that implementation could improve positive-exit outcomes from housing. The Vulnerability Index is constructed to predict early mortality, in theory. The VI-SPDAT has been referenced in the context of doing either or both of the above, but with minimal evaluation supporting either application.

Systematic Literature Review

Beyond the evidence presented by OrgCode in support and justification of the design of the SPDAT or VI-SPDAT, it is possible that research is already being done either using or validating the VI-SPDAT. To identify if any peer-reviewed literature has been published outside of the materials promoted by VI-SPDAT developers, a systematic literature review of four databases (Academic Search Complete, Medline, PsycInfo, & Information Science & Technology Abstracts (ISTA)) was performed. Three of these databases were searched using the EbscoHost service, available through UT Austin Library Services. The Medline database was searched using both the EbscoHost and Pubmed search engines. Supplemental searches were performed with these terms in Google Scholar and Google search engine in support of the background review above. Use of the keyword "Coordinated Assessment" yielded too many results (2675 in Pubmed), with no relevance identified to the topic of interest, and when used in combination with "homeless" or "HUD" yielded zero results in all four

databases. Multiple other keywords including, “SPDAT”, “VI-SPDAT”, and “Service Prioritization Decision Assistance” resulted in zero results from all databases. After multiple trials of negative keyword searches, two sets of keywords were identified: 1) "Vulnerability Index" and "homeless", and 2) {“homeless” or “HUD”} and “Coordinated Entry”. The abstracts for all articles returned in each search were reviewed for topic and relevance to the constructs of interest. Any articles that addressed homeless populations and their health, service utilization, or housing were documented as relevant and full texts were downloaded. Of these, the full text of each article was reviewed for any mention of the VI, SPDAT, or VI-SPDAT as well (Table 1).

Table 1: Systematic Review of Literature, 3 sets of key words in 4 databases

Search ID	**Search Engine**	**Database**	**Keywords**	**# articles for screen**	**# articles w/ partial relevance**	**# articles with VI, SPDAT, or VI-SPDAT mentioned**
1	EbscoHost	PsychInfo	"Vulnerability Index" and "homeless"	2	0	0
2	EbscoHost	ISTA	"Vulnerability Index" and "homeless"	0	0	0
3	EbscoHost	Academic Search Complete	"Vulnerability Index" and "homeless"	67	6^	2
4	EbscoHost	Medline	"Vulnerability Index" and "homeless"	2	2*^	1*
5	Pubmed	Medline	"Vulnerability Index" and "homeless"	6	3*^	1*
6	EbscoHost	PsychInfo	{“homeless” or “HUD”} and “Coordinated Entry”	0	0	0
7	EbscoHost	ISTA	{“homeless” or “HUD”} and “Coordinated Entry”	0	0	0

8	EbscoHost	Academic Search Complete	{“homeless” or “HUD”} and “Coordinated Entry”	8	3	0
9	EbscoHost	Medline	{“homeless” or “HUD”} and “Coordinated Entry”	0	0	0
10	Pubmed	Medline	{“homeless” or “HUD”} and “Coordinated Entry”	2	1	0
***1 duplicate article in EbscoHost(Medline) & PubMed(Medline)**						
^1 duplicate of EbscoHost(Medline & Academic Search Complete) & Pubmed(Medline)						

Research Evaluating or using the VI, SPDAT, or VI-SPDAT

An external validation of the Vulnerability Index’s ability to predict the true rate of hospital encounters was performed on the assessments collected throughout 2008, prior to the 100,000 Homes campaign, in Fort Worth, Texas (Cronley et al., 2013). Records of documented hospital encounter rates collected from a single, large hospital network in the community and compared to the self-reported, prior-year hospitalization rate at the time of assessment. Ninety-seven participants who were assessed by the VI and were subsequently housed in PSH, thus reflecting the highest range of scores on the VI identified during the 2008 assessment period. The ‘official’ hospitalization rate was calculated as the log transformation of the number of hospital encounters from January 1, 2008 to the date of their assessment, divided by the number of days in this same interval {0–0.017, mean= 0.001, sd= 0.003}. The self-reported hospitalization rate was calculated as the log transformation of the prior-year hospitalization rate reported on the VI, divided by the days between January 1, 2008 and the date of assessment {0–0.088, mean= 0.004, sd= 0.010}. The VI was captured as overall score {0–8} and 3 subcomponents: substance use (dichotomous: 78.5%), mental

health (dichotomous: 72.2%), and sum of reported health conditions (ordinal: {0-6}, mean= 1.81, sd= 1.39) (Cronley et al., 2013). Pairwise correlations showed that the overall VI score was significantly correlated with the a) official, documented hospitalization rate, b) self-reported hospitalization rate, and c) the sum of reported health conditions, which also constitute a majority of the points included in the overall VI (correlation coefficients = 0.23, 0.25, 0.34, respectively), but not the mental health or substance abuse components. In addition, the official hospitalization rate was correlated with the self-reported hospitalization rate significantly ($r = 0.40$, $p<0.01$). Multivariate analysis examined the association of the official hospitalization rate with: overall VI score (ordinal regression model) and the 3 subcomponent scores (linear or logistic regression models), adjusted for race/ethnicity and gender, and demonstrated a significant relationship between documented hospitalization rate and the overall VI score, but not for models of the subcomponents (Cronley et al., 2013).

During October and December of 2013, the City of Calgary also collected the VI in a targeted health assessment of the downtown homeless population (N=137). The study found higher rates of liver disease, kidney disease, and frostbite than in five other VI samples from elsewhere in North America. Although females are under-represented in the homeless population, they reported higher rates of multiple health conditions (Nicholson et al., 2010). Comparing their sample of VI assessments to the national Canadian health registry (CCHS), the study found that individuals experiencing homelessness reported higher rates of kidney disease, asthma, emphysema, and cancer than their national population and the national population with incomes less than $15,000 per year (all $p<0.001$) (Nicholson et al., 2010).

Another study of the relationship of vulnerability risk factors to rates of health service utilization in Phoenix, Arizona, divided the 35 items within the VI based on a superimposed behavioral model to create four domains: predisposing, need, enabling, and outcome factors. Predisposing factors included demographics, education, veteran status, and involvement with the criminal justice or foster care systems. Enabling factors included measures of health insurance, financial assistance, and contact with a trusted outreach worker. Need was defined by reported physical illnesses, mental health conditions, and substance abuse. Outcomes fit into three categories of hospitalization, mental health, and substance abuse treatment service utilization (Linton & Shafer, 2014). In Phoenix, heat stroke (28.4%) and hepatitis C (16.7%) were the highest prevalence diseases; 73.6% of respondents self-reported substance use problems; 33.8% reported mental health issues (Linton & Shafer, 2014). Regression models showed that each domain of factors was in some way tied to each of the three service utilization categories, but health insurance was the only item that was significantly associated with all three service types. Older participants and those reporting either a physical, mental, or substance use illness were all more likely to access mental health services, and those with a high school education or better, history of interaction with the criminal justice system, or report a substance use disorder were all more likely to have accessed substance use disorder treatment services (all $p<0.5$) (Linton & Shafer, 2014).

In addition to the studies identified through systematic review of the literature, a study was published in July of 2018 that reported reliability and validity analyses of the VI-SPDAT tool using 1495 assessments collected from a Midwestern CoC from 2014 to 2016

(Brown et al., 2018). Specifically the authors took steps to investigate the inter-rater and test-retest reliability, the construct validity, and the predictive validity of the measure.

In order to account for the time delay between repeated assessments, the attempted test-retest analysis was restricted to three time intervals (2 weeks, 1 month, 3 months) with increasing numbers of cases eligible for inclusion (Brown et al., 2018). Reliability coefficients fell below their a priori cutoff of 0.7 for all three timeframes (Brown et al., 2018). Inter-rater reliability correlation measures of the 4 interviewer-directed questions in the VI-SPDAT (respectively: observation of 20) poor hygiene and daily living skills, 34) serious health condition, 41) alcohol or drug abuse, and 48) mental health conditions) also performed poorly. Cohen's kappa statistics were all less than 0.4 for all 4 questions when restricted to any of the three time intervals (Brown et al., 2018).

The authors also tested the construct validity of the tool using Confirmatory Factor Analysis (CFA) to assess the fit of the measure's domains. The CFA tested the fit of a single factor model and a second, hierarchical model with a single top-level factor joining 4 latent domains similar to the 4 areas explicitly identified by the VI-SPDAT (Brown et al., 2018). The 2nd model used the domains of the measure excluding the "History of Homelessness" (2 items), retaining the "Risks" (11 items) and "Socialization and Daily Functions" (7 items) sections, and splitting the Wellness section into two factors, "Wellness-Health" (14 items) and "Wellness-Substance Use and Mental Health" (16 items). Neither model demonstrated adequate fit (single factor: RMSEA=0.067, CFI=0.786, SRMR=0.127; 4 factor-hierarchical model: RMSEA=0.063, CFI=0.816, SRMR=0.122) and several factor loadings in either

model were below the standard threshold of 0.3 suggesting a poor match with the latent factors to which they were assigned (Brown et al., 2018).

The predictive validity of the tool was used by measuring the association between score on the VI-SPDAT and re-entry into homelessness (Brown et al., 2018). The score itself was not predictive of re-entry outcome (HR=1.09, p=0.07), and both the type of housing (RRH, PSH) and the availability of permanent housing subsidy were better predictors of return to homelessness than the initial prioritization score (Brown et al., 2018).

Housing is intended to improve the health and wellness of individuals receiving such services, among other benefits. Recognizing this, communities across the country are agreeing to prioritize housing based on standardized assessment of health needs in those seeking services. However, the assessments currently in popular use are not thoroughly researched. Additionally, the effects of this new paradigm of prioritization based on vulnerability are not well understood. There is a need for a comprehensive evaluation of the measurement characteristics of the assessments such as the VI-SPDAT being used in this fashion. Such evaluation would necessarily examine the reliability, criterion validity, factor groupings within the measure, and the ability to meaningfully differentiate levels of vulnerability. Additionally, the rich data that results from use of such surveys are often overlooked. An evaluation of the individual vulnerability items themselves is a much needed step toward determining what effect such prioritization systems are having on the way communities provide housing services.

Specific Aims

The objectives of this proposal are to gain insight into the strengths and limitations of the VI-SPDAT as a measurement tool as it is being used in Austin and to study the characteristics of the data collected through the Coordinated Assessment process. The specific aims of this investigation are:

1) To quantify the psychometric characteristics of the VI-SPDAT measure, by testing for internal consistency and internal factor groupings;
2) To study the criterion validity of the VI-SPDAT, by calculating the sensitivity and specificity of the comparable self-report measures on two sources of health information in the same community; and
3) To calculate bi-variate and multivariate associations related to homelessness and health within the VI-SPDAT with demographics and exposure to homelessness (3a); the items that best predict overall score on the tool (3b); and the associations with placement in housing programs (3c);

as collected in Travis County, Texas from 2014-2017, by the local CoC agencies.

METHODS

Study Design

This study examined the patterns and correlates within a programmatic assessment tool being used by homeless services and housing programs in Travis County. This proposed study was a descriptive analysis using a retrospective cohort of the individuals who agreed to participate in the CA using the VI-SPDAT for health vulnerability and service eligibility assessment. The VI-SPDAT is used to determine prioritization in the waiting list for social services clients seeking Rapid Re-Housing (RRH) or Permanent Supportive Housing (PSH). The final score from the assessment provides a recommendation on the appropriate level of housing and then facilitates the referral of the client to any agency in the system. The VI-SPDAT does not determine program eligibility.

Study Setting

The Central Texas non-profit, Ending Community Homelessness Coalition (ECHO), serves as the local HUD CoC coordinating agency by managing federally-budgeted funds for the housing, emergency shelter, and other homelessness service agencies of Travis County. All members of the CoC for Travis County (see Table 2 for sites collecting assessments) are required to participate in a Coordinated Assessment (CA) which incorporates a vulnerability assessment (VI) and community prioritization (SPDAT) review.

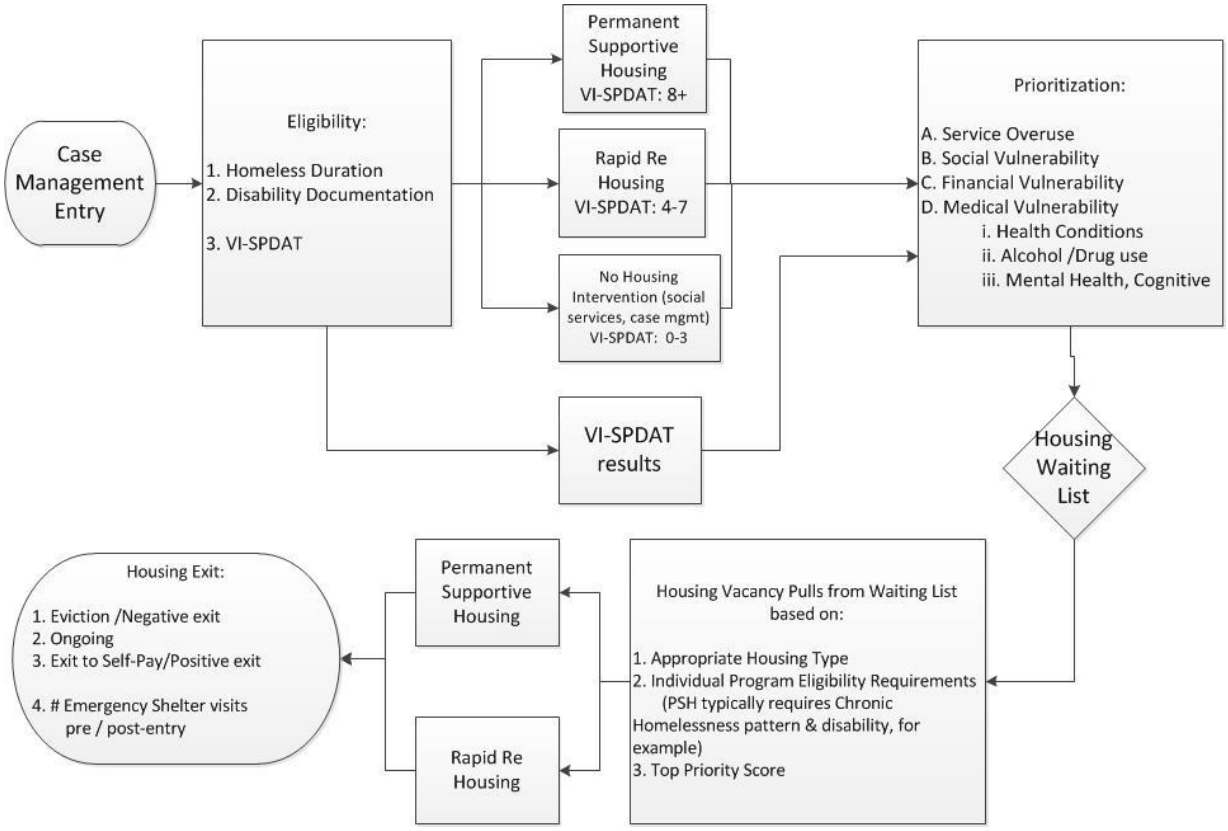
Table 2: Sites Collecting Coordinated Assessments during study period

Sites
Ending Community Homelessness (via telephone)
Ending Community Homelessness (via staff outreach)

Front Steps (ARCH)
Caritas
Salvation Army
Austin Public Library System
ATC Integral Care "PATH" program
ATC EMS Community Health Paramedics

The VI-SPDAT is currently used by ECHO to prioritize those who demonstrate greater vulnerability of health and wellbeing and therefore who should be prioritized in receiving housing services. The original measure's items (version 1) included subject demographics and fifty questions. Items on the tool cover participants' demographics, homelessness history, medical history including injury and trauma, risk behaviors, victimization, socioeconomic conditions, and community service utilization levels (see Appendix A: Table 9 for questions; see Table 12 for scoring procedure). The assessment is used to identify the type of housing for which an individual is best suited and rank the participant pool within each housing intervention category based on their assessment score (See Figure 1). ECHO has completed a Data Use Agreement with Seton Healthcare under a research protocol to assess the dynamics of the VI-SPDAT measure and validate it using electronic medical records.

Figure 1: Coordinated Assessment Workflow



Study Subjects

The proposed research involves a dataset of 4,739 unique assessment participants (5,594 total assessments) experiencing homelessness and seeking housing support services in Travis County, from approximately August 2014 through January 2017, when the first version of the VI-SPDAT was implemented. Although there is available data on an updated 2nd version of the VI-SPDAT, this analysis will be restricted to the period of time when version 1 of the measure was in use. In order to be included in this analysis, eligible subjects must necessarily have completed at least one CA in the Homeless Management Information System (HMIS) of the Travis County CoC. The full analysis was further restricted to those

individuals who signed a Release of Information (ROI) within the HMIS system and accepted the optional, general release for evaluation and research. Additionally, subjects will be restricted to those of age greater than or equal to 18 years and less than 90 years in order to avoid inclusion of vulnerable populations. However, this last inclusion criterion did not exclude any otherwise eligible individuals in the HMIS system.

Sample Size Calculation and/or Study Power

The Integrated Care Collaborative's (ICC) Health Information Exchange (HIE) report produced 274,670 diagnoses, coded from 50,769 encounters, which were associated with 4,477 individuals with records in the HMIS system. Of these, 3,240 individual's records were linked to the Coordinated Assessment data and used to test criterion validity of the medical history items on the VI-SPDAT. Approximately half of these (n=1,754) were found to have healthcare visits in the 6 months prior to first assessment. Visit counts were calculated for these cases in order to validate the self-reported 6-month hospitalization and emergency department utilization rates on the measure.

Seton clinical records (EMR) were abstracted for measure validation on a random sample of up to 1.5% (~75) of unique subjects who were found to have records in the Compass database [Seton Healthcare sites: Dell Seton Medical Center at UT (DSMC), Dell Children's Medical Center (DCMC), Seton Medical Center Austin (SMCA), Seton Northwest Hospital (SNW), Seton Southwest Hospital (SSW), Seton Medical Center Williamson (SMCW), Seton Medical Center Hays (SMCH), Seton Highland Lakes (SHL), and Seton Edgar B Davis (SEBD)].

There are a wide range of approaches to calculating and reporting sample size estimation for validation of self-reported scales (Anthoine et al., 2014). For this study, a post hoc analysis of power was performed following the calculation of the criterion validation statistics and again following the regression analyses and final model selection proposed in Aim 3. Risks of type one error from multiple testing were reported as the False Discovery Rate (FDR) and probability of at least one false positive test or Familywise Error Rate (FWER).

Criterion validation using the HIE involved thirty one odds ratios generated and tested for statistical significance. The number of expected false-positives (FDR) for this set of tests is 1.6 and the probability of a false positive in that table is 79.6%. The available sample (n=3,240) provided over 80% power to sufficiently measure an effect size of OR = 1.24 (assuming prevalence in controls at 11% (average); α=0.05).

The criterion validation of the EMR had a much smaller sample (n=72) and involved thirty three odds ratios tested for statistical significance. The FDR for this was 1.7 and the probability of at least one false positive in that table is 81.6%. The available sample provided over 80% power to sufficiently measure an effect size of at least OR = 4.84 (assuming prevalence in controls at 5% (average); α=0.05).

The FDR and FWER are calculated within each table generated in Aim 3. The sample of all first assessments used in Aim 3 (n=4,739) provided over 80% power to sufficiently measure an effect size of OR = 1.30 (assuming sample evenly divided; prevalence in controls at 10% (average for Table 11); α=0.05).

Data Collection

Data collected by agencies across the CoC is captured by a HUD-mandated system known as the Homeless Management Information System (HMIS). Clients are asked to complete a Release of Information (ROI) form which includes an additional, optional authorization to use the information collected by all agencies across the CoC for evaluation of services and research purposes. These are completed at each initial visit with an agency in the CoC network and at annual intervals afterward. This measure has been collected since approximately August of 2014 with over 4,739 unique individuals (5,594 total assessments) completing at least one assessment {frequency range: 1-6} (see Tables 3 and 4).

Table 3: Number of subjects with exactly k assessments

k (#)	n (# subjects taking exactly k assessments)
# taken 1	4,026
# taken 2	589
# taken 3	110
# taken 4	11
# taken 5	2
# taken 6	1
Total (unique)	4,739

Table 4: Number of subjects with at least k assessments

k (#)	n (# with at least k assessments)
at least 1	4,739
at least 2	713
at least 3	124
at least 4	14
at least 5	3
at least 6	1
Total assessments	5,594

Only identifiers from those signing the ROI were shared with the Principal Investigator and research team. De-identified descriptive data were reported on those participants who completed the CA but did not agree to or sign the optional ROI in order to assess for potential selection bias or confounding. Variables provided by the HMIS social services database for the full sample agreeing to the terms of the ROI included:

- Name,
- Date of Birth (DOB),

- Social Security Number (SSN),
- Date of Coordinated Assessment (CA) performed,
- all CA fields:
    - Demographics,
    - VI-SPDAT (standardized tool),
    - Housing intervention recommendation (PSH, RRH, minimal),
- RRH or PSH placement date,
- Agency providing RRH or PSH,
- Duration of RRH or PSH visit until exit (in days, or just date of exit) OR placement ongoing (1/0).

Chart Review Data Collection (Aim 2)

Each identified patient in the sampling frame was assigned a unique pre-formatted study identification number in place of their service identifier provided by the HMIS system (encounter identifier), name, SSN, and DOB. Repeated CA entries were encoded with the same identification numbers at each entry and the order and date of each measure was documented. Before this, these personal identifiers were required for and were used to link the social service database record to the corresponding medical record data in the Seton Healthcare Family's Electronic Medical Record (EMR) and the Integrated Care Collaborative's (ICC) iCare Health Information Exchange (HIE) system. Only the criterion validation data related to the first CA was abstracted and this step in the analysis was restricted to first time assessments (n=4,739).

Data collection from the EMR was performed by the PI or trained research personnel using a standardized electronic data collection form (Appendix A: DCF) using systematic and standardized procedures for medical chart review. The data collected by chart review involved measures that were used to confirm the presence or absence of individual items

reported in the VI-SPDAT. These were recorded side-by-side in order to compare medical record documentation with self-reported status of the various behavioral and medical health conditions.

Data collection from the HIE was performed through an automated report by ICC and ECHO staff (Appendix B: Agreement and Scope of Work with ICC) and involved measures of healthcare utilization (clinic and hospital) across the entire catchment area of the ICC. Since name and DOB were sometimes unreliably available (whether due to reporting or recording errors) in both of the systems being linked together, the SSN was a critical third identifier for this purpose. As soon as the records were matched and the charts were abstracted, the identifiers were replaced by the study identification number (see Protection of Human Subjects). The patient medical record number (personal identifier) and financial indicator number (encounter identifier) from the healthcare system were used for site data collection-purposes only and were removed prior to analysis in order to ensure patient confidentiality.

Data Analysis

Gender was initially coded into four distinct, nominal categories: 1) male, 2) female, 3) transgender female-to-male, 4) transgender male-to-female. For specific tests that required using a binary structure for gender (e.g., multiple group testing of CFA in Aim 1; initial difference testing in Aim 3) the transgender categories will be tested for difference in overall VI-SPDAT score from their self-identified gender using the Wilcoxon ranksum test. Significant differences in overall vulnerability would have resulted in excluding the transgender category from analysis. Alternatively, failure to reject the null would permit

transgender cases to be included with their self-identified gender for tests requiring binary gender structure.

The initial step was to assess the sample itself including measures of missing data patterns and differences between repeated measures (for the subset with multiple assessments).

Selection bias: De-identified data was provided for the HMIS clients who did not provide an ROI, including age, gender, race, ethnicity, and responses on the VI-SPDAT. Results of the demographics in the first-time assessments were compared to the data available for the limited dataset of subjects who did not provide a ROI in order to identify any differences between those individuals opting in to data-sharing and those who declined. The available variables from the non-ROI sample were summarized in both groups and tested for differences (either chi-squared tests for proportions or non-parametric tests for continuous variables).

Repeated Measures: The VI-SPDAT can be repeated as often as every 6 months if an individual is still homeless and seeking housing services. For those subjects with multiple assessments, repeated measures analysis of individual items, domain scores, and overall score were investigated for changes within the first interval (i.e. between 1st and 2nd assessments; n=713). Tests of normality using the Shapiro-Wilk test were performed on continuous or ordinal variables, such as overall scores. Direction and magnitude of changes were reported using tests for difference (non-parametric when appropriate) and correlation coefficients. These results were discussed in the context of disease progression, risk behavior patterns, and secondary gain or 'learning effects' by subjects indicated by outliers in score

elevation on this measure. The variations to which individual items changed in either direction were reported and those items that increase at higher rates relative to the others were discussed.

There was a subset of the individual items in the VI-SPDAT that were expected to demonstrate stability over repeated measures (race, ethnicity, gender, veteran status, and to a lesser degree: health conditions, social, and financial measures of vulnerability, primary sleeping location and source of healthcare). A secondary step in this analysis focused on the level of agreement for these 'stable' variables relative to the others. Percent-agreement and kappa statistics for unique raters and multiple measurements were calculated for all measures in the VI-SPDAT.

Aim 1: To quantify the psychometric characteristics of the VI-SPDAT measure

Construct Domains: The domains built into the scoring of the VI-SPDAT are conceptually distinct, and the measure is explicitly broken up to include 4 sections (Figure 2, Table 5): History of Housing and Homelessness (q1-q2), Risks (q3-q13), Socialization and Daily Functions (q14-q20), and Wellness (q21-q50). However, the Wellness domain alone is worth half of the potential points awarded (10/20) in the VI-SPDAT final score (Community Solutions & OrgCode, 2014). This unbalanced set of domains explicitly encoded into the measure was augmented with two additional sets of 'a priori' domains prior to analysis, established by application of the 'Behavioral Model of Vulnerable Populations' (Small, 2010; Linton & Shafer, 2014) (Figure 3, Table 6) parsing items into the 4 domains: Predisposing, Need, Enabling, and Outcome factors; and a third conceptual framework (Figure 4, Table 7) which sorts the 41 dichotomous items in version 1 of the measure into 5

groups: Social Vulnerability, Financial Vulnerability, Health Conditions, Alcohol/Drugs, and Mental Wellness (including Mental Health, Cognitive, and Developmental Disabilities).

Figure 2: Explicit Domains in the VI-SPDAT (Model 1)

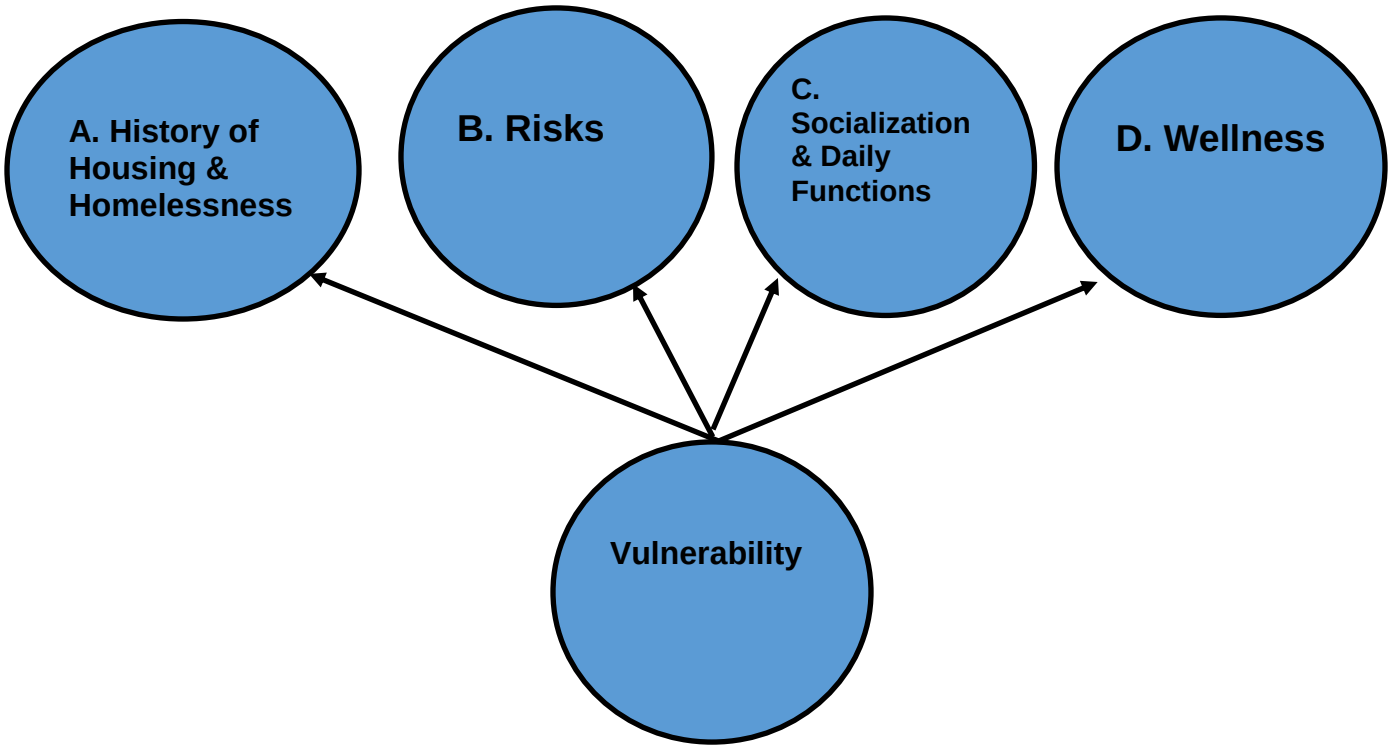


Table 5: Explicit Domains in the VI-SPDAT (Model 1)

List of Items on VI-SPDAT by Domain
A. History of Housing and Homelessness
1. What is the total length of time you have lived on the streets or shelters?
2. In the past three years, how many times have you been housed and then homeless again?
B. Risks
3. In the past six months, how many times have you been to the emergency department/room?
4. In the past six months, how many times have you had an interaction with the police?
5. In the past six months, how many times have you been taken to the hospital in an ambulance?

6. In the past six months, how many times have you used a crisis service, including distress centers and suicide prevention hotlines?
7. In the past six months, how many times have you been hospitalized as an in-patient, including hospitalizations in a mental health hospital?
8. Have you been attacked or beaten up since becoming homeless?
9. Threatened to or tried to harm yourself or anyone else in the last year?
10. Do you have any legal stuff going on right now that may result in you being locked up or having to pay fines?
11. Does anybody force or trick you to do things you do not want to do?
12. Ever do things that may be considered risky like exchange sex for money, run drugs for someone, have unprotected sex with someone you don't really know, share a needle, or anything like that?
13. I am going to read types of places people sleep. Please tell me which one that you sleep at most often

C. Socialization and Daily Functions

14. Is there anybody that thinks you owe them money?
15. Do you have any money coming in on a regular basis, like a job or government benefit or even working under the table, binning or bottle collecting, sex work, odd jobs, day labor, or anything like that?
16. Do you have enough money to meet all of your expenses on a monthly basis?
17. Do you have planned activities each day other than just surviving that bring you happiness and fulfillment?
18. Do you have any friends, family or other people in your life out of convenience or necessity, but you do not like their company?
19. Do any friends, family or other people in your life ever take your money, borrow cigarettes, use your drugs, drink your alcohol, or get you to do things you really don't want to do?
20. Surveyor, do you detect signs of poor hygiene or daily living skills?

D. Wellness

21. Where do you usually go for healthcare or when you're not feeling well?
22. Kidney disease/End Stage Renal Disease or Dialysis
23. History of frostbite, Hypothermia, or Immersion Foot
24. Liver disease, Cirrhosis, or End-Stage Liver Disease
25. HIV+/AIDS
26. History of Heat Stroke/Heat Exhaustion
27. Heart disease, Arrhythmia, or Irregular Heartbeat
28. Emphysema
29. Diabetes
30. Asthma
31. Cancer
32. Hepatitis
33. Tuberculosis
34. Surveyor, do you observe signs or symptoms of a serious health condition?
35. Have you ever had problematic drug or alcohol use, abused drugs or alcohol, or told you do?
36. Have you consumed alcohol and/or drugs almost every day or every day for the past month?
37. Have you ever used injection drugs or shots in the last six months?
38. Have you ever been treated for drug or alcohol problems and returned to drinking or using drugs?
39. Have you used non-beverage alcohol like cough syrup, mouthwash, rubbing alcohol, cooking wine, or anything like that in the past six months?
40. Have you blacked out because of your alcohol or drug use in the past month?
41. Surveyor, do you observe signs or symptoms of problematic alcohol or drug use?
42. Ever been taken to a hospital against your will for a mental health reason?
43. Gone to the emergency room because you weren't feeling 100% well emotionally or because of your nerves?
44. Spoken with a psychiatrist, psychologist or other mental health professional in the last six months because of your mental health - whether that was voluntary or because someone insisted that you do so?
45. Had a serious brain injury or head trauma?
46. Ever been told you have a learning disability or developmental disability?
47. Do you have any problems concentrating and/or remembering things?
48. Surveyor, do you detect signs or symptoms of severe, persistent mental illness or severely compromised cognitive functioning?

49. Have you had any medicines prescribed to you by a doctor that you do not take, sell, had stolen, misplaced, or where the prescription was never filled? 50. Yes or No - Have you experienced any emotional, physical, psychological, sexual or other type of abuse or trauma in your life which you have not sought help for, and/or which has caused your homelessness?

Figure 3: Conceptual framework of VI-SPDAT domains based on Behavioral Model of Vulnerable Populations (Model 2)

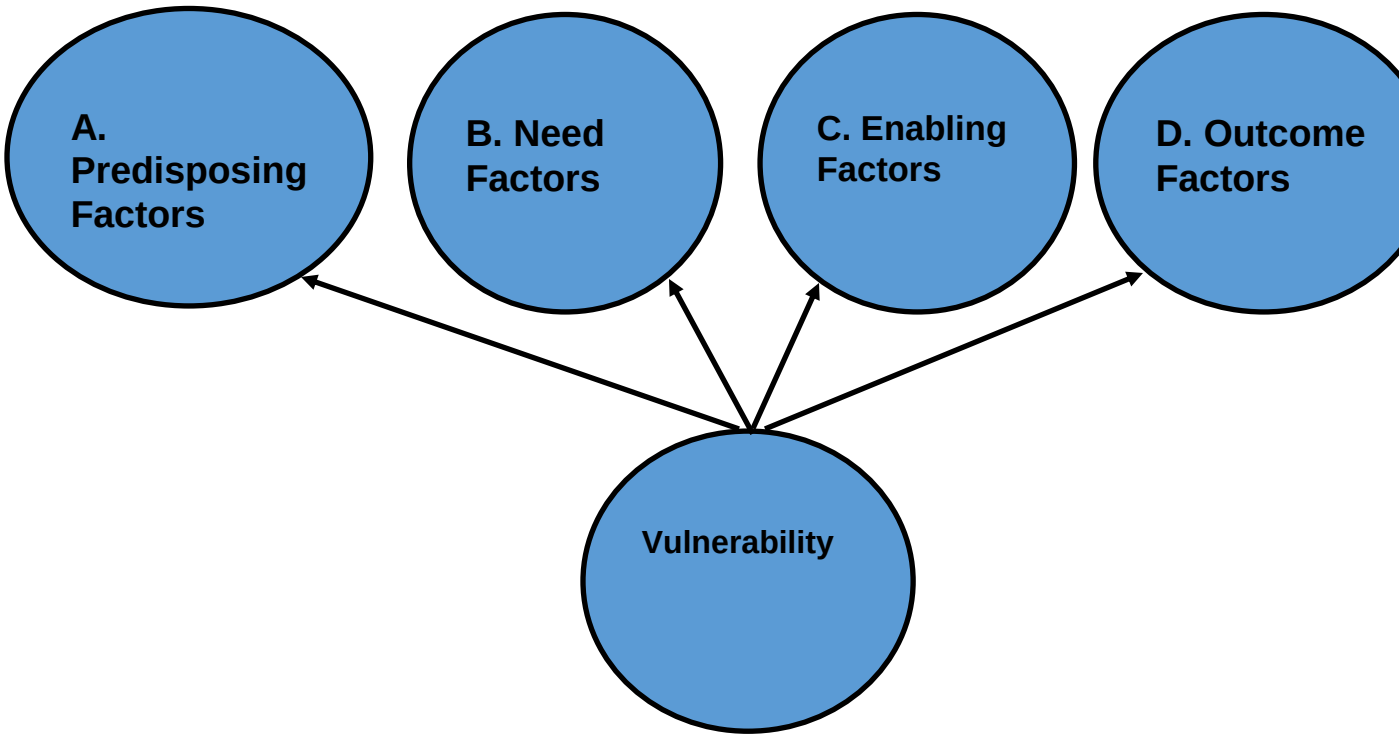


Table 6: Conceptual framework of VI-SPDAT domains based on Behavioral Model of Vulnerable Populations (Model 2)

List of Items on VI-SPDAT by Domain
A. Predisposing Factors
45. Had a serious brain injury or head trauma?
46. Ever been told you have a learning disability or developmental disability?
47. Do you have any problems concentrating and/or remembering things?

50. Yes or No - Have you experienced any emotional, physical, psychological, sexual or other type of abuse or trauma in your life which you have not sought help for, and/or which has caused your homelessness?

B. Need Factors

20. Surveyor, do you detect signs of poor hygiene or daily living skills?
22. Kidney disease/End Stage Renal Disease or Dialysis
23. History of frostbite, Hypothermia, or Immersion Foot
24. Liver disease, Cirrhosis, or End-Stage Liver Disease
25. HIV+/AIDS
26. History of Heat Stroke/Heat Exhaustion
27. Heart disease, Arrhythmia, or Irregular Heartbeat
28. Emphysema
29. Diabetes
30. Asthma
31. Cancer
32. Hepatitis
33. Tuberculosis
34. Surveyor, do you observe signs or symptoms of a serious health condition?
35. Have you ever had problematic drug or alcohol use, abused drugs or alcohol, or told you do?
36. Have you consumed alcohol and/or drugs almost every day or every day for the past month?
37. Have you ever used injection drugs or shots in the last six months?
38. Have you ever been treated for drug or alcohol problems and returned to drinking or using drugs?
39. Have you used non-beverage alcohol like cough syrup, mouthwash, rubbing alcohol, cooking wine, or anything like that in the past six months?
40. Have you blacked out because of your alcohol or drug use in the past month?
41. Surveyor, do you observe signs or symptoms of problematic alcohol or drug use?
42. Ever been taken to a hospital against your will for a mental health reason?
43. Gone to the emergency room because you weren't feeling 100% well emotionally or because of your nerves?
44. Spoken with a psychiatrist, psychologist or other mental health professional in the last six months because of your mental health - whether that was voluntary or because someone insisted that you do so?
48. Surveyor, do you detect signs or symptoms of severe, persistent mental illness or severely compromised cognitive functioning?

C. Enabling Factors

1. What is the total length of time you have lived on the streets or shelters?
2. In the past three years, how many times have you been housed and then homeless again?
8. Have you been attacked or beaten up since becoming homeless?
9. Threatened to or tried to harm yourself or anyone else in the last year?
10. Do you have any legal stuff going on right now that may result in you being locked up or having to pay fines?
11. Does anybody force or trick you to do things you do not want to do?
12. Ever do things that may be considered risky like exchange sex for money, run drugs for someone, have unprotected sex with someone you don't really know, share a needle, or anything like that?
13. I am going to read types of places people sleep. Please tell me which one that you sleep at most often
14. Is there anybody that thinks you owe them money?
15. Do you have any money coming in on a regular basis, like a job or government benefit or even working under the table, binning or bottle collecting, sex work, odd jobs, day labor, or anything like that?
16. Do you have enough money to meet all of your expenses on a monthly basis?
17. Do you have planned activities each day other than just surviving that bring you happiness and fulfillment?
18. Do you have any friends, family or other people in your life out of convenience or necessity, but you do not like their company?
19. Do any friends, family or other people in your life ever take your money, borrow cigarettes, use your drugs, drink your alcohol, or get you to do things you really don't want to do?
49. Have you had any medicines prescribed to you by a doctor that you do not take, sell, had stolen, misplaced, or where the prescription was never filled?

D. Outcome Factors
3. In the past six months, how many times have you been to the emergency department/room?
4. In the past six months, how many times have you had an interaction with the police?
5. In the past six months, how many times have you been taken to the hospital in an ambulance?
6. In the past six months, how many times have you used a crisis service, including distress centers and suicide prevention hotlines?
7. In the past six months, how many times have you been hospitalized as an in-patient, including hospitalizations in a mental health hospital?
21. Where do you usually go for healthcare or when you're not feeling well?

Figure 4: Conceptual framework of the VI-SPDAT domains for factor analysis (Model 3)

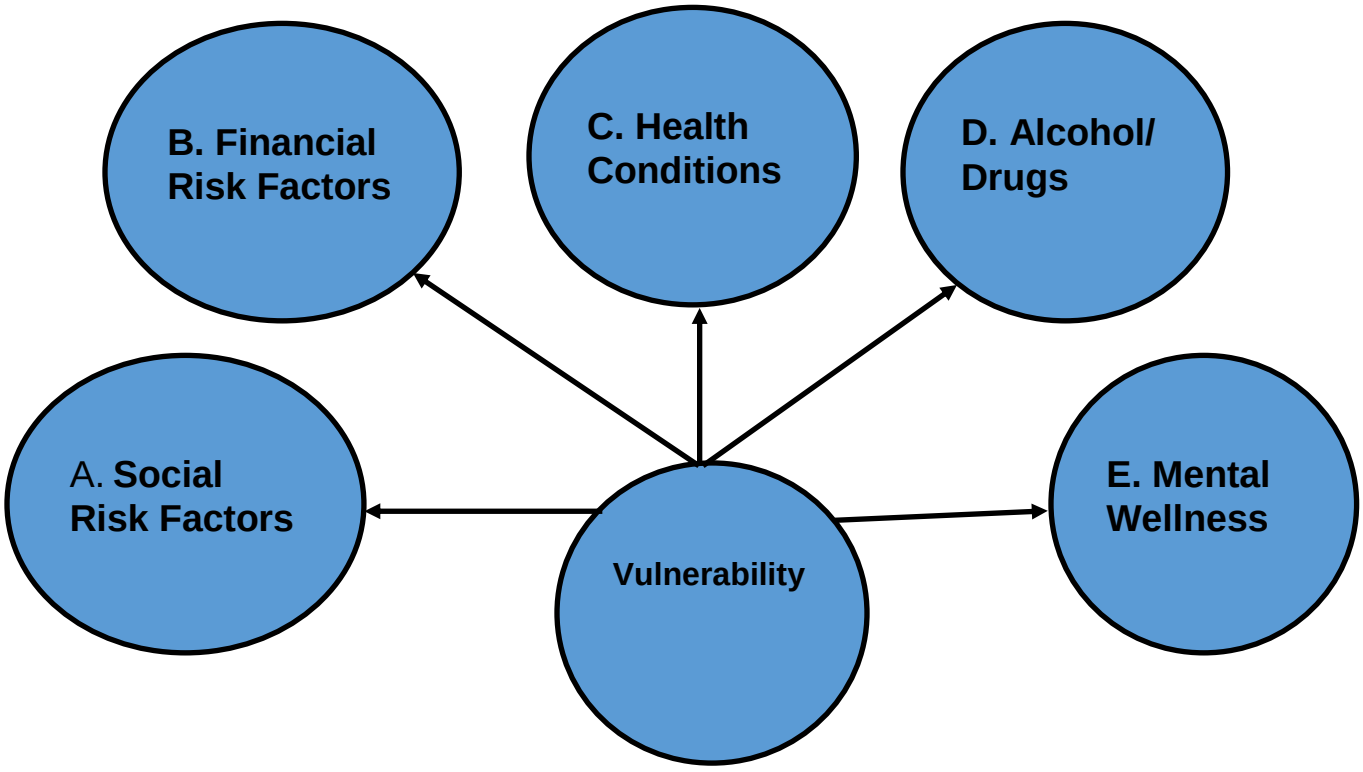


Table 7: Conceptual framework of the VI-SPDAT domains for factor analysis (Model 3)

List of Items on VI-SPDAT by Domain
A. Social Vulnerability

8. Have you been attacked or beaten up since becoming homeless?
9. Threatened to or tried to harm yourself or anyone else in the last year?
10. Do you have any legal stuff going on right now that may result in you being locked up or having to pay fines?
11. Does anybody force or trick you to do things you do not want to do?
12. Ever do things that may be considered risky like exchange sex for money, run drugs for someone, have unprotected sex with someone you don't really know, share a needle, or anything like that?
17. Do you have planned activities each day other than just surviving that bring you happiness and fulfillment?

B. Financial Vulnerability

14. Is there anybody that thinks you owe them money?
15. Do you have any money coming in on a regular basis, like a job or government benefit or even working under the table, binning or bottle collecting, sex work, odd jobs, day labor, or anything like that?
16. Do you have enough money to meet all of your expenses on a monthly basis?
18. Do you have any friends, family or other people in your life out of convenience or necessity, but you do not like their company?
19. Do any friends, family or other people in your life ever take your money, borrow cigarettes, use your drugs, drink your alcohol, or get you to do things you really don't want to do?
20. Surveyor, do you detect signs of poor hygiene or daily living skills?

C. Health Conditions

22. Kidney disease/End Stage Renal Disease or Dialysis
23. History of frostbite, Hypothermia, or Immersion Foot
24. Liver disease, Cirrhosis, or End-Stage Liver Disease
25. HIV+/AIDS
26. History of Heat Stroke/Heat Exhaustion
27. Heart disease, Arrhythmia, or Irregular Heartbeat
28. Emphysema
29. Diabetes
30. Asthma
31. Cancer
32. Hepatitis
33. Tuberculosis
34. Surveyor, do you observe signs or symptoms of a serious health condition?

D. Alcohol / Drugs

35. Have you ever had problematic drug or alcohol use, abused drugs or alcohol, or told you do?
36. Have you consumed alcohol and/or drugs almost every day or every day for the past month?
37. Have you ever used injection drugs or shots in the last six months?
38. Have you ever been treated for drug or alcohol problems and returned to drinking or using drugs?
39. Have you used non-beverage alcohol like cough syrup, mouthwash, rubbing alcohol, cooking wine, or anything like that in the past six months?
40. Have you blacked out because of your alcohol or drug use in the past month?
41. Surveyor, do you observe signs or symptoms of problematic alcohol or drug use?

E. Mental Wellness

42. Ever been taken to a hospital against your will for a mental health reason?
43. Gone to the emergency room because you weren't feeling 100% well emotionally or because of your nerves?
44. Spoken with a psychiatrist, psychologist or other mental health professional in the last six months because of your mental health - whether that was voluntary or because someone insisted that you do so?
48. Surveyor, do you detect signs or symptoms of severe, persistent mental illness or severely compromised cognitive functioning?
49. Have you had any medicines prescribed to you by a doctor that you do not take, sell, had stolen, misplaced, or where the prescription was never filled?

50. Yes or No - Have you experienced any emotional, physical, psychological, sexual or other type of abuse or trauma in your life which you have not sought help for, and/or which has caused your homelessness?

Internal consistency: Cronbach's alpha statistics were calculated for the entire set of first-time assessments using the VI-SPDAT (n= 4,739), across the entire tool as well as within the four domains into which the tool is explicitly divided, other than demographics (Tables 5 & 9; History of Housing and Homelessness, Risks, Socialization and Daily Functions, and Wellness).

Confirmatory Factor Analysis: This process systematically compared the three models adopted from theoretical constructs by assessing the quality of each models' goodness of fit. It was hypothesized that there are dimensions representing latent constructs grouped by either: a) the explicit VI-SPDAT domains (Figure 2, Table 5), b) domains assigned according to the Behavioral Framework for Vulnerable Populations (Figure 3, Table 6), c) domains from the *a priori* conceptual framework of dichotomous variables (Figure 4, Table 7), or d) an amended model based on modifications made to one of the previous three.

These three models were applied to the data (1^{st} time assessments, n=4,739) using confirmatory factor analysis, and the resulting goodness of fit statistics and modification indices. The models and their goodness of fit were compared and contrasted and reported accordingly. Modification indices were reported for the model with best fit and the improvements in fit from adopting such modifications were reported.

The optimal factor model was checked for variation between gender, ethnicity, race (White vs other), homelessness duration ($<$ or $\geq$ 1 year), and chronic homelessness categories

for consistency. Using dichotomous values for each group variable at a time, multiple group models were used to test and generate summary reports of 1) "weak invariance" between groups by reporting significance-testing of random slopes and 2) intercepts of the structural equation model; 3) significant differences in factor correlations between groups; and 4) significant differences in error correlations for each factor between groups.

Aim 2: To study the criterion validity of the VI-SPDAT

Specific elements of the VI-SPDAT overlap with information that is collected during interactions with the healthcare system. These individual items available from multiple sources were compared in an attempt to characterize the criterion validity of the self-reported values. Those elements from the first-time assessments of the VI-SPDAT (n=4,739) which can be abstracted from clinical electronic medical charts (Appendix B for EMR abstraction elements) or from the ICC's iCare Health Information Exchange (HIE) system were tested for correlation as available (Appendix A: Table 10 for a map of VI-SPDAT questions onto the validation criteria; See Appendix D.1 for HIE report elements). The sensitivity and specificity of the dichotomous variables self-reported in the VI-SPDAT and those same elements abstracted from either the EMR or HIE were reported.

The self-reported age and utilization rates in the VI-SPDAT were used to form dichotomous variables based on standard thresholds (utilization: <3 vs ≥ 3 encounters; age: <65 vs ≥ 65 years) and the sensitivity and specificity was calculated for these as well. These discrete variables were tested for consistency with a normal distribution and correlations between self-reported and abstracted values were reported using either the Pearson *r* or Spearman rho (ρ) statistic, as appropriate depending on the distribution.

2a. Integrated Care Collaborative – Health Information Exchange report: Health encounter and diagnostic data were provided for all individuals initially matched and pulled from the ICC's iCARE HIE system using their name, date of birth, and social security number which were provided from the ECHO agency's Travis County HMIS. All individuals shared to the ICC would have approved the optional ROI for evaluation purposes. The report included all hospital, and emergency department visits from January, 2013 to approximately March 15, 2018. The report from the ICC produced 274,670 diagnoses, coded from 50,769 encounters, which were associated with 4,477 individuals with records in the HMIS system {encounter frequency, range=1-402}. Diagnostic codes (ICD-9 and ICD-10) were filtered to match pre-specified ranges that matched the medical history questions on the VI-SPDAT as closely as possible (Appendix D.2).

From that full ICC dataset 1,237 individuals, comprising 11,805 of the 50,769 encounters, were not able to be linked back to the primary Coordinated Assessment dataset. These dropped cases were likely due either to individuals with service interactions in HMIS, but did not result in a Coordinated Assessment or their CA was performed outside of the time window of the original report from ECHO, but their information was provided to the ICC for linkage.

Conversely, Coordinated Assessment data was available for 3,240 individuals, contributing 38,964 encounters {encounter frequency, mean= 20.75; median= 10 [IQR=4,23]; range=1-402}. This sample was used as the basis for all criterion validation testing between data from the self-reported CA and the ICC's HIE. The rates of relative conditions identified in the top 5 priority diagnoses for each encounter over the first 52

encounters for each individual during the available observational period (restricted number of encounter diagnostics summarized due to software limitations).[1] The prevalence of each diagnosis referenced in the VI-SPDAT was summarized and compared between various samples: a) by all encounters, b) by all encounters within 6 months, c) by individual (diagnostic prevalence), d) by individuals with any encounters 6 months prior to CA, and e) by individuals restricted to encounters within 6 months of CA.

In order to test the questions restricted to 6 months prior to CA, those encounters were sorted by importing the date of the coordinated assessment from the original CA dataset and filtered for those with encounters in the 182 days (approximately 6 months) prior to assessment. This yielded 5,707 encounter records for 1,661 individuals {encounter frequency, mean= 21.49; median= 9 [IQR=4,20]; range=1-104}.

Restriction to include just the encounters occurring within 6 months of the first CA provided the most accurate standard to test the accuracy of questions 3 (Number of ED visits in past 6 months) and 7 (number of hospitalizations in past 6 months) on the VI-SPDAT. Naturally, restriction also reduced the prevalence of conditions identified and the frequency of the encounters captured, relative to the full sample. The first 80 encounters (23 encounters deleted in a single case due to software limitations)[2] were used to summarize diagnostic

[1] STATA Inter-Cooled (IC), 64-bit, version 15.0, provided by the UT Houston School of Public Health permits a maximum variable list size of 2,048. There was a maximum encounter rate of 402 encounters for a single subject and 41 variables retained (39 repeating variables). When data was reshaped from long to wide, up to 52 encounters were able to be retained ((39x52)+2= 2,030). The remaining room was used for additional variables generated to collapse the diagnostics across all encounters.

[2] STATA Inter-Cooled (IC), 64-bit, version 15.0, provided by the UT Houston School of Public Health permits a maximum variable list size of 2,048. There was a maximum encounter rate of 104 encounters for a single subject and 27 variables retained (25 repeating variables). When data was reshaped from long to wide, up to 80

prevalence and encounter rates. Both encounter frequency rates determined from this sample were converted to a range of $\{0 - \geq 10\}$ in order to match the format of the VI-SPDAT utilization questions.

2b. Seton Healthcare Family – Compass Electronic Medical Record abstraction: In all seventy two charts were selected for review and abstraction. Of those, 64 charts were located, reviewed and abstracted using a REDCap data collection form (Appendix B). The work was performed by a team of two research team members and the author, who also provided training to the team and supervised the first chart reviews (2 minimum). A research protocol and Manual of Procedures (Appendix C) were used to support training of team members and continuous improvement of the abstraction process during its operation.

Aim 3: To calculate associations related to homelessness and health in the VI-SPDAT

The final step of the research was a study of the results collected by the prioritization tool itself. The VI-SPDAT involves a thorough list of behavioral and health-related items, involving a range of complex relationships which offer valuable information about the effects of prioritization and the population undergoing assessment. This involved: 3a) testing for differences in individual and overall results across groups, 3b) modeling overall score on the VI-SPDAT on demographics and individual items within the full measure, and 3c) modeling factors associated with placement in Rapid Re-Housing or non-placement in spite of eligible

encounters were retained ((25x80)+2= 2,002). This removed just 23 encounters from the dataset, all from a single individual. Another encounter could have been retained but room was needed for additional variables generated to summarize encounter frequencies and collapse the diagnostics across all encounters.

scores on the VI-SPDAT. Analyses were limited to the first-assessments of all unique individuals included in the dataset who provided a ROI to participate (n=4,739).

3a. Descriptive reports and Tests for Disparities in Vulnerability: A single summary table of all results (count, proportion, mean or median, and 95% confidence intervals or interquartile ranges (IQR)) was reported. Histograms, kernel density plots, and tests of normal distribution were performed on all continuous (or discrete, count, or ordinal) variables. The overall VI-SPDAT scores were characterized thoroughly with skew, kurtosis, tests and plots of normality. In preparation for negative binomial modeling the VI-SPDAT was also assessed for fit with a Poisson distribution (mean = variance) and for significant effects of zero-inflation.

Results on the VI-SPDAT were stratified and tested for differences between demographic (sex, race, ethnicity) groups and HUD-defined threshold patterns of homelessness (a) HUD-defined chronic homeless vs not, b) duration of homelessness less than or greater than one year, and c) frequency: up to three or at least four cycles of entry and exit from homelessness in the past three years). Tests for differences in proportions between the above groups included odds ratios and chi-squared tests. Tests for differences in discrete (either ordinal or count) variables between groups used the non-parametric Wilcoxon ranksum or Kruskal-Wallis tests.

Following these stratified tables and tests, multiplicative interaction effects were assessed by further stratifying the tests of association (odds ratios) between sex and VI-SPDAT results by race, ethnicity, and chronic homelessness and further stratifying the tests of association between race and VI-SPDAT results by ethnicity, sex, and chronic

homelessness. Stratified and collapsed Mantel-Hantzel (MH) odds ratios were calculated and reported. MH tests for heterogeneity in odd ratios were performed with MH test significance indicating presence of multiplicative interaction effects.

3b. Negative Binomial Models of total VI-SPDAT score: Due to the large number of ordinal levels in the VI-SPDAT score and in accordance with the theoretical underpinnings of the VI-SPDAT and the Behavioral Model of Vulnerable Populations, the total score summarizing vulnerability factors on the tool was treated as a count variable in this step, with individual factors in the measure used to predict overall count of factors. Three structures of negative binomial regression models were used: a) a generalized linear model (GLM) with negative binomial family and a log-link function, b) a standard negative binomial regression, and c) a generalized estimating equation (GEE) negative binomial regression model using population-averaged estimation, exchangeable correlation structure, and including data collector ID used as a panel variable (model c was only used in multivariate models). All three model structures used the robust method of variance estimation.

First, a test that the distribution of the VI-SPDAT scores does not meet the assumption of a Poisson distribution (that the mean is equal to the variance) was performed to ensure that a Poisson regression should not be used. Alpha statistics were also used to test this assumption in all negative binomial regression models. The VI-SPDAT was also tested for zero-inflation during descriptive testing. Zero-inflated negative binomial models were used to incorporate a simultaneous logistic regression model testing for covariates associated with a possible zero-inflation effect contingent on the outcome of such testing. The

significance of zero-inflation effects were determined by likelihood ratio (LR) tests between the models with and without the zero-inflation function.

Univariate binomial regression models of the full score {range= 0-20} were performed for each demographic question and every item in the full measure. The odds ratios (95% CI, p value) corresponding to individual factors were reported in a table.

For multivariate modeling, three sets of variables were incorporated. First, all variables representing demographic or homeless history variables outside of the measurement tool itself were included in each of the three model structures above (a-c). Second, the predicted factor scores from the final SEM model selected (Aim 1 for CFA method) were used in each model structure (a-c). The generation of predicted factor scores for the latent variables can be interpreted as a form of missing-value imputation. Each latent variable was treated as an observed variable that had only missing values which are then imputed using the values of the items loaded onto each factor. Finally, the measure's items with the top factor loadings (>0.4) from the final SEM model (Aim 1; Figure 5, Table 8) were included in each model structure (a-c).

A multivariate model for each set of covariates and each structure (a-c), with odds ratios for all final variables selected, was reported in another table. Additionally, the demographics were combined with the second (predicted factor scores) and third (items with top factor loadings) sets of covariates to create two additional models, labeled "model 12" and "model 13". Since the first three sets of covariates are nested in models 12 and 13, likelihood ratio (LR) tests were performed to assess whether the addition of the second or third sets of variables contributed significantly over demographics alone.

Post-estimation for each of the three model structures was performed to study the unique parameters for each. Link tests were performed for each of the GLM models in order to determine the fit of the log link function as the appropriate transformation from the generalized linear model. The negative binomial models were tested for goodness of fit using model deviance, Akaike (AIC) and Bayesian Information Criterion (BIC), and McFadden's adjusted-R^2. The "Quasi-likelihood under the Independence Model Criterion" (QIC) statistic was used to test the acceptability of the exchangeable correlation structure applied to the GEE models. The QIC_u was used to obtain information criterion (IC) on the population-averaged GEE models incorporating the variability between data collectors. The QIC statistic was designed to test accuracy of GEE correlation structures, while the QIC_u was designed for comparing models with quasi-likelihood estimation, using the same correlation structures but different sets of covariates (Pan, 2001).

3c. Rapid Re-Housing Outcomes: The data also included all housing program assignments (and whether PSH or RRH) and housing exit types (positive, negative, ongoing) which followed participation in at least one assessment. For cases with a VI-SPDAT score in the 4-7 range and the associated recommendation for referral to Rapid Re-Housing (RRH) intervention, the proportion placed in housing and their housing exits (RRH ongoing or positive exit "0", negative exits "1") were calculated from the data. While higher vulnerability scores within a given recommendation range ought to be associated with selection for housing services, neither this nor the ability to predict housing outcomes has been assessed.

Placement in Rapid Re-Housing services (dichotomous) was tested for degree of association with the VI-SPDAT score using Wilcoxon ranksum tests given the discrete (ordinal) distribution of VI-SPDAT scores restricted to the RRH-recommended range (4-7). Cases with scores within the RRH-recommended range were tested for association with demographics and all items in the VI-SPDAT using univariate and multivariate logistic regression tests. The factors significantly associated with non-selection were reported and later discussed for potential association with or mediation by un-measured barriers to housing placement. While keeping in mind the issues of selection bias the prioritization score causes, a test of association between VI-SPDAT score, the individual items on the tool, and housing exit outcome limited to those successfully placed in RRH was also performed, once again using logistic regression models.

Human Subjects

The research described has been approved by the University of Texas at Austin IRB (UTIRB; Approval # 2017-05-0050; Appendix E), the UTHSC-Houston IRB Committee for Protection of Human Subjects (CPHS; Approval # HSC-SPH-18-0362; Appendix E), and the UT School of Public Health Office of Student Research. A Data Use Agreement between Seton Healthcare Family and ECHO (Travis County CoC) has been initiated in order to permit the sharing of data relevant to this proposal. ICC has been contracted through Seton Healthcare Family (a member of the iCare collaboration) to provide the report described in this proposal.

a. Waiver of Informed Consent

A Waiver of Informed Consent was approved for this study from the UTIRB and UTHSC-H CPHS. The study was a retrospective review of a social services database and associated medical information that had already been gathered for treatment purposes within the standard of care for each patient's hospital visit. No information other than what was gathered in the course of service delivery or treatment was examined. No changes to treatment or testing were involved in this study and no risks or benefits needed to be communicated to the subjects. There was only minimal risk associated with the study, involving brief collection and storage of PHI.

This study could not have been practicably carried out without a waiver of informed consent. Exclusion of study subjects due to lack of informed consent would have led to heightened risk of response bias in the results of testing and greatly limited the sample size, which could have been detrimental to interpretation of the results of this study. The waiver of informed consent did not adversely affect the welfare of the subjects and there was no need for subjects to be contacted and provided with any additional pertinent information. Since the participants had already concluded their CA and the healthcare visits used as criterion in order to validate the assessments, contacting them to obtain consent for the review would have only increased exposure of PHI, requiring geographical and contact information to be gathered.

b. Privacy and Confidentiality

The risks involved with this study were managed through careful data storage and management practices. For the duration of the study, the database was maintained on a secured, password-protected, and firewalled shared drive with access restricted to those

research staff working on the study. The transfer of social services database records to the principal investigator was supported by a secure, encrypted, and HIPAA-compliant file-transfer-protocol service. As part of the data collection process, a unique study identification number was assigned to each subject in the study in order to protect the privacy of all identified data.

Data were collected through a data report provided by ECHO staff, through linkage to a report from a community healthcare registry, and through electronic medical record abstraction on a random sample selected from that initial dataset. Once the database was completed and prior to finalization of the analysis, patient identifiers were removed so that the dataset was de-identified completely and no remaining link between the patient and the study ID remained in the dataset used for the analysis. De-identification (i.e. destruction of identifiable data) was performed by electronic removal of all identifiers in the dataset. There was no need or reason to maintain the identifiers once the database was completed for reporting or legal reasons. The anonymous dataset will be maintained for an additional three years after analysis.

RESULTS

Sample Description

A total of 4,739 individuals approved the optional ROI and completed a total of 5,594 assessments using version 1 of the VI-SPDAT during the time period being evaluated. Approximately one quarter (27.4%; 1,300) of the sample reported female gender, with another 0.1% (4) and 0.4% (19) reporting female-to-male and male-to-female transgender

status respectively. The median age was 47 {IQR=35-55}. Just under one fifth (18.1%; 858) of the sample reported Hispanic ethnicity and 40.9% (1,936) reported a racial group other than Caucasian / White (See Table 11 for a descriptive summary of all responses to 1st assessment on the VI-SPDAT).

Shapiro-Wilk tests for normality found that all continuous and discrete variables had non-normal distributions, including: age, episodes of homelessness, months of homelessness, service utilization counts, and overall VI-SPDAT score (all $p<0.05$).

VI-SPDAT scores for transgender female-to-male cases (n=4) were not found to be significantly different from male (n=3,415) scores (mean: 9.75 vs 8.92; $p>0.05$). Scores for male-to-female cases (n=19) were not found to be significantly different from female (n=1,300) scores (mean: 9.89 vs 9.07; $p>0.05$). Therefore, both transgender categories were incorporated into their self-identified gender categories as needed for the purpose of binary gender testing (i.e. transgender male-to-female included with females).

Selection Bias from Release of Information

There is a proportion of the sampling frame who were excluded from all subsequent analysis because they did not approve the optional ROI for evaluation and research (n=203; 4.1%). Additionally there were scattered missing values due to incomplete data collection within the sample which approved the ROI (n=4,739; 95.9%). These two types of missingness are discussed in this and the following sections.

Subjects who declined to opt into releasing their personal information for evaluation and research (ROI=no; n=203) tended to report risk behaviors and health conditions less

frequently and lower rates of service utilization than subjects who approved the optional release of information (ROI=yes; n=4,739; Table 13). On average, the overall VI-SPDAT scores were lower in those declining the ROI (median: 8 vs 9; $p<0.0001$). In particular, those who did not opt into sharing their information reported fewer instances of victimization, engagement in risky behaviors including sleeping in unsheltered locations, owing people money, and having negative social influences (all $p<0.05$). They reported fewer diagnoses of several chronic and infectious health conditions: liver disease, emphysema, asthma, hepatitis C, HIV/AIDS; fewer instances of alcohol or drug use, mental health visits, learning disabilities, and cognitive deficits (all $p<0.05$). They also reported fewer ambulance rides, hospital, and crisis service visits (all $p<0.05$; Table 13 for details).

A formal test of whether the values excluded for this reason are missing completely at random (MCAR) is not necessary because in this case, the missing values are known and differences are reported and recognized. The association between exclusion or missingness due to participants' decline of the optional ROI and the results on the assessment indicates that the missingness was not missing completely at random and therefore informative. Since differences between the excluded and included values were identified in the measured items of the tool, the assumption that the excluded values are Missing at Random (MAR) may be reasonable. However, it is still possible that missingness is associated with additional, unobserved factors or variables as well.

Data Quality and Completeness

Within the full dataset of participants who approved the ROI and completed at least one assessment (n=4,739), there remain issues with incomplete data (Table 14 for details). While just 54.1% (n=2,563) of the sample had complete data across all variables, the penetration of missing data was low. Eighty five percent (85.4%; n=4,048) of the sample is missing no more than one value, and 89.8% (n=4,257) were missing no more than two values. Very few (n=3) observations were missing more than four values across the entire dataset with one observation missing 5, 6, and 7 values each (Table 14). While the penetration depth of the missingness was low, the impact across the measure was wide. Of the 60 original variables (50 VI-SPDAT questions, 4 demographics (at the beginning), total VI-SPDAT, housing recommendation, and 4 additional history questions (at the end)), 46 (76.7%) were missing at least one value (Table 14).

The test of whether the incomplete observations in this dataset were missing completely at random (Little's MCAR test) was significant ($p<0.0001$), meaning that the assumption of MCAR was rejected. A second test limited to just the 50 questions included in version 1 of the VI-SPDAT was also significant ($p<0.0001$). In both cases, this indicates that the missingness is either dependent on measured variables in the data or possible unmeasured factors.

One of these unmeasured factors in the full dataset is likely to be a secular trend in the data, as questions about entry from the streets or shelter (missing n=460; 9.71%), the number of homelessness episodes in the past 3 years (missing n=632; 13.3%) and number of

cumulative months across those episodes in the past 3 years were added (missing n=2,064; 43.6%) were each separately added to the end of the assessment at separate points part way through the collection period being studied in this sample. These three questions are not part of the VI-SPDAT itself. They are HUD-mandated universal data elements (UDEs) used in the definition of chronic homelessness which were not incorporated into version 1 of the VI-SPDAT but are critical to determining eligibility for most permanent supportive housing programs.

The missing data patterns within the VI-SPDAT and within the full dataset were not found to be MCAR. However, the results presented use pairwise deletion for available case analysis in almost every instance (see Limitations for details). The decision to use available case analysis was made given 1) the low overall proportion of missing data within the 50 questions on the VI-SPDAT itself, with 2) missing values largely restricted to a few questions about homelessness history at the end, and 3) the theoretical assumption that the missing values may still be missing at random (MAR). The MAR assumption cannot be tested for, but holds that the missingness is contingent on the other measured values in the dataset. The total sample included in each test ("n") will be reported along with all results in order to help clarify the potential impact of the available case analysis approach.

Repeated Measures

The subset of the sample that provided multiple assessments over their time experiencing homelessness (n=713; median interval: 306 days; IQR: 216,441 days) tended to demonstrate increases in vulnerability (Table 15 for details). These repeated measures

demonstrated increased overall vulnerability on the VI-SPDAT over the time between measures (median: 9 vs 10; $p<0.001$; percent agreement=9.7%, $\kappa=0.017$), with several items showing particular susceptibility to change. Due to the increase in VI-SPDAT score, the distribution of recommendations shifted significantly over this interval as well (PSH recommendation: 45.6% vs 54.8%; $p<0.01$; percent agreement=55.5%, $\kappa=0.215$). As expected variables such as duration of homelessness increased (percentage of the sample with greater than 2 years homeless: 70.0% vs 76.0%; $p<0.05$) although the frequency of homeless experiences over the previous 3 years did not change ($p>0.05$). The frequency with which several victimization and risk behavior items were reported increased significantly: attempts to harm self or others, history of abuse or trauma leading to homelessness, and unsheltered sleeping locations (all $p<0.05$). The frequencies with which individuals reported a history of heart disease and heatstroke (or hypothermia) were also greater (both $p<0.05$). Importantly, items that should be resistant to change over time (race, ethnicity, gender, and veteran status) all showed no change and correlated perfectly over the interval between assessments (all $p=1.0$). The frequency of all other specific health conditions and all service utilization rates neither increased nor decreased significantly over the interval between assessments (Table 15 for details).

Aim 1: To quantify the psychometric characteristics of the VI-SPDAT measure

1a. Internal Consistency

Testing demonstrated reasonably strong internal consistency of the full VI-SPDAT (50 items; α=0.759) and when restricted to the dichotomous items (41 items; α=0.818). The individual domains of the measure demonstrated a range of consistency measures: "A. History of Housing and Homelessness" (2 items; α=0.055), "B. Risks" (11 items; α=0.655), "C. Socialization and Daily Functions" (7 items; α=0.407), "D. Wellness" (30 items; α=0.725) (Table 16 for details).

1b. Confirmatory Factor Analysis

The goodness of fit statistics, including the root mean squared error of approximation (RMSEA and p(RMSEA<0.05)), Aikake and Bayesian Information Criteria (AIC & BIC), the Comparative fit index (CFI), Standardized root mean squared residual (SRMR), and Coefficient of determination (CD), were compared side by side for all three predetermined models (Table 17 for details). Model 3 demonstrated the best fit statistics across the board (RMSEA=0.045, probability of RMSEA<0.05=1.0; CFI=0.714; SRMR=0.044; CD=0.979) and the lowest AIC and BIC statistics of the three models proposed a priori (Table 17). This was the model of items on the VI-SPDAT which relied on an a priori conceptual framework (Figure 4, Table 7) dividing the items into five domains: "A. Social Vulnerability", "B. Financial Vulnerability", "C. Health Conditions", "D. Alcohol/Drugs", and "E. Mental Wellness".

However, there were several factor loadings in this model which demonstrated coefficients under 0.3. These items (Social Vulnerability: Q10 & 17; Financial Vulnerability: 15, 16, 20; Health Conditions: 22, 25, 29, 30, 31, 33) were removed from the model and the updated, reduced Model 3.1 showed similar goodness of fit statistics to Model 3 (Table 17). The modification indices generated by this Model 3.1 (MI >3.84) included 77 direct effects and 191 covariance effects (Table 18) recommended. Of these, several MI statistics were greater than 100.0 suggesting strong relevance for this model structure. Those indices both with strong MI statistics and a theoretically sound relationship to the relevant latent factors were incorporated into the model (Table 18). History of harm to self or others (Q9) was connected with two new factors: B. Financial Risk and E. Mental Wellness. The social vulnerability factor of being forced or tricked to do things (Q11) was newly associated with factors: B. Financial Risk and D. Substance Abuse. Self-reported general risk behaviors (Q12) were newly associated with factors: D. Substance Abuse & E. Mental Wellness. Self-reported history of heatstroke or heat exhaustion (Q26) was newly associated with factors: A. Social Risk, B. Financial Risk, and E. Mental Wellness. Medication adherence issues (Q49) were newly associated with factors: A. Social Risk and B. Financial Risk.

The model was run again with loading factors under 0.3 removed. History of emphysema (Q28) and the interviewer's observation of serious health conditions (Q34) were added to the list of items removed from the model. Meanwhile, the initial items removed (10, 15, 16, 17, 20, 22, 25, 29, 30, 31, 33) remained excluded from the model (Figure 5, Table 8; Table 18 for a full list of modifications).

This also naturally reduced the model back to having a single latent factor associated with each item in the model. Effectively, heat stroke (Q26) and medication adherence (Q49) were moved from factors C & E, respectively, to factor A. Social Risk; harm to self or others (Q9) was moved from factor A to factor E. Mental Health/Cognition; forced or tricked to do things (Q11) was moved from factor A to factor B. Financial Risk; general risk behaviors (Q12) was moved from factor A to factor D. Substance Abuse. Covariance terms (6) between items 12 & 37, 24 & 32, 35 & 38, 36 & 40, 41 & 48, and 43 & 44 were also added for Model 3.2, based on strong Modification Index coefficients and the strength of the rationale for these relationships.

This new Model 3.2 demonstrated lower AIC and BIC statistics than Model 3 and the best mix of goodness of fit statistics of all models tested: RMSEA=0.036; probability of RMSEA<0.05=1.0; CFI=0.904; SRMR=0.035; CD=0.960 (Table 17; see Discussion section for implications of the changes made between the initially proposed Model 3 and this new Model 3.2). This time, the modification indices generated by this Model 3.2 (MI >3.84) still included 58 direct effects and 139 covariance effects (Table 18) recommended.

The model included several changes which affect the characterization of the latent factors with which they are associated. Factor A. Social Vulnerability was overhauled with several items of social vulnerability transferred or dropped. Of note, engaging in general risk behaviors (Q12) was moved to factor D and history of harm to self or others in the past year (Q9) was moved to factor E. Instead Factor A consisted of 3 linked items that describe the negative experiences of an individual exposed to the environment of homelessness. The name of Factor A was changed to “Environmental Threats”.

Factor B. Financial Vulnerability was changed by the combination of social and financial vulnerability items to include being taken advantage of, negative views of social network, and owing money to others. Accordingly, the name for Factor B was changed to "Social Network Threats".

While factor C. Health Conditions remained largely unchanged in nature, several items from this cluster were moved to other factors. Similarly, apart from each adopting one item from factor A, factors D. Alcohol/ Drugs and E. Mental Wellness were both largely unchanged.

The updated model also included introduction of covariance terms between 1) 'hepatitis C' and 'liver disease', 2) 'any risk behavior' and 'injection drug use', 3) 'problematic alcohol or drug use' and 'experience with drug or alcohol treatment', 4) 'daily use of alcohol or drugs' and 'blacking out from alcohol use', 5) interviewers' 'observation of signs of drug or alcohol use' and their 'observation of signs of severe, persistent mental illness or compromised cognition', and 6) 'ED visits for mental health symptoms' and 'any visit with a mental health provider in past 6 months'. These were all conceptually related, easily identifiable in their relationships to each other, and demonstrated overwhelming associations through the medication indices generated from models 3 and 3.1.

Figure 5: Final conceptual framework of VI-SPDAT domains (Model 3.2)

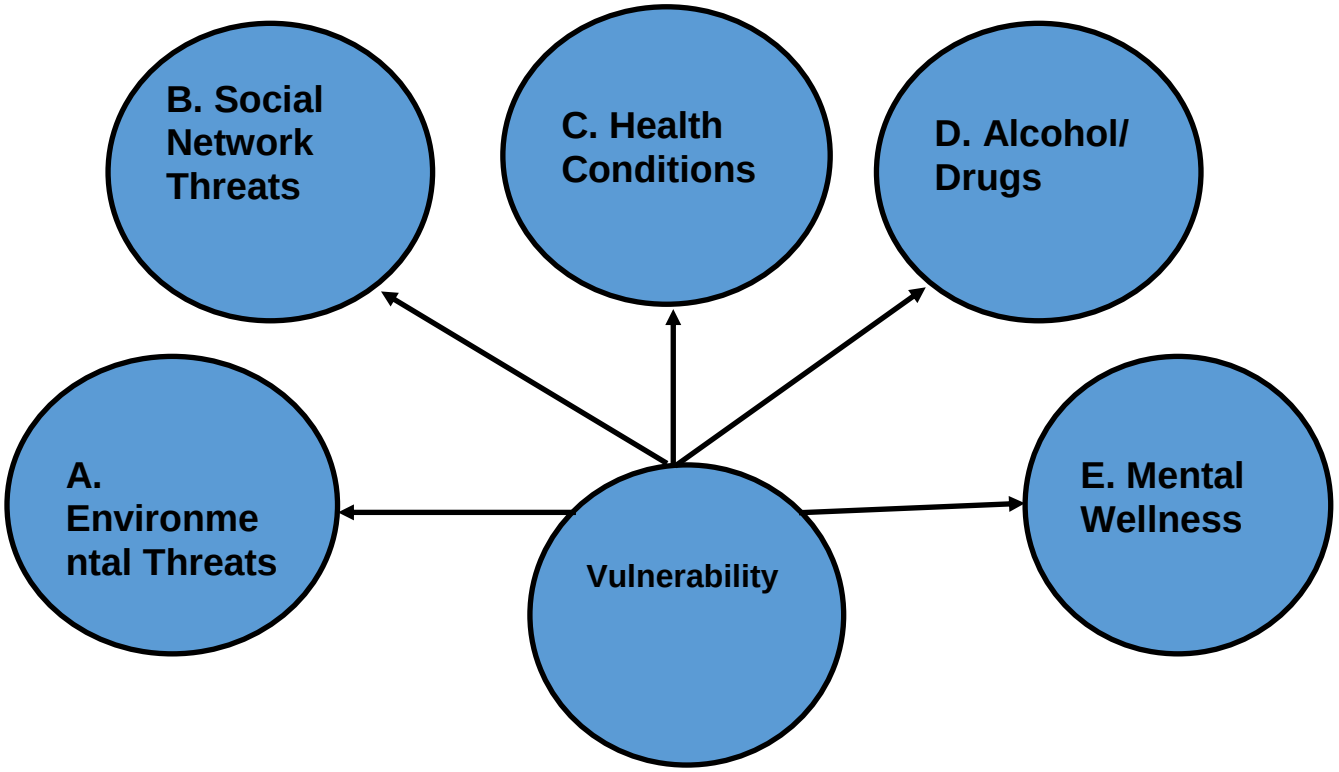


Table 8: Final conceptual framework of VI-SPDAT domains (Model 3.2)

List of Items on VI-SPDAT by Domain
A. Environmental Threats
8. Have you been attacked or beaten up since becoming homeless?
26. History of Heat Stroke/Heat Exhaustion
49. Have you had any medicines prescribed to you by a doctor that you do not take, sell, had stolen, misplaced, or where the prescription was never filled?
B. Social Network Threats
11. Does anybody force or trick you to do things you do not want to do?
14. Is there anybody that thinks you owe them money?
18. Do you have any friends, family or other people in your life out of convenience or necessity, but you do not like their company?
19. Do any friends, family or other people in your life ever take your money, borrow cigarettes, use your drugs, drink your alcohol, or get you to do things you really don't want to do?
C. Health Conditions

23. History of frostbite, Hypothermia, or Immersion Foot
24. Liver disease, Cirrhosis, or End-Stage Liver Disease
27. Heart disease, Arrhythmia, or Irregular Heartbeat
29. Diabetes
32. Hepatitis

D. Alcohol / Drugs

12. Ever do things that may be considered risky like exchange sex for money, run drugs for someone, have unprotected sex with someone you don't really know, share a needle, or anything like that?
35. Have you ever had problematic drug or alcohol use, abused drugs or alcohol, or told you do?
36. Have you consumed alcohol and/or drugs almost every day or every day for the past month?
37. Have you ever used injection drugs or shots in the last six months?
38. Have you ever been treated for drug or alcohol problems and returned to drinking or using drugs?
39. Have you used non-beverage alcohol like cough syrup, mouthwash, rubbing alcohol, cooking wine, or anything like that in the past six months?
40. Have you blacked out because of your alcohol or drug use in the past month?
41. Surveyor, do you observe signs or symptoms of problematic alcohol or drug use?

E. Mental Wellness

9. Threatened to or tried to harm yourself or anyone else in the last year?
42. Ever been taken to a hospital against your will for a mental health reason?
43. Gone to the emergency room because you weren't feeling 100% well emotionally or because of your nerves?
44. Spoken with a psychiatrist, psychologist or other mental health professional in the last six months because of your mental health - whether that was voluntary or because someone insisted that you do so?
48. Surveyor, do you detect signs or symptoms of severe, persistent mental illness or severely compromised cognitive functioning?
50. Yes or No - Have you experienced any emotional, physical, psychological, sexual or other type of abuse or trauma in your life which you have not sought help for, and/or which has caused your homelessness?

1c. Multiple Group Testing of Confirmatory Factor Analysis

Application of the model to subsets of the sample divided along demographics or exposure to homelessness had consistent effects on the factor model's overall goodness of fit. Most of the time, AIC and BIC slightly decreased. The coefficient of determination (CD) stayed close to the same level, with a small elevation seen when divided by duration of homelessness. Measures of error such as RMSEA and SRMR often rose slightly.

Step by step, systematic testing of the extent of invariance was only able to determine the presence or absence of 'strict invariance' at best, by testing the difference in Likelihood

Ratios between models of increasing levels of model constraint. Strict invariance refers to the absence of variability in residuals/error terms of the model between groups, as well as consistency in the coefficients and intercepts. The least constrained two models, 1) completely unrestricted and 2) coefficients-constrained-only, for each sub-division tested were unable to converge (Table 19 for details). However, weak and strong invariance could be tested through post-estimation of the models fit separately for each set of sub-divisions, using score tests (for item loading coefficients) and Wald tests (for testing item variance, factor variance, item-item covariance, and factor covariance; Table 20).

Assessment of the final factor model applied separately by race (White vs other categories) demonstrated marginally worse overall fit than the final model (RMSEA=0.038; CFI=0.880; SRMR=0.042; CD=0.959). Group-level measures of fit showed only small changes in the coefficient of determination (CD: 0.959 White vs. 0.954 other race) and standardized root mean-squared residuals (SRMR: 0.040 vs. 0.043 respectively). Systematic testing of Model 3.2 to determine the extent of model invariance by race demonstrated variations at the level of the model's error terms/residuals, factor means, and factor variances at a minimum (Table 19 for details of tests between unconstrained and increasingly constrained models).

Model 3.2 showed weak invariance in 10 specific items related to risk behaviors, physical health, substance use and cognition when the model was compared between White subjects and other race categories. These items were a history of being attacked (Q8), being forced to do something (Q11), any risk behaviors (Q12), liver disease (Q24), heatstroke (Q26), heart disease (Q27), daily drug or alcohol use in the past month (Q36), injection drug

use (Q37), learning disability (Q46), and concentration or memory problems (Q47). There were also 18 item variances, 3 out of 5 factor variance terms, 4 out of 6 modeled item-item covariance terms, and 8 out of the 10 factor covariance terms which were found to differ significantly by race (Table 20).

Division of the final model structure by ethnicity resulted in similar or slightly improved fit to the final model (RMSEA=0.35; CFI=0.901; SRMR=0.041; CD=0.960). Group-level measures of fit showed only minor changes in the CD (0.959 non-Hispanic vs. 0.961 Hispanic) although SRMR was improved for the model when applied to non-Hispanic cases (0.035 vs. 0.046 respectively). The latter effect was likely due to the relatively higher proportion of non-Hispanics in the sample.

Testing the extent of model invariance successfully demonstrated invariance across ethnicity at the level of the model's factor means and factor covariance terms, but did not meet the criteria for strict invariance based on testing of the model's error terms/residuals (Table 19). Post-estimation of Model 3.2 divided by group showed weak invariance between the factor model specific to Hispanic and non-Hispanic participants for two specific items, including problematic drug or alcohol use (Q35) and concentration or memory problems (Q47). There were also four item variances which were found to differ significantly by ethnicity (Table 20).

The final factor model applied separately by gender showed marginally poorer fit than the final model overall, by most assessments except the coefficient of determination (RMSEA=0.38; CFI=0.886; SRMR=0.042; CD=0.960). Group-level measures of fit showed the largest differences for any sub-group comparison (CD: 0.961 Male vs. 0.946 Female;

SRMR: 0.036 vs. 0.047 respectively). Systematic testing of model invariance by gender demonstrated variability at the level of the model's error terms/residuals, factor means, and factor variances at a minimum (Table 19). Post-estimation of the split model demonstrated that loading factor coefficients varied by gender for the following items: being forced to do things (Q11), bad influences in social network (Q19), heart disease (Q27), hepatitis C (Q32), problematic drug or alcohol use (Q35), non-beverage alcohol consumption (Q39), and traumatic brain injury (Q45). There were also 14 item variances, 3 out of 5 factor variance terms, 3 out of 6 modeled item-item covariance terms, and 2 out of the 10 factor covariance terms which were found to differ significantly by gender (Table 20).

In general, separate application of the model by those with duration of homelessness <1 year and ≥1 year showed a marginally poorer fit (RMSEA=0.38; CFI=0.875; SRMR=0.044; CD=0.965), although there was also a small increase to the coefficient of determination. In addition and unlike the other tests across sub-groups, the information criteria (AIC and BIC) was dramatically reduced by application of the model separately to those less than and greater than 1 year of homelessness (AIC=67500.286, BIC=68404.586). Group-level measures of fit showed small differences in the SRMR (0.045 <1yr vs. 0.043 ≥1yr) but also revealed the highest CD statistic for the sample that was homeless for more than 1 year (0.948 vs. 0.965 respectively).

Systematic testing of Model 3.2 to determine the extent of model invariance by duration demonstrated variations at the level of the model's error terms/residuals, factor means, and factor variances at a minimum (Table 19). The factor model showed weak invariance in 5 items when divided by those experiencing homelessness for more or less than

a year, including history of being attacked (Q8), history of harm to self or others (Q9), problematic drug and alcohol use (Q35), concentration or memory problems (Q47), and issues with medication adherence (Q49). There were also 18 item variances, 4 out of 5 factor variance terms, 5 out of 6 modeled item-item covariance terms, and 9 out of the 10 factor covariance terms which were found to differ significantly by duration less than or greater than one year (Table 20).

Application of the final factor model separately based on chronic homelessness status resulted in only slightly poorer fit statistics than the final model applied to the whole sample (RMSEA=0.36; CFI=0.895; SRMR=0.039; CD=0.960). Group-level measures of fit showed small differences in the CD (0.958 non- vs. 0.960 chronic homelessness) and SRMR (0.038 vs. 0.039 respectively).

Testing of Model 3.2 to determine the extent of model invariance by chronic homelessness detected variability at the level of the model's error terms/residuals, factor means, and factor variances at a minimum (Table 19). There were several items that showed weak invariance in the model by chronic homeless status. Weak invariance of the model was identified in 4 items, including general risk behaviors (Q12), frostbite/ hypothermia (Q23), problematic drug and alcohol use (Q35), and non-beverage alcohol use (Q39). There were also 10 item variances, 3 out of 5 factor variance terms, 3 out of 6 modeled item-item covariance terms, and 5 out of the 10 factor covariance terms which were found to differ significantly by chronic homelessness (Table 20).

Weak invariance was found with every attempt to test the model across sub-groups. Although the particular item loading coefficients, intercepts, and error terms which showed variability changed between subgroups tested, the finding was consistent.

Aim 2: To study the criterion validity of the VI-SPDAT

2a. Integrated Care Collaborative – Health Information Exchange report

The primary sample for this analysis was the 38,964 encounters identified for 3,240 out of the 4,739 subjects who participated in coordinated assessment over the observation period. Of the 38,964 encounters, 34,876 (89.5%) were Emergency Department visits and 4,088 (10.5%) were inpatient hospital admissions. Both the Shapiro-Wilk and Skew-Kurtosis tests for normality rejected the assumption of normal distribution of either ED or hospital visit frequency (all $p<0.0001$).

The second sample tested (n=1,661 out of 3,749), provided 5,707 encounter records and contributed data on ED visit and hospitalization frequency in the previous 6 months prior to first assessment. Again, both the Shapiro-Wilk and Skew-Kurtosis tests for normality rejected the assumption of normal distribution of visit frequency (all $p<0.0001$). Of the 5,707 encounters, 5,106 (89.5%) were Emergency Department visits and 601 (10.5%) were inpatient hospital admissions.

The diagnostic prevalence rates (3rd column, Table 21) and the encounter frequencies from just those encounters 6 months prior to CA (5th column, Table 21) were used to validate the respective, relevant questions on the VI-SPDAT (Table 22 for details). The most

accurately documented condition identified between self-report and the ICC's HIE system was HIV+/AIDS, with 88.4% sensitivity and 98.0% specificity (AUC=0.932). Although the prevalence was one of the lowest (0.49%) self-reported intellectual and/or developmental disability also showed relatively good sensitivity (87.5%) and specificity (64.4%; AUC=0.759) with a documented diagnosis of same. However, there were several conditions / diagnostic-clusters that did not perform as well. While frostbite and/or hypothermia showed good specificity (93.2%), self-report on the VI-SPDAT was not sensitive (false negatives common) in predicting a history of diagnosis (7.6%; AUC=0.504). The 4 mental health-specific and 7 substance use/abuse-specific questions on the VI-SPDAT generally showed better specificity than sensitivity to a diagnosis of their respective ranges of diagnostic codes. Indeed overall, the self-report of specific medical histories appeared to demonstrate better specificity than sensitivity when compared against the HIE record system (Table 22).

2b. Seton Healthcare Family – Compass Electronic Medical Record abstraction

The abstraction of medical records (n=72) to provide validation criteria for items in the VI-SPDAT provided for lower accuracy statistics than the HIE data. On the whole, detection rates for conditions and healthcare encounters were also lower than those detected in the HIE and the self-reported rates provided (Table 23 for details). To some extent, this should be expected since the records were collected from a single hospital network (one of two) in the region and therefore reflect a narrower range of visits than the HIE system. There were also issues with data quality from the abstraction process due to a small number of CA

participants with no records in the EMR system (n=8). Additional data quality concerns led to further variability in the total number of responses available on items for comparison with the sample of charts abstracted (n=72). Detection of conditions such as developmental, learning or cognitive disabilities was particularly limited through review of electronic medical records, as was locating documentation or evidence of alcohol misuse /abuse.

Testing of the accuracy of the self-report in predicting findings in the electronic medical record also suggests that the electronic record performed more poorly than the HIE in the role of validation criterion. Overall, the Negative Predictive Value (NPV) of most self-report items remained high whereas the Positive Predictive Value (PPV) was much lower than it was in comparison to the HIE (Table 24).

As was the case with findings from the HIE report, self-report of physical medical conditions tended to show higher specificity than sensitivity, although there were several instances in the other direction (such as asthma; Table 24). This effect was partly due to the already low prevalence of conditions and even lower prevalence identified within the EMR. The reclassification of a small number of self-reported non-cases as false negatives was able to heavily influence the sensitivity calculation. Overall, the rate of false negatives was low (high sensitivity) for items addressing cognitive or intellectual conditions which were detected at lower rates in the EMR, although the PPV for these items was among the lowest. Of the cases that were self-reported (37.5%), most were not identified on EMR review (1.6%; 1 case in EMR). The lower prevalence of conditions identified in the EMR played a primary role in nearly all findings. AUC statistics were highest for demographic data points, ambulance and hospitalization utilization and asthma (AUC >0.900; Table 24).

Aim 3: To calculate associations related to homelessness and health in the VI-SPDAT

3a. Descriptive reports and Tests for Disparities in Vulnerability

Shapiro-Wilk tests rejected the assumption of normality for all discrete or ordinal variables in the dataset: age, number of episodes of homelessness in past 3 years, number of months of homelessness in past 3 years, number of episodes of housing and relapse into homelessness in past 3 years (Q2), utilization rates of Emergency Department (Q3), police (Q4), ambulance (Q5), and crisis services (Q6), hospitalizations (Q7), and overall score on the VI-SPDAT. While the distribution of VI-SPDAT scores cannot be considered to match a normal curve, histogram, kernel density, and Q-norm plots of the scores (Figures 6-8) show that the spread was similar. The Quantile-Normal plot of scores reveals deviation from the normal curve more clearly, and Skew-Kurtosis tests for normality show that the issue is the kurtosis of the distribution ($k=2.42$; $p<0.0001$) and not the skew ($s=0.024$, $p=.5072$).

Figure 6: Histogram of VI-SPDAT scores

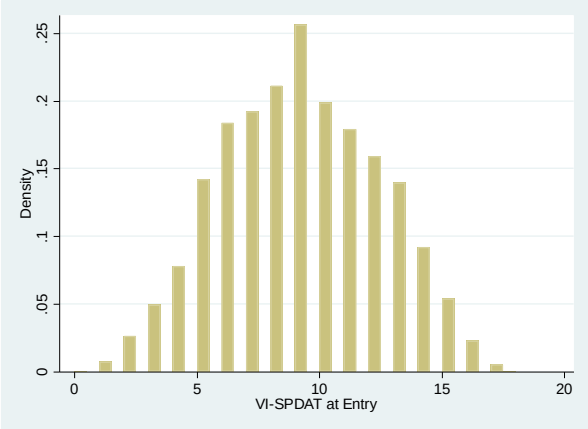


Figure 7: Kernel density plot of VI-SPDAT scores compared to normal curve

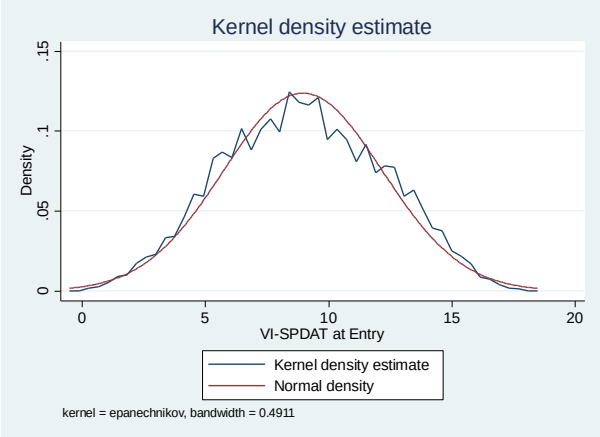
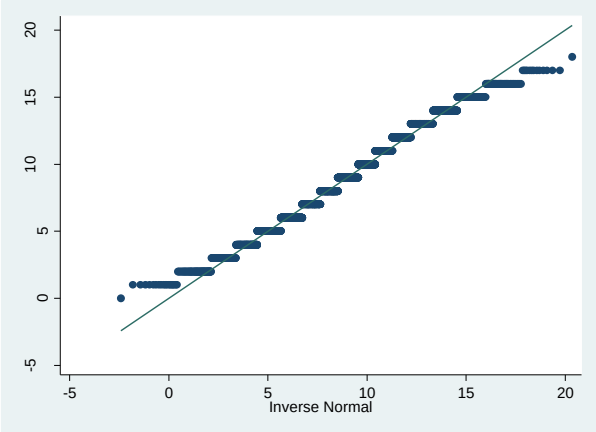


Figure 8: Q-norm plot of VI-SPDAT scores



Comparisons of VI-SPDAT score and items by Group

Comparison of responses between White participants and either Black /African American or all other racial groups demonstrated a large number of differences (Table 25). In aggregate, White participants scored higher on the VI-SPDAT than did Black participants or all other racial groups combined (median {IQR}: 9 {7-12} vs 8 {6-11} and 9 {6-11} respectively; both $p<0.001$). Directly related to this, White subjects scored higher on 37 individual items within the VI-SPDAT (Table 25). The only items where Black /African

American participants scored higher were duration of homelessness more than 2 years and histories of HIV/AIDS and tuberculosis.

Due to the elevated scores on the VI-SPDAT, White participants were more likely to receive a recommendation for Permanent Supportive Housing (69.4% vs 60.0%; $p<0.001$) and less likely to be recommended for rapid re-housing (RRH) and non-housing interventions ($p<0.001$). They were also experiencing homelessness for less time than participants in other racial groups (proportion with duration less than 2 years: 43.4% vs 40.2%; $p<0.05$) although months of homelessness and number of episodes of homelessness in the past 3 years did not differ significantly according to race (Table 25).

There were no differences in VI-SPDAT scores or housing intervention recommendations between Hispanic and non-Hispanic participants (Table 26). Ethnicity-dependent differences included lower age at assessment, lower income rate (Q15), lower rates of hypothermia (Q23), heart disease (Q27), emphysema (Q28), and cancer (Q31), higher rates of diabetes (Q29), and lower levels of problematic alcohol use (Q35) and episodes of treatment and relapse (Q38) (all $p<0.05$).

Tests for differences in responses between identified genders (using a binary transformation of the 4 gender categories) demonstrated a considerable number of areas of heightened vulnerability for females (Table 27 for details). However, the overall scores on the VI-SPDAT and associated recommendations for housing intervention were not found to differ by gender ($p>0.05$). Females reported more episodes of relapse into homelessness, although they reported fewer total months of homelessness in the past 3 years, and it was less likely that their current episode of homelessness had lasted 2 or more years (all $p<0.05$).

Females were more likely to be younger ($p<0.001$), but also reported higher rates of kidney disease (Q22), heart disease (Q27), asthma (Q30) and cancer (Q31) (all $p<0.05$). Males were more likely to report medical histories of hypothermia (Q23), HIV/AIDS (Q25), hepatitis C (Q32), tuberculosis (Q33), and every single item measuring alcohol or drug use (Q35-41) (all $p<0.05$). Females were more likely to report being attacked (Q8) or forced or tricked to do something they didn't want (Q11) (both $p<0.001$). Females were less likely to report pending legal issues (Q10), but more likely to owe someone money (Q14) and have people they didn't like or negative social influences in their lives (Q18-19) (all $p<0.05$). Females also reported more frequent use of the emergency department, ambulance services, and crisis services in the past 6 months (all $p<0.05$). Females were more likely to access hospitals or clinics as their primary source of healthcare (Q21) than males and less likely to report not seeking care ($p<0.001$). Males were more likely to report a history of brain injury (Q45) ($p<0.05$), but females were more likely to report problems of untreated abuse or trauma related to their homelessness (Q50), problems with concentration (Q47), and multiple measures of mental health burden (Q42-44) (all $p<0.001$), as well as non-adherence with their medication (Q49) ($p<0.01$; Table 27).

The duration of homelessness also demonstrated a strong association with vulnerability as measured by the VI-SPDAT (Tables 28-30). In addition to differences in every other measure of homelessness duration and episodic frequency, individuals who reported experiencing more than 12 months of homelessness in the past 3 years scored higher on the VI-SPDAT than those with less than a year of homelessness experience (median {IQR}: 10 {8-13} vs 8 {6-10}; $p<0.001$) and were significantly more likely to receive a

recommendation for PSH compared with those with less than 12 months (80.9% vs 59.0%; p<0.001; Table 28 for details). Similarly, individuals with 4 or more episodes of homelessness in the past 3 years scored higher on the VI-SPDAT than those with 3 or fewer episodes (median {IQR}: 10 {8-12} vs 8 {6-11}; p<0.001) and were more likely to receive a score in the qualifying range for PSH (Table 29 for details). Those labeled as chronically homeless (approximation of the HUD-defined criterion incorporating the previous two definitions) also demonstrated significantly elevated vulnerability scores (median {IQR}: 10 {8-12} vs 8 {6-10}; p<0.001; Table 30 for details).

Nearly every item on the VI-SPDAT was worse for those individuals with at least one year of homelessness in the past 3 years, or 4 or more episodes of homelessness in the past 3 years, or those meeting proxy criteria for chronic homelessness, including every measure of service utilization, alcohol or drug use, mental health, or cognitive problems. There were only a few measures of social vulnerability, income, and medical history in which there were no differences (Tables 29-31).

Tests for Interactions

Secondary stratification of the assessment results by race and by gender showed even further variability in the results across demographics. This effect demonstrates the potential for disparities in risk to aggregate into smaller and smaller sub-populations of the larger community experiencing homelessness. It also demonstrates the hazard that disproportionate levels of prioritization scores may influence systematic disparities in allocation of interventions.

Multiple dissimilarities in the degree of the racial (White vs other race) and gender (binary: Male /Female) differences were observed when the effects reported above (Tables 26-31) were further stratified by race, gender, ethnicity, and chronic homelessness (Tables 32 & 33).

Race differences seen for sleep in an unsheltered setting (Q13) and experience with substance abuse treatment and relapse (Q38) both differed by gender (MH tests of homogeneity of ORs; all $p<0.05$). The results suggest that while White male subjects were more likely to sleep unsheltered than males of another race (OR=1.19, $p<0.05$), females of another race were more likely to sleep unsheltered than White female participants (OR=0.78, $p<0.05$; MH test of homogeneity $p<0.05$). While White subjects reported higher rates of treatment and relapse overall, the effect was heightened for White females over those of another race (OR=1.92, $p<0.001$) than the association for males (OR=1.32, $p<0.001$; MH test of homogeneity: $p<0.05$). The association of race with age, duration of homelessness, and veteran status were all different between the two genders as well (all $p<0.05$).

Associations between race and items in the VI-SPDAT also varied by ethnicity (Table 31) including items regarding risk behaviors, economic status, medical conditions, substance misuse, mental and cognitive health. The interviewer documenting signs of poor hygiene, and several risk behavior items including history of harm to self or others, being forced or tricked to do something, and outstanding legal issues were all elevated for White non-Hispanics compared to non-White non-Hispanics, with no racial differences seen for Hispanic participants. Similarly, White Hispanic status was inversely associated with reporting negative social influences compared to Hispanics of other races (OR=0.59, $p<0.05$)

while White non-Hispanics reported such influences at higher rates than non-Hispanics of other races (OR=1.32, $p<0.001$; MH test of homogeneity: $p<0.001$). The association between age and race also varied by ethnicity. More White non-Hispanics were over the age of 65 compared to non-Hispanics of other races (5.2% vs 3.2%; $p<0.05$), while White and non-White Hispanics had similar proportions over 65 years of age (MH test of homogeneity: $p<0.05$).

Whereas racial disparities in heart disease (Q27) appear in those chronically homeless (OR=1.24, $p<0.05$; MH test of homogeneity: $p<0.05$), racial disparities in experience with mental health service utilization (Q44) appeared for shorter term homelessness (OR=1.44, $p<0.001$) but disappear for those experiencing chronic homelessness (MH test of homogeneity: $p<0.05$). Given that frequency of homelessness episodes was one of the criteria contributing to the definition of chronic homelessness, it is assumed that these would be strongly related. However, an association between race and episodes of homelessness was also revealed in participants labeled chronically homeless (OR=0.89, $p<0.05$), but not in those experiencing shorter-term homelessness (MH test of homogeneity: $p<0.05$).

When gender differences (binary) were further stratified by race, ethnicity, and chronic homelessness, several multiplicative interactions were identified once again (Table 32). A gender disparity in unsheltered sleeping location was uncovered, with White females less likely than males to sleep in non-shelter locations (OR=0.78, $p<0.05$), while the same gender disparity was not found for participants of other races (MH test for homogeneity, $p<0.05$). The gender disparities in cancer history (OR=3.54 vs 1.90, both $p<0.05$) and

experience with treatment and relapse (OR=0.48 vs 0.70, both $p<0.001$) were both greater for non-White females (MH test of homogeneity: $p<0.05$). Gender differences in age, duration of homelessness, and veteran status differed significantly by race as well (all $p<0.05$).

Gender differences in results also varied by ethnicity. Specifically, the gender disparities in emergency department visits for emotional symptoms and the interviewer observing 'signs of severe, persistent mental illness' were both heightened for Hispanics (tests of homogeneity: both $p<0.05$). For example, Hispanic females were more likely to report emergency visits for emotional symptoms (OR=1.74, $p<0.001$) than Hispanic males, while non-Hispanic participants did not demonstrate the same effect size (OR=1.23, $p<0.05$; MH test of homogeneity: $p<0.05$). While there were no gender differences identified in total VI-SPDAT score or housing intervention recommendation overall, secondary stratification by ethnicity demonstrated significant disparity. There was a gender difference within Hispanic participants in the assessment, as Hispanic females scored higher on the assessment (OR=1.05, $p<0.05$) and were more likely to be recommended for PSH placement while no such effect was seen for non-Hispanics ($p<0.05$; test of homogeneity: $p<0.05$).

Since chronic homelessness represents increases in duration or episodic frequency of homelessness, it was expected that risk factors associated with increased time or frequency of homelessness episodes would have been elevated for those labeled as chronically homeless and this was repeatedly confirmed by these results (Table 30). However, stratification of gender differences by chronic homelessness also showed an obscuring of gender differences in medical conditions seen by participants not meeting the criteria for chronic homelessness but not in the chronically homeless group (Table 32). Differences such as increased history

of frostbite /hypothermia in males (OR=0.37, p<0.001), greater ambulance utilization by females (OR=1.08, p<0.001), or increased observations of medical conditions by the interviewer for females (OR=1.48, p<0.001) all disappeared for the set of individuals with chronic homelessness (tests of homogeneity were all p<0.05). Gender differences in age (females were younger on average) and veteran status (males were more commonly veterans) were also heightened for the chronically homeless relative to those experiencing shorter term homelessness (tests of homogeneity, all p<0.05).

3b. Negative Binomial Models of total VI-SPDAT score

Since the variance of the VI-SPDAT scores is greater than the mean (mean: 8.97; var: 10.41), negative binomial models were used over Poisson for the treatment of the total score as a count variable. While the distribution of scores does not meet normal distribution, there is no evidence of a zero-inflation effect in these values (See Figures 6-8. Histogram, Kernal Density, and Q-norm plots of VI-SPDAT score distribution). Goodness of fit test comparisons of negative binomial models with zero-inflated negative binomial models, using Akaike (AIC) and Bayesian Information Criteria (BIC), demonstrated that modeling zero-inflation did not improve the model fit.

Univariate, negative binomial regression tests for 9 of the 50 items in the VI-SPDAT were unable to process (Table 33). Models were unable to converge, giving errors of "not concave" or "backed up". This indicated a failure of the Newton-Raphson maximization to identify the maximum likelihood estimate (MLE). The data showed over-dispersion (hence the negative binomial model), but there was no evidence of zero-inflation found. One

common reason for this outcome is a log-likelihood maximum on the boundary of the estimation parameter space (Williamson et al., 2013), and this is likely the case here. Estimating the association of the measure's items with the overall score is an example of auto-regression. This leads to a situation where iterative estimation steps past the boundary of the possible parameter space (Williamson et al., 2013).

Of those tests that could be conducted, all items which contribute to the score calculation demonstrated a significant relationship with the overall score (all $p<0.001$; Table 33 for details). Race other than White (either "Black /African American" compared to White, incidence rate ratio (IRR): 0.903; $p<0.001$; and White compared to all other races, IRR: 1.098; $p<0.001$) and veteran status (IRR: 0.939; $p<0.001$) were significantly, negatively associated with total VI-SPDAT score (Table 33).

The multivariate models of demographics and homelessness history retained all covariates except for age and (binary) gender fit in all three model designs (both $p>0.10$; see Table 34 for Final Model). Age fit in the mixed-effects GEE model but not in the other two designs. All 5 predicted factor scores from Model 3.2 (Aim 1 final CFA model) fit all three model designs (all $p<0.001$). Factor C demonstrated the strongest association with total VI-SPDAT score (OR= 11.34, 11.42, & 9.90 respectively, all $p<0.001$) and factor A was inversely associated with VI-SPDAT (OR= 0.45, 0.42, and 0.52, all $p<0.001$) in all three designs.

Eighteen of the 50 items in the VI-SPDAT were included from model 3.2 into the full set of covariates for the third negative binomial model (3 from factor A, 2 from Factor B, 7 from factor D, and 6 from factor E). Factor C was not represented in this model because no

items loaded high enough on that factor (all factor loadings: 0.3-0.4). Of these, 6 more were dropped for non-significant Wald tests and 12 were retained in the final GLM and negative binomial regression models. Thirteen covariates were retained in the mixed-effects, population-averaged GEE negative binomial regression model (Table 34). Substance abuse treatment and relapse (Q38) was retained in this model but not previously.

Post-tests for goodness of it provided some insight into the issues with model convergence seen in univariate and multivariate testing. Link tests of the GLM models resulted in both the 'hat' and 'hat-squared' statistics being either significant or non-significant in unison (Table 34). This suggests that the log link function may not be the optimal choice. However adjustments to the link function using other possible transformations did not change the results of the link tests. The QIC_u statistic used to assess information criteria in the 3 GEE models demonstrated the lowest statistic for model the final model of 13 items with the highest SEM loading factors and homelessness exposure measures. The highest QIC_u statistic was given to the GEE model of VI-SPDAT using the 5 predicted factor scores (Table 34).

Post-estimation of the standard negative binomial regression models provided the broadest window into model fit (Table 34). AIC, BIC, and model deviance were lowest for the model of demographics and homeless exposure history (AIC: 13158.260) and highest for the model of predicted factor scores (AIC: 21192.136). McFadden's adjusted-R was highest for the final model of the highest-loading items on the VI-SPDAT (Table 34). Of note, adjusted-R^2 did not decrease measurably with the removal of the 6 items for non-significant Wald tests.

The combination of the first (demographics and homeless exposure history) and second (predicted factor scores) sets of covariates prompted the removal of race, ethnicity and age for non-significant Wald tests in predicting overall VI-SPDAT score (Table 34). The GEE model accounting for data collector ID removed veteran status in addition to the three aforementioned independent variables.

The combination of the first and third (highest loading items on the VI-SPDAT) sets of covariates prompted removal of the demographics (race, ethnicity, and age) and veteran status, as well as ED visits for mental health symptoms (Q43) from the multivariate model for non-significant Wald tests (Table 34). The GEE model retained age and dropped the documented entry into services from the street and Substance abuse treatment and relapse (Q38), which was the additional item initially retained by the original multivariate GEE model.

The nested Likelihood Ratio (LR) test comparing the demographics/ homelessness exposure negative binomial model to the model of homelessness exposure plus predicted factor scores (model 12) was significant ($p<0.0001$; Table 34). Similarly, the LR test comparing the demographics/ homelessness exposure negative binomial model to a model of homelessness exposure plus the 12 factor items retained (model 13) was significant ($p<0.0001$; Table 34). Post-estimation of these combined models (models 12 & 13) showed large reductions in model deviance (11824.96 & 11.567.81 respectively), AIC (11846.96 & 11599.81 respectively) and BIC, and small reductions in McFadden's adjusted-R^2 (0.140 & 0.149 respectively; Table 34). There were also large reductions in the QIC_u statistic for the GEE model accounting for data collector ID when homelessness exposure and either system

of measuring the factors within the VI-SPDAT were combined (greatest for model 13; Table 34).

3c. Rapid Re-Housing Outcomes

Of the 1,277 cases with a housing entry assigned, 828 (64.8% of all assignments) were recommended to receive PSH (VI-SPDAT range {8-20}), 397 (31.1%) were originally recommended to receive RRH (VI-SPDAT range {4-7}), and 52 (4.1%) were originally assigned to 'no intervention' (VI-SPDAT range {0-3}). However, similar proportions of cases within each recommendation range received housing assignment and entry. Of the 3,126 cases scoring the PSH recommendation range, 26.5% were assigned to housing, compared to 28.1% of those in the RRH recommendation range, and 26% of those in the 'no intervention' range. Further, program type assigned did not necessarily match the recommendation from the prioritization score. Two hundred sixty four (20.7%) of the cases assigned to housing were assigned to PSH and 1,013 (79.3%) of assignments were to RRH.

On the whole, the majority of documented housing exit outcomes (n=1,160) were either positive (634; 54.7%) or not yet determined as participants were still involved in their subsidized housing programs at the end of the observation period on September 1, 2017 (358; 30.9%). 5.1% of subjects had been institutionalized (jail, hospital, rehabilitation, etc.) and 2.3% became deceased as their reason for exiting subsidized housing. Just 82 participants, (7.1%) had a negative exit destination, from subsidized housing back to shelters or 'places not meant for human habitation' (Table 35). Out of all cases with housing placements assigned (n=1277), 117 cases (9.2%) did not have a documented exit destination from

housing programs which had concluded (i.e. the client refused, data were not collected, or 'Other' not clarified).

VI-SPDAT was not significantly associated with selection for assignment to a housing program either overall (median score: 9 vs 9; mean: 8.9 in housed vs 9.0 in those not assigned housing) or within any stratified level of recommendation (i.e. 0-3, 4-7, 8-20). However, within those placed in any housing program, initial score on the VI-SPDAT was significantly higher for those assigned to PSH over those assigned to RRH ($p<0.0001$).

Modeling housing assignment for those with RRH recommendations

Specifically for the subset of cases with a VI-SPDAT score in the RRH recommendation range {4-7; n=1,413}, 397 (28.1%) were provided with a housing placement through the Coordinated Assessment process (Table 35 for details). Thirty six (9.1%) of these were placed into Permanent Supportive Housing and 361 (90.9%) were placed in RRH or Transitional Housing programs (a precursor to the RRH model). Of those provided with housing intervention in this range, 39 (10.7%) had documented negative exits as of September 1, 2017 (Table 35). Eighty one (22.2%) were still enrolled in their original program, 224 (61.4%) had achieved a positive housing exit to another, stable housing solution, 4.4% went into institutional programs, and 5 (1.4%) became deceased (Table 35).

Within the RRH recommended range, housing assignment was modeled using logistic regression beginning with univariate tests of overall score on the VI-SPDAT, demographics and all other items in the assessment. There were 12 items on the VI-SPDAT which were found to be associated with housing assignment as well as multiple other covariates, including male gender, non-Hispanic ethnicity, age, and months of homelessness in the past 3

years (Table 35 For details). As discussed above, score on the VI-SPDAT was not directly associated with placement into a housing program. The same list of variables were tested in combination with overall VI-SPDAT score and the inclusion of these variables did not produce a model in which VI-SPDAT was associated with housing assignment (Table 35).

A multivariate logistic regression model of housing assignment, restricted to those with scores in the RRH-recommendation range and using all covariates included in univariate testing, produced a set of 8 significant, independent covariates. These identified covariates did not include overall VI-SPDAT score ($p>0.05$). The relationships of these individual items in predicting later assignment to housing were sometimes unexpected. Four of 8 the items included in the final model were inversely associated with housing: not seeking healthcare (Q21; OR=0.67), mental health hospital visits against will (Q42; OR=0.55), learning disorders or developmental disability (Q46; OR=0.61), and poor medication adherence (Q49; OR=0.57; all $p<0.05$). Each of these items is able to contribute a point toward the VI-SPDAT score, contingent on responses to the questions around them, but are in fact protective of placement in subsidized housing programs. Meanwhile, two questions which are typically reverse coded when scoring the VI-SPDAT: having any regular income (Q15) and activities that cause happiness (Q17) were positively associated with housing assignment (OR=1.60 and 1.51 respectively).

In contrast to question 42, any mental healthcare provider visits (Q44) was positively associated with placement in housing (OR=1.81; $p<0.001$), as was owing money to others (Q14; OR=1.68; $p<0.001$). This all suggests there is a strong relationship with successful

housing assignment for positive interactions with systems of care and available financial resources, while VI-SPDAT score does not have as strong an influence as might be expected.

Modeling negative housing exit for those with RRH recommendations

Alternatively, a multivariate logistic regression model of negative housing exit resulted in inclusion of just two items: interviewer-observed serious health conditions (Q34; OR=0.25; $p<0.05$) and poor medication adherence (Q49; OR=2.70; $p<0.05$). VI-SPDAT score was not associated with negative housing exit in this multivariate model either ($p>0.05$).

Modeling negative housing exits for RRH entries

Specific to the subset of cases who were eventually assigned to RRH during the period observed (n=1,013), their VI-SPDAT score and associated recommended level of housing service spanned almost the entire range of scores (median: 8, IQR: 6,10; range=1,17). Of these, 608 (60.0%) originally scored in the range above RRH and were recommended to receive PSH intervention, while 35.6% scored in the RRH-recommendation range, and 4% were originally recommended for 'no intervention' (Table 35). Of the 918 cases with documented housing exit outcomes, 163 (17.8%) had ongoing RRH support at the end of the observation period. The majority of those remaining had positive exit outcomes documented: 619 (67.4%) with positive exit to stable housing plans, 47 (5.1%) leaving RRH for an institution, and 74 (8.1%) with a negative exit documented. Fifteen individuals (1.6%) became deceased while in their initial RRH program (Table 35).

In those cases receiving the RRH intervention, multivariate models of negative housing exit (Table 35) resulted in inclusion of three items from the VI-SPDAT instrument:

emergency department visits in past 6 months (Q3; OR=1.16; $p<0.05$), ambulance transports in past 6 months (Q5; OR=0.73; $p<0.05$), and problems with concentration or memory (Q47; OR=0.44; $p<0.01$). VI-SPDAT score was not associated with negative housing exits in this sub-sample either ($p>0.05$). Frequency of using emergency department services was associated with subsequent negative exits from RRH. Whereas, ambulance interventions and self-reported problems with concentration or memory on the VI-SPDAT are inversely related to a negative exit from the housing assignment that followed. This finding may be indicative of the level of care individuals required and received once provided with subsidized, rapid rehousing.

DISCUSSION

This research investigation has uncovered a number of key findings about the use of the VI-SPDAT in Travis County which merit further consideration. To briefly summarize, threats to the validity of this research were first explored. The internal consistency of the VI-SPDAT and each section in it was described and various models were tested to explore the latent factor structure of vulnerability as measured by this tool. The criterion validity of the measure was tested for the items that could be validated using two distinct sources of electronic health data. The results of the assessment were summarized and parsed for group differences. The mechanics of the measure were studied once again by modeling the overall score on the tool using demographic information and the items that comprise the tool. Finally, the association of the score with housing-entry and –exit outcomes were examined.

There are several findings to highlight in particular. The characterization of the constructs behind the measure shines a light on how vulnerability is defined, as measured by the items in the VI-SPDAT. There is now evidence to suggest that medical condition items in this measure are under reported compared to community medical record systems (generally low sensitivity), but that cases of over-reporting are rare (generally high specificity). The issue of racial, ethnic, and gender disparities arises in both the multiple group tests of the final factor model (Aim 1c) and testing for demographic differences in the results (Aim 3a). Finally, there is the concerning result of the disconnect between score on the VI-SPDAT and actual decision to place clients into housing.

Findings in Context

This research builds upon the recently published findings of Brown et al., which was the first examination of the performance and psychometric characteristics of the VI-SPDAT. Their research is fundamentally rooted in the same understanding that measures of constructs such as this need to be validated and tested rigorously. They also stress that this step was either not sufficiently performed or not communicated, while the creators publicly claimed that the tool was evidence-based and scientifically tested (Brown et al., 2018).

The study by Brown and colleagues (2018) also consisted of a single CoC's available data. However, that work used a sample that combined use of the tool through both the coordinated assessment and the annual, cross-sectional survey known as the HUD Point in Time Count. It also used a smaller pool of assessments (unique n=1,495) than was available for this research (unique n=4,739).

Brown and colleagues' (2018) test-retest measures were predicated on a sample that contained repeated measures performed less than 2 weeks, 1 month, and 3 months apart from each other (Brown et al., 2018). However, this study was limited to studying the reassessments conducted at a minimum of 6 months apart. It is expected that overall vulnerability and answers to many of the questions on the VI-SPDAT should change over time. Therefore no claim is made by this research to examine test-retest or inter-rater reliability.

Brown et al. also explored the claim that the VI-SPDAT could reduce negative housing outcomes (i.e. return to homelessness) by recommending the most appropriate level of intervention and prioritizing those most likely to succeed in each program. Score on the tool was inversely associated with returns to homelessness overall. It went on to demonstrate that the level of housing and the availability of a permanent subsidy was a far better predictor than VI-SPDAT score. Since higher scores on the VI-SPDAT should improve likelihood of higher levels of support and permanent subsidies, this association appears to be responsible for the improvements in housing outcomes.

Neither Brown et al. nor this research portfolio explores the other extant claim that the VI-SPDAT serves as an index of health vulnerability in order to predict premature mortality. It is recognized that both of these claims are no longer being made by the creators of the VI-SPDAT. This change is possibly attributed to OrgCode's ongoing accrual and examination of data from several communities that have implemented their tool, although no such results have been released yet. This research does not attempt to address either claim,

and instead focuses on more pragmatic issues of how the measure performs within the Travis County's CoC.

This research also represents a significant step forward for the available research and evidence regarding the Vulnerability Index (VI; precursor measure to the VI-SPDAT). Conceptually, this measure was developed for a very similar purpose (the 100,000 Homes Campaign) years before the Coordinated Assessment was introduced. It was intended to prioritize those with the greatest 'health vulnerability' for placement in PSH. This made it a natural precursor to contribute to the VI-SPDAT. For example, the CoC's of Houston and Dallas both began using the VI as their coordinated assessment prioritization tool before internally developing measures of their own.

One of the first studies to publish results from the VI, Cronley et al. (2013) used hospital records to validate the self-reported utilization rates in the VI (r =0.4, p<0.01). Subsequent testing of the relationships between overall score on the VI and various subsections in that tool is similar in conception to the work produced in section 3b of this research. While Cronley and colleagues limited their constructs to substance use, mental health, and the 'sum of reported health conditions' (Cronley et al., 2013), their research explored multiple avenues for analyzing the theoretical latent factors within the VI-SPDAT. Linton & Shafer (2014) tested the relationships of the so-called predisposing, need, and enabling factors in the measure in predicting utilization types (outcome factors). While this is not specifically recreated by this analysis, the core idea for testing the relationships between elements of the measure has echoes in this work; namely the use of the Behavioral Model for Vulnerable Populations in Aim 1 and the testing for interactions in Aim 3 of this project.

Summary of the findings in this research

Selection bias

Overall, results from this study suggested that those who approved the optional ROI for evaluation purposes also reported higher rates on many items in the VI-SPDAT. This may be due to an association between individuals declining the ROI and having reservations about reporting their risk factors and medical history in an interview. It could also be something more systematic about the route through which these cases encounter the CA. This missingness is clearly informative, as differences between those providing and declining the ROI are consistently identified. The missing responses that result from not including this group are not associated with any demographics or levels of exposure to homelessness measured. However, it seems unlikely that the approximately 4% of the sample who declined the optional ROI will have caused significant bias to the findings. Still it is important to recognize that these results are representative of only those participants who approved the use of their information for such study.

Aside from this small group, the data used in this analysis represents the entire sample of individuals completing assessments from the beginning of the process all the way through until the system switched to version 2 of the tool in early 2017. Therefore these findings are considered representative of individuals experiencing homelessness and seeking housing or other services in this specific community and willing to share their data (See Limitations, below, for further discussion of sample biases).

Data quality and completeness

For the missing data points distributed throughout the rest of the data, a test of whether they were Missing Completely at Random (MCAR) was rejected. While it is not known, it is possible that these missing values are Not Missing at Random (NMAR), with unmeasured causes driving the distribution of missing values. Accordingly, the use of available case analysis is a potential source of bias (see Limitations for details). It is considerably more appropriate if it is accepted that the assumption of MAR is accurate. As described in the Results section, there were a very limited number of variables in the data that had a substantial number of missing values. The missingness in these variables, ancillary to the VI-SPDAT, can be explained by adjustments to the CA data elements made at an interim point during the observation period. For the purpose of this research, it is therefore assumed that these values are not missing as a result of unmeasured bias that would influence the data or the results of statistical tests.

Repeated measures

Given the large time intervals between reassessments (minimum of 6 months), it was not expected that scores on the VI-SPDAT or individual items would be perfectly correlated. Statistical tests of correlation are informative, but the focus of this analysis was to identify the degree of change in the items over time. In the end, fewer (7) items significantly increased from first to second assessment than might be expected. However every instance showed an increase in vulnerability, and the median overall score on the tool increased by 1 point (median 9 [IQR=7,12] vs 10 [IQR=8,13]). It is worth noting that two of the items that increased were interviewer-directed questions about observation of signs of poor hygiene

(Q20) and signs of drug or alcohol use (Q41). Two of twelve possible medical conditions: heatstroke /heat exhaustion (Q26) and heart disease (Q27) increased. Attempts to harm self or others in the past year (Q9), most commonly sleeping in an unsheltered location (Q13) and reported history of unresolved trauma (Q50) also increased over time. While the interviewer-directed questions are more subjective, they may represent overall appearance of the individual participating in the assessment. Meanwhile, attempts to harm self or others and an unsheltered sleeping location are more likely related to the social and environmental exposures associated with homelessness and the degradation of individuals' safety. The increase in reports of unresolved trauma is particularly curious. This is a question that requires a certain level of self-awareness about the complex circumstances that are known to lead to homelessness. It is possible that the added time and experience with homelessness eventually leads individuals to this insight about themselves. This may also stem from accumulated interactions with case managers and other services' advocates who are trained to recognize this influence and practice trauma-informed care.

While this research does not directly address the issue of reliability as it is typically understood, it supports the belief that variability in scores exists between scheduled measurement periods. It demonstrates that scores may be expected to change, possibly over time periods shorter than 6 months.

Aim 1

It is worth emphasizing here that the structural models of vulnerability which were explored in this research study were specifically limited to the definition of vulnerability that the VI-SPDAT captures. It is a separate theoretical exercise to explore how to define

"vulnerability". However, it is one which should be considered and continuously reconsidered by communities. Questions might include: a) what sort of "vulnerability" a community would like to prioritize, b) the scope, weight, and structure of the constructs to include, and c) how to best obtain measures of such a global definition. For the purpose of this research, vulnerability was defined by the content of the VI-SPDAT itself, which may or may not be a reasonable assumption.

Aim 1: Internal consistency

The internal consistency of the measure was high (α=0.759) and higher when considering just the dichotomous items (excluding questions 2-7, 13 and 21: α=0.818). This suggests that there may actually have been a singular construct which the VI-SPDAT was measuring. It also reflects the fact that the various ways in which the construct of "vulnerability" is construed in this measure were highly related to each other. However, that same level of consistency was not seen when measured within the explicit domains of the tool {range= 0.055-0.725}. This indicates that there were more complex dynamics involved within the 50 items used to assess vulnerability than the 4 sections of the measure are able explain. Testing of alternative models using confirmatory factor analysis has shown that the domains into which the tool is divided do not best represent the latent factors which the tool measures (more on this below).

Confining consistency measures within the ranges of scores that produce single points on the tool also resulted in highly variable results, with the highest consistency found in the ranges addressing various service utilization rates (Q3-7: α=0.679), substance use (Q26-34:

α=0.689), and mental and cognitive health (Q35-41: α=0.662). The purpose of these groups are to capture a single issue of vulnerability through a breadth of questions, so it could be argued that high internal consistency actually suggests that some items in these ranges are redundant. A few, more broadly worded questions might be just as sensitive to the intended source of vulnerability without pursuing overlapping questions. Along this same line of reasoning, smaller ranges of questions with lower internal consistency could be an efficient way to broadly capture a construct using a sort of "either/or" operant logic.

Aim 1: Construct Validity

One of the most critical findings from this phase of the analysis is that the structure of the VI-SPDAT is not well represented by the section headers that are used to carve the tool up into 4 sections. The model using the labeled sections of the measure as latent factors (1) is most directly comparable to model 2, since model 3 excluded the questions about service utilization (question 3-7). Yet model 1 yielded the poorest fit statistics out of the initial three.

The 5 latent factor model conceived of by the author (Model 3) demonstrated superior fit to the data than either the explicit domains of the measure (1) or the Behavioral Model of Vulnerability (2). This model was improved upon by dropping items with the lowest factor loading coefficients (<0.3), and then relying on statistical indices and basic theoretical understanding of the behaviors or conditions described. In the end, Model 3.2 resulted in further improvement to the goodness of fit and several conceptual changes which strengthened the original design (see Results, Aim 3 for details). Substantive changes were made to the first two proposed factors, necessitating new titles. This new model, and the new

"Environmental Threats" factor in particular, also has some curious implications. In contrast to the four other factors, it showed an inverse relationship when the predicted factor means were used to model the overall score on the VI-SPDAT (see Discussion, Aim 3 for details).

All item-factor rearrangements were supported by a combination of both post-estimation modification indices and theoretical support for the changes to relationships being proposed. The factor of "Social Risk Factors" as first proposed was largely dissected by this process. Despite the original concept behind model 3, it makes good sense that an item such as the history of harm to self or others (Q9) is more strongly associated with the latent factor of "Mental Wellness" than social risk. Similar to this, the move for the item regarding engagement in risky behaviors (Q12) from social risk factors to the "Alcohol/Drug" factor is conceptually sound. It is also likely to be a reflection of how participants interpret or perceive the question's intent. Given all of the interrelatedness between items in the measure, there is a strong rationale for the introduction of each of the specific covariance terms into the model as well.

The most curious move involved 2 questions: heatstroke /heat exhaustion (Q26) and poor medication adherence (Q49) into combination with a history of being attacked while homeless (Q8). This transition was supported by exceptionally high modification indices following the fit of model 3, in both cases. These three measures appear to reflect a new factor based on the unique environmental exposures and threats associated with being homeless. Since the theory tying these factors together is more implicit than explicit, future research into the VI-SPDAT should further explore this factor and perhaps better characterize what latent domain is being measured by these items. This new factor also represents the

smallest number of items and the smallest possible contribution to points on the overall tool, which may need to be reexamined in the future. The mechanisms by which this factor is inversely associated with overall score on the VI-SPDAT need to be clarified as well.

Aim 1: Multiple-group CFA

Multiple group testing of model 3.2 failed to demonstrate even "weak invariance" across all 5 characteristics for which it was tested (White vs other races, Hispanic ethnicity, (binary) gender, duration of homelessness and chronic homelessness). Despite any limitations of the structural models applied, it is clear that the factors identified in the data are not consistently organized across sub-groups within the population for which it is intended to measure. This suggests that the patterns of 'vulnerability' as measured on the VI-SPDAT are different for these different groups. The immediate implication of this is that the VI-SPDAT is not necessarily measuring the same construct in each group. As a result, scores between sub-groups like this may not be comparable. In other words, it may not be that whites score higher on the VI-SPDAT because of inherent increases in vulnerability, but just that the VI-SPDAT doesn't represent the same constructs equally between these two groups and thereby skews scores in favor of one group over the other.

The inability of the measure to demonstrate even weak invariance suggests the need for one of two options. Unique versions of the VI-SPDAT can be tailored to group-specific factor structures using adjustments to the grouping of items or the points awarded. Alternatively, a new measure development process could begin from scratch, focused on achieving more stability between sub-groups. This process would require testing the

reliability, construct and content validity of the intended factor structure in different demographic and exposure-based sub-groups.

Aim 2

At a minimum, it seems clear that use of EMR systems for locating objective evidence of the health vulnerability factors covered by the VI-SPDAT remains a limited option. Between the EMR and HIE systems, the HIE seems to provide much more comprehensive and consistent data for use as a criterion in comparing the VI-SPDAT. As an alternative procedure to collection of self-reported vulnerability, the HIE appears to serve as the more optimal source of objective data for characterizing vulnerability as well.

When using the HIE as the criterion for validation, there is some indication that the VI-SPDAT has high specificity for medical history and healthcare utilization items. However the sensitivity of the self-report measures is often very low. By association, this would be true for the interview procedure for coordinated assessment as well. The implication of those items with good specificity (low false positives) is that it is rare for someone to claim a condition without documentation in the HIE records to back that up. On the other hand, the low sensitivity (higher false negatives) indicates that participants are more likely to not report history of conditions for which there is evidence they have.

Obviously, the measurement of self-reported health conditions and diagnostics captured by a community HIE cannot be expected to coincide perfectly. There are issues of health literacy and cognitive issues that may create recall bias on self-report. It has also been informally suggested that CA participants might over report conditions in order to inflate their scores. On the other hand, there are issues of thorough documentation based on short

clinical encounters, data capture across multiple healthcare agencies, and HIE data management that effect the ability of the HIE to capture diagnostics. There may also be real disagreement about disease status between the provider and patient causing such discrepancies. There is no perfect, gold-standard for this information. That said, any possible concerns from the community about false over-reporting on elements of the VI-SPDAT seem to be overblown, at least for the items regarding health conditions and healthcare encounter rates.

An objective measure of health and self-reported health status also don't necessarily intend to measure the same thing. Objective measures of health care interactions and diagnoses require that individuals are successfully accessing systems of care and those systems are accurately documenting the issues of interest. However, it would also offer the ability to more finely parse the levels of complexity, severity, and specificity of medical comorbidities. Conversely, collection via self-report is closer to a measure of perceived health and wellness.

This issue involves a departure from the question of criterion validity of the VI-SPDAT as well. Instead it introduces challenges to construct validity of the measure, by questioning what information and sources should be used to assemble a definition of "vulnerability". Since the actual definition of vulnerability and what it should incorporate is still open to discussion, it isn't clear whether documentation of a diagnosis is preferable to self-reporting. It also raises the question whether diagnosis is a sufficient or appropriate threshold for health status to demonstrate that "vulnerability" is met. For example, the measure collects history of disease and several sub-clinical behavioral patterns associated

with substance misuse and mental health. The VI-SPDAT does not collect the degree to which these affect the lives or disability status of individuals.

Another concern is whether levels of severity should be included in accurately capturing overall vulnerability. The VI-SPDAT does not consider stages or severity of conditions. A participant with a history of melanoma receives the same conditional point on the tool as someone with stage IV liver cancer. A participant with medication-managed depression and another with debilitating psychosis may receive several of the same conditional points on the measure as well.

What this data does show is that if the community wanted to use more objective measures of vulnerability, their intentions need to be determined first. Clinical-facing electronic medical record systems offer much more information about the acuity and severity of many health conditions. However, if the goal is accuracy of documented diagnoses, they should probably steer away from narrative and episodic sources of documentation such as EMRs and rely on integrated administrative systems instead. While Health Information Exchanges are not available in every community, this study indicates that homeless services might consider advocating for these and for their agencies' access to them.

Aim 3

3a. Descriptive reports and Tests for Disparities in Vulnerability

Perhaps the most concerning finding is the imbalance in vulnerability scores based on race and ethnicity. Gender disparities tended to result in slightly higher scores for females (the minority). However, it is the White, non-Hispanic participants that demonstrate the

highest overall scores on the VI-SPDAT. This has the potential to result in unequal allocation of housing programs or higher prioritization of some groups at the expense of others. This combined with some indications that White and non-Hispanic participants have been homeless for less time when they first participate in the coordinated assessment, suggests the possibility that this group may be over-triaged into housing by the current system and spend less time in homelessness, relative to minority populations – assuming the score has the effect on the system for which it was implemented.

There are at least three possible explanations for the multitude of racial and ethnic disparities and interactions in the assessment items and scores. First, it has been suggested that there may be demographic differences in reporting or recall biases, however this was not identified during the criterion validation step.

The second explanation is that these effects are accurately portraying a fascinating dynamic in the community of individuals experiencing homelessness. This is the research question being proposed by researchers working on the relationship between race, systemic racism, and homelessness (Olivet et al., 2018). Their framework attempts to address the issue of greater disease burden, service utilization, and behavioral health symptoms in White individuals experiencing homeless (Olivet et al., 2018). Summarily, they suggest that White individuals who become homeless tend to have greater depth of resources through their social and family network prior to becoming homeless. White individuals have had to use up more resources and pass through a stronger social safety net than persons of color who have less social capital in place to prevent entry into homelessness. Their qualitative research might simultaneously explain the disproportionate numbers of minorities experiencing

homelessness and the greater level of vulnerability factors seen in White non-Hispanics (Olivet et al., 2018).

Women may be at risk for homelessness for different reasons than men and their experience prior to homelessness may result in a different type of vulnerability. This idea is supported by the fact that women tended to score lower on items addressing risk behaviors but higher on items describing victimization. It is also supported by the items that showed variability in factor model 3.2 when tested by gender.

The third option is that the measure itself is the cause of the differences measured. Further context for this result is provided by the failure to demonstrate consistency of the tool between demographics. Such variability in the model may directly cause disproportionate scores because the factor structures on the instrument differ between these groups. Since the measure was never tested within and across demographic sub-groups before, it is unclear to what extent this model variability drives the disparities observed in this community's data.

While this research also demonstrates (Aim 3c) that the overall score is not a strong predictor of housing program entry, variations in individual items could still have an unbalancing effect on other steps along the way. Follow up on this issue showed that race was not statistically associated with housing entry, but that it does lead to an increased proportion of White individuals being recommended for and placed in Permanent Supportive Housing, over Rapid Re-Housing programs (23.7% vs 16.5%, $p<0.05$). This finding has social justice implications that could also offer a glimpse into a possible, new driver that is recycling an old strain of systemic racism.

3b Modeling score on the VI-SPDAT

The association between demographics and score on the VI-SPDAT became nullified in the final, composite, mixed-effects GEE models of the total score on the VI-SPDAT, only when merged with components of the measure itself (either the factor scores or the most highly predictive items; see Results, Aim 3). However, there are identified and acknowledged differences in items on the measure between demographic groups. There are also several univariate relationships between demographics and overall VI-SPDAT score. Therefore, this exclusion of demographics in the model combined with elements of the measure itself may be a result of multiple mediation effects. Variations in responses rooted in racial, ethnic, and gender disparities more directly influence changes in the final score. This extensive and complex relationship between race, vulnerability scores, and housing entry simultaneously: 1) demonstrates the importance of continuous evaluation of the results that are produced by the coordinated assessment system and 2) calls for corrective action to address this sort of disparity.

3c VI-SPDAT and Housing

The VI-SPDAT does not appear to work the way it was intended. There is a myriad of implications to the fact that the VI-SPDAT was not associated with placement in housing, in at least this one community where it has been adopted. Other barriers and eligibility criteria apparently still dictate the client intake and evaluation process. The effect of these concerns supersedes the influence of the VI-SPDAT to serve the purpose for which it was implemented (if not the reason for its original design).

The reason that this is happening is unclear. The VI-SPDAT may not be in use in the manner for which it was intended. It is possible there is a breakdown in the process between initial assessment and placement in housing. The tool is certainly not being implemented in the way that OrgCode originally and officially presented the instrument, as a pre-screen and triage tool prior to a full prioritization and service recommendation assessment. There is also likely to be a critical failure occurring at one or more steps along the complex process to bring an individual from homelessness into a housing program. A comprehensive program evaluation will be required to isolate and depict such failure and future research is needed to help explain this phenomenon. However it could start such exploration with this measure's items and related topics determined to be associated with housing placement and housing outcomes by this research.

Policy recommendations

The results of this research contain lessons that are immediately applicable to local CoC practice and to federal policy. First and foremost, many of the steps involved in this work can easily be replicated by CoCs using their own coordinated assessment data. These findings show that communities must adopt an ongoing approach to evaluation of their CA process performance. This should include the impact made by their prioritization measures and the ability of these new processes to predict system intervention and outcome. Measures should be adjusted with an aim to see processes improved until the system is 1) truly reflecting community goals and intended definitions of 'vulnerability', 2) interventions are following the prioritization proscribed, and 3) inequities are addressed.

More broadly, the administration at HUD has a mandate to help disseminate this practice and require reporting of CA performance that addresses the concerns raised. The team at HUD responsible for compiling and managing System Performance Measures (SPM) reports from the CoCs may be in the best position to take the lead on this effort. There are already annual performance reports (APRs) required for all Coordinated Assessment programs which could be strengthened to include such information.

Communities are already permitted to define vulnerability for themselves (either alone or in collaborations) and think broadly. They are also allowed to choose another construct for coordinated assessment prioritization entirely. There is still a strong case to be made for this decentralized approach to assessment, as long as those communities are able to support the evaluation of such independent ventures. This would preferably occur with the input of members of the community experiencing homelessness, frontline service providers, healthcare advocates and, critically, experts in measurement development and validation. Perhaps, some could even consider moving away from notions of ordinal scoring and ranking at all. Preliminary steps to the work reported here showed that the casual practice of using the total score on the VI-SPDAT as an ordinal measure was problematic, since it did not meet assumptions of proportional odds.

Of course, there are strong arguments to standardize the definition of vulnerability for the entire country as well. Data sharing is a central component of every efficient administrative system. It would markedly improve the ability of HUD to evaluate system performance of the CoCs it funds. Standardized measures for allocating services and prioritizing individuals would also allow for direct comparisons across communities that

could help raise service planning and budgeting to the next level. Although, commitment to standardization would require a depth of evidence-base that does not currently exist. Without a best practice available and evidence of harm done by not properly evaluating the tool used, it makes sense to create a community-driven research study by evaluating multiple strategies in parallel. Standardization will also require a top-down political will, given the decentralized structure of CoCs.

In order to address the possible failure of CA to actually drive housing entry decisions, a distinction in definitions must be clarified at the national level. Currently, the terms 'coordinated assessment' and 'coordinated entry' are used interchangeably. However, for cases when the CA prioritization is not associated with probability of housing entry, then an expansion of the CA system must be adopted. This expansion would move to incorporate housing program eligibility criteria and automation of the program entry decision. This new, expanded system is already in place in several communities and would be better served by the label of 'coordinated entry'. In other words, all communities should endorse an expansion of their 'coordinated assessment' into 'coordinated entry'. At a minimum, this should be a federally-mandated requirement for sites that cannot demonstrate a strong association between their prioritization scoring system and their actual housing entry rates. The impact of this distinction should then be systematically studied to see if it improves the ability of prioritization systems to drive housing decisions.

Limitations

This research is a reflection of a single community's data. It is entirely possible that the findings are not generalizable to other communities, or even to those communities using

the VI-SPDAT. There are many significant findings in this research, but a large number of tests of difference and association were performed which drive up the false discovery rate for the overall analysis.

It is also important to recognize that this research evaluates a now outdated version of the VI-SPDAT. Version 2 has already been implemented in the community and it is rumored that a third version is in "development". Version 2 involves a shorter, 27-item tool. The specific health history questions and the interviewer-directed observational items are entirely removed. It may be that the condensed design of version 2 improves many of the issues identified in this work. However, this work needs to be repeated on these versions both now and iteratively, preferably before they are released for use.

Concerns about selection bias from missing data or from those participants who refused to approve the optional ROI are addressed earlier in this discussion. These data should be considered representative only for individuals experiencing homelessness and actively seeking housing and other supportive services from a single HUD-funded Continuum of Care in central Texas, completing the Coordinated Assessment, and providing their consent for use of their information. To that end, external validation of these findings in broader populations of homelessness and in other geographically-defined communities would strengthen the evidence uncovered in this research.

Importantly, there are several reasons why individuals experiencing homelessness may not have been included in this assessment. It would not be expected to capture those individuals experiencing very short periods of homelessness, able to either self-resolve their situation or rely on less formalized services than those in the CoC. Nor would it identify the,

possibly substantial, number of individuals living in homelessness who do not interact with CoC services. This sample also does not capture data from people who solely interact with homeless services through the agencies that work specifically with domestic violence. These shelter and housing agencies operate in a secondary data repository with additional levels of confidentiality for their own security and safety.

Pairwise deletion of cases (i.e. available case analysis) was used throughout this research in order to take advantage of the largest sample available for each test performed. However, the use of available case analysis presents several possible limitations. The use of either complete case analysis or available case analysis requires an assumption that missing values are MCAR for there to be no threat of bias. Some of the analyses performed with the statistical package used (STATA, v15.0; College Station, Texas) calculate standard errors using average sample size across analyses. This could have over or under-estimated standard errors in some multivariate models that did not use robust error variance. It has also been shown that pairwise deletion can result in 'non-positive definite matrices' in complex multivariate analyses such as structural equation modeling.

It is expected that there is fluctuation in the characteristics and acuity of the individuals participating in the CA between different agencies offering access to the assessment. From its earliest conception, the CA adopted a "no wrong door" philosophy which set out to provide access to the CA through interaction with any single agency in the CoC without referral to a second agency. While this ideal met some resistance in real-world practice, it was offered at a large number of different agencies over the engagement period. The CA extended beyond the CoC agencies and into other community non-profits and even

healthcare agencies and eventually hospitals. For a period of time it was even possible to have CoC staff conduct the assessment over the phone. This decentralized approach emphasized thorough dissemination and wide availability of the CA, but may have led to variability in the participant characteristics documented by the VI-SPDAT across sites (e.g. the Psychiatric Emergency Department vs. the day shelters downtown). For the most part, it was assumed that this variability was balanced out by the breadth of available locations offering the assessment and actually contributed to the representativeness of the total sample. The models of total VI-SPDAT score (section 3b) incorporated such variance by adjusting for the data collector IDs in the mixed effects model stage.

Relatedly, there is also some likelihood for secular fluctuations in the characteristics and acuity of the individuals covered in this assessment. In practice, the available locations and the number of trained staff dedicated to the "no wrong door" philosophy of coordinated assessment varied over the observation period in which these assessments were collected. Agency staff experienced turn over. Several agencies incorporated the CA into their internal processes or handed that responsibility back to the CoC staff over the months and years in which the data were collected. It is unlikely that there are many seasonal trends or dramatic fluctuations from one period to the next, but these organizational changes likely influenced some variability that is not directly addressed by this study.

Aim 1

Unfortunately, the extent to which systematic, step-by-step testing of invariance could be performed was limited by the complexity and the fit of the model being proposed and the size of the measure being modeled. Since models stipulating completely unrestricted

parameters (1) and invariance-restriction of the coefficients (2) could not be calculated (Table 19), this approach could only test for strict invariance (differences in models 3-6), or variance in the error terms of the model between groups. Application of more parsimonious SEM models provided successful tests of these less-constrained models, and failed to demonstrate even weak invariance across each of the 5 sub-groups tested. Additionally, post-estimation of the SEM model 3.2 applied separately across each group demonstrated a failure of invariance at the level of the coefficients, constants, and error terms of the model which indicates that weak invariance exists across all of the groups tested.

Aim 2

Both of the criterion selected for validation of the self-report responses on the tool have deeply-ingrained inadequacies. Personal health information systems (such as the HIE or EMR) are subject to their own sources of information bias. By no means should they be considered a gold-standard definition for medical conditions. The results of the criterion validation steps reported here should be considered carefully with the understanding that over-reporting is just as likely a result of documentation failure by the criterion as it is a measure of false-claims made by those participating in the assessment. The noted issues with sensitivity of the self-reporting are likely to be a result of the participants' recall or reporting bias, but could easily also be a result of misdiagnosis or data errors. The very fact that the two sources of "objective" information resulted in such different measures of accuracy of the VI-SPDAT indicates that there may not be such a thing as truly objective data to validate the medical status of a population.

The EMR system used only covered a single hospital network, albeit the largest in the geographic area. It would not cover treatment provided by mental or behavioral health services outside of the hospital network setting. Alternatively, the HIE report covers both hospital networks and the largest clinic system providing safety net healthcare to low income and homeless clients. It covers some but not all of the mental health institutions in the area, but still primarily accounts for mental health and substance use diagnoses made by primary care clinics, hospital and emergency medicine providers. Neither source of health information is expected to thoroughly document substance use or abuse since these issues are not always addressed during episodic healthcare visits. Overall, it does appear that relying on comprehensive, collaborative, and administrative sources of medical data such as the ICC's HIE is preferable to the narrative and clinical-facing EMR.

Aim 3

Chronic homelessness is included in the first set of covariates tested with the negative binomial models. The definition used in this research approximates the first two criteria: 1) greater than one year of homelessness, or 2) greater than three episodes in the past three years with the duration of those episodes totaling 12 months or more. As previously discussed, this label is incompletely defined and does not represent the full criteria required for chronic homelessness status and eligibility for specific housing interventions (PSH). A documented medical disability is also required to meet the HUD-defined criteria for this label. However, that information is not available within or collected alongside version 1 of the VI-SPDAT. This missing piece of the puzzle complicates several steps in the analysis and interpretation of the results from this research. It is likely that accurate chronic homelessness

status is a major determinant for those selected for entry into housing and it is an entry requirement for nearly every PSH program in the community. It is also highly correlated with the first two questions on the VI-SPDAT ('duration greater than 2 years' and 'number of times housed and re-entering homelessness'), worth a combined point on the tool.

Future Directions

The importance of taking the steps to formally evaluate prioritization tools like the VI-SPDAT is already being recognized. The first research focused on the formal psychometric qualities of version 1 of the measure has already been produced (Brown et al., 2018). However, there is still a lot of work to be done. The areas for further research on this topic are diverse and innumerable, beginning with replication of these findings in other communities and within current (version 2) and future versions of the measure. There is also an immediate need for further investigation into the imbalances between sub-populations of individuals experiencing homelessness. Regarding the latter, the possibility of disparate levels of vulnerability for race, gender, transgender and other LGBT+ groups, and those with severe cognitive or other disabilities warrants further investigation. Race-conscious methods for prioritizing housing need to be developed, either by directly or indirectly acknowledging and then addressing the measurable disparities in the system.

Critically, the entire system of housing, shelter, case management services, affiliated governmental and non-governmental funders that work on issues of homelessness should take a hard look at what is meant by 'vulnerability'. This work should re-examine, iteratively and often, how local communities and the nation as a whole should be allocating

and prioritizing housing services. Community-based research is needed to establish, test, and understand the potential for a comprehensive and broadly accepted definition of 'vulnerability' in homelessness. The advantages and disadvantages of establishing a standard definition for the country or encouraging communities to develop their own need to be more fully understood. If communities are encouraged to develop localized definitions of vulnerability, best practices for engaging consumers and front line service providers should be disseminated to help the system arrive at the optimal definitions.

Broadening the scope of this investigation, it is worth exploring whether vulnerability is the only domain of concern in allocating and prioritizing housing services. It is possible that incorporating other constructs, such as strengths-based measures, could improve successful housing outcomes or create process efficiencies not currently considered. Once the domains of priority are determined, a standard for measure development, validation, and (continuous) testing should be implemented to monitor for disparities in process measures and outcomes of the CA system.

Aim 1

More research, preferably involving a mixed-methods approach, is definitely needed to better understand the latent factors at the center of the VI-SPDAT in addition to the central construct of "vulnerability". Iterative exploratory factor analyses, new rounds of confirmatory factor modeling, and tests of content validity in combination with other standardized measurement tools would go a long way to helping understand what the VI-SPDAT is actually able to measure. Systematic observations of assessments, and interviews with potential participants and front line service staff would be useful in order to better

understand how these questions and the latent constructs are being communicated, interpreted and how vulnerability is represented during the assessment process.

Within the factors currently modeled in the VI-SPDAT, the "Environmental Threats" factor requires some attention. It is critical to build an understanding of why this latent factor is inversely associated with overall score on the VI-SPDAT in multivariate models. To aid in this, the true construct being measured by this factor, with just 3 questions loading onto it, needs to be better understood. This can be gained by generating and testing new items which load similarly to those already included. It should also involve additional, external measures alongside the VI-SPDAT for correlation and content validation. If there is a sound rationale for this construct to be included, then perhaps additional items or points-awarded are needed to bolster the weight of this factor in the measure. Subsequently, the points system may need to be adjusted to account for the apparent penalties to other areas of the tool involved with affirmative responses to the items on this factor. Or if the construct does not serve a specific purpose in the community's definition of vulnerability, the factor and associated items could be removed from the tool.

All of this same work should be done in multiple communities to determine replicability of factors and try to find models that demonstrate consistency across groups. Alternatively, the tool could be tailored to make scoring equitable across demographics. If the community decides that starting from the beginning with a new framework is the best strategy, these evaluation steps can be introduced from the outset to create an instrument that is both invariant and equitable.

Aim 2

Identification or creation of an ideal criterion for validating the self-report measures such as the VI-SPDAT would be a helpful step in testing and ensuring an equitable and accurate measurement strategy. Alternatively, the opportunity to shift the measure itself to a more objective source of information, or a hybrid of the two, should be explored as well. Relying on objective sources offers the appeal of alleviating concerns about recall or reporting biases.

There is a large amount of data already being collected about individual's health, financial, and social circumstances. However the source of such information needs to be considered carefully in the context of the intended definition of vulnerability. The changes to the content and constructs of a vulnerability assessment should be studied, with an eye toward equity and consistency of measures across groups. These types of measures ought to be less prone to racial or gender biases. However, they will likely present a new set of limitations and information biases and could disadvantage participants in the Coordinated Assessment who do not have a recent history of interactions with appropriate systems of care.

Aim 3

Further research is needed to explore the many identified disparities in results on the measure. Mixed methods approaches and detailed investigations into any of the differences and interaction effects would be helpful to improve current understanding of the relationships between demographics, exposure to homelessness, and items that comprise the construct of vulnerability.

In addition, a thorough evaluation is needed to understand the reasons behind the lack of a relationship between score on a tool intended to prioritize housing placement and actual entry into housing. This future work should examine the full length of the pipeline from entry into homelessness, through assessment, wait-listing, and eventually placement into housing in order to understand where the failure happens within the system. Several factors were identified in this research which predict placement in housing more effectively than score on the VI-SPDAT. These identified factors may provide a good starting point for future investigation. One aspect which needs to be further parsed is the degree to which these factors association with placement in housing is mediated by these items' contribution to the total VI-SPDAT score through its particular scoring algorithm.

CONCLUSION

The findings of this research demonstrate that the VI-SPDAT cannot be said to be entirely reliable or valid. The domains into which the tool is organized do not reflect latent factors which predict the ways in which people's responses are grouped. Nor does it reflect an accurate understanding of how the questions in the measure are related to each other.

Based on comparison with an administrative health information system, medical history and utilization questions on the VI-SPDAT generally showed higher specificity but often very low sensitivity. The predictive value of a positive self-report was consistently much higher than the predictive value of a negative response through the CA interview.

Critically, there are disconcerting differences in overall score and individual items on the VI-SPDAT between important sub-groups such as race, gender, and ethnicity.

Interactions between these social drivers of vulnerability status (as defined by the tool) may increase risks even further for sub-sub-groups. As a result, some sub-populations may also encounter longer wait times to receiving supportive, subsidized housing services or even greater barriers to receiving any assistance at all because of variability in the distribution of scores across such lines.

The factors which are represented within the measurement tool frequently vary across sub-populations of individuals experiencing homelessness. This indicates that the VI-SPDAT is measuring the constructs of vulnerability differently by race, ethnicity, gender and duration of homelessness. When consistency across groups cannot be established, scores should not be compared between those groups.

Several specific items are predictive of final score on the tool, to the exclusion of the other items, indicating that the measure may incorporate a lot of unnecessary information. The redesigned structural model of vulnerability in the VI-SPDAT includes a factor termed "Environmental Threats", which needs closer consideration. It appears that this factor is inversely related to higher scores on the VI-SPDAT, which is somewhat counterintuitive.

Perhaps most curious, the VI-SPDAT is not actually associated with likelihood of assignment or entry into housing yet. The old influences of housing eligibility and service interactions appear to be better predictors of housing placement than score on the VI-SPDAT. Emphasis on positive service and care interactions may actually help explain why factors like unsheltered sleep and poor medication adherence work against the overall score and against probability of housing placement.

REFERENCES

Anthoine E, Moret L, Regnault A, Sebille V, & Hardouin JB. Sample size used to validate a scale: a review of publications on newly-developed patient reported outcomes measures. Health and Quality of Life Outcomes. 2014;12:176

Avery J. "Chapter 8. Health, Homelessness, and Chronicity: Major Findings and Implications." Poverty and Health: A Crisis among America's Most Vulnerable, vol. 1. Ed: Fitzpatrick K. Praeger: 2013.

Baggett TP & Jenkins DM. "Chapter 6. Homelessness and Health: Key Themes from Three Decades." Poverty and Health: A Crisis among America's Most Vulnerable, vol. 1. Ed: Fitzpatrick K. Praeger: 2013.

Bernstein RS, Meurer LN, Plumb EJ, & Jackson JL. Diabetes and Hypertension Prevalence in Homeless Adults in the United States: A Systematic Review and Meta-Analysis. American Journal of Public Health. 2015; 105(2):e46-e60.

Brown M, Cummings C, Lyons J, Carrion A, & Watson D. Reliability and validity of the Vulnerability Inedx-Service Prioritization Decision Assistance Tool (VI-SPDAT) in real-world implementation. Journal of Social Distress and the Homeless. 2018; Epub ahead of print, 08Jun2018.

Castellow J, Kloos B, & Townley G. Previous Homelessness as a Risk Factor for Recovery from Serious Mental Illnesses. Community Mental Health Journal. 2015; 51(6):674-84.

Community Solutions & OrgCode Consulting, Inc. The Vulnerability Index – Service Prioritization Decision Assistance Tool (VI-SPDAT): Manual for Single Person Households. July, 2014. http://www.rihomeless.org/Portals/0/Uploads/Documents/VI-SPDAT-Manual-2014-v1.pdf

Cronley C, Petrovich J, Spence-Almaguer E, Preble K. Do official hospitalizations predict medical vulnerability among the homeless?: a postdictive validity study of the vulnerability index. J Health Care Poor Underserved. 2013; May;24(2):469-86.

Fritsch A, Hiler H, Mueller B, Wu M, & Wustmann J. The Vulnerability of Assessments: A Qualitative Analysis of Housing Professionals' Experiences with the VI-SPDAT in Minnesota and a Comparative Review of Alternative Housing Triage Assessments. Hubert H. Humphrey School of Public Affairs, University of Minnesota. 2017.

Goodale G. Los Angeles to serve as crucible for reform in ending chronic homelessness. Christian Science Monitor. 08827729, January 6, 2016.

Hwang SW, Orav EJ, O'Connell JJ, Lebow JM, & Brennan TA. Causes of death in homeless adults in Boston. Ann Intern Med. 1997; 126(8):625-628.

Kanis B. 2008. Vulnerability Index*:* Prioritizing the Street Homeless Population by Mortality Risk. Handout. New York: Common Ground. (http://www.jedc.org/forms/Vulnerability%20Index.pdf, accessed Jan 2018).

Kenney E. Why Housing First? Policy & Practice. 2017; 75(1):5-28.

Lebrun-Harris LA, Baggett T, Jenkins DM, Sharma R, Sripipatana A, Hayashi S, Daly CA & Ngo-Metzger Q. Health status and health care experiences among homeless patients in federally supported health centers: findings from the 2009 patient survey. *Health Services Research*. 2013; 48(3):992-1017.

Leopold J & Ho H. Evaluation of the 100,000 Homes Campaign: Assessing the Campaign's Effectiveness in Housing the Chronically and Vulnerable Homeless. Urban Institute: 2015.

Linton KF & Shafer MS. Factors Associated with the Health Service Utilization of Unsheltered, Chronically Homeless Adults. Social Work in Public Health. 2014; 29(1):73-80.

Lippert AM & Lee BA. Stress, Coping, and Mental Health Differences among Homeless People. Sociol Inq. 2015; 85:343–374.

Martin EJ. Affordable housing, homelessness, and mental health: What heath care policy needs to address. Journal of Health and Human Services Administration. 2015; 38(1):67-89.

Moore DT & Rosenheck RA. Factors Affecting Emergency Department Use by a Chronically Homeless Population. Psychiatric Services. 2016; 67(12):1340-1347.

National Alliance to End Homelessness. Changes in the HUD Definition of "Homeless". Jan 18, 2012. http://endhomelessness.org/wp-content/uploads/2012/01/changes-in-hud-definition-homeless.pdf Accessed March 22, 2018.

National Coalition for the Homeless. McKinney-Vento Act: NCH Fact Sheet #18. June 2006.

National Law Center on Homelessness and Poverty. Homelessness in the United States and the Human Right to Housing. January, 2004.

National Health Care for the Homeless Council. Fact Sheet 2013: The Health Care for the Homeless Program. Fact Sheets. 2013. http://www.nhchc.org/wp-content/uploads/2011/09/hch-fact-sheet-2013.pdf Accessed March 22, 2018.

Nicholson, Cherie L.; Graham, John R.; Emery, J.C. Herbert; Schiff, Jeannette Waegemakers; Giacomin, Marina L.; Tanasescu, Alina I. Describing the Health of the Absolutely Homeless Population in Downtown Calgary 2008. Canadian Journal of Urban Research. 2010; 19(2):62-79.

O'Connell JJ. Premature Mortality in Homeless Populations: A Review of the Literature. Nashville: National Health Care for the Homeless Council, Inc., 2005.

Olivet J, Dones M, Richard M, Wilkey C, Yampolskaya S, Beit-Arie M, & Joseph L. Supporting Partnerships for Anti-Racist Communities (SPARC): Phase One Study Findings. 2018. Center for Social Innovation: Boston, MA.

OrgCode Consulting, Inc. The SPDAT and VI-SPDAT: Tools Grounded in Evidence. 2014. http://ceslosangeles.weebly.com/uploads/1/2/2/1/1221685/spdat_vi-spdat_evidence_brief_final.pdf

OrgCode Consulting, Inc. The Release of SPDAT & VI-SPDAT Data: Questions and Answers. June 8, 2015.

OrgCode Consulting, Inc & Community Solutions. SPDAT BRIEF: Changes in the VI-SPDAT v2.0. May, 2015. http://www.ncceh.org/files/6130/

OrgCode Consulting, Inc & Community Solutions. VI-SPDAT Version 2 & Family VI-SPDAT Version 2. 2015. https://www.community.solutions/sites/default/files/about_the_vi-spdat_2.0.pdf

Pan W. Akaike's Information Criterion in Generalized Estimating Equations. Biometrics. 2001; 57(1):120-125.

PD&R Expert Convenings. Assessment Tools for Allocating Homelessness Assistance: State of the Evidence. Prepared for the US Department of Housing and Urban Development. February 2015. Washington, DC.

Quigley JM, Raphael S, Smolensky E, Mansur E, & Rosenthal LA. Homelessness in California. Public Policy Institute of California. 2001.

Roos LE, Mota N, Afifi TO, Katz LY, Distasio J, & Sareen J. Relationship Between Adverse Childhood Experiences and Homelessness and the Impact of Axis I and II Disorders. *American Journal of Public Health.* 2013; 103(suppl 2):S275-S281.

Small LF. Determinants of physician utilization, emergency room use, and hospitalizations among populations with multiple health vulnerabilities. Health: An Interdisciplinary Journal for the Social Study of Health, Illness & Medicine. 2011; 15(5):491-516.

Spence-Almaguer E, Cronley C, & Petrovich J. The reliability and validity of the Vulnerability Index and a community-based revised version from Fort Worth, TX. Presentation to the National Health Care for the Homeless Conference. March 16, 2013. https://www.nhchc.org/wp-content/uploads/2012/11/The-Reliability-and-Validity-of-the-Vulnerability-Index-Spence-Almaguer.pdf, accessed Jan 2018.

Sprake EF, Russell JM, & Barker ME. Food choice and nutrient intake amongst homeless people. Public Health Nutrition and Epidemiology. 2013; 27:242-250.

Troisi CL, D'Andrea R, Grier G, & Williams S. Enhanced Methodologies to Enumerate Persons Experiencing Homelessness in a Large Urban Area. Evaluation Review. 2015; 39(5):480-500.

US Code. McKinney-Vento Homeless Assistance Act of 1987. Pub. L. 100-77, July 22, 1987, 101 Stat. 482, 42 U.S.C. § 11301

US Department of Housing and Urban Development, Office of Community Planning and Development. The McKinney-Vento Homeless Assistance Act; As amended by S. 896 The Homeless Emergency Assistance and Rapid Transition to Housing (HEARTH) Act of 2009. Sec. 103.[42 USC 11302]. General Definition of Homeless Individual. HUD Exchange. May 2009. https://www.hudexchange.info/resources/documents/HomelessAssistanceActAmendedbyHEARTH.pdf

US Department of Housing and Urban Development, Office of Community Planning and Development. The 2010 Annual Homeless Assessment Report (AHAR) to Congress. December 2010.

US Department of Housing and Urban Development, Office of Community Planning and Development. Homeless Emergency Assistance and Rapid Transition to Housing: Defining "Homeless"; 24 CFR Parts 91, 582, &583. Federal Register. 2011; 76(233):75994-76019.

US Department of Housing and Urban Development, Office of Community Planning and Development. Homeless Emergency Assistance and Rapid Transition to Housing:

Continuum of Care Program: Interim Rule, 24 CFR 578.7(a)(8). Federal Register. 2012; 77(147): 45422-45467.

US Department of Housing and Urban Development, Office of Community Planning and Development. The 2017 Annual Homeless Assessment Report (AHAR) to Congress, Part 1: Point in Time Estimates of Homelessness. December 2017.

US Department of Housing and Urban Development. CPD-17-01 Notice Establishing Additional Requirements for a Continuum of Care Centralized or Coordinated Assessment System. January 23, 2017.

US Interagency Council on Homelessness. Opening Doors: Federal Strategic Plan to Prevent and End Homelessness. June 2010. https://www.usich.gov/opening-doors

Williamson T, Eliasziw M, & Fick GH. Log-binomial models: exploring failed convergence. Emerging Themes in Epidemiology. 2013;10:14.

Wong YL & Piliavin I. Stressors, resources, and distress among homeless persons: a longitudinal analysis. Social Science & Medicine. 2001; 52(7):1029-1042.

Zuvekas SH & Hill SC. Income and employment among homeless people: the role of mental health, health and substance abuse. J Mental Health Policy Econ. 2000; 3:153–163.

APPENDICES

Appendix A: Tables 9-35

Appendix B: Seton EMR Chart Review Data Collection Form (DCF)

Appendix C: Manual of Procedures (MOP) for EMR abstraction elements

Appendix D.1: Integrated Care Collaborative (ICC) Health Information Exchange (HIE) data request

Appendix D.2: Diagnostic Code ranges for matching ICC HIE with VI-SPDAT

Appendix E: Human Subjects Protection Approvals

Appendix A. Tables 9-35

Table 9: VI-SPDAT v1; Dichotomous responses highlighted

Client ID
Order of CA repeat
Client Last Name
Client First Name
Client Middle Name
DoB
Age
SSN
SSN Data Quality
Gender
genderm1ftm3
Primary Race
Secondary Race
Ethnicity
Date of VI-SPDAT
1. What is the total length of time you have lived on the streets or shelters?(3427)
2. In the past three years, how many times have you been housed and then homeless again?(3428)
3. In the past six months, how many times have you been to the emergency department/room?(3431)
4. In the past six months, how many times have you had an interaction with the police?(3432)
5. In the past six months, how many times have you been taken to the hospital in an ambulance?(3433)
6. In the past six months, how many times have you used a crisis service, including distress centers and suicide prevention hotlines?(3434)
7. In the past six months, how many times have you been hospitalized as an in-patient, including hospitalizations in a mental health hospital?(3435)
8. Have you been attacked or beaten up since becoming homeless?(3436)
9. Threatened to or tried to harm yourself or anyone else in the last year?(3437)
10. Do you have any legal stuff going on right now that may result in you being locked up or having to pay fines?(3438)
11. Does anybody force or trick you to do things you do not want to do?(3439)
12. Ever do things that may be considered risky like exchange sex for money, run drugs for someone, have unprotected sex with someone you don't really know, share a needle, or anything like that?(3440)
13. I am going to read types of places people sleep. Please tell me which one that you sleep at most often.(3441)
Other (specify)(3442)
14. Is there anybody that thinks you owe them money?(3444)
15. Do you have any money coming in on a regular basis, like a job or government benefit or even working under the table, binning or bottle collecting, sex work, odd jobs, day labor, or anything like that?(3445)
16. Do you have enough money to meet all of your expenses on a monthly basis?(3446)
17. Do you have planned activities each day other than just surviving that bring you happiness and fulfillment?(3447)
18. Do you have any friends, family or other people in your life out of convenience or necessity, but you do not like their company?(3448)
19. Do any friends, family or other people in your life ever take your money, borrow cigarettes, use your drugs, drink your alcohol, or get you to do things you really don't want to do?(3449)
20. Surveyor, do you detect signs of poor hygiene or daily living skills?(3451)
21. Where do you usually go for healthcare or when you're not feeling well?(3453)
Other (Specify)(3454)
22. Kidney disease/End Stage Renal Disease or Dialysis(3456)

23. History of frostbite, Hypothermia, or Immersion Foot(3457)

24. Liver disease, Cirrhosis, or End-Stage Liver Disease(3458)

25. HIV+/AIDS(3459)

26. History of Heat Stroke/Heat Exhaustion (3460)

27. Heart disease, Arrhythmia, or Irregular Heartbeat(3461)

28. Emphysema(3462)

29. Diabetes(3463)

30. Asthma(3464)

31. Cancer(3465)

32. Hepatitis C(3466)

33. Tuberculosis(3467)

34. Surveyor, do you observe signs or symptoms of a serious health condition?(3469)

35. Have you ever had problematic drug or alcohol use, abused drugs or alcohol, or told you do?(3470)

36. Have you consumed alcohol and/or drugs almost every day or every day for the past month?(3471)

37. Have you ever used injection drugs or shots in the last six months?(3472)

38. Have you ever been treated for drug or alcohol problems and returned to drinking or using drugs?(3473)

39. Have you used non-beverage alcohol like cough syrup, mouthwash, rubbing alcohol, cooking wine, or anything like that in the past six months?(3474)

40. Have you blacked out because of your alcohol or drug use in the past month?(3475)

41. Surveyor, do you observe signs or symptoms of problematic alcohol or drug use?(3477)

42. Ever been taken to a hospital against your will for a mental health reason?(3478)

43. Gone to the emergency room because you weren't feeling 100% well emotionally or because of your nerves?(3479)

44. Spoken with a psychiatrist, psychologist or other mental health professional in the last six months because of your mental health - whether that was voluntary or because someone insisted that you do so?(3480)

45. Had a serious brain injury or head trauma?(3481)

46. Ever been told you have a learning disability or developmental disability?(3482)

47. Do you have any problems concentrating and/or remembering things? (3483)

48. Surveyor, do you detect signs or symptoms of severe, persistent mental illness or severely compromised cognitive functioning?(3485)

49. Have you had any medicines prescribed to you by a doctor that you do not take, sell, had stolen, misplaced, or where the prescription was never filled?(3486)

50. Yes or No - Have you experienced any emotional, physical, psychological, sexual or other type of abuse or trauma in your life which you have not sought help for, and/or which has caused your homelessness?(3487)

Calculated Field: VI-SPDAT at Entry

Outcome: Recommendation

51. Veteran Status

52. Entering from Streets, ES, SH

52b. If Yes, Date Started

53. Number of times on Streets, ES, SH

54. Months in last three years on Streets, ES, SH

Q1-50 are the formal VI-SPDAT;

Table 10: Map of VI-SPDAT v1 questions onto validation criteria	
Client Last Name	used for linking to EMR

Client First Name	used for linking to EMR
Client Middle Name	used for linking to EMR
DoB	used for linking to EMR
Age	EMR: face page
SSN	used for linking to EMR
Gender	EMR: face page
Primary Race	EMR: face page
Secondary Race	EMR: face page
Ethnicity	EMR: face page
Date of VI-SPDAT	n/a
1. What is the total length of time you have lived on the streets or shelters?(3427)	n/a
2. In the past three years, how many times have you been housed and then homeless again?(3428)	n/a
3. In the past six months, how many times have you been to the emergency department/room?(3431)	EMR & HIE: encounters
4. In the past six months, how many times have you had an interaction with the police?(3432)	n/a
5. In the past six months, how many times have you been taken to the hospital in an ambulance?(3433)	EMR & HIE: arrival method
6. In the past six months, how many times have you used a crisis service, including distress centers and suicide prevention hotlines?(3434)	n/a
7. In the past six months, how many times have you been hospitalized as an in-patient, including hospitalizations in a mental health hospital?(3435)	EMR & HIE: encounters / admit type
8. Have you been attacked or beaten up since becoming homeless?(3436)	n/a
9. Threatened to or tried to harm yourself or anyone else in the last year?(3437)	n/a
10. Do you have any legal stuff going on right now that may result in you being locked up or having to pay fines?(3438)	n/a
11. Does anybody force or trick you to do things you do not want to do?(3439)	n/a
12. Ever do things that may be considered risky like exchange sex for money, run drugs for someone, have unprotected sex with someone you don't really know, share a needle, or anything like that?(3440)	EMR: Does electronic record include any reference to risk behaviors such as those listed in the VI-SPDAT?
13. I am going to read types of places people sleep. Please tell me which one that you sleep at most often.(3441)	n/a
Other (specify)(3442)	n/a
14. Is there anybody that thinks you owe them money?(3444)	n/a
15. Do you have any money coming in on a regular basis, like a job or government benefit or even working under the table, binning or bottle collecting, sex work, odd jobs, day labor, or anything like that?(3445)	n/a
16. Do you have enough money to meet all of your expenses on a monthly basis?(3446)	n/a
17. Do you have planned activities each day other than just surviving that bring you happiness and fulfillment?(3447)	n/a
18. Do you have any friends, family or other people in your life out of convenience or necessity, but you do not like their company?(3448)	n/a

19. Do any friends, family or other people in your life ever take your money, borrow cigarettes, use your drugs, drink your alcohol, or get you to do things you really don't want to do?(3449)	n/a
20. Surveyor, do you detect signs of poor hygiene or daily living skills?(3451)	n/a
21. Where do you usually go for healthcare or when you're not feeling well?(3453)	EMR & HIE: encounter types
Other (Specify)(3454)	n/a
22. Kidney disease/End Stage Renal Disease or Dialysis(3456)	EMR: diagnostics
23. History of frostbite, Hypothermia, or Immersion Foot(3457)	EMR: diagnostics
24. Liver disease, Cirrhosis, or End-Stage Liver Disease(3458)	EMR: diagnostics
25. HIV+/AIDS(3459)	EMR: diagnostics
26. History of Heat Stroke/Heat Exhaustion (3460)	EMR: diagnostics
27. Heart disease, Arrhythmia, or Irregular Heartbeat(3461)	EMR: diagnostics
28. Emphysema(3462)	EMR: diagnostics
29. Diabetes(3463)	EMR: diagnostics
30. Asthma(3464)	EMR: diagnostics
31. Cancer(3465)	EMR: diagnostics
32. Hepatitis C(3466)	EMR: diagnostics
33. Tuberculosis(3467)	EMR: diagnostics
34. Surveyor, do you observe signs or symptoms of a serious health condition?(3469)	n/a
35. Have you ever had problematic drug or alcohol use, abused drugs or alcohol, or told you do?(3470)	EMR: Any evidence of alcohol and what term is used; EMR: AUDIT C assessment done at triage or after intake?
36. Have you consumed alcohol and/or drugs almost every day or every day for the past month?(3471)	EMR: AUDIT C Q1 if available
37. Have you ever used injection drugs or shots in the last six months?(3472)	EMR: Toxicology
38. Have you ever been treated for drug or alcohol problems and returned to drinking or using drugs?(3473)	n/a
39. Have you used non-beverage alcohol like cough syrup, mouthwash, rubbing alcohol, cooking wine, or anything like that in the past six months?(3474)	n/a
40. Have you blacked out because of your alcohol or drug use in the past month?(3475)	n/a
41. Surveyor, do you observe signs or symptoms of problematic alcohol or drug use?(3477)	n/a
42. Ever been taken to a hospital against your will for a mental health reason?(3478)	EMR: encounters
43. Gone to the emergency room because you weren't feeling 100% well emotionally or because of your nerves?(3479)	EMR: ER primary diagnosis of psychiatric condition?
44. Spoken with a psychiatrist, psychologist or other mental health professional in the last six months because of your mental health - whether that was voluntary or because someone insisted that you do so?(3480)	n/a
45. Had a serious brain injury or head trauma?(3481)	EMR: diagnostics
46. Ever been told you have a learning disability or developmental disability?(3482)	EMR: diagnostics

47. Do you have any problems concentrating and/or remembering things? (3483)	EMR: diagnostics
48. Surveyor, do you detect signs or symptoms of severe, persistent mental illness or severely compromised cognitive functioning?(3485)	EMR: Diagnosis of psychiatric condition of any kind?
49. Have you had any medicines prescribed to you by a doctor that you do not take, sell, had stolen, misplaced, or where the prescription was never filled?(3486)	EMR: Any mention, allusion, reference to, or evidence of medication nonadherence, noncompliance?
50. Yes or No - Have you experienced any emotional, physical, psychological, sexual or other type of abuse or trauma in your life which you have not sought help for, and/or which has caused your homelessness?(3487)	EMR: history & diagnostics
Calculated Field: VI-SPDAT at Entry	n/a
Outcome: Recommendation	n/a
51. Veteran Status	EMR: face page
52. Entering from Streets, ES, SH	n/a
52b. If Yes, Date Started	n/a
53. Number of times on Streets, ES, SH	n/a
54. Months in last three years on Streets, ES, SH	n/a

Table 11: Summary of 1st Assessments in VI-SPDAT v1			
		# or Median	% or IQR
Gender	Male	3,925	72.0%
	Female	1,497	27.5%
	F to M	5	0.1%
	M to F	24	0.4%
Ethnicity			
	Hispanic	995	18.3%
	Non-Hisp	4,457	81.8%
Race			
	White	3,203	58.8%
	Black/AA	2,066	37.9%
	Asian	31	0.6%
	American Indian	95	1.7%
	Hawaiian / Pacific Islander	18	0.3%
	Refused	39	0.7%
	non-White	2,249	41.3%
Age		50	38, 57

Homelessness			
1	< 2 years	2,114	38.8%
	>= 2 years	3,338	61.2%
2	Housed & homeless again in past 3 yrs	1	0, 3
	0	1,459	26.8%
	1	1,679	30.9%
	2	822	15.1%
	3	414	7.6%
	4	417	7.7%
	5	233	4.3%
	6	104	1.9%
	7	40	0.7%
	8	37	0.7%
	9	11	0.2%
	>=10	227	4.2%
	Number of times homeless in past 3 years	2	1,3
	% > 0		99.0%
	Months homless in past 3 years	12	4,12
	% > 0		100.0%
	Street or Shelter Entry into Program	4,341	87.0%
Utilization			
3	ED in past 6 mo (0- >=10)	1	0,3
	% > 0	3468	63.6%
4	Police interx in past 6 mo (0- >=10)	1	0,2
	% > 0	2882	52.9%
5	Ambulance in past 6 mo (0- >=10)	0	0,1
	% > 0	2163	39.7%
6	Crisis services in past 6 mo (0- >=10)	0	0,1
	% > 0	1517	27.9%
7	Hospitalizations in past 6 mo (0- >=10)	0	0,1
	% > 0	1888	34.7%
History			
8	Attacked while homeless	2,254	41.4%
9	Harm self or others in past year	1,377	25.3%
10	Legal 'stuff' pending	1,997	36.6%
11	Force or trick to do anything	980	18.0%
12	Risk behaviors	1,220	22.4%

Sleep most often			
13	Street, Sidewalk or Doorway	1,557	28.6%
	Beach, Riverbed or Park	857	15.7%
	Bus or Subway	107	2.0%
	Car, Van or RV	890	16.3%
	Shelter	1,499	27.5%
	Other (Specify)	542	9.9%
14	Anyone think you owe them money?	2,547	46.7%
15	Any income source?	2,612	47.9%
16	Enough money to meet expenses?	756	13.9%
17	Activities that cause happiness or fulfillment?	2,043	37.5%
18	People you don't like in your life?	2,044	37.6%
19	Negative social influences?	1,806	33.2%
20	Signs of poor hygiene or negative ADLs?	2,983	54.7%
Main healthcare location			
21	Does not go for care	1,210	22.2%
	Hospital	2,141	39.3%
	VA	556	10.2%
	Clinic	1,491	27.4%
	Other (Specify)	54	1.0%
Med History			
22	Renal dialysis	290	5.3%
23	Frostbite /hypothermia	443	8.1%
24	Liver disease /cirrhosis	609	11.2%
25	HIV/ AIDS	294	5.4%
26	Heat stroke /exhaustion	1,608	29.5%
27	Heart Disease /Arrhythmia	1,405	25.8%
28	Emphysema	376	6.9%
29	Diabetes	754	13.8%
30	Asthma	1,253	23.0%
31	Cancer	331	6.1%
32	Hepatitis C	1,089	20.0%
33	Tuberculosis	340	6.2%
34	Signs of a serious health condition?	1,630	29.9%
35	Problematic drug or alcohol use	3,368	61.9%

36	Alcohol /drug use almost daily for past month	924	17.0%
37	IDU in past 6 months	406	7.5%
38	Treated and relapsed- Ever?	2,139	39.3%
39	Non-beverage alcohol use past 6 mo?	205	3.8%
40	Blacked out in past month from drug /alcohol use	500	9.2%
41	Signs of serious /problematic drug /alcohol use?	1,142	21.0%
42	Mental health hospital against will?	1,208	22.2%
43	ED visit for emotions or nerves?	2,139	39.3%
44	Spoken with a mental health professional in last 6 months?	2,637	48.4%
45	Serious brain injury or head trauma ever?	1,872	34.4%
46	Learning disability / developmental disability ever?	1,842	33.8%
47	Problems concentrating or remembering things?	3,559	65.3%
48	Signs or symptoms of severe, persistent mental illness or severely compromised cognitive functioning?	2,154	39.5%
49	Medication non-adherence?	2,325	42.7%
50	Abuse or trauma - untreated or cause of homelessness?	3,097	57.0%
	VI SPDAT at entry	9	6,11
Recommendation			
	PSH	3,731	68.4%
	RRH	1,515	27.8%
	Self-Resolve	206	3.8%
	Veteran status	1,059	19.6%

Table 12: Scoring Procedure for VI-SPDAT v1

Question	Logic fx	Points
General Information		
Age	>=60	1
A. History of Housing and Homelessness		
1. What is the total length of time you have lived on the streets or shelters?(3427)	>=2, or	
2. In the past three years, how many times have you been housed and then homeless again?(3428)	4 or more times	1
B. Risks		

3. In the past six months, how many times have you been to the emergency department/room?(3431)	Total interactions >3	1
4. In the past six months, how many times have you had an interaction with the police?(3432)		
5. In the past six months, how many times have you been taken to the hospital in an ambulance?(3433)		
6. In the past six months, how many times have you used a crisis service, including distress centers and suicide prevention hotlines?(3434)		
7. In the past six months, how many times have you been hospitalized as an in-patient, including hospitalizations in a mental health hospital?(3435)		
8. Have you been attacked or beaten up since becoming homeless?(3436)	Yes, or	1
9. Threatened to or tried to harm yourself or anyone else in the last year?(3437)	Yes (Either)	
10. Do you have any legal stuff going on right now that may result in you being locked up or having to pay fines?(3438)	Yes	1
11. Does anybody force or trick you to do things you do not want to do?(3439)	Yes, or	1
12. Ever do things that may be considered risky like exchange sex for money, run drugs for someone, have unprotected sex with someone you don't really know, share a needle, or anything like that?(3440)	Yes, or	
13. I am going to read types of places people sleep. Please tell me which one that you sleep at most often.(3441)	Anything other than "Shelter"	
Other (specify)(3442)		
C. Socialization and Daily Functions		
14. Is there anybody that thinks you owe them money?(3444)	Yes, or	1
15. Do you have any money coming in on a regular basis, like a job or government benefit or even working under the table, binning or bottle collecting, sex work, odd jobs, day labor, or anything like that?(3445)	No, or	
16. Do you have enough money to meet all of your expenses on a monthly basis?(3446)	No	
17. Do you have planned activities each day other than just surviving that bring you happiness and fulfillment?(3447)	No	1
18. Do you have any friends, family or other people in your life out of convenience or necessity, but you do not like their company?(3448)	Yes, or	1
19. Do any friends, family or other people in your life ever take your money, borrow cigarettes, use your drugs, drink your alcohol, or get you to do things you really don't want to do?(3449)	Yes (Either)	
20. Surveyor, do you detect signs of poor hygiene or daily living skills?(3451)	Yes	1
D. Wellness		
21. Where do you usually go for healthcare or when you're not feeling well?(3453)	"Does not go for care", or	1
Other (Specify)(3454)	Other: indicates does not actually receive healthcare	
22. Kidney disease/End Stage Renal Disease or Dialysis(3456)	Yes	1
23. History of frostbite, Hypothermia, or Immersion Foot(3457)	Yes	1
24. Liver disease, Cirrhosis, or End-Stage Liver Disease(3458)	Yes	1

25. HIV+/AIDS(3459)	Yes	1
26. History of Heat Stroke/Heat Exhaustion (3460)		Any single condition = X for Other medical condition
27. Heart disease, Arrhythmia, or Irregular Heartbeat(3461)		
28. Emphysema(3462)		
29. Diabetes(3463)		
30. Asthma(3464)		
31. Cancer(3465)		
32. Hepatitis C(3466)		
33. Tuberculosis(3467)		
34. Surveyor, do you observe signs or symptoms of a serious health condition?(3469)		
35. Have you ever had problematic drug or alcohol use, abused drugs or alcohol, or told you do?(3470)	Yes, or	1
36. Have you consumed alcohol and/or drugs almost every day or every day for the past month?(3471)	Yes, or	
37. Have you ever used injection drugs or shots in the last six months?(3472)	Yes, or	
38. Have you ever been treated for drug or alcohol problems and returned to drinking or using drugs?(3473)	Yes, or	
39. Have you used non-beverage alcohol like cough syrup, mouthwash, rubbing alcohol, cooking wine, or anything like that in the past six months?(3474)	Yes, or	
40. Have you blacked out because of your alcohol or drug use in the past month?(3475)	Yes, or	
41. Surveyor, do you observe signs or symptoms of problematic alcohol or drug use?(3477)	Yes (Any "Yes" for 35-41)	
42. Ever been taken to a hospital against your will for a mental health reason?(3478)	Yes, or	1
43. Gone to the emergency room because you weren't feeling 100% well emotionally or because of your nerves?(3479)	Yes, or	
44. Spoken with a psychiatrist, psychologist or other mental health professional in the last six months because of your mental health - whether that was voluntary or because someone insisted that you do so?(3480)	Yes, or	
45. Had a serious brain injury or head trauma?(3481)	Yes, or	
46. Ever been told you have a learning disability or developmental disability?(3482)	Yes, or	
47. Do you have any problems concentrating and/or remembering things? (3483)	Yes, or	
48. Surveyor, do you detect signs or symptoms of severe, persistent mental illness or severely compromised cognitive functioning?(3485)	Yes (Any "Yes" for 42-48)	
49. Have you had any medicines prescribed to you by a doctor that you do not take, sell, had stolen, misplaced, or where the prescription was never filled?(3486)	Yes	1
50. Yes or No - Have you experienced any emotional, physical, psychological, sexual or other type of abuse or trauma in your life which you have not sought help for, and/or which has caused your homelessness?(3487)	Yes	1

Trimorbidity	(Any "Yes" for 22-25 or X for Other Medical Condition) AND (1 in Substance Abuse range) AND (1 in Mental Health range)	1

General Information	up to 1
A. History of Housing and Homelessness	up to 1
B. Risks	up to 4
C. Socialization and Daily Functions	up to 4
D. Wellness	up to 10
Total	Max 20

Table 13: Comparison of sample who did and did not provide optional ROI for research

	ROI No (n=203)		ROI Yes (n=4,739)			
	% or median	n or IQR	% or median	n or IQR	Raw difference	p
Age (median[IQR])	45	36,56	47	35,55	2	0.8582
Genderm1f2ftm3 (% female)	29.06%	59	27.44%	1,300	-1.62%	0.751
Race						0.931
WhitevOther	56.16%	114	59.15%	2,803	2.99%	0.396
Hispanic	16.75%	34	18.11%	858	1.36%	0.623
Q01	57.14%	116	61.23%	3,338	4.09%	0.241
Q02	1	0,3	1	0,3	0	0.9997
Q03	1	0,2	1	0,3	0	0.0514
Q04	0	0,2	1	0,2	1	0.0858
Q05	0	0,1	0	0,1	0	0.0469
Q06	0	0,0	0	0,1	0	0.0049
Q07	0	0,0	0	0,1	0	0.0011
Q08	29.06%	59	38.92%	1,843	9.86%	0.005
Q09	16.00%	32	23.66%	1,120	7.66%	0.012
Q10	30.69%	62	35.68%	1,690	4.99%	0.147
Q11	14.29%	29	16.92%	801	2.63%	0.325
Q12	12.44%	25	21.19%	1,003	8.75%	0.003
Q13						0.002

Q13 (% unsheltered)		64.04%	130	72.84%	3,452	8.80%	0.006
Q14		37.31%	75	45.72%	2,166	8.41%	0.019
Q15		52.71%	107	47.25%	2,238	-5.46%	0.127
Q16		16.42%	33	14.36%	680	-2.06%	0.417
Q17		43.84%	89	39.03%	1,847	-4.81%	0.169
Q18		29.70%	60	36.28%	1,716	6.58%	0.057
Q19		22.28%	45	31.69%	1,500	9.41%	0.005
Q20		48.28%	98	52.46%	2,486	4.18%	0.243
Q21							0.043
Q21 (% does not go for care)		23.65%	48	22.87%	1,084	-0.78%	0.798
Q22		5.42%	11	5.09%	241	-0.33%	0.835
Q23		7.43%	15	7.62%	361	0.19%	0.918
Q24		5.94%	12	10.85%	514	4.91%	0.027
Q25		0.99%	2	5.22%	247	4.23%	0.007
Q26		19.21%	39	28.22%	1,337	9.01%	0.005
Q27		22.66%	46	24.98%	1,183	2.32%	0.453
Q28		2.46%	5	6.59%	312	4.13%	0.019
Q29		10.34%	21	13.07%	619	2.73%	0.258
Q30		13.84%	28	22.78%	1,079	8.94%	0.003
Q31		6.93%	14	5.93%	281	-1.00%	0.559
Q32		13.30%	27	19.14%	906	5.84%	0.037
Q33		3.94%	8	6.08%	288	2.14%	0.208
Q34		20.69%	42	28.02%	1,328	7.33%	0.022
Q35		52.71%	107	60.56%	2,865	7.85%	0.025
Q36		11.39%	23	16.07%	761	4.68%	0.075
Q37		5.42%	11	7.32%	347	1.90%	0.305
Q38		33.17%	67	37.89%	1,795	4.72%	0.175
Q39		0.99%	2	3.59%	170	2.60%	0.048
Q40		7.39%	15	8.70%	412	1.31%	0.514
Q41		10.34%	21	19.77%	937	9.43%	0.001
Q42		18.23%	37	21.46%	1,016	3.23%	0.271
Q43		33.66%	68	38.13%	1,806	4.47%	0.200
Q44		35.15%	71	46.55%	2,203	11.40%	0.001
Q45		30.69%	62	33.69%	1,594	3.00%	0.378
Q46		23.76%	48	32.76%	1,551	9.00%	0.007
Q47		53.73%	108	64.05%	3,034	10.32%	0.003
Q48		39.90%	81	38.24%	1,812	-1.66%	0.633
Q49		25.87%	52	40.60%	1,923	14.73%	<0.001
Q50		41.50%	83	55.21%	2,609	13.71%	<0.001
VI-SPDAT (mean, sd)		8	6,10	9	7,11	1	<0.0001
Recommendation	PSH	47.62%	10	42.60%	2,019	-5.02%	0.393

	RRH	52.38%	11	49.27%	2,335	-3.11%	
	Self-resolve	0.00%	0	8.12%	385	8.12%	
Veteran status		16.34%	33	20.17%	949	3.83%	0.182
Entry from streets or shelter		76.06%	143	86.12%	3,685	10.06%	<0.001
Number of times homeless past 3 years		1	1,3	1	1,3	0	0.6292
Months homeless 3 years		12	7,12	12	3,12	0	0.058
1 year homeless y/n		59.55%	53	53.16%	1,422	-6.39%	0.234

Table 14: Missing Data Patterns

(n=4,739)	Number missing	Freq.	Percent
	0	2,563	54.08
	1	1,485	31.34
	2	209	4.41
	3	466	9.83
	4	13	0.27
	5	1	0.02
	6	1	0.02
	7	1	0.02
Total		4,739	100

Variable	Missing	Total n	Percent Missing
age	0	4,739	0
genderm1f2~3	1	4,739	0.02
race_code_1	0	4,739	0
race_code_2	0	4,739	0
whitevother	0	4,739	0
hispyn	0	4,739	0
q01totalti~s	0	4,739	0
q02timesho~r	9	4,739	0.19
q03edtimes~o	2	4,739	0.04
q04policei~o	4	4,739	0.08
q05ambulan~o	4	4,739	0.08
q06crisiss~o	5	4,739	0.11
q07hospita~o	5	4,739	0.11
q08attacke~n	4	4,739	0.08
q09harmsel~r	5	4,739	0.11
q10legalst~n	2	4,739	0.04
q11forceor~n	6	4,739	0.13
q12anyrisk~n	5	4,739	0.11

q13sleepmo~n	0	4,739	0
q14owemoney	1	4,739	0.02
q15anyregu~e	2	4,739	0.04
q16enoughm~s	4	4,739	0.08
q17activit~s	7	4,739	0.15
q18dontlik~e	9	4,739	0.19
q19badinfl~e	6	4,739	0.13
q20poorhyg~n	0	4,739	0
q21commonh~n	0	4,739	0
q22renaldi~n	4	4,739	0.08
q23frostbi~n	2	4,739	0.04
q24liverdi~n	3	4,739	0.06
q25hivaidsyn	6	4,739	0.13
q26heatstr~n	1	4,739	0.02
q27heartdi~n	4	4,739	0.08
q28emphyse~n	2	4,739	0.04
q29diabete~n	3	4,739	0.06
q30asthmayn	3	4,739	0.06
q31canceryn	4	4,739	0.08
q32hepatit~n	5	4,739	0.11
q33tubercu~n	3	4,739	0.06
q34observe~n	0	4,739	0
q35drugalc~n	8	4,739	0.17
q36dailyal~n	2	4,739	0.04
q37anyinje~o	1	4,739	0.02
q38drugora~a	2	4,739	0.04
q39nonbeve~n	0	4,739	0
q40blackou~o	5	4,739	0.11
q41observe~s	0	4,739	0
q42hospita~e	4	4,739	0.08
q43edvisit~n	3	4,739	0.06
q44anyment~i	6	4,739	0.13
q45tbihxyn	7	4,739	0.15
q46learnin~i	4	4,739	0.08
q47concent~n	2	4,739	0.04
q48observe~e	0	4,739	0
q49medicat~n	3	4,739	0.06
q50untreat~n	13	4,739	0.27
vispdatate~y	0	4,739	0
recommenda~n	0	4,739	0
veteranyn	34	4,739	0.72
entryfroms~n	460	4,739	9.71
numberofti~s	632	4,739	13.34

monthshome~s	2,064	4,739	43.55
Total			0.766667

Table 15: Comparison of results between 1st two assessments (n=713)

	1st Assessment (n=713)		2nd Assessment (n=713)			
	% or median	IQR	% or median	IQR	Raw difference	P value
Age (median[IQR])	49	41,55	50	42,56	1	0.0763
Genderm1f2ftm3 (% female)	27.60%	197	27.60%	197	0	1.00
Race						1.00
WhitevOther	56.10%	400	56.10%	400	0	1.00
Hispanic	19.20%	137	19.20%	137	0	1.00
Q01	69.99%	499	76.02%	542	6.03%	0.01
Q02	1	0,3	1	0,3	0	0.1607
Q03	1	0,3	2	0,3	1	0.4103
Q04	1	0,2	1	0,2	0	0.67
Q05	0	0,1	0	0,2	0	0.9072
Q06	0	0,1	0	0,1	0	0.8982
Q07	0	0,1	0	0,1	0	0.2097
Q08	46.84%	334	50.35%	359	3.51%	0.185
Q09	25.39%	181	30.48%	217	5.09%	0.032
Q10	36.04%	257	39.13%	279	3.09%	0.229
Q11	21.35%	152	20.76%	148	-0.59%	0.784
Q12	23.17%	165	26.83%	191	3.66%	0.112
Q13						0.389
Q13 (% unsheltered)	62.97%	449	68.30%	487	5.33%	0.034
Q14	45.30%	323	46.14%	329	0.84%	0.750
Q15	52.73%	376	52.03%	371	-0.70%	0.791
Q16	15.73%	112	14.04%	100	-1.69%	0.372
Q17	41.21%	293	36.24%	258	-4.97%	0.054
Q18	40.03%	285	39.89%	284	-0.14%	0.957
Q19	36.57%	260	37.55%	267	0.98%	0.701
Q20	50.63%	361	61.29%	437	10.66%	< 0.001
Q21						0.823
Q21 (% does not go for care)	15.57%	111	16.13%	115	0.56%	0.772
Q22	7.44%	53	6.20%	44	-1.24%	0.351
Q23	8.15%	58	9.26%	66	1.11%	0.457
Q24	12.06%	86	11.78%	84	-0.28%	0.870
Q25	5.89%	42	6.04%	43	0.15%	0.906

Q26		29.03%	207	33.94%	242	4.91%	0.046
Q27		25.56%	182	30.58%	218	5.02%	0.035
Q28		7.01%	50	8.15%	58	1.14%	0.419
Q29		17.28%	123	16.85%	120	-0.43%	0.833
Q30		23.70%	169	24.86%	177	1.16%	0.611
Q31		6.87%	49	5.62%	40	-1.25%	0.328
Q32		23.80%	169	25.04%	178	1.24%	0.589
Q33		6.73%	48	6.31%	45	-0.42%	0.748
Q34		30.43%	217	34.92%	249	4.49%	0.071
Q35		65.45%	466	65.54%	466	0.09%	0.971
Q36		18.51%	132	20.62%	147	2.11%	0.317
Q37		6.59%	47	7.44%	53	0.85%	0.529
Q38		43.32%	308	44.88%	320	1.56%	0.553
Q39		3.65%	26	4.35%	31	0.70%	0.496
Q40		9.12%	65	11.38%	81	2.26%	0.160
Q41		19.92%	142	24.68%	176	4.76%	0.031
Q42		21.88%	156	24.68%	176	2.80%	0.210
Q43		40.81%	291	43.54%	310	2.73%	0.297
Q44		54.84%	391	57.78%	412	2.94%	0.262
Q45		35.20%	251	35.72%	254	0.52%	0.837
Q46		36.19%	258	39.94%	284	3.75%	0.144
Q47		68.68%	489	72.79%	519	4.11%	0.088
Q48		42.92%	306	42.50%	303	-0.42%	0.872
Q49		43.96%	313	47.41%	338	3.45%	0.192
Q50		53.80%	382	65.54%	466	11.74%	< 0.001
VI-SPDAT		9	7,12	10	8,13	1	0.0003
Recommendation	PSH	45.58%	325	54.84%	391	9.26%	0.002
	RRH	46.56%	332	38.29%	273	-8.27%	
	Self-resolve	7.85%	56	6.87%	49	-0.98%	
Veteran status		15.47%	110	15.47%	110	0.00%	1
Entry from streets or shelter		87.76%	624	88.34%	629	0.58%	0.736
Number of times homeless past 3 years		2	1,4	2	1,4	0	0.8901
Months homeless 3 years		12	8,12	12	10,12	0	0.0687
1 year homeless y/n		68.43%	323	73.42%	384	4.99%	0.083

Table 16: Internal Consistency

	items	alpha (Scale reliability coefficient)	Average inter-item covariance
Q1-Q50	50	0.7586	0.0488844
Q8-12, 14-20, 22-50	41	0.8183	0.0178517

Q1-2	2	0.0546	0.0819469
Q3-13	11	0.6552	0.3611656
Q14-Q20	7	0.407	0.0198448
Q21-50	30	0.7246	0.0154753
Collective sections worth a single point:			
Age	1		
Q1-2	2	"	"
Q3-7	5	0.6794	1.349998
Q8-9	2	0.3263	0.0407813
Q10	1		
Q11-13	3	0.1501	0.067688
Q14-16	3	0.2817	0.0239169
Q17	1		
Q18-19	2	0.4269	0.0607454
Q20	1		
Q21	1		
Q22	1		
Q23	1		
Q24	1		
Q25	1		
Q26-34	9	0.4811	0.0125626
Q35-41	7	0.6878	0.0324709
Q42-48	7	0.6616	0.0487638
Q49	1		
Q50	1		

Table 17: Confirmatory Factor Analysis Goodness-of-Fit tests

	Model 1	**Model 2**	**Model 3**	**Model 3.1**	**Final Model 3.2**
model vs. saturated	17641.08	14221.62	7891.933	5099.806	2316.556
p> chi2	0	0	0	0	0
baseline vs. saturated	36819.13	36819.13	25743.1	21826.52	20922.77
p> chi2	0	0	0	0	0
Root mean squared error of approximation	0.055	0.049	0.045	0.051	0.036
90% CI, lower bound	0	0	0.044	0.049	0.034
90% CI, upper bound	.	.	0.046	0.052	0.037
Probability RMSEA <= 0.05	.	.	1.000	0.191	1.000
Akaike's information criterion (AIC)	292181.6	288762.2	158847.9	125405.7	117632.3

Bayesian information criterion (BIC)	293185.2	289765.8	159704	126050	118276.6
Comparative fit index (CFI)	0.537	0.633	0.714	0.78	0.904
Tucker-Lewis index (TLI)	0.515	0.616	0.695	0.758	0.891
Standardized root mean squared residual (SRMR)	0.062	0.054	0.044	0.046	0.035
Coefficient of determination (CD)	0.965	0.987	0.979	0.978	0.96

Table 18: Changes made from SEM Model 3 to Model 3.2

Table: Model 3 (items dropped are highlighted)

Standardized		Coef.	Std. Err.	[95% Conf.	Interval]
q08attackedyn	A	0.467017	0.012568	0.442383	0.49165
q09harmselfothersyn1yr	A	0.482139	0.012339	0.457956	0.506322
q10legalstuffnowyn	A	0.283143	0.013983	0.255737	0.310549
q11forceortrickyn	A	0.460822	0.012856	0.436	0.486019
q12anyriskbehaviorsyn	A	0.520989	0.012138	0.4972	0.544778
q17activitiesthatcauseha~s <-	A	-0.16817	0.014635	-0.19685	-0.13948
q14owemoney	B	0.363331	0.014772	0.334378	0.392284
q15anyregularincome	B	-0.06454	0.016396	-0.09668	-0.03241
q16enoughmoneyexpenses	B	-0.17366	0.015896	-0.205	-0.1425
q18dontlikepeopleinyourlife	B	0.362794	0.015177	0.333	0.392541
q19badinfluencepeopleinyourlife	B	0.604902	0.013884	0.577689	0.632114
q20poorhygieneyn	B	0.204452	0.015695	0.17369	0.235213
q22renaldiseasedialysisyn	C	0.25749	0.016248	0.225645	0.289336
q23frostbitehypothermiaimmersion	C	0.321639	0.015996	0.290287	0.35299
q24liverdiseasecirrhosisyn	C	0.483687	0.016482	0.451383	0.515992
q25hivaidsyn	C	0.164807	0.016583	0.132305	0.197308
q26heatstrokeheatexhaustionyn	C	0.479069	0.015704	0.448291	0.509847
q27heartdiseasearrhythmiayn	C	0.376857	0.015672	0.346141	0.407573
q28emphysemayn	C	0.304241	0.015926	0.273026	0.335455
q29diabetesyn	C	0.156216	0.016705	0.123474	0.188957
q30asthmayn	C	0.255535	0.01651	0.223176	0.287894
q31canceryn	C	0.204184	0.016414	0.172013	0.236355
q32hepatitiscyn	C	0.452089	0.01693	0.418907	0.485272
q33tuberculosisyn	C	0.18323	0.016519	0.150854	0.215606
q34observeserioushealthcondition	C	0.306739	0.015824	0.275724	0.337754
q35drugalcoholuseyn	D	0.603319	0.01221	0.579388	0.62725
q36dailyalcoholdrugs1moyn	D	0.528925	0.012807	0.503825	0.554025
q37anyinjectiondruguseyn6mo	D	0.396376	0.013881	0.369169	0.423583
q38drugoralcoholtreatmentandrela	D	0.614551	0.012075	0.590885	0.638216
q39nonbeveragealcoholuse6moyn	D	0.311172	0.014672	0.282415	0.339929

q40blackoutyn1mo	D	0.503209	0.01312	0.477495	0.528922
q41observealcoholdrugusesigns	D	0.505298	0.012732	0.480344	0.530252
q42hospitalvisitagainstwillforme	E	0.45207	0.01286	0.426866	0.477274
q43edvisitforemotionsornervesyn	E	0.573003	0.011449	0.550564	0.595442
q44anymentalhealthprofessionalvi	E	0.50378	0.012374	0.479527	0.528032
q45tbihxyn	E	0.405697	0.013334	0.379564	0.43183
q46learningordevelopmentaldisabi	E	0.351215	0.013921	0.323931	0.3785
q47concentrationmemoryproblemsyn	E	0.535867	0.011847	0.512647	0.559087
q48observementalorcognitiveillne	E	0.356742	0.013796	0.329703	0.383782
q49medicationnonadherenceyn	E	0.496518	0.012348	0.472316	0.52072
q50untreatedtraumayn	E	0.546908	0.011655	0.524064	0.569751

Standardized	Coef.	Std. Err.	[95% Conf.	Interval]
var(e.q08attackedyn)	0.781896	0.011739	0.759223	0.805246
var(e.q09harmselfothersyn1yr)	0.767542	0.011898	0.744574	0.791219
var(e.q10legalstuffnowyn)	0.91983	0.007918	0.904441	0.935482
var(e.q11forceortrickyn)	0.787643	0.011849	0.764759	0.811211
var(e.q12anyriskbehaviorsyn)	0.728571	0.012647	0.7042	0.753785
var(e.q17activitiesthatcauseh~s)	0.97172	0.004922	0.96212	0.981416
var(e.q14owemoney)	0.867991	0.010734	0.847205	0.889287
var(e.q15anyregularincome)	0.995834	0.002117	0.991694	0.999991
var(e.q16enoughmoneyexpenses)	0.969844	0.005521	0.959084	0.980725
var(e.q18dontlikepeopleinyour~e)	0.86838	0.011012	0.847063	0.890235
var(e.q19badinfluencepeoplein~e)	0.634094	0.016797	0.602012	0.667885
var(e.q20poorhygieneyn)	0.9582	0.006418	0.945703	0.970861
var(e.q22renaldiseasedialysisyn)	0.933699	0.008368	0.917442	0.950244
var(e.q23frostbitehypothermia~n)	0.896549	0.01029	0.876606	0.916945
var(e.q24liverdiseasecirrhosi~n)	0.766047	0.015945	0.735425	0.797944
var(e.q25hivaidsyn)	0.972839	0.005466	0.962185	0.983611
var(e.q26heatstrokeheatexhaus~n)	0.770493	0.015046	0.741561	0.800555
var(e.q27heartdiseasearrhythm~n)	0.857979	0.011812	0.835137	0.881445
var(e.q28emphysemayn)	0.907438	0.009691	0.888642	0.926631
var(e.q29diabetesyn)	0.975597	0.005219	0.965421	0.98588
var(e.q30asthmayn)	0.934702	0.008438	0.91831	0.951387
var(e.q31canceryn)	0.958309	0.006703	0.945261	0.971537
var(e.q32hepatitiscyn)	0.795615	0.015308	0.766171	0.826191
var(e.q33tuberculosisyn)	0.966427	0.006053	0.954635	0.978364
var(e.q34observeserioushealth~n)	0.905911	0.009708	0.887083	0.925139
var(e.q35drugalcoholuseyn)	0.636006	0.014733	0.607775	0.665548
var(e.q36dailyalcoholdrugs1moyn)	0.720239	0.013547	0.69417	0.747286
var(e.q37anyinjectiondrugusey~o)	0.842886	0.011005	0.821592	0.864733
var(e.q38drugoralcoholtreatme~a)	0.622328	0.014841	0.593909	0.652106
var(e.q39nonbeveragealcoholus~n)	0.903172	0.009131	0.885451	0.921248

var(e.q40blackoutyn1mo)	0.746781	0.013204	0.721346	0.773114
var(e.q41observealcoholdrugus~s)	0.744674	0.012867	0.719878	0.770324
var(e.q42hospitalvisitagainst~e)	0.795633	0.011627	0.773168	0.81875
var(e.q43edvisitforemotionsor~n)	0.671668	0.013121	0.646438	0.697882
var(e.q44anymentalhealthprofe~i)	0.746206	0.012468	0.722166	0.771047
var(e.q45tbihxyn)	0.83541	0.010819	0.814473	0.856886
var(e.q46learningordevelopmen~i)	0.876648	0.009778	0.857691	0.896024
var(e.q47concentrationmemoryp~n)	0.712847	0.012697	0.68839	0.738171
var(e.q48observementalorcogni~e)	0.872735	0.009843	0.853654	0.892242
var(e.q49medicationnonadheren~n)	0.75347	0.012262	0.729816	0.777891
var(e.q50untreatedtraumayn)	0.700892	0.012749	0.676346	0.726329
cov(A,B)	0.992832	0.020348	0.952951	1.032713
cov(A,C)	0.521267	0.020939	0.480227	0.562306
cov(A,D)	0.722853	0.016212	0.691079	0.754627
cov(A,E)	0.862712	0.013749	0.835765	0.88966
cov(B,C)	0.459762	0.024092	0.412542	0.506982
cov(B,D)	0.5546	0.020638	0.514151	0.595049
cov(B,E)	0.713904	0.019118	0.676434	0.751375
cov(C,D)	0.428271	0.018669	0.39168	0.464861
cov(C,E)	0.540806	0.017895	0.505732	0.57588
cov(D,E)	0.52036	0.015597	0.48979	0.55093

Table: Model 3.1 with Factor loadings dropped

Standardized		Coef.	Std. Err.	[95% Conf.	Interval]
q08attackedyn	A	0.452201	0.013958	0.424844	0.479558
q09harmselfothersyn1yr	A	0.481078	0.013629	0.454366	0.50779
q11forceortrickyn	A	0.454014	0.014328	0.425932	0.482095
q12anyriskbehaviorsyn	A	0.524238	0.013479	0.49782	0.550657
q14owemoney	B	0.334201	0.016585	0.301695	0.366708
q18dontlikepeopleinyourlife	B	0.400476	0.016343	0.368444	0.432508
q19badinfluencepeopleinyourlife	B	0.641329	0.016249	0.609482	0.673176
q23frostbitehypothermiaimmersion	C	0.317312	0.018891	0.280287	0.354337
q24liverdiseasecirrhosisyn	C	0.490544	0.022254	0.446927	0.534161
q26heatstrokeheatexhaustionyn	C	0.464546	0.020927	0.423529	0.505562
q27heartdiseasearrhythmiayn	C	0.34605	0.018326	0.310132	0.381968
q28emphysemayn	C	0.279275	0.017738	0.244509	0.314041
q32hepatitiscyn	C	0.470066	0.022987	0.425013	0.515119
q34observeserioushealthcondition	C	0.271422	0.017801	0.236532	0.306311
q35drugalcoholuseyn	D	0.616516	0.012927	0.59118	0.641852
q36dailyalcoholdrugs1moyn	D	0.508037	0.014041	0.480517	0.535556
q37anyinjectiondruguseyn6mo	D	0.393595	0.01493	0.364333	0.422858
q38drugoralcoholtreatmentandrela	D	0.628553	0.012771	0.603522	0.653584

q39nonbeveragealcoholuse6moyn	D	0.300489	0.015851	0.269421	0.331557
q40blackoutyn1mo	D	0.491115	0.014277	0.463132	0.519098
q41observealcoholdrugusesigns	D	0.491515	0.013853	0.464364	0.518666
q42hospitalvisitagainstwillforme	E	0.461662	0.013726	0.434759	0.488565
q43edvisitforemotionsornervesyn	E	0.577495	0.012281	0.553424	0.601566
q44anymentalhealthprofessionalvi	E	0.507915	0.013274	0.481899	0.533932
q45tbihxyn	E	0.393946	0.014515	0.365497	0.422396
q46learningordevelopmentaldisabi	E	0.353397	0.014954	0.324087	0.382707
q47concentrationmemoryproblemsyn	E	0.526578	0.012913	0.501269	0.551886
q48observementalorcognitiveillne	E	0.352276	0.014893	0.323087	0.381466
q49medicationnonadherenceyn	E	0.476359	0.013562	0.449779	0.50294
q50untreatedtraumayn	E	0.539708	0.012674	0.514868	0.564548

Standardized	Coef.	Std. Err.	[95% Conf.	Interval]
var(e.q08attackedyn)|	0.795514	0.012624	0.771153	0.820644
var(e.q09harmselfothersyn1yr)|	0.768564	0.013113	0.743288	0.7947
var(e.q11forceortrickyn)|	0.793872	0.01301	0.768778	0.819784
var(e.q12anyriskbehaviorsyn)|	0.725175	0.014133	0.697998	0.75341
var(e.q14owemoney)|	0.88831	0.011086	0.866846	0.910305
var(e.q18dontlikepeopleinyourlife)|	0.839619	0.01309	0.814351	0.865671
var(e.q19badinfluencepeopleinyourlife)|	0.588697	0.020841	0.549234	0.630996
var(e.q23frostbitehypothermiaimmersion)|	0.899313	0.011988	0.876121	0.92312
var(e.q24liverdiseasecirrhosisyn)|	0.759367	0.021833	0.717758	0.803388
var(e.q26heatstrokeheatexhaustionyn)|	0.784197	0.019443	0.747	0.823247
var(e.q27heartdiseasearrhythmiayn)|	0.880249	0.012683	0.855738	0.905463
var(e.q28emphysemayn)|	0.922006	0.009908	0.90279	0.94163
var(e.q32hepatitiscyn)|	0.779038	0.021611	0.737813	0.822566
var(e.q34observeserioushealthcondition)|	0.92633	0.009663	0.907583	0.945465
var(e.q35drugalcoholuseyn)|	0.619908	0.015939	0.589442	0.651949
var(e.q36dailyalcoholdrugs1moyn)|	0.741899	0.014267	0.714457	0.770394
var(e.q37anyinjectiondruguseyn6mo)|	0.845083	0.011753	0.822359	0.868435
var(e.q38drugoralcoholtreatmentandrela)|	0.604921	0.016055	0.574259	0.637221
var(e.q39nonbeveragealcoholuse6moyn)|	0.909706	0.009526	0.891226	0.92857
var(e.q40blackoutyn1mo)|	0.758806	0.014024	0.731813	0.786796
var(e.q41observealcoholdrugusesigns)|	0.758413	0.013618	0.732187	0.785579
var(e.q42hospitalvisitagainstwillforme)|	0.786868	0.012674	0.762416	0.812104
var(e.q43edvisitforemotionsornervesyn)|	0.666499	0.014185	0.639269	0.694889
var(e.q44anymentalhealthprofessionalvi)|	0.742022	0.013484	0.716059	0.768927
var(e.q45tbihxyn)|	0.844807	0.011437	0.822686	0.867522
var(e.q46learningordevelopmentaldisabi)|	0.875111	0.01057	0.854638	0.896074
var(e.q47concentrationmemoryproblemsyn)|	0.722716	0.013599	0.696548	0.749868
var(e.q48observementalorcognitiveillne)|	0.875901	0.010493	0.855575	0.89671
var(e.q49medicationnonadherenceyn)|	0.773082	0.012921	0.748168	0.798825

var(e.q50untreatedtraumayn)|	0.708715	0.01368	0.682403	0.736042
cov(A,B)|	0.905664	0.023393	0.859814	0.951513
cov(A,C)|	0.51494	0.026715	0.462579	0.567301
cov(A,D)|	0.694952	0.01873	0.658242	0.731662
cov(A,E)|	0.852903	0.015988	0.821567	0.884238
cov(B,C)|	0.441595	0.028536	0.385666	0.497525
cov(B,D)|	0.507459	0.022289	0.463773	0.551146
cov(B,E)|	0.648101	0.021405	0.606147	0.690054
cov(C,D)|	0.478028	0.020426	0.437993	0.518063
cov(C,E)|	0.52966	0.022874	0.484827	0.574492
cov(D,E)|	0.515261	0.016814	0.482306	0.548215

Modification Indices for Model 3.1 (items added to model are highlighted)

	Modification indices >= 3.48	EPC = expected parameter change	
	MI	**EPC**	**Standard EPC**
q08attackedyn			
C	15.21	0.5876	0.100475
D	6.648	-0.11692	-0.07227
E	4.686	0.248827	0.096862
q09harmselfothersyn1yr			
B	117.163	-1.73954	-0.68127
C	9.781	-0.41404	-0.0812
E	122.42		0.49909
q11forceortrickyn			
B	144.477	1.678775	0.751123
D	161.548	-0.44002	-0.3564
q12anyriskbehaviorsyn			
D	210.465	0.565757	0.416895
E	144.585	-1.19039	-0.55239
q14owemoney			
A	8.566	0.421345	0.186478
C	4.02	0.293951	0.049194
E	10.388	0.269904	0.102831
q18dontlikepeopleinyourlife			
A	7.172	-0.40728	-0.18694
D	8.289	-0.11339	-0.07115
q19badinfluencepeopleinyourlife			
E	3.897	-0.24259	-0.09905
q23frostbitehypothermiaimmersion			
A	21.726	0.126157	0.105865

B	24.775	0.181398	0.114946
E	13.196	0.116427	0.084104
q24liverdiseasecirrhosisyn			
A	53.813	-0.25069	-0.17791
B	43.806	-0.29861	-0.16002
E	67.782	-0.3304	-0.20185
q26heatstrokeheatexhaustionyn			
A	195.75	0.679806	0.333831
B	173.687	0.848981	0.314818
D	7.949	0.096006	0.064447
E	212.917	0.834084	0.352595
q27heartdiseasearrhythmiayn			
D	19.821	-0.14167	-0.09873
E	4.995	0.118461	0.051987
q28emphysemayn			
A	11.267	-0.08472	-0.07582
B	4.756	-0.07428	-0.0502
D	11.828	-0.06192	-0.07576
E	10.819	-0.0984	-0.07581
q32hepatitiscyn			
A	52.914	-0.31061	-0.17413
B	75.733	-0.49224	-0.20837
D	20.881	0.136624	0.104698
E	77.497	-0.44206	-0.21333
q34observeserioushealthcondition			
D	9.056	-0.09865	-0.06626
q35drugalcoholuseyn			
B	7.192	-0.18029	-0.0614
C	8.577	0.382897	0.065299
q36dailyalcoholdrugs1moyn			
C	28.87	-0.53228	-0.12132
E	30.277	-0.21828	-0.11326
q37anyinjectiondruguseyn6mo			
A	7.822	0.085641	0.072155
B	11.749	0.125808	0.08004
C	5.026	0.162379	0.051732
q38drugoralcoholtreatmentandrela			
A	9.694	-0.17461	-0.0793
B	18.176	-0.28504	-0.09776
q39nonbeveragealcoholuse6moyn			
A	18.499	0.094976	0.112402
B	16.901	0.108897	0.097318
E	10.438	0.067353	0.068618

q40blackoutyn1mo			
A	4.332	0.06748	0.052999
B	6.028	0.095276	0.056507
q41observealcoholdrugusesigns			
E	4.376	0.090329	0.043151
q42hospitalvisitagainstwillforme			
C	10.07	-0.37667	-0.07638
q43edvisitforemotionsornervesyn			
A	6.537	-0.2313	-0.10497
B	13.945	-0.32252	-0.11052
q44anymentalhealthprofessionalvi			
A	42.223	-0.6065	-0.26795
B	58.289	-0.68177	-0.22745
C	8.929	-0.42592	-0.07115
D	3.852	-0.06736	-0.04068
q45tbihxyn			
C	92.523	1.332645	0.235085
D	4.368	0.06959	0.044379
q46learningordevelopmentaldisabi			
A	21.671	-0.41679	-0.19601
B	10.392	-0.27686	-0.09832
C	26.145	-0.7086	-0.12601
D	32.634	-0.19017	-0.12225
q47concentrationmemoryproblemsyn			
A	17.501	-0.37507	-0.1722
B	8.91	-0.25591	-0.08872
D	10.569	-0.10696	-0.06713
q48observementalorcognitiveillne			
A	5.772	-0.22279	-0.10117
D	4.32	-0.07167	-0.04449
q49medicationnonadherenceyn			
A	111.969	0.975044	0.437957
B	103.178	0.89613	0.303947
C	25.043	0.706781	0.120043
D	49.809	0.239863	0.147277
q50untreatedtraumayn			
A	65.267	0.749815	0.332193
B	76.301	0.774964	0.259261
C	5.971	-0.34479	-0.05776
cov(e.q08attackedyn,e.q09harmselfothersyn1yr)|	4.065	-0.00543	-0.03353
cov(e.q08attackedyn,e.q11forceortrickyn)|	25.201	0.011849	0.082244
cov(e.q08attackedyn,e.q23frostbitehypothermiaimmersion)|	22.308	0.007894	0.072907
cov(e.q08attackedyn,e.q26heatstrokeheatexhaustionyn)|	27.379	0.014521	0.084049

cov(e.q08attackedyn,e.q42hospitalvisitagainstwillforme)|	9.253	-0.00756	-0.0477
cov(e.q08attackedyn,e.q44anymentalhealthprofessionalvi)|	15.869	-0.01181	-0.0632
cov(e.q08attackedyn,e.q45tbihxyn)|	32.049	0.016542	0.087632
cov(e.q08attackedyn,e.q50untreatedtraumayn)|	21.276	0.013454	0.073902
cov(e.q09harmselfothersyn1yr,e.q18dontlikepeopleinyourlife)|	4.058	-0.00538	-0.03281
cov(e.q09harmselfothersyn1yr,e.q19badinfluencepeopleinyourlife)|	46.181	-0.01745	-0.13141
cov(e.q09harmselfothersyn1yr,e.q24liverdiseasecirrhosisyn)|	8.153	-0.00471	-0.04667
cov(e.q09harmselfothersyn1yr,e.q27heartdiseasearrhythmiayn)|	3.925	-0.00467	-0.03092
cov(e.q09harmselfothersyn1yr,e.q32hepatitiscyn)|	13.968	-0.00783	-0.06056
cov(e.q09harmselfothersyn1yr,e.q38drugoralcoholtreatmentandrela)|	4.157	-0.00483	-0.03432
cov(e.q09harmselfothersyn1yr,e.q39nonbeveragealcoholuse6moyn)|	3.934	0.002015	0.030456
cov(e.q09harmselfothersyn1yr,e.q41observealcoholdrugusesigns)|	6.217	0.005106	0.039628
cov(e.q09harmselfothersyn1yr,e.q42hospitalvisitagainstwillforme)|	39.774	0.013511	0.099479
cov(e.q09harmselfothersyn1yr,e.q43edvisitforemotionsornervesyn)|	57.103	0.018264	0.123649
cov(e.q09harmselfothersyn1yr,e.q44anymentalhealthprofessionalvi)|	67.576	0.02101	0.131235
cov(e.q09harmselfothersyn1yr,e.q45tbihxyn)|	11.66	-0.0086	-0.05315
cov(e.q11forceortrickyn,e.q19badinfluencepeopleinyourlife)|	66.253	0.018263	0.154562
cov(e.q11forceortrickyn,e.q23frostbitehypothermiaimmersion)|	14.807	0.004905	0.059415
cov(e.q11forceortrickyn,e.q26heatstrokeheatexhaustionyn)|	30.347	0.01166	0.088521
cov(e.q11forceortrickyn,e.q27heartdiseasearrhythmiayn)|	7.072	0.005552	0.041296
cov(e.q11forceortrickyn,e.q32hepatitiscyn)|	10.805	-0.00609	-0.05294
cov(e.q11forceortrickyn,e.q35drugalcoholuseyn)|	45.203	-0.01424	-0.11166
cov(e.q11forceortrickyn,e.q36dailyalcoholdrugs1moyn)|	4.319	-0.00345	-0.03301
cov(e.q11forceortrickyn,e.q38drugoralcoholtreatmentandrela)|	38.758	-0.01302	-0.10412
cov(e.q11forceortrickyn,e.q39nonbeveragealcoholuse6moyn)|	7.565	0.002475	0.042038
cov(e.q11forceortrickyn,e.q43edvisitforemotionsornervesyn)|	6.165	-0.0053	-0.04036
cov(e.q11forceortrickyn,e.q50untreatedtraumayn)|	7.426	0.006062	0.043676
cov(e.q12anyriskbehaviorsyn,e.q27heartdiseasearrhythmiayn)|	15.528	-0.00877	-0.06209
cov(e.q12anyriskbehaviorsyn,e.q32hepatitiscyn)|	13.968	0.007402	0.061266
cov(e.q12anyriskbehaviorsyn,e.q34observeseriousheathcondition)|	8.803	-0.00693	-0.04608
cov(e.q12anyriskbehaviorsyn,e.q36dailyalcoholdrugs1moyn)|	22.279	0.008351	0.076154
cov(e.q12anyriskbehaviorsyn,e.q37anyinjectiondruguseyn6mo)|	124.344	0.014656	0.175046
cov(e.q12anyriskbehaviorsyn,e.q38drugoralcoholtreatmentandrela)|	3.906	0.004427	0.033686
cov(e.q12anyriskbehaviorsyn,e.q39nonbeveragealcoholuse6moyn)|	5.681	0.002283	0.036916
cov(e.q12anyriskbehaviorsyn,e.q42hospitalvisitagainstwillforme)|	3.976	-0.00403	-0.03178
cov(e.q12anyriskbehaviorsyn,e.q43edvisitforemotionsornervesyn)|	6.525	-0.00584	-0.04232
cov(e.q12anyriskbehaviorsyn,e.q44anymentalhealthprofessionalvi)|	18.861	-0.01049	-0.0701
cov(e.q12anyriskbehaviorsyn,e.q45tbihxyn)|	9.387	-0.00728	-0.04816
cov(e.q12anyriskbehaviorsyn,e.q47concentrationmemoryproblemsyn)|	16.511	-0.00938	-0.06599
cov(e.q12anyriskbehaviorsyn,e.q48observementalorcognitiveillne)|	31.36	-0.01383	-0.08744
cov(e.q12anyriskbehaviorsyn,e.q49medicationnonadherenceyn)|	6.071	0.005922	0.039421
cov(e.q12anyriskbehaviorsyn,e.q50untreatedtraumayn)|	5.628	0.005643	0.038703
cov(e.q14owemoney,e.q18dontlikepeopleinyourlife)|	8.628	0.009827	0.047586

cov(e.q14owemoney,e.q19badinfluencepeopleinyourlife)|	23.407	-0.0184	-0.10993
cov(e.q14owemoney,e.q24liverdiseasecirrhosisyn)|	5.327	-0.00471	-0.03709
cov(e.q14owemoney,e.q26heatstrokeheatexhaustionyn)|	19.063	0.012962	0.069485
cov(e.q14owemoney,e.q32hepatitiscyn)|	22.976	-0.01245	-0.07643
cov(e.q14owemoney,e.q34observeserioushealthcondition)|	61.926	0.0243	0.119914
cov(e.q14owemoney,e.q38drugoralcoholtreatmentandrela)|	5.994	-0.00714	-0.0403
cov(e.q14owemoney,e.q42hospitalvisitagainstwillforme)|	21.171	-0.0122	-0.07129
cov(e.q14owemoney,e.q43edvisitforemotionsornervesyn)|	4.748	-0.00647	-0.03479
cov(e.q14owemoney,e.q44anymentalhealthprofessionalvi)|	6.512	-0.00805	-0.03993
cov(e.q14owemoney,e.q45tbihxyn)|	4.119	0.006339	0.031104
cov(e.q14owemoney,e.q46learningordevelopmentaldisabi)|	18.069	-0.01334	-0.06482
cov(e.q14owemoney,e.q48observementalorcognitiveillne)|	18.077	0.01382	0.064824
cov(e.q14owemoney,e.q49medicationnonadherenceyn)|	34.558	0.018498	0.091348
cov(e.q14owemoney,e.q50untreatedtraumayn)|	23.769	0.01512	0.07692
cov(e.q18dontlikepeopleinyourlife,e.q19badinfluencepeopleinyourlife)|	7.038	0.01152	0.073435
cov(e.q18dontlikepeopleinyourlife,e.q27heartdiseasearrhythmiayn)|	13.574	0.010271	0.057552
cov(e.q18dontlikepeopleinyourlife,e.q32hepatitiscyn)|	8.005	-0.00699	-0.04577
cov(e.q18dontlikepeopleinyourlife,e.q37anyinjectiondruguseyn6mo)|	6.045	-0.00404	-0.03821
cov(e.q18dontlikepeopleinyourlife,e.q45tbihxyn)|	4.493	-0.00628	-0.03288
cov(e.q18dontlikepeopleinyourlife,e.q50untreatedtraumayn)|	5.902	0.007158	0.038847
cov(e.q19badinfluencepeopleinyourlife,e.q32hepatitiscyn)|	5.655	-0.00541	-0.04374
cov(e.q19badinfluencepeopleinyourlife,e.q34observeserioushealthcondition)|	10.71	-0.00863	-0.05604
cov(e.q19badinfluencepeopleinyourlife,e.q36dailyalcoholdrugs1moyn)|	22.255	0.009412	0.083822
cov(e.q19badinfluencepeopleinyourlife,e.q40blackoutyn1mo)|	4.477	0.003258	0.037379
cov(e.q19badinfluencepeopleinyourlife,e.q41observealcoholdrugusesigns)|	9.879	-0.00685	-0.05553
cov(e.q19badinfluencepeopleinyourlife,e.q43edvisitforemotionsornervesyn)|	6.116	-0.00638	-0.04511
cov(e.q19badinfluencepeopleinyourlife,e.q44anymentalhealthprofessionalvi)|	28.296	-0.01445	-0.0943
cov(e.q19badinfluencepeopleinyourlife,e.q49medicationnonadherenceyn)|	24.361	0.013329	0.086652
cov(e.q19badinfluencepeopleinyourlife,e.q50untreatedtraumayn)|	5.084	0.006038	0.040438
cov(e.q23frostbitehypothermiaimmersion,e.q24liverdiseasecirrhosisyn)|	39.385	-0.00735	-0.10901
cov(e.q23frostbitehypothermiaimmersion,e.q26heatstrokeheatexhaustionyn)|	69.897	0.014095	0.142389
cov(e.q23frostbitehypothermiaimmersion,e.q27heartdiseasearrhythmiayn)|	5.684	0.003859	0.038199
cov(e.q23frostbitehypothermiaimmersion,e.q32hepatitiscyn)|	61.4	-0.01158	-0.13398
cov(e.q23frostbitehypothermiaimmersion,e.q35drugalcoholuseyn)|	5.498	-0.00367	-0.03833
cov(e.q23frostbitehypothermiaimmersion,e.q39nonbeveragealcoholuse6moyn)|	5.324	0.001551	0.035053
cov(e.q23frostbitehypothermiaimmersion,e.q43edvisitforemotionsornervesyn)|	5.376	-0.00365	-0.03696
cov(e.q23frostbitehypothermiaimmersion,e.q44anymentalhealthprofessionalvi)|	9.238	-0.00509	-0.04751
cov(e.q23frostbitehypothermiaimmersion,e.q45tbihxyn)|	22.557	0.007871	0.072772
cov(e.q23frostbitehypothermiaimmersion,e.q49medicationnonadherenceyn)|	5.407	0.00388	0.036107
cov(e.q24liverdiseasecirrhosisyn,e.q26heatstrokeheatexhaustionyn)|	127.857	-0.02355	-0.21894
cov(e.q24liverdiseasecirrhosisyn,e.q27heartdiseasearrhythmiayn)|	19.799	-0.00861	-0.07845
cov(e.q24liverdiseasecirrhosisyn,e.q32hepatitiscyn)|	742.814	0.049861	0.530944
cov(e.q24liverdiseasecirrhosisyn,e.q35drugalcoholuseyn)|	5.647	0.004245	0.040767

cov(e.q24liverdiseasecirrhosisyn,e.q38drugoralcoholtreatmentandrela)|	5.632	0.004186	0.040985
cov(e.q24liverdiseasecirrhosisyn,e.q39nonbeveragealcoholuse6moyn)|	7.836	-0.00213	-0.04438
cov(e.q24liverdiseasecirrhosisyn,e.q46learningordevelopmentaldisabi)|	16.72	-0.00772	-0.06511
cov(e.q24liverdiseasecirrhosisyn,e.q48observementalorcognitiveillne)|	4.905	-0.00433	-0.03526
cov(e.q24liverdiseasecirrhosisyn,e.q50untreatedtraumayn)|	20.313	-0.00843	-0.07439
cov(e.q26heatstrokeheatexhaustionyn,e.q27heartdiseasearrhythmiayn)|	40.266	0.017664	0.109568
cov(e.q26heatstrokeheatexhaustionyn,e.q32hepatitiscyn)|	145.553	-0.0315	-0.22841
cov(e.q26heatstrokeheatexhaustionyn,e.q38drugoralcoholtreatmentandrela)|	7.161	-0.00686	-0.04574
cov(e.q26heatstrokeheatexhaustionyn,e.q44anymentalhealthprofessionalvi)|	9.471	-0.00852	-0.04987
cov(e.q26heatstrokeheatexhaustionyn,e.q45tbihxyn)|	49.819	0.019321	0.111952
cov(e.q26heatstrokeheatexhaustionyn,e.q46learningordevelopmentaldisabi)|	10.543	0.008927	0.051232
cov(e.q26heatstrokeheatexhaustionyn,e.q50untreatedtraumayn)|	18.456	0.011687	0.070216
cov(e.q27heartdiseasearrhythmiayn,e.q28emphysemayn)|	23.487	0.007362	0.076757
cov(e.q27heartdiseasearrhythmiayn,e.q32hepatitiscyn)|	51.126	-0.01745	-0.12398
cov(e.q27heartdiseasearrhythmiayn,e.q34observeserioushealthcondition)|	6.838	0.007238	0.04133
cov(e.q27heartdiseasearrhythmiayn,e.q37anyinjectiondruguseyn6mo)|	13.106	-0.00545	-0.0559
cov(e.q27heartdiseasearrhythmiayn,e.q41observealcoholdrugusesigns)|	9.915	-0.00695	-0.04954
cov(e.q27heartdiseasearrhythmiayn,e.q45tbihxyn)|	10.37	0.008734	0.049588
cov(e.q27heartdiseasearrhythmiayn,e.q47concentrationmemoryproblemsyn)|	4.771	0.005707	0.034477
cov(e.q28emphysemayn,e.q37anyinjectiondruguseyn6mo)|	4.371	-0.00182	-0.03194
cov(e.q28emphysemayn,e.q41observealcoholdrugusesigns)|	4.906	-0.00282	-0.03448
cov(e.q28emphysemayn,e.q45tbihxyn)|	11.188	0.005233	0.050967
cov(e.q32hepatitiscyn,e.q35drugalcoholuseyn)|	49.798	0.016033	0.120081
cov(e.q32hepatitiscyn,e.q36dailyalcoholdrugs1moyn)|	14.635	-0.00682	-0.06244
cov(e.q32hepatitiscyn,e.q37anyinjectiondruguseyn6mo)|	70.478	0.01116	0.133736
cov(e.q32hepatitiscyn,e.q38drugoralcoholtreatmentandrela)|	45.256	0.015092	0.11523
cov(e.q32hepatitiscyn,e.q39nonbeveragealcoholuse6moyn)|	9.776	-0.00303	-0.04922
cov(e.q32hepatitiscyn,e.q40blackoutyn1mo)|	11.85	-0.00474	-0.05593
cov(e.q32hepatitiscyn,e.q42hospitalvisitagainstwillforme)|	10.178	-0.00649	-0.05127
cov(e.q32hepatitiscyn,e.q44anymentalhealthprofessionalvi)|	5.714	0.005788	0.038811
cov(e.q32hepatitiscyn,e.q46learningordevelopmentaldisabi)|	11.769	-0.00825	-0.05423
cov(e.q32hepatitiscyn,e.q48observementalorcognitiveillne)|	11.655	-0.0085	-0.05396
cov(e.q32hepatitiscyn,e.q50untreatedtraumayn)|	18.736	-0.0103	-0.07089
cov(e.q34observeserioushealthcondition,e.q35drugalcoholuseyn)|	5.143	-0.00611	-0.0368
cov(e.q34observeserioushealthcondition,e.q36dailyalcoholdrugs1moyn)|	6.865	-0.00556	-0.04091
cov(e.q34observeserioushealthcondition,e.q38drugoralcoholtreatmentandrela)|	25.539	-0.01345	-0.08251
cov(e.q34observeserioushealthcondition,e.q39nonbeveragealcoholuse6moyn)|	5.471	-0.00271	-0.03531
cov(e.q34observeserioushealthcondition,e.q40blackoutyn1mo)|	9.124	-0.00496	-0.04696
cov(e.q34observeserioushealthcondition,e.q41observealcoholdrugusesigns)|	130.609	0.026535	0.177689
cov(e.q34observeserioushealthcondition,e.q42hospitalvisitagainstwillforme)|	15.235	-0.00945	-0.06003
cov(e.q34observeserioushealthcondition,e.q43edvisitforemotionsornervesyn)|	7.658	-0.0075	-0.04379
cov(e.q34observeserioushealthcondition,e.q46learningordevelopmentaldisabi)|	6.292	-0.00719	-0.038
cov(e.q34observeserioushealthcondition,e.q48observementalorcognitiveillne)|	206.725	0.04271	0.217777

cov(e.q34observeserioushealthcondition,e.q49medicationnonadherenceyn)|	14.311	0.010869	0.058347
cov(e.q35drugalcoholuseyn,e.q36dailyalcoholdrugs1moyn)|	38.872	-0.01397	-0.11526
cov(e.q35drugalcoholuseyn,e.q37anyinjectiondruguseyn6mo)|	23.566	-0.00783	-0.08459
cov(e.q35drugalcoholuseyn,e.q38drugoralcoholtreatmentandrela)|	634.201	0.076414	0.526185
cov(e.q35drugalcoholuseyn,e.q39nonbeveragealcoholuse6moyn)|	49.666	-0.00816	-0.11941
cov(e.q35drugalcoholuseyn,e.q40blackoutyn1mo)|	114.49	-0.0184	-0.19561
cov(e.q35drugalcoholuseyn,e.q41observealcoholdrugusesigns)|	24.294	-0.01199	-0.09013
cov(e.q35drugalcoholuseyn,e.q44anymentalhealthprofessionalvi)|	6.444	0.00698	0.042216
cov(e.q35drugalcoholuseyn,e.q47concentrationmemoryproblemsyn)|	9.47	0.008074	0.051415
cov(e.q35drugalcoholuseyn,e.q48observementalorcognitiveillne)|	41.638	-0.01828	-0.10459
cov(e.q36dailyalcoholdrugs1moyn,e.q38drugoralcoholtreatmentandrela)|	86.848	-0.02074	-0.1745
cov(e.q36dailyalcoholdrugs1moyn,e.q39nonbeveragealcoholuse6moyn)|	12.122	0.003111	0.055616
cov(e.q36dailyalcoholdrugs1moyn,e.q40blackoutyn1mo)|	254.384	0.020779	0.269893
cov(e.q36dailyalcoholdrugs1moyn,e.q41observealcoholdrugusesigns)|	21.478	0.008545	0.078437
cov(e.q36dailyalcoholdrugs1moyn,e.q42hospitalvisitagainstwillforme)|	9.643	-0.00565	-0.04921
cov(e.q36dailyalcoholdrugs1moyn,e.q43edvisitforemotionsornervesyn)|	6.431	-0.00516	-0.04135
cov(e.q36dailyalcoholdrugs1moyn,e.q44anymentalhealthprofessionalvi)|	37.62	-0.01328	-0.09811
cov(e.q36dailyalcoholdrugs1moyn,e.q49medicationnonadherenceyn)|	6.72	0.005597	0.041191
cov(e.q37anyinjectiondruguseyn6mo,e.q38drugoralcoholtreatmentandrela)|	9.613	-0.00496	-0.0546
cov(e.q37anyinjectiondruguseyn6mo,e.q41observealcoholdrugusesigns)|	11.478	0.004568	0.054916
cov(e.q37anyinjectiondruguseyn6mo,e.q45tbihxyn)|	23.022	-0.00768	-0.07359
cov(e.q38drugoralcoholtreatmentandrela,e.q39nonbeveragealcoholuse6moyn)|	17.989	-0.00486	-0.07254
cov(e.q38drugoralcoholtreatmentandrela,e.q40blackoutyn1mo)|	70.87	-0.01438	-0.15581
cov(e.q38drugoralcoholtreatmentandrela,e.q41observealcoholdrugusesigns)|	18.341	-0.01035	-0.07928
cov(e.q38drugoralcoholtreatmentandrela,e.q43edvisitforemotionsornervesyn)|	13.902	0.009526	0.063655
cov(e.q38drugoralcoholtreatmentandrela,e.q44anymentalhealthprofessionalvi)|	39.707	0.017102	0.10544
cov(e.q38drugoralcoholtreatmentandrela,e.q46learningordevelopmentaldisabi)|	7.095	-0.00719	-0.04344
cov(e.q38drugoralcoholtreatmentandrela,e.q48observementalorcognitiveillne)|	27.33	-0.01461	-0.08524
cov(e.q39nonbeveragealcoholuse6moyn,e.q40blackoutyn1mo)|	42.4	0.004488	0.103366
cov(e.q39nonbeveragealcoholuse6moyn,e.q42hospitalvisitagainstwillforme)|	10.565	0.003225	0.049807
cov(e.q40blackoutyn1mo,e.q41observealcoholdrugusesigns)|	8.423	0.004119	0.048723
cov(e.q41observealcoholdrugusesigns,e.q44anymentalhealthprofessionalvi)|	6.124	-0.00586	-0.03942
cov(e.q41observealcoholdrugusesigns,e.q47concentrationmemoryproblemsyn)|	11.529	-0.00767	-0.05433
cov(e.q41observealcoholdrugusesigns,e.q48observementalorcognitiveillne)|	327.83	0.044212	0.281417
cov(e.q42hospitalvisitagainstwillforme,e.q43edvisitforemotionsornervesyn)|	74.688	0.021004	0.14532
cov(e.q42hospitalvisitagainstwillforme,e.q44anymentalhealthprofessionalvi)|	18.101	0.010858	0.069308
cov(e.q42hospitalvisitagainstwillforme,e.q45tbihxyn)|	6.137	-0.00619	-0.03909
cov(e.q42hospitalvisitagainstwillforme,e.q47concentrationmemoryproblemsyn)|	22.29	-0.01153	-0.07748
cov(e.q42hospitalvisitagainstwillforme,e.q49medicationnonadherenceyn)|	12.408	-0.00893	-0.05677
cov(e.q42hospitalvisitagainstwillforme,e.q50untreatedtraumayn)|	5.71	-0.00602	-0.03943
cov(e.q43edvisitforemotionsornervesyn,e.q44anymentalhealthprofessionalvi)|	207.052	0.042013	0.24658
cov(e.q43edvisitforemotionsornervesyn,e.q45tbihxyn)|	23.972	-0.01388	-0.08064
cov(e.q43edvisitforemotionsornervesyn,e.q46learningordevelopmentaldisabi)|	7.835	-0.00794	-0.04567

cov(e.q43edvisitforemotionsornervesyn,e.q47concentrationmemoryproblemsyn)|	13.935	-0.01045	-0.06455
cov(e.q43edvisitforemotionsornervesyn,e.q49medicationnonadherenceyn)|	26.262	-0.01482	-0.08665
cov(e.q43edvisitforemotionsornervesyn,e.q50untreatedtraumayn)|	12.598	-0.01026	-0.06181
cov(e.q44anymentalhealthprofessionalvi,e.q45tbihxyn)|	19.841	-0.0133	-0.07127
cov(e.q44anymentalhealthprofessionalvi,e.q48observementalorcognitiveillne)|	4.692	0.006708	0.034366
cov(e.q44anymentalhealthprofessionalvi,e.q49medicationnonadherenceyn)|	38.65	-0.01887	-0.10176
cov(e.q44anymentalhealthprofessionalvi,e.q50untreatedtraumayn)|	10.046	-0.00958	-0.05322
cov(e.q45tbihxyn,e.q46learningordevelopmentaldisabi)|	7.355	0.007965	0.041839
cov(e.q45tbihxyn,e.q47concentrationmemoryproblemsyn)|	4.319	0.005932	0.033473
cov(e.q46learningordevelopmentaldisabi,e.q47concentrationmemoryproblemsyn)|	161.271	0.036287	0.202818
cov(e.q46learningordevelopmentaldisabi,e.q48observementalorcognitiveillne)|	14.392	0.011574	0.05812
cov(e.q46learningordevelopmentaldisabi,e.q49medicationnonadherenceyn)|	11.853	-0.01024	-0.05412
cov(e.q47concentrationmemoryproblemsyn,e.q48observementalorcognitiveillne)|	9.825	0.009278	0.05005
cov(e.q48observementalorcognitiveillne,e.q49medicationnonadherenceyn)|	5.18	0.007009	0.035767
cov(e.q48observementalorcognitiveillne,e.q50untreatedtraumayn)|	12.599	-0.01083	-0.05696

Model 3.2 - Final

Standardized		Coef.	Std. Err.	[95% Conf.	Interval]
q08attackedyn	A	0.452158	0.014976	0.422807	0.48151
q26heatstrokeheatexhaustionyn	A	0.442221	0.014721	0.413368	0.471074
q49medicationnonadherenceyn	A	0.474185	0.014392	0.445978	0.502392
q11forceortrickyn	B	0.532671	0.014384	0.504479	0.560863
q14owemoney	B	0.337263	0.016199	0.305513	0.369013
q18dontlikepeopleinyourlife	B	0.394172	0.015733	0.363335	0.425008
q19badinfluencepeopleinyourlife	B	0.633951	0.013899	0.60671	0.661193
q23frostbitehypothermiaimmersion	C	0.371481	0.020495	0.331311	0.41165
q24liverdiseasecirrhosisyn	C	0.30234	0.020388	0.262381	0.342299
q27heartdiseasearrhythmiayn	C	0.332074	0.021379	0.290172	0.373977
q32hepatitiscyn	C	0.266137	0.021039	0.224901	0.307373
q12anyriskbehaviorsyn	D	0.567619	0.013776	0.540619	0.594618
q35drugalcoholuseyn	D	0.508347	0.01432	0.48028	0.536414
q36dailyalcoholdrugs1moyn	D	0.492676	0.014565	0.464129	0.521223
q37anyinjectiondruguseyn6mo	D	0.407572	0.01566	0.376878	0.438265
q38drugoralcoholtreatmentandrela	D	0.521786	0.014128	0.494096	0.549475
q39nonbeveragealcoholuse6moyn	D	0.325407	0.015899	0.294245	0.356569
q40blackoutyn1mo	D	0.477879	0.014734	0.449002	0.506757
q41observealcoholdrugusesigns	D	0.504884	0.013891	0.477658	0.53211
q09harmselfothersyn1yr	E	0.506895	0.013312	0.480805	0.532985
q42hospitalvisitagainstwillforme	E	0.467512	0.013822	0.440422	0.494602
q43edvisitforemotionsornervesyn	E	0.553956	0.012841	0.528788	0.579125
q44anymentalhealthprofessionalvi	E	0.476169	0.014014	0.448703	0.503636
q45tbihxyn	E	0.398752	0.014611	0.370116	0.427388

q46learningordevelopmentaldisabi	E	0.367031	0.014947	0.337735	0.396328
q47concentrationmemoryproblemsyn	E	0.529923	0.013026	0.504392	0.555454
q48observementalorcognitiveillne	E	0.358452	0.014676	0.329687	0.387216
q50untreatedtraumayn	E	0.545657	0.012756	0.520656	0.570658

Standardized	Coef.	Std. Err.	[95% Conf.	Interval]
var(e.q08attackedyn)|	0.79555	0.01354	0.76945	0.82254
var(e.q26heatstrokeheatexhaustionyn)|	0.80444	0.01302	0.77932	0.83037
var(e.q49medicationnonadherenceyn)|	0.77515	0.01365	0.74885	0.80237
var(e.q11forceortrickyn)|	0.71626	0.01532	0.68685	0.74693
var(e.q14owemoney)|	0.88625	0.01093	0.86509	0.90793
var(e.q18dontlikepeopleinyourlife)|	0.84463	0.01240	0.82067	0.86929
var(e.q19badinfluencepeopleinyourlife)|	0.59811	0.01762	0.56454	0.63366
var(e.q23frostbitehypothermiaimmersion)|	0.86200	0.01523	0.83267	0.89237
var(e.q24liverdiseasecirrhosisyn)|	0.90859	0.01233	0.88475	0.93308
var(e.q27heartdiseasearrhythmiayn)|	0.88973	0.01420	0.86233	0.91800
var(e.q32hepatitiscyn)|	0.92917	0.01120	0.90748	0.95138
var(e.q12anyriskbehaviorsyn)|	0.67781	0.01564	0.64784	0.70916
var(e.q35drugalcoholuseyn)|	0.74158	0.01456	0.71359	0.77068
var(e.q36dailyalcoholdrugs1moyn)|	0.75727	0.01435	0.72966	0.78593
var(e.q37anyinjectiondruguseyn6mo)|	0.83389	0.01277	0.80924	0.85928
var(e.q38drugoralcoholtreatmentandrela)|	0.72774	0.01474	0.69941	0.75722
var(e.q39nonbeveragealcoholuse6moyn)|	0.89411	0.01035	0.87406	0.91462
var(e.q40blackoutyn1mo)|	0.77163	0.01408	0.74452	0.79973
var(e.q41observealcoholdrugusesigns)|	0.74509	0.01403	0.71810	0.77310
var(e.q09harmselfothersyn1yr)|	0.74306	0.01350	0.71707	0.76998
var(e.q42hospitalvisitagainstwillforme)|	0.78143	0.01292	0.75651	0.80718
var(e.q43edvisitforemotionsornervesyn)|	0.69313	0.01423	0.66580	0.72159
var(e.q44anymentalhealthprofessionalvi)|	0.77326	0.01335	0.74754	0.79987
var(e.q45tbihxyn)|	0.84100	0.01165	0.81847	0.86415
var(e.q46learningordevelopmentaldisabi)|	0.86529	0.01097	0.84405	0.88706
var(e.q47concentrationmemoryproblemsyn)|	0.71918	0.01381	0.69263	0.74676
var(e.q48observementalorcognitiveillne)|	0.87151	0.01052	0.85113	0.89238
var(e.q50untreatedtraumayn)|	0.70226	0.01392	0.67550	0.73008
cov(e.q24liverdiseasecirrhosisyn,e.q32hepatitiscyn)|	0.41568	0.01314	0.38992	0.44144
cov(e.q12anyriskbehaviorsyn,e.q37anyinjectiondruguseyn6mo)|	0.09741	0.01698	0.06413	0.13068
cov(e.q35drugalcoholuseyn,e.q38drugoralcoholtreatmentandrela)|	0.38287	0.01428	0.35488	0.41086
cov(e.q36dailyalcoholdrugs1moyn,e.q40blackoutyn1mo)|	0.21770	0.01590	0.18654	0.24885
cov(e.q41observealcoholdrugusesigns,e.q48observementalorcognitiveillne)|	0.27452	0.01470	0.24570	0.30333
cov(e.q43edvisitforemotionsornervesyn,e.q44anymentalhealthprofessionalvi)|	0.21411	0.01576	0.18322	0.24501

cov(A,B)|	0.87963	0.02423	0.83214	0.92711
cov(A,C)|	0.94241	0.04364	0.85687	1.02794
cov(A,D)|	0.68463	0.02303	0.63948	0.72977
cov(A,E)|	0.89350	0.02051	0.85330	0.93370
cov(B,C)|	0.54128	0.03585	0.47103	0.61154
cov(B,D)|	0.57819	0.01983	0.53932	0.61706
cov(B,E)|	0.66713	0.01796	0.63193	0.70234
cov(C,D)|	0.54815	0.03595	0.47769	0.61860
cov(C,E)|	0.55870	0.03237	0.49526	0.62214
cov(D,E)|	0.56206	0.01694	0.52885	0.59527

Modification Indices for Model 3.2

Modification indices >= 3.48

EPC = expected parameter change

Measurement	MI	EPC	Standard EPC
q08attackedyn			
B	24.679	0.635319	0.258275
q26heatstrokeheatexhaustionyn			
B	41.717	-0.755	-0.33331
C	40.487	1.785149	0.38807
D	27.532	-0.30654	-0.15851
E	13.603	-0.38785	-0.18615
q49medicationnonadherenceyn			
C	19.912	-1.42759	-0.28386
D	11.419	0.221636	0.104827
E	13.439	0.432712	0.189959
q11forceortrickyn			
A	7.284	0.231717	0.137283
D	22.182	-0.20956	-0.13075
E	11.894	0.206273	0.119452
q18dontlikepeopleinyourlife			
C	4.359	-0.35205	-0.07153
q19badinfluencepeopleinyourlife			
A	5.593	-0.29019	-0.13763
D	18.995	0.267843	0.133773
E	15.263	-0.3327	-0.15423
q23frostbitehypothermiaimmersion			
D	8.035	-0.10709	-0.09463
q27heartdiseasearrhythmiayn			
D	50.14	-0.41421	-0.22235
q32hepatitiscyn			
B	3.911	-0.10937	-0.05512

D	84.876	0.382246	0.225639
q12anyriskbehaviorsyn			
A	94.693	0.459782	0.247823
B	182.153	0.705241	0.341766
C	20.035	0.537955	0.128373
E	65.063	0.34407	0.181273
q35drugalcoholuseyn			
A	4.36	0.102965	0.046433
C	7.25	0.341645	0.06821
E	6.655	0.115813	0.051049
q36dailyalcoholdrugs1moyn			
A	36.539	-0.24297	-0.14644
B	9.476	-0.13766	-0.07459
C	12.653	-0.36734	-0.09801
E	50.783	-0.2605	-0.15346
q37anyinjectiondruguseyn6mo			
A	11.801	-0.10415	-0.08774
B	12.049	-0.11704	-0.08865
E	13.468	-0.10112	-0.08327
q38drugoralcoholtreatmentandrela			
B	6.297	-0.13667	-0.0558
q41observealcoholdrugusesigns			
A	34.278	-0.27075	-0.14928
B	40.311	-0.32155	-0.1594
C	18.799	-0.50507	-0.12329
E	16.585	-0.17324	-0.09336
q09harmselfothersyn1yr			
D	53.699	0.304237	0.16615
q42hospitalvisitagainstwillforme			
C	7.993	-0.36365	-0.08633
q44anymentalhealthprofessionalvi			
A	20.346	-0.41923	-0.1852
B	34.423	-0.42421	-0.16848
C	19.738	-0.66263	-0.12959
D	6.985	-0.12349	-0.05745
q45tbihxyn			
A	53.701	0.681129	0.317726
B	6.894	0.189824	0.079612
C	121.223	1.643271	0.339366
q46learningordevelopmentaldisabi			
A	28.441	-0.49385	-0.23223
B	16.739	-0.29469	-0.12459
C	23.945	-0.72771	-0.1515

D	32.611	-0.26821	-0.13282
q47concentrationmemoryproblemsyn			
D	16.547	-0.19006	-0.09188
q48observementalorcognitiveillne			
C	4.059	-0.30469	-0.06106
D	39.733	-0.31801	-0.1516
q50untreatedtraumayn			
A	25.343	0.484917	0.214814
B	83.095	0.683075	0.27206
C	9.684	0.480918	0.09432
D	16.863	0.19836	0.092537
cov(e.q08attackedyn,e.q26heatstrokeheatexhaustionyn)|	4.578	0.006739	0.038507
cov(e.q08attackedyn,e.q11forceortrickyn)|	12.004	0.00798	0.058308
cov(e.q08attackedyn,e.q19badinfluencepeopleinyourlife)|	3.923	0.005676	0.03633
cov(e.q08attackedyn,e.q27heartdiseasearrhythmiayn)|	15.822	-0.01177	-0.06638
cov(e.q08attackedyn,e.q12anyriskbehaviorsyn)|	4.15	0.004812	0.032882
cov(e.q08attackedyn,e.q36dailyalcoholdrugs1moyn)|	4.648	0.004533	0.032771
cov(e.q08attackedyn,e.q42hospitalvisitagainstwillforme)|	12.017	-0.00862	-0.0546
cov(e.q08attackedyn,e.q44anymentalhealthprofessionalvi)|	9.604	-0.00894	-0.04686
cov(e.q08attackedyn,e.q45tbihxyn)|	16.206	0.011756	0.062418
cov(e.q08attackedyn,e.q47concentrationmemoryproblemsyn)|	7.59	-0.00783	-0.04426
cov(e.q08attackedyn,e.q50untreatedtraumayn)|	19.956	0.013086	0.072207
cov(e.q26heatstrokeheatexhaustionyn,e.q49medicationnonadherenceyn)|	10.038	-0.01024	-0.05886
cov(e.q26heatstrokeheatexhaustionyn,e.q14owemoney)|	7.151	0.007844	0.041565
cov(e.q26heatstrokeheatexhaustionyn,e.q19badinfluencepeopleinyourlife)|	20.097	-0.01183	-0.0818
cov(e.q26heatstrokeheatexhaustionyn,e.q23frostbitehypothermiaimmersion)|	52.665	0.012108	0.123347
cov(e.q26heatstrokeheatexhaustionyn,e.q27heartdiseasearrhythmiayn)|	53.513	0.019934	0.121431
cov(e.q26heatstrokeheatexhaustionyn,e.q40blackoutyn1mo)|	6.092	-0.0037	-0.03729
cov(e.q26heatstrokeheatexhaustionyn,e.q09harmselfothersyn1yr)|	5.526	-0.00551	-0.03739
cov(e.q26heatstrokeheatexhaustionyn,e.q44anymentalhealthprofessionalvi)|	11.877	-0.00919	-0.05202
cov(e.q26heatstrokeheatexhaustionyn,e.q45tbihxyn)|	51.783	0.019427	0.11139
cov(e.q49medicationnonadherenceyn,e.q11forceortrickyn)|	11.766	-0.00792	-0.05823
cov(e.q49medicationnonadherenceyn,e.q14owemoney)|	23.659	0.015419	0.076132
cov(e.q49medicationnonadherenceyn,e.q23frostbitehypothermiaimmersion)|	7.155	-0.00489	-0.04643
cov(e.q49medicationnonadherenceyn,e.q27heartdiseasearrhythmiayn)|	4.355	-0.00621	-0.03527

cov(e.q49medicationnonadherenceyn,e.q12anyriskbehaviorsyn)|	4.332	0.004909	0.033759
cov(e.q49medicationnonadherenceyn,e.q48observementalorcognitiveillne)|	16.726	0.011979	0.061015
cov(e.q49medicationnonadherenceyn,e.q50untreatedtraumayn)|	6.168	0.007267	0.040352
cov(e.q11forceortrickyn,e.q14owemoney)|	4.323	-0.00524	-0.0355
cov(e.q11forceortrickyn,e.q23frostbitehypothermiaimmersion)|	7.193	0.003459	0.045053
cov(e.q11forceortrickyn,e.q12anyriskbehaviorsyn)|	28.908	0.009562	0.090236
cov(e.q11forceortrickyn,e.q35drugalcoholuseyn)|	17.138	-0.00814	-0.06141
cov(e.q11forceortrickyn,e.q36dailyalcoholdrugs1moyn)|	9.389	-0.00486	-0.04854
cov(e.q11forceortrickyn,e.q38drugoralcoholtreatmentandrela)|	10.372	-0.00625	-0.04799
cov(e.q11forceortrickyn,e.q39nonbeveragealcoholuse6moyn)|	4.72	0.001923	0.03469
cov(e.q11forceortrickyn,e.q41observealcoholdrugusesigns)|	5.716	-0.00416	-0.03832
cov(e.q11forceortrickyn,e.q48observementalorcognitiveillne)|	5.604	0.005223	0.03651
cov(e.q11forceortrickyn,e.q50untreatedtraumayn)|	6.094	0.005398	0.041131
cov(e.q14owemoney,e.q18dontlikepeopleinyourlife)|	8.748	0.00974	0.047078
cov(e.q14owemoney,e.q19badinfluencepeopleinyourlife)|	15.858	-0.01284	-0.07619
cov(e.q14owemoney,e.q32hepatitiscyn)|	9.769	-0.00762	-0.04286
cov(e.q14owemoney,e.q12anyriskbehaviorsyn)|	9.924	0.007915	0.050153
cov(e.q14owemoney,e.q35drugalcoholuseyn)|	5.512	0.006553	0.033215
cov(e.q14owemoney,e.q38drugoralcoholtreatmentandrela)|	7.298	-0.00745	-0.03837
cov(e.q14owemoney,e.q39nonbeveragealcoholuse6moyn)|	4.28	-0.0026	-0.03153
cov(e.q14owemoney,e.q42hospitalvisitagainstwillforme)|	20.981	-0.0121	-0.07107
cov(e.q14owemoney,e.q46learningordevelopmentaldisabi)|	19.367	-0.01373	-0.06719
cov(e.q14owemoney,e.q48observementalorcognitiveillne)|	16.309	0.012653	0.059388
cov(e.q14owemoney,e.q50untreatedtraumayn)|	22.399	0.014631	0.074859
cov(e.q18dontlikepeopleinyourlife,e.q19badinfluencepeopleinyourlife)|	7.908	0.008946	0.056407
cov(e.q18dontlikepeopleinyourlife,e.q27heartdiseasearrhythmiayn)|	10.461	0.009143	0.050805
cov(e.q18dontlikepeopleinyourlife,e.q37anyinjectiondrugusey n6mo)|	6.638	-0.00418	-0.03962
cov(e.q18dontlikepeopleinyourlife,e.q45tbihxyn)|	7.579	-0.00815	-0.04262
cov(e.q18dontlikepeopleinyourlife,e.q50untreatedtraumayn)|	4.475	0.00622	0.033809
cov(e.q19badinfluencepeopleinyourlife,e.q12anyriskbehaviorsyn)|	28.385	0.01148	0.094905
cov(e.q19badinfluencepeopleinyourlife,e.q36dailyalcoholdrugs1moyn)|	15.11	0.007438	0.065049
cov(e.q19badinfluencepeopleinyourlife,e.q41observealcoholdrugusesigns)|	11.641	-0.00719	-0.05798
cov(e.q19badinfluencepeopleinyourlife,e.q44anymentalhealthprofessionalvi)|	13.126	-0.00945	-0.05991

cov(e.q19badinfluencepeopleinyourlife,e.q47concentrationmemoryproblemsyn)|	4.226	-0.00528	-0.03609
cov(e.q23frostbitehypothermiaimmersion,e.q32hepatitiscyn)|	4.854	-0.00304	-0.03291
cov(e.q23frostbitehypothermiaimmersion,e.q45tbihxyn)|	22.052	0.007765	0.073502
cov(e.q24liverdiseasecirrhosisyn,e.q27heartdiseasearrhythmiayn)|	5.305	0.004171	0.034547
cov(e.q24liverdiseasecirrhosisyn,e.q12anyriskbehaviorsyn)|	5.084	-0.00323	-0.03245
cov(e.q24liverdiseasecirrhosisyn,e.q37anyinjectiondruguseyn6mo)|	5.096	-0.00219	-0.03102
cov(e.q24liverdiseasecirrhosisyn,e.q40blackoutyn1mo)|	10.232	0.003166	0.043393
cov(e.q24liverdiseasecirrhosisyn,e.q46learningordevelopmentaldisabi)|	6.739	-0.00461	-0.03573
cov(e.q24liverdiseasecirrhosisyn,e.q50untreatedtraumayn)|	5.611	-0.00417	-0.03378
cov(e.q27heartdiseasearrhythmiayn,e.q12anyriskbehaviorsyn)|	10.164	-0.0071	-0.05172
cov(e.q27heartdiseasearrhythmiayn,e.q37anyinjectiondruguseyn6mo)|	9.549	-0.00464	-0.04763
cov(e.q27heartdiseasearrhythmiayn,e.q41observealcoholdrugusesigns)|	7.375	-0.00592	-0.0421
cov(e.q27heartdiseasearrhythmiayn,e.q09harmselfothersyn1yr)|	12.287	-0.00831	-0.0556
cov(e.q27heartdiseasearrhythmiayn,e.q43edvisitforemotionsornervesyn)|	4.856	0.005605	0.033995
cov(e.q27heartdiseasearrhythmiayn,e.q45tbihxyn)|	13.561	0.010084	0.057075
cov(e.q27heartdiseasearrhythmiayn,e.q47concentrationmemoryproblemsyn)|	8.042	0.007519	0.045288
cov(e.q32hepatitiscyn,e.q35drugalcoholuseyn)|	30.272	0.011129	0.069781
cov(e.q32hepatitiscyn,e.q36dailyalcoholdrugs1moyn)|	4.183	-0.00334	-0.02767
cov(e.q32hepatitiscyn,e.q37anyinjectiondruguseyn6mo)|	84.25	0.011348	0.12535
cov(e.q32hepatitiscyn,e.q38drugoralcoholtreatmentandrela)|	22.766	0.009532	0.060755
cov(e.q32hepatitiscyn,e.q40blackoutyn1mo)|	5.212	-0.00287	-0.03077
cov(e.q32hepatitiscyn,e.q41observealcoholdrugusesigns)|	5.048	0.004011	0.030674
cov(e.q32hepatitiscyn,e.q42hospitalvisitagainstwillforme)|	4.362	-0.004	-0.02902
cov(e.q32hepatitiscyn,e.q44anymentalhealthprofessionalvi)|	8.059	0.006315	0.037985
cov(e.q32hepatitiscyn,e.q45tbihxyn)|	3.858	0.00443	0.026978
cov(e.q32hepatitiscyn,e.q47concentrationmemoryproblemsyn)|	4.157	0.004433	0.028735
cov(e.q32hepatitiscyn,e.q48observementalorcognitiveillne)|	4.528	-0.00483	-0.02804
cov(e.q12anyriskbehaviorsyn,e.q40blackoutyn1mo)|	14.767	-0.00539	-0.06493
cov(e.q12anyriskbehaviorsyn,e.q41observealcoholdrugusesigns)|	32.703	-0.01169	-0.10068
cov(e.q12anyriskbehaviorsyn,e.q09harmselfothersyn1yr)|	12.054	0.006961	0.056457
cov(e.q12anyriskbehaviorsyn,e.q45tbihxyn)|	4.469	-0.00491	-0.03366
cov(e.q12anyriskbehaviorsyn,e.q50untreatedtraumayn)|	20.34	0.010403	0.074135
cov(e.q35drugalcoholuseyn,e.q36dailyalcoholdrugs1moyn)|	6.114	0.004808	0.035907

cov(e.q35drugalcoholuseyn,e.q39nonbeveragealcoholuse6moyn)|	14.488	-0.00407	-0.05489
cov(e.q35drugalcoholuseyn,e.q40blackoutyn1mo)|	9.079	-0.00451	-0.04345
cov(e.q35drugalcoholuseyn,e.q47concentrationmemoryproblemsyn)|	9.717	0.007762	0.045307
cov(e.q35drugalcoholuseyn,e.q48observementalorcognitiveilline)|	13.017	-0.00942	-0.04924
cov(e.q36dailyalcoholdrugs1moyn,e.q41observealcoholdrugusesigns)|	24.205	0.008664	0.078921
cov(e.q36dailyalcoholdrugs1moyn,e.q09harmselfothersyn1yr)|	5.639	0.004267	0.036603
cov(e.q36dailyalcoholdrugs1moyn,e.q42hospitalvisitagainstwillforme)|	14.256	-0.00667	-0.0577
cov(e.q36dailyalcoholdrugs1moyn,e.q44anymentalhealthprofessionalvi)|	22.055	-0.00965	-0.06912
cov(e.q36dailyalcoholdrugs1moyn,e.q46learningordevelopmentaldisabi)|	4.819	-0.00458	-0.03303
cov(e.q37anyinjectiondruguseyn6mo,e.q41observealcoholdrugusesigns)|	10.168	0.004238	0.051419
cov(e.q37anyinjectiondruguseyn6mo,e.q45tbihxyn)|	18.156	-0.00673	-0.06501
cov(e.q38drugoralcoholtreatmentandrela,e.q43edvisitforemotionsornervesyn)|	8.722	0.00698	0.041698
cov(e.q38drugoralcoholtreatmentandrela,e.q44anymentalhealthprofessionalvi)|	25.924	0.012812	0.070547
cov(e.q38drugoralcoholtreatmentandrela,e.q46learningordevelopmentaldisabi)|	7.535	-0.00702	-0.03888
cov(e.q39nonbeveragealcoholuse6moyn,e.q40blackoutyn1mo)|	27.989	0.003528	0.081284
cov(e.q39nonbeveragealcoholuse6moyn,e.q09harmselfothersyn1yr)|	4.295	0.002081	0.032261
cov(e.q39nonbeveragealcoholuse6moyn,e.q42hospitalvisitagainstwillforme)|	8.512	0.002881	0.045038
cov(e.q39nonbeveragealcoholuse6moyn,e.q47concentrationmemoryproblemsyn)|	5.032	-0.00252	-0.03512
cov(e.q40blackoutyn1mo,e.q41observealcoholdrugusesigns)|	6.876	0.003551	0.041752
cov(e.q40blackoutyn1mo,e.q42hospitalvisitagainstwillforme)|	3.927	0.002702	0.030172
cov(e.q41observealcoholdrugusesigns,e.q09harmselfothersyn1yr)|	15.892	0.007849	0.062108
cov(e.q41observealcoholdrugusesigns,e.q46learningordevelopmentaldisabi)|	5.466	-0.00534	-0.03549
cov(e.q41observealcoholdrugusesigns,e.q47concentrationmemoryproblemsyn)|	13.351	-0.00805	-0.05729
cov(e.q09harmselfothersyn1yr,e.q42hospitalvisitagainstwillforme)|	14.284	0.008271	0.062152
cov(e.q09harmselfothersyn1yr,e.q43edvisitforemotionsornervesyn)|	14.534	0.009208	0.06217

cov(e.q09harmselfothersyn1yr,e.q44anymentalhealthprofessionalvi)|	24.524	0.012583	0.078304
cov(e.q09harmselfothersyn1yr,e.q45tbihxyn)|	34.201	-0.01495	-0.09423
cov(e.q09harmselfothersyn1yr,e.q46learningordevelopmentaldisabi)|	7.118	-0.00681	-0.04268
cov(e.q09harmselfothersyn1yr,e.q47concentrationmemoryproblemsyn)|	18.388	-0.01079	-0.07239
cov(e.q09harmselfothersyn1yr,e.q48observementalorcognitiveillne)|	5.811	-0.00618	-0.03711
cov(e.q09harmselfothersyn1yr,e.q50untreatedtraumayn)|	8.102	-0.0074	-0.04844
cov(e.q42hospitalvisitagainstwillforme,e.q43edvisitforemotionsornervesyn)|	66.146	0.019166	0.130483
cov(e.q42hospitalvisitagainstwillforme,e.q44anymentalhealthprofessionalvi)|	11.65	0.008475	0.053179
cov(e.q42hospitalvisitagainstwillforme,e.q45tbihxyn)|	8.561	-0.00732	-0.04653
cov(e.q42hospitalvisitagainstwillforme,e.q47concentrationmemoryproblemsyn)|	27.93	-0.01298	-0.08778
cov(e.q42hospitalvisitagainstwillforme,e.q50untreatedtraumayn)|	9.4	-0.00777	-0.05132
cov(e.q43edvisitforemotionsornervesyn,e.q45tbihxyn)|	11.494	-0.00932	-0.05323
cov(e.q43edvisitforemotionsornervesyn,e.q46learningordevelopmentaldisabi)|	5.748	-0.00658	-0.03735
cov(e.q43edvisitforemotionsornervesyn,e.q47concentrationmemoryproblemsyn)|	8.717	-0.00802	-0.04869
cov(e.q43edvisitforemotionsornervesyn,e.q50untreatedtraumayn)|	4.21	-0.00575	-0.03413
cov(e.q44anymentalhealthprofessionalvi,e.q45tbihxyn)|	6.61	-0.00747	-0.03928
cov(e.q44anymentalhealthprofessionalvi,e.q47concentrationmemoryproblemsyn)|	7.268	0.007691	0.043066
cov(e.q44anymentalhealthprofessionalvi,e.q48observementalorcognitiveillne)|	13.939	0.010864	0.054491
cov(e.q45tbihxyn,e.q46learningordevelopmentaldisabi)|	4.618	0.006304	0.033376
cov(e.q46learningordevelopmentaldisabi,e.q47concentrationmemoryproblemsyn)|	147.28	0.034754	0.195825
cov(e.q46learningordevelopmentaldisabi,e.q48observementalorcognitiveillne)|	15.854	0.011721	0.059163
cov(e.q46learningordevelopmentaldisabi,e.q50untreatedtraumayn)|	6.55	-0.00755	-0.04157
cov(e.q47concentrationmemoryproblemsyn,e.q48observementalorcognitiveillne)|	15.993	0.011489	0.062095
cov(e.q48observementalorcognitiveillne,e.q50untreatedtraumayn)|	12.404	-0.01043	-0.05505

Table 19: Invariance Testing

	Model 1 none	Model 2 (+) coef	Model 3 (+) cons	Model 4 (+) merrvar			Model 5 (+) meanex			Model 6 (+) covex		
	chi^2	chi^2	chi^2	chi^2	Model 3-4 diffs	Model 3-4 p value	chi^2	Model 4-5 diffs	Model 4-5 p value	chi^2	Model 5-6 diffs	Model 5-6 p value
White vs Other	did not converge	did not converge	3134.07	4359.59	1225.52	1.476E-235	4506.21	146.62	6.996E-30	4636.37	130.16	1.978E-20
df			714	748	34		753	5		768	15	
Hispanic ethnicity	did not converge	did not converge	2747.03	2825.99	78.96	1.9504E-05	2839.08	13.09	0.0225498	2852.12	13.04	0.599208246
df			714	748	34		753	5		768	15	
Gender (binary)	did not converge	did not converge	3060.78	3609.82	549.04	3.1624E-94	3853.73	243.91	1.113E-50	3933.63	79.9	7.284E-11
df			714	748	34		753	5		768	15	
>= 1 year of homelessness	did not converge	did not converge	2080.85	3004.66	923.81	5.305E-172	3246.11	241.45	3.752E-50	3425.7	179.59	2.875E-30
df			714	748	34		753	5		768	15	
Chronic homelessness	did not converge	did not converge	2858.04	3174.79	316.75	1.3769E-47	3246.54	71.75	4.429E-14	3325.3	78.76	1.176E-10
df			714	748	34		753	5		768	15	

Table 20: Multiple Group Testing of Model 3.2

	Baseline	A. Race (whitevother)					
	Model 3.2	White		Other			
chi2_ms(1169)	2316.556					3134.067	
p > chi2	0					0	
chi2_bs(1225)	20922.768					20913.312	
p > chi2	0					0	
RMSEA	0.036					0.038	
90% CI, lower bound	0.034					0.037	
upper bound	0.037					0.04	
AIC	117632.322					116238.016	
BIC	118276.612					117230.223	
CFI	0.904					0.880	
TLI	0.891					0.873	
SRMR	0.035					0.042	
CD	0.960					0.959	
	n	2738		1904			
Group level fit:	SRMR	0.04		0.043			
	CD	0.959		0.954			
		A. Race (whitevother)				Invariance	
		White		Other		Score test	
		coeff	p	coeff	p	chi^2	p>chi^2
Q08	A	0.452218	0	0.4315933	0	8.402	0.0037
Q26	A	0.4311397	0	0.4417029	0	18.767	0
Q49	A	0.4760277	0	0.4494268	0	1.906	0.1674
Q11	B	0.5250129	0	0.5374814	0	4.03	0.0447
Q14	B	0.3436597	0	0.3235211	0	1.855	0.1731
Q18	B	0.4075826	0	0.3742361	0	0.856	0.355
Q19	B	0.6462004	0	0.6122447	0	0.121	0.7283
Q23	C	0.3856858	0	0.3309896	0	0.437	0.5084
Q24	C	0.2987476	0	0.3051856	0	12.083	0.0005
Q27	C	0.345359	0	0.2692468	0	19.313	0
Q32	C	0.2790686	0	0.2530535	0	0.433	0.5108

Q12		0.5593477	0	0.5341754	0	32.258	0
Q35	D	0.5459239	0	0.4372312	0	2.452	0.1174
Q36	D	0.4944324	0	0.4526023	0	9.085	0.0026
Q37	D	0.3113151	0	0.4523004	0	141.828	0
Q38	D	0.5395665	0	0.4682498	0	0.04	0.8414
Q39	D	0.3243188	0	0.2937392	0	0.482	0.4877
Q40	D	0.4591664	0	0.4848817	0	2.134	0.1441
Q41	D	0.4992072	0	0.4858843	0	0.261	0.6093
Q09	E	0.5009165	0	0.5044702	0	1.68	0.1949
Q42	E	0.4537229	0	0.4801598	0	1.221	0.2693
Q43	E	0.5500947	0	0.5484471	0	0.256	0.6127
Q44	E	0.4786897	0	0.4661125	0	0.001	0.9693
Q45	E	0.3899139	0	0.4063316	0	2.125	0.1449
Q46	E	0.3670746	0	0.3582378	0	4.259	0.039
Q47	E	0.5374597	0	0.5085071	0	4.539	0.0331
Q48	E	0.3569202	0	0.3541888	0	0.213	0.6447
Q50	E	0.5568237	0	0.52492	0	0.998	0.3178
mean(A)|		0.3797983	0	0 (constrained)			
mean(B)|		0.1484254	0	0 (constrained)			
mean(C)|		0.2947035	0	0 (constrained)			
mean(D)|		0.3393066	0	0 (constrained)			
mean(E)|		0.2659215	0	0 (constrained)			
						Wald Test (chi^2)	
var(e.q08a~n)		0.7954988		0.8137272		2.546	0.1106
var(e.q26h~n)		0.8141185		0.8048985		29.507	0
var(e.q49m~n)		0.7733976		0.7980155		0.888	0.346
var(e.q11f~n)		0.7243615		0.7111137		23.08	0
var(e.q14o~y)		0.881898		0.8953341		0.533	0.4653
var(e.q18d~e)		0.8338764		0.8599474		0.554	0.4568
var(e.q19b~e)		0.582425		0.6251564		0.036	0.8491
var(e.q23f~n)		0.8512465		0.8904459		14.224	0.0002
var(e.q24l~n)		0.9107499		0.9068618		151.951	0
var(e.q27h~n)		0.8807272		0.9275062		0.135	0.7132
var(e.q32h~n)		0.9221207		0.9359639		51.952	0
var(e.q12a~n)		0.6871302		0.7146567		26.766	0
var(e.q35d~n)		0.7019671		0.8088289		18.039	0
var(e.q36d~n)		0.7555366		0.7951511		10.996	0.0009
var(e.q37a~o)		0.9030829		0.7954243		539.065	0
var(e.q38d~a)		0.708868		0.7807422		0.001	0.9701
var(e.q39n~n)		0.8948173		0.9137173		14.186	0.0002
var(e.q40b~o)		0.7891662		0.7648898		123.935	0

var(e.q41o~s)	0.7507922		0.7639165		44.45	0
var(e.q09h~r)	0.7490827		0.7455098		3.737	0.0532
var(e.q42h~e)	0.7941355		0.7694466		22.86	0
var(e.q43e~n)	0.6973958		0.6992058		1.659	0.1978
var(e.q44a~i)	0.7708561		0.7827391		0	0.9847
var(e.q45t~n)	0.8479671		0.8348947		14.509	0.0001
var(e.q46l~i)	0.8652562		0.8716657		0.092	0.7618
var(e.q47c~n)	0.711137		0.7414205		3.141	0.0763
var(e.q48o~e)	0.8726079		0.8745503		1.419	0.2336
var(e.q50u~n)	0.6899474		0.724459		4.253	0.0392
var(A)	1		1		3.244	0.0717
var(B)	1		1		4.639	0.0312
var(C)	1		1		8.996	0.0027
var(D)	1		1		30.252	0
var(E)	1		1		1.355	0.2444
cov(e.q24l~n, e.q32hepat~n)	0.4114923	0	0.4172505	0	25.393	0
cov(e.q12a~n, e.q37anyin~o)	0.1589997	0	0.0277336	0.308	47.172	0
cov(e.q35d~n, e.q38drugo~a)	0.3610190	0	0.4122161	0	5.94	0.0148
cov(e.q36d~n, e.q40black~o)	0.2244508	0	0.222571	0	5.073	0.0243
cov(e.q41o~s, e.q48obser~e)	0.2767420	0	0.2733641	0	2.642	0.1041
cov(e.q43e~n, e.q44anyme~i)	0.2222674	0	0.2025244	0	0.588	0.4433
cov(A,B)	0.8682678	0	0.9102954	0	3.208	0.0733
cov(A,C)	0.9868425	0	0.8370775	0	25.991	0
cov(A,D)	0.6994117	0	0.6678229	0	14.484	0.0001
cov(A,E)	0.8870483	0	0.9032484	0	2.789	0.0949
cov(B,C)	0.5550030	0	0.4844316	0	10.622	0.0011
cov(B,D)	0.5763521	0	0.5862804	0	8.419	0.0037
cov(B,E)	0.6944673	0	0.6170335	0	9.373	0.0022
cov(C,D)	0.5459675	0	0.5665699	0	9.997	0.0016
cov(C,E)	0.5444871	0	0.5394287	0	5.717	0.0168
cov(D,E)	0.5654046	0	0.5521478	0	8.841	0.0029

B. Ethnicty (Hispanic)

	Hispanic	Not Hispanic	
chi2_ms(1169)			2747.032
p > chi2			0
chi2_bs(1225)			21346.268
p > chi2			0
RMSEA			0.035
90% CI, lower bound			0.034
upper bound			0.036

AIC						117635.235	
BIC						118627.442	
CFI						0.901	
TLI						0.895	
SRMR						0.041	
CD						0.960	
	Group level fit:						
	n	844		3798			
	SRMR	0.046		0.035			
	CD	0.961		0.959			
		B. Ethnicty (Hispyn) Hispanic		Not Hispanic		Invariance Score test chi^2	p>chi^2
Q08	A	0.4414912	0	0.4539299	0	0.058	0.8093
Q26	A	0.4326424	0	0.4434661	0	0.032	0.8578
Q49	A	0.4572755	0	0.4793785	0	0.167	0.6825
Q11	B	0.532054	0	0.5330852	0	0.196	0.6579
Q14	B	0.3366963	0	0.3374967	0	2.552	0.1102
Q18	B	0.3800543	0	0.3972965	0	1.629	0.2018
Q19	B	0.6314753	0	0.6344881	0	0.26	0.6101
Q23	C	0.4342351	0	0.3573511	0	0.085	0.7705
Q24	C	0.304392	0	0.2989628	0	1.123	0.2894
Q27	C	0.3610405	0	0.3235493	0	0.033	0.8549
Q32	C	0.281511	0	0.259027	0	0.42	0.5171
Q12		0.540394	0	0.5747512	0	2.371	0.1236
Q35	D	0.4870332	0	0.5128914	0	5.181	0.0228
Q36	D	0.4869421	0	0.4930352	0	0.004	0.9491
Q37	D	0.4102343	0	0.407295	0	0.234	0.6286
Q38	D	0.5163253	0	0.5238808	0	0.122	0.7271
Q39	D	0.3290882	0	0.3228297	0	2.118	0.1456
Q40	D	0.4566966	0	0.4803981	0	3.27	0.0706
Q41	D	0.4761763	0	0.5119202	0	2.58	0.1082
Q09	E	0.5411417	0	0.5002817	0	2.062	0.151
Q42	E	0.4995787	0	0.4606875	0	0.153	0.6953
Q43	E	0.5829759	0	0.5467089	0	0.626	0.4288

Q44	E	0.5030278	0	0.4699911	0	0.212	0.6456
Q45	E	0.4240929	0	0.3934855	0	0.833	0.3613
Q46	E	0.3814825	0	0.3637657	0	1.294	0.2553
Q47	E	0.5515552	0	0.5242212	0	4.042	0.0444
Q48	E	0.3827319	0	0.3532718	0	0.573	0.4493
Q50	E	0.5650604	0	0.5408847	0	1.476	0.2244
mean(A)|		0.0586415	0.306	0 (constrained)			
mean(B)|		0.0503947	0.305	0 (constrained)			
mean(C)|		0.0672151	0.026	0 (constrained)			
mean(D)|		0.0473825	0.056	0 (constrained)			
mean(E)|		0.0438561	0.829	0 (constrained)			
						Wald Test (chi^2)	
var(e.q08a~n)		0.8050855		0.7939477		0.041	0.8403
var(e.q26h~n)		0.8128206		0.8033378		0.004	0.9492
var(e.q49m~n)		0.7908991		0.7701962		1.096	0.2951
var(e.q11f~n)		0.7169186		0.7158201		0.369	0.5434
var(e.q14o~y)		0.8866356		0.886096		0.454	0.5005
var(e.q18d~e)		0.8555587		0.8421555		1.132	0.2873
var(e.q19b~e)		0.601239		0.5974248		0.14	0.708
var(e.q23f~n)		0.8114399		0.8723002		34.302	0
var(e.q24l~n)		0.9073455		0.9106212		1.789	0.1811
var(e.q27h~n)		0.8696497		0.8953159		4.879	0.0272
var(e.q32h~n)		0.9207515		0.932905		1.143	0.285
var(e.q12a~n)		0.7079743		0.6696611		1.078	0.2992
var(e.q35d~n)		0.7627987		0.7369424		0.167	0.6828
var(e.q36d~n)		0.7628874		0.7569162		1.903	0.1677
var(e.q37a~o)		0.8317078		0.8341108		5.562	0.0184
var(e.q38d~a)		0.7334082		0.7255489		1.513	0.2187
var(e.q39n~n)		0.891701		0.895781		8.618	0.0033
var(e.q40b~o)		0.7914282		0.7692177		0.076	0.7821
var(e.q41o~s)		0.7732562		0.7379377		1.661	0.1975
var(e.q09h~r)		0.7071656		0.7497182		2.539	0.1111
var(e.q42h~e)		0.7504211		0.7877671		2.353	0.125
var(e.q43e~n)		0.6601391		0.7011094		1.173	0.2788
var(e.q44a~i)		0.7469631		0.7791083		0.881	0.3478
var(e.q45t~n)		0.8201452		0.8451691		1.013	0.3142
var(e.q46l~i)		0.8544711		0.8676745		0.058	0.8099
var(e.q47c~n)		0.6957869		0.7251921		0.104	0.7474
var(e.q48o~e)		0.8535163		0.875199		1.25	0.2635
var(e.q50u~n)		0.6807068		0.7074438		0.001	0.9732
var(A)		1		1		0.185	0.6669
var(B)		1		1		0.194	0.6597

var(C)	1		1		0.392	0.5312
var(D)	1		1		1.996	0.1578
var(E)	1		1		2.608	0.1063
cov(e.q24l~n, e.q32hepat~n)	0.4004503	0	0.4201853	0	0.118	0.7314
cov(e.q12a~n, e.q37anyin~o)	0.1057191	0.005	0.095009	0	0.031	0.8608
cov(e.q35d~n, e.q38drugo~a)	0.3616037	0	0.3868896	0	0.548	0.459
cov(e.q36d~n, e.q40black~o)	0.253736	0	0.2109843	0	0.649	0.4205
cov(e.q41o~s, e.q48obser~e)	0.2381616	0	0.2828388	0	1.027	0.311
cov(e.q43e~n, e.q44anyme~i)	0.2758478	0	0.2015707	0	1.88	0.1703
cov(A,B)	0.9518525	0	0.8650715	0	0.247	0.6194
cov(A,C)	0.8251548	0	0.9787658	0	1.335	0.2478
cov(A,D)	0.7395395	0	0.6741719	0	0.005	0.9455
cov(A,E)	0.8824847	0	0.8973414	0	0.037	0.847
cov(B,C)	0.5168082	0	0.5498754	0	0.019	0.8915
cov(B,D)	0.6198111	0	0.5686766	0	0.006	0.9401
cov(B,E)	0.6860009	0	0.6635968	0	0.59	0.4424
cov(C,D)	0.5312647	0	0.5558983	0	0.073	0.7876
cov(C,E)	0.5278042	0	0.5708735	0	0.083	0.7739
cov(D,E)	0.5849935	0	0.5575107	0	0.266	0.6058

C. Gender (bin_gender)

	Male	Female	
chi2_ms(1169)			3060.776
p > chi2			0
chi2_bs(1225)			21333.297
p > chi2			0
RMSEA			0.038
90% CI, lower bound			0.036
upper bound			0.039
AIC			116831.872
BIC			117824.045
CFI			0.886
TLI			0.879
SRMR			0.042
CD			0.960
Group level fit:			
n	3352	1289	
SRMR	0.036	0.047	
CD	0.961	0.946	

		C. Gender (bin_gender) Male		Female		Invariance Score test chi^2	p>chi^2
Q08	A	0.4632054	0	0.4258094	0	2.34	0.1261
Q26	A	0.447348	0	0.4173454	0	1.057	0.304
Q49	A	0.4838878	0	0.4455039	0	0.252	0.6154
Q11	B	0.5448936	0	0.4898125	0	41.49	0
Q14	B	0.329802	0	0.3463966	0	3.835	0.0502
Q18	B	0.39134	0	0.3982279	0	0.638	0.4244
Q19	B	0.6203648	0	0.6307742	0	15.27	0.0001
Q23	C	0.3806478	0	0.3656933	0	0.897	0.3437
Q24	C	0.3082924	0	0.2557291	0	0.116	0.7329
Q27	C	0.3465517	0	0.2493301	0	6.262	0.0123
Q32	C	0.2818554	0	0.2350016	0	7.779	0.0053
Q12		0.5645788	0	0.540118	0	0.983	0.3215
Q35	D	0.5224812	0	0.4808962	0	14.347	0.0002
Q36	D	0.4774048	0	0.5339209	0	0.033	0.8549
Q37	D	0.3979592	0	0.4111736	0	1.301	0.2539
Q38	D	0.5250486	0	0.5199905	0	0.103	0.7486
Q39	D	0.3080305	0	0.3517225	0	4.374	0.0365
Q40	D	0.4610763	0	0.5096347	0	1.62	0.2031
Q41	D	0.496463	0	0.5084953	0	1.208	0.2717
Q09	E	0.5138877	0	0.4572114	0	0.101	0.7505
Q42	E	0.4848325	0	0.405209	0	0.145	0.7031
Q43	E	0.56483	0	0.5054358	0	2.517	0.1126
Q44	E	0.4869132	0	0.4383922	0	0.127	0.7215
Q45	E	0.3997822	0	0.3642949	0	8.888	0.0029
Q46	E	0.3700169	0	0.3300721	0	3.136	0.0766
Q47	E	0.5303354	0	0.5160905	0	0.647	0.4212
Q48	E	0.3686145	0	0.3204515	0	0.004	0.9479
Q50	E	0.5617408	0	0.5281553	0	0.251	0.6163
mean(A)|		0 (constrained)		0.216738	0		
mean(B)|		0 (constrained)		0.2690374	0		
mean(C)|		0 (constrained)		0.2157488	0.004		
mean(D)|		0 (constrained)		0.2936935	0		
mean(E)|		0 (constrained)		0.335596	0		
						Wald Test (chi^2)	

var(e.q08a~n)	0.7854408		0.8186863		2.954	0.0856
var(e.q26h~n)	0.7998798		0.8258229		0.968	0.3251
var(e.q49m~n)	0.7658526		0.8015263		2.965	0.0851
var(e.q11f~n)	0.703091		0.7600837		51.571	0
var(e.q14o~y)	0.8912307		0.8800094		0.358	0.5494
var(e.q18d~e)	0.846853		0.8414146		3.797	0.0513
var(e.q19b~e)	0.6151475		0.6021239		1.762	0.1843
var(e.q23f~n)	0.8551072		0.8662684		76.115	0
var(e.q24l~n)	0.9049558		0.9346026		8.405	0.0037
var(e.q27h~n)	0.8799019		0.9378345		11.194	0.0008
var(e.q32h~n)	0.9205575		0.9447742		10.972	0.0009
var(e.q12a~n)	0.6812508		0.7082726		0.548	0.4592
var(e.q35d~n)	0.7270134		0.7687388		1.115	0.2911
var(e.q36d~n)	0.7720847		0.7149284		91.594	0
var(e.q37a~o)	0.8416285		0.8309363		26.715	0
var(e.q38d~a)	0.724324		0.7296099		7.616	0.0058
var(e.q39n~n)	0.9051172		0.8762913		106.103	0
var(e.q40b~o)	0.7874086		0.7402725		79.175	0
var(e.q41o~s)	0.7535245		0.7414326		21.957	0
var(e.q09h~r)	0.7359194		0.7909578		3.479	0.0622
var(e.q42h~e)	0.7649374		0.8358057		20.725	0
var(e.q43e~n)	0.6809671		0.7445346		3.697	0.0545
var(e.q44a~i)	0.7629156		0.8078122		1.269	0.2599
var(e.q45t~n)	0.8401742		0.8672893		0.024	0.8781
var(e.q46l~i)	0.8630875		0.8910524		1.064	0.3022
var(e.q47c~n)	0.7187443		0.7336506		7.346	0.0067
var(e.q48o~e)	0.8641234		0.8973108		4.808	0.0283
var(e.q50u~n)	0.6844472		0.721052		0.446	0.5043
var(A)	1		1		1.051	0.3053
var(B)	1		1		2.33	0.1269
var(C)	1		1		7.663	0.0056
var(D)	1		1		6.13	0.0133
var(E)	1		1		10.259	0.0014
cov(e.q24l~n, e.q32hepat~n)	0.3967118	0	0.4727233	0	0.096	0.7562
cov(e.q12a~n, e.q37anyin~o)	0.1200732	0	0.0507299	0.104	5.173	0.0229
cov(e.q35d~n, e.q38drugo~a)	0.3726363	0	0.3938818	0	0.015	0.9015
cov(e.q36d~n, e.q40black~o)	0.2260508	0	0.1850424	0	13.976	0.0002
cov(e.q41o~s, e.q48obser~e)	0.2794262	0	0.264738	0	0.775	0.3787
cov(e.q43e~n, e.q44anyme~i)	0.2478836	0	0.1326439	0	7.082	0.0078
cov(A,B)	0.8562309	0	0.9416868	0	1.594	0.2067
cov(A,C)	0.9395731	0	1.019113	0	5.927	0.0149
cov(A,D)	0.7075288	0	0.6884405	0	3.505	0.0612

cov(A,E)		0.8712093	0	0.957351	0	0.963	0.3264
cov(B,C)		0.5602173	0	0.5650321	0	1.651	0.1988
cov(B,D)		0.5953377	0	0.6185854	0	0.072	0.7891
cov(B,E)		0.6501079	0	0.7148294	0	0.513	0.474
cov(C,D)		0.5262103	0	0.6699952	0	0.781	0.3768
cov(C,E)		0.5488231	0	0.6695864	0	2.039	0.1533
cov(D,E)		0.5922876	0	0.571232	0	6.84	0.0089

D. Duration Homeless (Oneyearhomeless)

		<1 yr		>=1 yr			
chi2_ms(1169)						2080.855	
p > chi2						0	
chi2_bs(1225)						11673.282	
p > chi2						0	
RMSEA						0.038	
90% CI, lower bound						0.036	
upper bound						0.04	
AIC						67500.286	
BIC						68404.586	
CFI						0.875	
TLI						0.867	
SRMR						0.044	
CD						0.965	
	Group level fit:						
	n	1235		1388			
	SRMR	0.045		0.043			
	CD	0.948		0.965			
		D. Duration Homeless (Oneyearhomeless)				Invariance	
		<1 yr		>=1 yr		Score test	
						chi^2	p>chi^2
Q08	A	0.369986	0	0.4752515	0	10.773	0.001
Q26	A	0.3648331	0	0.456608	0	1.693	0.1932
Q49	A	0.3649763	0	0.4786997	0	3.965	0.0465
Q11	B	0.5184654	0	0.5636061	0	0.39	0.5323
Q14	B	0.2422382	0	0.3122784	0	0.165	0.6848
Q18	B	0.33503	0	0.4276185	0	0.213	0.6445
Q19	B	0.5924447	0	0.6826393	0	0.231	0.631

Q23	C	0.3932976	0	0.3300891	0	0.001	0.9723
Q24	C	0.3279704	0	0.3016962	0	0.05	0.8236
Q27	C	0.3030941	0	0.3219939	0	2.149	0.1426
Q32	C	0.302243	0	0.2760947	0	0.964	0.3261
Q12		0.4920085	0	0.5727224	0	0.268	0.605
Q35	D	0.3927827	0	0.5638627	0	11.362	0.0007
Q36	D	0.4889123	0	0.4958913	0	1.057	0.3038
Q37	D	0.4231087	0	0.3969561	0	0.001	0.9785
Q38	D	0.4351918	0	0.5418838	0	0.02	0.8873
Q39	D	0.2976158	0	0.2869598	0	2.469	0.1161
Q40	D	0.4662391	0	0.4608323	0	1.26	0.2616
Q41	D	0.4764859	0	0.5203803	0	0.083	0.7737
Q09	E	0.5203025	0	0.5129087	0	13.378	0.0003
Q42	E	0.4443238	0	0.4571462	0	2.409	0.1206
Q43	E	0.5456605	0	0.5746422	0	0.025	0.8745
Q44	E	0.4547085	0	0.4918351	0	1.324	0.2498
Q45	E	0.3688463	0	0.3944815	0	0.024	0.8775
Q46	E	0.3389034	0	0.3519737	0	0.809	0.3684
Q47	E	0.468008	0	0.542712	0	7.677	0.0056
Q48	E	0.3300848	0	0.3428046	0	2.049	0.1523
Q50	E	0.4931075	0	0.5665107	0	0.031	0.8594
mean(A)|		0 (constrained)		0.7005593	0		
mean(B)|		0 (constrained)		0.3202364	0		
mean(C)|		0 (constrained)		0.5034588	0		
mean(D)|		0 (constrained)		0.5245441	0		
mean(E)|		0 (constrained)		0.4417305	0		
						Wald Test (chi^2)	
var(e.q08a~n)		0.8631103		0.774136		0.683	0.4087
var(e.q26h~n)		0.8668968		0.7915092		3.953	0.0468
var(e.q49m~n)		0.8667923		0.7708466		0	0.9825
var(e.q11f~n)		0.7311936		0.6823482		16.701	0
var(e.q14o~y)		0.9413207		0.9024822		0.652	0.4195
var(e.q18d~e)		0.8877549		0.8171424		1.289	0.2563
var(e.q19b~e)		0.6490092		0.5340036		0.107	0.7434
var(e.q23f~n)		0.845317		0.8910412		94.199	0
var(e.q24l~n)		0.8924354		0.9089794		48.607	0
var(e.q27h~n)		0.908134		0.8963199		3.471	0.0625
var(e.q32h~n)		0.9086492		0.9237717		53.353	0
var(e.q12a~n)		0.7579277		0.671989		12.31	0.0005

var(e.q35d~n)	0.8457217		0.6820588		21.189	0
var(e.q36d~n)	0.7609648		0.7540918		87.614	0
var(e.q37a~o)	0.8209791		0.8424259		151.395	0
var(e.q38d~a)	0.8106081		0.706362		1.436	0.2308
var(e.q39n~n)	0.9114249		0.9176541		139.269	0
var(e.q40b~o)	0.7826211		0.7876336		108.385	0
var(e.q41o~s)	0.7729612		0.7292043		43.192	0
var(e.q09h~r)	0.7292853		0.7369247		15.836	0.0001
var(e.q42h~e)	0.8025764		0.7910174		5.088	0.0241
var(e.q43e~n)	0.7022547		0.6697863		0.743	0.3887
var(e.q44a~i)	0.7932402		0.7580983		0.002	0.9645
var(e.q45t~n)	0.8639524		0.8443843		0.683	0.4086
var(e.q46l~i)	0.8851445		0.8761145		4.331	0.0374
var(e.q47c~n)	0.7809685		0.7054637		9.912	0.0016
var(e.q48o~e)	0.891044		0.882485		4.386	0.0362
var(e.q50u~n)	0.756845		0.6790656		8.621	0.0033
var(A)	1		1		16.144	0.0001
var(B)	1		1		21.206	0
var(C)	1		1		1.214	0.2706
var(D)	1		1		42.302	0
var(E)	1		1		6.27	0.0123
cov(e.q24l~n, e.q32hepat~n)	0.433947	0	0.3709812	0	5.509	0.0189
cov(e.q12a~n, e.q37anyin~o)	0.0946313	0.003	0.100785	0.001	1.503	0.2202
cov(e.q35d~n, e.q38drugo~a)	0.4250272	0	0.3494777	0	5.916	0.015
cov(e.q36d~n, e.q40black~o)	0.0924873	0.005	0.241049	0	29.389	0
cov(e.q41o~s, e.q48obser~e)	0.2386514	0	0.2939714	0	8.427	0.0037
cov(e.q43e~n, e.q44anyme~i)	0.1346772	0	0.2296983	0	4.922	0.0265
cov(A,B)	0.8891991	0	0.877555	0	27.828	0
cov(A,C)	0.9283333	0	0.9059799	0	9.173	0.0025
cov(A,D)	0.5879171	0	0.6640257	0	31.589	0
cov(A,E)	1.017198	0	0.8564252	0	8.141	0.0043
cov(B,C)	0.3962982	0	0.5516104	0	10.449	0.0012
cov(B,D)	0.4543692	0	0.5744139	0	33.489	0
cov(B,E)	0.6297024	0	0.6778268	0	16.736	0
cov(C,D)	0.4033546	0	0.589059	0	16.798	0
cov(C,E)	0.5273127	0	0.5089273	0	1.187	0.2759
cov(D,E)	0.4804633	0	0.585738	0	26.306	0

E. Chronic Homelessness

		Chronic (1)		Not Chronic (0)			
chi2_ms(1169)						2858.045	
p > chi2						0	
chi2_bs(1225)						21206.495	
p > chi2						0	
RMSEA						0.036	
90% CI, lower bound						0.035	
upper bound						0.037	
AIC						117273.067	
BIC						118265.273	
CFI						0.895	
TLI						0.889	
SRMR						0.039	
CD						0.960	
	Group level fit:						
	n	1,993		2,649			
	SRMR	0.039		0.038			
	CD	0.960		0.958			
		E. Chronic Homelessness Chronic (1)		Not Chronic (0)		Invariance Score test chi^2	p>chi^2
Q08	A	0.470481	0	0.4382591	0	1.495	0.2215
Q26	A	0.4541874	0	0.418684	0	0.148	0.7001
Q49	A	0.4947617	0	0.4468059	0	0.684	0.4081
Q11	B	0.5415419	0	0.5245558	0	0.213	0.6447
Q14	B	0.3559803	0	0.3244836	0	0.164	0.6852
Q18	B	0.4109814	0	0.3800057	0	0.527	0.468
Q19	B	0.6446359	0	0.6223606	0	0.024	0.877
Q23	C	0.3686426	0	0.3601879	0	7.85	0.0051
Q24	C	0.309995	0	0.2930768	0	0.369	0.5435
Q27	C	0.3482928	0	0.2903451	0	2.176	0.1402
Q32	C	0.2795646	0	0.2640896	0	0.576	0.448
Q12		0.5616306	0	0.5688772	0	6.557	0.0104
Q35	D	0.5193016	0	0.4994332	0	4.608	0.0318

Q36	D	0.4749992	0	0.5049362	0	0.772	0.3797
Q37	D	0.3975632	0	0.4149159	0	0.196	0.6578
Q38	D	0.5193967	0	0.522913	0	0.013	0.9109
Q39	D	0.2993094	0	0.3366247	0	4.772	0.0289
Q40	D	0.4706401	0	0.4796669	0	0.774	0.379
Q41	D	0.4958032	0	0.5096418	0	1.603	0.2055
Q09	E	0.5057151	0	0.5064585	0	0.046	0.8307
Q42	E	0.4632454	0	0.468727	0	1.435	0.2309
Q43	E	0.546539	0	0.5580212	0	0.098	0.7547
Q44	E	0.4734987	0	0.4766442	0	0.332	0.5643
Q45	E	0.391954	0	0.4011626	0	2.198	0.1382
Q46	E	0.3611235	0	0.3689789	0	3.776	0.052
Q47	E	0.533453	0	0.5249961	0	1.297	0.2547
Q48	E	0.3502783	0	0.3655551	0	1.234	0.2665
Q50	E	0.546156	0	0.5438896	0	0.204	0.6516
mean(A)|		0.288916	0	0 (constrained)			
mean(B)|		0.1034733	0.006	0 (constrained)			
mean(C)|		0.3380314	0	0 (constrained)			
mean(D)|		0.1689243	0	0 (constrained)			
mean(E)|		0.1443591	0	0 (constrained)			
						Wald Test (chi^2)	
var(e.q08a~n)		0.7786476		0.807929		1.856	0.1731
var(e.q26h~n)		0.7937138		0.8247037		0.846	0.3577
var(e.q49m~n)		0.7552109		0.8003645		0.154	0.6946
var(e.q11f~n)		0.7067324		0.7248412		2.539	0.1111
var(e.q14o~y)		0.873278		0.8947104		0.948	0.3301
var(e.q18d~e)		0.8310943		0.8555957		0.177	0.6736
var(e.q19b~e)		0.5844445		0.6126673		0.758	0.3841
var(e.q23f~n)		0.8641027		0.8702647		59.668	0
var(e.q24l~n)		0.9039031		0.914106		46.303	0
var(e.q27h~n)		0.8786921		0.9156997		0.743	0.3888
var(e.q32h~n)		0.9218436		0.9302567		48.324	0
var(e.q12a~n)		0.6845711		0.6763788		4.377	0.0364
var(e.q35d~n)		0.7303258		0.7505665		0.717	0.3973
var(e.q36d~n)		0.7743758		0.7450394		22.611	0
var(e.q37a~o)		0.8419435		0.8278448		13.592	0.0002
var(e.q38d~a)		0.7302271		0.726562		3.119	0.0774
var(e.q39n~n)		0.9104139		0.8866838		52.291	0
var(e.q40b~o)		0.7784979		0.7699197		6.075	0.0137
var(e.q41o~s)		0.7541792		0.7402652		8.72	0.0031
var(e.q09h~r)		0.7442523		0.7434998		0.001	0.9709

var(e.q42h~e)	0.7854037		0.780295		0.381	0.5372
var(e.q43e~n)	0.7012951		0.6886124		1.482	0.2235
var(e.q44a~i)	0.7757989		0.7728103		0.106	0.7448
var(e.q45t~n)	0.8463721		0.8390686		1.438	0.2304
var(e.q46l~i)	0.8695898		0.8638546		1.174	0.2786
var(e.q47c~n)	0.7154279		0.7243791		1.024	0.3115
var(e.q48o~e)	0.8773051		0.8663695		4.76	0.0291
var(e.q50u~n)	0.7017136		0.7041841		0.092	0.7612
var(A)	1		1		5.358	0.0206
var(B)	1		1		4.659	0.0309
var(C)	1		1		6.094	0.0136
var(D)	1		1		1.065	0.302
var(E)	1		1		0.001	0.9692
cov(e.q24l~n, e.q32hepat~n)	0.4177265	0	0.409445	0	14.884	0.0001
cov(e.q12a~n, e.q37anyin~o)	0.0701058	0.006	0.1208906	0	1.238	0.2658
cov(e.q35d~n, e.q38drugo~a)	0.3443915	0	0.4106237	0	2.495	0.1142
cov(e.q36d~n, e.q40black~o)	0.2453898	0	0.1941173	0	6.516	0.0107
cov(e.q41o~s, e.q48obser~e)	0.3204406	0	0.2359795	0	12.346	0.0004
cov(e.q43e~n, e.q44anyme~i)	0.1994818	0	0.2254919	0	0.286	0.5926
cov(A,B)	0.8746301	0	0.8916344	0	6.279	0.0122
cov(A,C)	0.9613838	0	0.9087576	0	15.482	0.0001
cov(A,D)	0.6731843	0	0.6917151	0	2.181	0.1397
cov(A,E)	0.8897558	0	0.9015109	0	2.59	0.1076
cov(B,C)	0.6129444	0	0.4642005	0	15.313	0.0001
cov(B,D)	0.5823315	0	0.5698902	0	2.419	0.1199
cov(B,E)	0.685132	0	0.6511025	0	3.107	0.0779
cov(C,D)	0.5571643	0	0.543507	0	4.437	0.0352
cov(C,E)	0.6350718	0	0.48299	0	14.364	0.0002
cov(D,E)	0.5772362	0	0.5448807	0	1.177	0.278

Table 21: ICC HIE data summary

		Condition prevalence by Encounter				Condition prevalence by Individual					
		All CA participants w/ visits in observation period		CA participants with visits in previous 6 months (182 days)		All CA participants w/ visits in observation period		Visits in previous 6 months (182 days) first 52 visits in obs period, just the visits in 6 mo prior to CA		Visits in previous 6 months (182 days) first 81 visits in 6mo prior to CA	
		(n=38,964)	%	(n=5,707)	%	first 52 visits in obs period (n=3,240)	%	(n=1,734)	%	(n=1,754)	%
Medical History questions											
22	Kidney disease/End Stage Renal Disease or Dialysis	1,095	2.81%	169	2.96%	369	11.39%	262	15.11%	103	5.87%
23	History of frostbite, Hypothermia, or Immersion Foot	7,051	18.10%	943	16.52%	1,852	57.16%	1,189	68.57%	527	30.05%
24	Liver disease, Cirrhosis, or End-Stage Liver Disease	628	1.61%	121	2.12%	184	5.68%	143	8.25%	70	3.99%
25	HIV+/AIDS	640	1.64%	140	2.45%	147	4.54%	93	5.36%	63	3.59%
26	History of Heat Stroke/Heat Exhaustion	72	0.18%	12	0.21%	62	1.91%	42	2.42%	12	0.68%
27	Heart disease, Arrhythmia, or Irregular Heartbeat	5,936	15.23%	793	13.90%	1,253	38.67%	824	47.52%	356	20.30%
28	Emphysema	60	0.15%	7	0.12%	44	1.36%	30	1.73%	7	0.40%
29	Diabetes	1,786	4.58%	325	5.69%	326	10.06%	245	14.13%	115	6.56%
30	Asthma	2,547	6.54%	356	6.24%	522	16.11%	351	20.24%	183	10.43%
31	Cancer	273	0.70%	36	0.63%	137	4.23%	95	5.48%	24	1.37%
32	Hepatitis C	443	1.14%	73	1.28%	230	7.10%	177	10.21%	61	3.48%
	Hepatitis NOS	750	1.92%	98	1.72%	339	10.46%	241	13.90%	82	4.68%
33	Tuberculosis	17	0.04%	3	0.05%	16	0.49%	11	0.63%	3	0.17%
Mental Health questions											
	Any MH dx	18,616	47.78%	3,144	55.09%	2,511	77.5	1,523	87.83%	1,189	67.79%

Substance use/abuse dx	14,879	38.19%	2,482	43.49%	2,264	69.88%	1,402	80.85%	1,018	58.04%
Intellectual or developmental disability	42	0.11%	7	0.12%	16	0.49%	13	0.75%	5	0.29%
TBI	963	2.47%	139	2.44%	577	17.81%	384	22.15%	113	6.44%
ICC data about utilization										
% ED encounters	34,876	89.51%	5,106	89.47%	mean of %s	89.35%	mean of %s	89.04%	mean of %s	89.43%
ED encounters									2	1,3 {0-79}
IP encounters									0	0,0 {0-22}
% Outpatient (only?)	26,671	68.45%	3,859	67.62%	mean of %s	50.62%	mean of %s	57.27%	mean of %s	57.53%
Frequent ED user	35,289	90.57%	5,206	91.22%	2,014	62.16%	1,337	77.10%	1,357	77.37%
Frequent Inpatient user	0	0%	0	0%	0	0%	0	0%		
ICC documented homeless	19,505	50.06%	2,992	52.43%	1,483	45.77%	846	48.79%	860	49.03%
					(any visit coded with 'homeless')		(any visit coded with 'homeless')		(any visit coded with 'homeless')	

Table 22: HIE Criterion Validation results

	prevalence in HIE	Sensitivity	Specificity	PPV	NPV	ROC-AUC	OR	95% CI	p	% agreement	kappa
Medical History questions vs Condition Specific Dx List (see Appendix)											
22 Kidney disease/End Stage Renal Disease or Dialysis	11%	18.8%	95.7%	35.9%	90.2%	0.572	5.153846	3.688978, 7.152046	0	86.97%	0.1827
23 History of frostbite, Hypothermia, or Immersion Foot	57%	7.6%	93.2%	59.7%	43.0%	0.504	1.121404	0.8493454 1.485268	0.4053	44.26%	0.0067
24 Liver disease, Cirrhosis, or End-Stage Liver Disease	5.70%	58.7%	90.4%	26.9%	97.3%	0.745	13.34533	9.598649, 18.57237	0	88.58%	0.3152

25	HIV+/AIDS	4.54%	88.4%	98.0%	67.2%	99.4%	0.932	364.4762	202.3887, 677.576	0	97.53%	0.7505
26	History of Heat Stroke/Heat Exhaustion	1.90%	51.6%	70.0%	3.3%	98.7%	0.608	2.490381	1.456731, 4.267645	0.0002	69.66%	0.0261
27	Heart disease, Arrhythmia, or Irregular Heartbeat	39%	40.3%	81.2%	57.4%	68.3%	0.607	2.909864	2.473073, 3.423995	0	65.38%	0.2272
28	Emphysema	1.40%	63.6%	93.4%	11.8%	99.5%	0.785	24.875	12.73603 49.90339	0	93.02%	0.1798
29	Diabetes	10.00%	67.5%	91.6%	47.3%	96.2%	0.795	22.58452	17.16061 29.75098	0	89.16%	0.4967
30	Asthma	16%	75.6%	84.9%	49.1%	94.8%	0.803	17.50673	13.88966 22.11141	0	83.45%	0.497
31	Cancer	4.20%	42.3%	94.9%	26.9%	97.4%	0.686	13.66592	9.19777 20.17328	0	92.68%	0.2919
32	Hepatitis C	7.10%	86.5%	82.9%	27.9%	98.8%	0.847	31.04973	20.87572 47.40929	0	83.13%	0.3519
vs All/Any Hepatitis dx		10%	68.7%	83.4%	32.6%	95.8%	0.761	11.04083	8.544574 14.30348	0	81.86%	0.3502
33	Tuberculosis	0.49%	37.5%	94.4%	3.2%	99.7%	0.659	10.08398	2.972285 30.96253	0	94.10%	0.0505
Mental Health questions vs Any MH dx												
42	Ever been taken to a hospital against your will for a mental health reason?	78%	25.5%	87.2%	87.3%	25.4%	0.564	2.336864	1.840399 2.989007	0	39.38%	0.0682
43	Gone to the emergency room because you weren't feeling 100% well emotionally or because of your nerves?	78%	46.5%	75.4%	86.7%	29.0%	0.609	2.66282	2.20152 3.221688	0	52.98%	0.1396

44	Spoken with a psychiatrist, psychologist or other mental health professional in the last six months because of your mental health - whether that was voluntary or because someone insisted that you do so?	78%	54.7%	66.9%	85.1%	30.0%	0.608	2.445561	2.049047 2.919228	0	57.46%	0.1508
48	Surveyor, do you detect signs or symptoms of severe, persistent mental illness or severly compromised cognitive functioning?	78%	42.9%	67.5%	82.0%	25.6%	0.552	1.56167	1.307418 1.865634	0	48.46%	0.0659
vs Any Substance use/abuse dx												
35	Have you ever had problematic drug or alcohol use, abused drugs or alcohol, or told you do?	70%	70.4%	53.3%	77.8%	43.7%	0.619	2.716208	2.319388 3.18104	0	65.24%	0.2233
36	Have you consumed alcohol and/or drugs almost every day or every day for the past month?(	70%	21.7%	91.0%	84.8%	33.4%	0.564	2.803347	2.195802 3.606865	0	42.61%	0.0854
37	Have you ever used injection drugs or shots in the last six months?	70%	10.2%	96.9%	88.5%	31.8%	0.536	3.600262	2.431991 5.497669	0	36.36%	0.0453
38	Have you ever been treated for drug or alcohol problems and returned to	70%	47.80%	75.5%	81.9%	38.4%	0.616	2.821	2.377702 3.348367	0	56.15%	0.1828

	drinking or using drugs?												
39	Have you used non-beverage alcohol like cough syrup, mouthwash, rubbing alcohol, cooking wine, or anything like that in the past six months?	70%	5.0%	98.6%	88.9%	30.9%	0.518	3.576208	2.031157 6.78559	0	33.15%	0.0216
40	Have you blacked out because of your alcohol or drug use in the past month?	70%	12.8%	96.9%	90.6%	32.4%	0.549	4.632353	3.144916 7.0435	0	38.15%	0.0622
41	Surveyor, do you observe signs or symptoms of problematic alcohol or drug use?	70%	25.6%	87.9%	83.1%	33.7%	0.567	2.498526	2.009844 3.122216	0	44.35%	0.0926
Intellectual or developmental disability													
46	Ever been told you have a learning disability or developmental disability?	0.49%	87.5%	64.4%	1.2%	99.9%	0.759	12.65126	2.89579 114.7883	0	64.49%	0.0142
47	Do you have any problems concentrating and/or remembering things?	0.49%	75%	32.3%	0.5%	99.6%	0.537	1.432631	.4328224 6.108335	0.5322	32.53%	0.0011
Any TBI dx (brain or head injury)													
45	Had a serious brain injury or head trauma?	18%	47.3%	67.5%	23.9%	85.6%	0.574	1.861798	1.544367 2.244443	0	63.88%	0.1068
vs 6 mo prior HIE encounters			ICC encounters		VI-SPDAT Q								
3	ED encounters 6 mo prior		2	1,3	1	0,3	corr= 0.4807				25.71%	0.117	

	1/0 <3 vs >=3 (1pt)	35.58%	78.5%		62.4%	53.6%	84.0%	0.705	6.065847	4.813364 7.660233	0	68.13%	0.3705
7	IP encounters 6 mo prior		0	0,0	0	0,1	corr=0.4187					52.85%	0.1936
	1/0 <3 vs >=3 (1pt)	2.57%	73.3%		84.5%	11.1%	99.2%	0.789	15.03125	7.431419 32.31312	0	84.25%	0.1553

Table 23: Seton Hospital EMR data summary

		VI-SPDAT items of sample abstracted				Items abstracted from the EMR		
		n	%	total n		n	%	total n
Gender	Male	61	84.7%	72		47	82.46%	52
	Female	11	15.3%			10	17.54%	
	F to M		0.0%				0.0%	
	M to F		0.0%				0.0%	
Ethnicity								
	Hispanic	38	55.1%	69		33	58.93%	
	Non-Hisp	31	44.9%			23	41.07%	
Race								
	White	40	55.6%	72		31	54.39%	55
	Black/AA	30	41.7%			22	38.60%	
	Asian	0	0.0%				0.0%	
	American Indian	1	1.4%				0.0%	
	Hawaiian / Pacific Islander	1	1.4%				0.0%	
	Other Race					2	3.51%	
	Refused	0	0.0%			2	3.51%	
	non-White	32	44.5%					

Age		52	41.5,59.5	72					
Veteran status		7	9.9%	71			4	8.16%	49
Homelessness									
	Number of times homeless in past 3 years	2	1,4	61					
	% > 0	0	0.0%						
	% > 3	17	27.9%						
	Months homless in past 3 years	8.5	1,13	44					
	% > 0	35	79.5%						
	% ≥ 12	19	43.2%						
	Street or Shelter Entry into Program	54	85.7%	63					
Utilization									
3	ED in past 6 mo (0- >=10)	1	0,3	72	3	ED in past 6 mo (0- >=10)	0	0,2	64
	% > 0	43	59.7%			% > 0	26	40.6%	
5	Ambulance in past 6 mo (0- >=10)	0	0,2	72	5	Ambulance in past 6 mo (0- >=10)	0	0,1	63
	% > 0	35	48.6%			% > 0	20	0.31746	
6	Crisis services in past 6 mo (0- >=10)	0	0,0	72					
	% > 0	16	22.2%						
7	Hospitalizations in past 6 mo (0- >=10)	0	0,1	71	7	Hospitalizations in past 6 mo (0- >=10)	0	0,0	62
	% > 0	27	38.0%			% > 0	6	9.7%	
Med History									

22	Kidney disease /Renal dialysis	5	6.9%	72	Kidney disease /Renal dialysis	3	4.84%	62
23	Frostbite /hypothermia	6	8.3%	72	Frostbite /hypothermia	0	0%	61
24	Liver disease /cirrhosis	5	7.0%	71	Liver disease /cirrhosis	4	6.45%	62
25	HIV/ AIDS	6	8.3%	72	HIV/ AIDS	7	11.67%	60
26	Heat stroke /exhaustion	23	31.9%	72	Heat stroke /exhaustion	1	1.39%	72
27	Heart Disease /Arrhythmia	23	31.9%	72	Heart Disease /Arrhythmia	9	12.50%	72
28	Emphysema	9	12.5%	72	Emphysema	5	6.94%	72
29	Diabetes	6	8.3%	72	Diabetes	4	5.56%	72
30	Asthma	11	15.5%	71	Asthma	3	4.17%	72
31	Cancer	7	9.7%	72	Any history of cancer documented?	4	6.56%	61
32	Hepatitis C	16	22.2%	72	Hepatitis C	10	13.89%	72
33	Tuberculosis	6	8.3%	72	Tuberculosis	2	2.78%	72
35	Problematic drug or alcohol use	41	56.9%	72	Any mention of alcohol use 6 months before OR after the VI-SPDAT date?	13	23.64%	55
36	Alcohol /drug use almost daily for past month	13	18.1%	72	Any evidence of alcohol and what term is used	2.00%	3.23%	62
37	IDU in past 6 months	6	8.5%	71		11	17.7%	
38	Treated and relapsed- Ever?	28	38.9%	72	Any mention of drug use 6 months before OR after the VI-SPDAT date?	12	21.82%	55
39	Non-beverage alcohol use past 6 mo?	2	2.8%	71	Are there toxicology results (6 mo before/after VI-SPDAT date)?	4	33.33%	12
40	Blacked out in past month from drug /alcohol use	0	0.0%	72				

41	Signs of serious /problematic drug /alcohol use?	15	21.1%	71					
42	Mental health hospital against will?	14	19.7%	71					
43	ED visit for emotions or nerves?	24	33.8%	71	ED Diagnosis of psychiatric condition of any kind? (MUST be ED visit initiated encounter) (the so called "because you weren't feeling 100% well emotionally or because of your nerves")		8	12.90%	62
44	Spoken with a mental health professional in last 6 months?	29	40.3%	72	Diagnosis of psychiatric condition of any kind?		12	21.43%	56
45	Serious brain injury or head trauma ever?	27	37.5%	72	Had a serious brain injury or head trauma?		6	10%	60
46	Learning disability / developmental disability ever?	27	37.5%	72	Any current diagnosis or history of developmental or learning disability?		1	1.61%	62
					Any mention of the following cognitive conditions in the chart:	Learning disability	1	1.39%	72
						Developmental disability	0	0%	72
						Cognitive deficit	1	1.39%	72
						Mental retardation	1	1.39%	72
47	Problems concentrating or remembering things?	44	62.0%	71		"Problems concentrating"	0	0%	72

49	Medication non-adherence?	30	41.7%	72	Any mention, allusion, reference to, or evidence of medication nonadherence, noncompliance? (eg medication refills declined, documentation of lapses in prescribed medication)	11	18.03%	61
	VI SPDAT at entry	9	7,12	72				
Recommendation								
8+	PSH	35	48.6%	72				
(4-7)	RRH	22	30.6%					
0-3	Self-Resolve	15	20.8%					

Table 24: EMR Criterion Validation results

VI-SPDAT	vs	EMR	prevalence	Sensitivity	Specificity	PPV	NPV	ROC-AUC	OR	p	% agreement	kappa
Gender		Gender	17.5%	100.0%	100.0%	100.0%	100.0%	1.000	-	-	100%	1.000
Ethnicity		Ethnicity	57.0%	96.8%	78.3%	85.7%	94.7%	0.875	108	0	88.89%	0.768
Race (white vs other)		Race	56.0%	96.8%	95.8%	96.8%	95.8%	0.963	690	0	96.36%	0.926
Veteran Status		Veteran Status	8.2%	100.0%	97.8%	80.0%	100.0%	0.989	-	-	97.96%	0.878
Utilization												

3	ED in past 6 mo (0- >=10) % > 3	ED in past 6 mo (0- >=10) % > 3	7.8%	40.0%	76.3%	12.5%	93.8%	0.581	2.142857	0.4198	73.44%	0.081
5	Ambulance in past 6 mo (0- >=10) % > 3	Ambulance in past 6 mo (0- >=10) % > 3	1.60%	100%	91.90%	16.7%	100.0%	0.960	-	-	92.06%	0.266
7	Hospitalizations in past 6 mo (0- >=10) % > 3	Hospitalizations in past 6 mo (0- >=10) % > 3	1.6%	100.0%	91.7%	16.7%	100.0%	0.958	-	-	91.80%	0.265
Med History												
22	Kidney disease /Renal dialysis	Kidney disease /Renal dialysis	4.8%	66.7%	96.6%	50.0%	98.3%	0.816	57	0	95.16%	0.546
23	Frostbite /hypothermia	Frostbite /hypothermia	-	-	-	-	-	-	-	-	90.16%	0.000
24	Liver disease /cirrhosis	Liver disease /cirrhosis	6.6%	0.0%	91.2%	0.0%	92.9%	0.456	-	-	85.25%	0.079
25	HIV/ AIDS	HIV/ AIDS	12.0%	57.1%	96.2%	66.7%	94.4%	0.767	34	0	91.67%	0.569
26	Heat stroke /exhaustion	Heat stroke /exhaustion	1.40%	100.0%	69.0%	4.4%	100.0%	0.845	-	-	69.44%	0.058
27	Heart Disease /Arrhythmia	Heart Disease /Arrhythmia	13.0%	55.6%	71.4%	21.7%	91.8%	0.635	3.125	0.1044	69.44%	0.162
28	Emphysema	Emphysema	6.9%	60.0%	91.0%	33.3%	96.8%	0.755	15.25	0.0009	88.89%	0.373
29	Diabetes	Diabetes	5.6%	75.0%	95.6%	50.0%	98.5%	0.853	65	0	94.44%	0.571
30	Asthma	Asthma	4.2%	100.0%	88.2%	27.3%	100.0%	0.941	-	-	88.73%	0.388
31	Cancer	Any history of cancer documented?	6.6%	75.0%	93.0%	42.9%	98.1%	0.840	39.75	0	91.80%	0.504
32	Hepatitis C	Hepatitis C	14.0%	70.0%	85.5%	43.8%	94.6%	0.777	13.74074	0.0001	83.33%	0.443
33	Tuberculosis	Tuberculosis	2.8%	50.0%	92.9%	16.7%	98.5%	0.714	13	0.0306	91.67%	0.217

35	Problematic drug or alcohol use	Any mention of alcohol use 6 months before OR after the VI-SPDAT date?	24.0%	76.9%	50.0%	32.3%	87.5%	0.635	3.333333	0.0872	56.36%	0.182
36	Alcohol /drug use almost daily for past month	Any mention of alcohol use 6 months before OR after the VI-SPDAT date?	24.0%	23.1%	78.6%	25.0%	76.7%	0.508	1.1	0.8999	65.45%	0.017
37	IDU in past 6 months	Any mention of drug use 6 months before OR after the VI-SPDAT date?	22.0%	8.3%	90.7%	20.0%	78.0%	0.495	0.886364	0.9178	72.73%	-0.012
43	ED visit for emotions or nerves?	ED Diagnosis of psychiatric condition of any kind? (MUST be ED visit initiated encounter)	13.0%	75.0%	71.7%	28.6%	95.0%	0.733	7.6	0.0096	72.13%	0.276
44	Spoken with a mental health professional in last 6 months?	Diagnosis of psychiatric condition of any kind?	21.0%	66.7%	65.9%	34.8%	87.9%	0.663	3.866667	0.0420	66.07%	0.244
45	Serious brain injury or head trauma ever?	Had a serious brain injury or head trauma?	10.0%	100.0%	70.4%	27.3%	100.0%	0.852	-	-	73.33%	0.322
46	Learning disability /	Any current diagnosis or history of	1.6%	100.0%	65.6%	4.6%	100.0%	0.828	-	-	66.13%	0.058

	developmental disability ever?	developmental or learning disability?											
		Learning disability		1.4%	100.0%	63.4%	3.7%	100.0%	0.817	-	-	63.89%	0.046
		Developmental disability	-	-	-	-	-	-	-	-	-	62.50%	0.000
		Cognitive deficit		1.4%	100.0%	63.4%	3.7%	100.0%	0.817	-	-	63.89%	0.046
		Mental retardation		1.4%	100.0%	63.4%	3.7%	100.0%	0.817	-	-	63.89%	0.046
47	Problems concentrating or remembering things?	"Problems concentrating"	-	-	-	-	-	-	-	-	-	38.03%	0.000
48	Signs or symptoms of severe, persistent mental illness or severly compromised cognitive functioning?	Diagnosis of psychiatric condition of any kind?		21.0%	41.7%	63.6%	23.8%	80.0%	0.527	1.25	0.7366	58.93%	0.042
49	Medication non-adherence?	Any mention, allusion, reference to, or evidence of medication nonadherence, noncompliance?		18.0%	63.6%	62.0%	26.9%	88.6%	0.628	2.855263	0.1196	62.30%	0.167

Table 25: Results by Race (White vs Black and White vs Other)

		White (n=2,803)		Black (n=1,300)		W/B test p value	Non-White (n=1,936)		W/Other p value	All groups p value	Association White vs Other		
		# or Median	% or IQR	# or Median	% or IQR		# or Median	% or IQR		(across all race groups, not refused)	OR	p	n
Ethnicity													
	Hispanic	748	26.7%	62	3.5%	< 0.001	110	5.7%	< 0.001	< 0.001	6.04224		n=4739
	Non-Hisp	2,055	73.3%	1,709	96.5%		1,826	94.3%					
											test of homogeneity		
Gender											(equal odds):	0.9077	
	Male	2,018	72.0%	1,284	72.5%	0.798	1,397	72.2%	0.908	0.487	1		
	Female	770	27.5%	481	27.2%		530	27.4%			1.00575	0.9311	
	Female to Male	3	0.1%	1	0.1%		1	0.1%			2.07681	0.5178	
	Male to Female	12	0.4%	5	0.3%		7	0.4%			1.18675	0.7193	
											test of homogeneity		
Age		47	36,55	48	35,55	0.4332	48	35,55	0.9344	0.0117	(equal odds):	0.0409	
	Age ≥ 65	127	4.53%	59	3.33%	0.045	61	3.15%	0.017	< 0.001	1.45878	0.0167	
Homelessness													

	Number of times homeless in past 3 years	1	1,3	1	1,3	0.9154	1	1,3	0.7028	0.235	test of homogeneity (equal odds):	0.9598
	% > 0	2393	98.8%	1528	98.9%		1668	98.9%				
	% > 3	563	23.3%	350	22.7%	0.661	378	22.4%	0.531	0.497	1.04853	0.5312
	Months homless in past 3 years	12	3,12	12	3,12	0.5387	12	3,12	0.4283	0.2806	test of homogeneity (equal odds):	0.2746
	% > 1	1333	82.2%	782	81.9%		861	81.8%				
	% >= 12 months	869	53.6%	503	52.7%	0.656	553	52.5%	0.592	0.576	1.04345	0.5918
	Street or Shelter Entry into Program	2196	87.4%	1356	83.8%	0.001	1489	84.4%	0.005	0.017	1.28003	0.0054
	Chronic Homeless**	1590	56.7%	1024	57.8%	0.466	1118	57.8%	0.484	0.754	0.90794	0.1052
A. History of Homelessness												
1	< 2 years	1217	43.4%	711	40.2%	0.029	779	40.2%	0.029	0.238	0.87744	0.0293
	>= 2 years	1586	56.6%	1060	59.9%		1157	59.8%				
2	Housed & homeless again in past 3 yrs											
		1	0,3	1	0,3	0.1798	1	0,3	0.1512	0.6151	test of homogeneity (equal odds):	0.1725
	<1	722	25.8%	472	26.7%	0.099	516	26.7%	0.172	0.498		
	1	873	31.2%	582	32.9%		636	32.9%				
	2	439	15.7%	265	15.0%		289	15.0%				
	3	223	8.0%	129	7.3%		139	7.2%				
	4	203	7.3%	114	6.4%		127	6.6%				

		5	118	4.2%	75	4.2%		81	4.2%			
		6	65	2.3%	21	1.2%		23	1.2%			
		7	19	0.7%	17	1.0%		18	0.9%			
		8	19	0.7%	13	0.7%		14	0.7%			
		9	8	0.3%	1	0.1%		3	0.2%			
		>=10	109	3.9%	81	4.6%		86	4.5%			
Utilization												
3	ED in past 6 mo (0- >=10)		1	0,3	1	0,3	< 0.0001	1	0,3	< 0.0001	0.0001	test of homogeneity (equal odds): 0.0008
	% > 0		1819	64.9%	1036	58.5%	< 0.001	1136	58.7%	0.001		
4	Police interx in past 6 mo (0- >=10)		1	0,2	0	0,2	< 0.0001	0	0,2	< 0.0001	0.0001	test of homogeneity (equal odds): 0.0034
	% > 0		1502	53.6%	833	47.1%	< 0.001	928	48.0%	0.003		
5	Ambulance in past 6 mo (0- >=10)		0	0,1	0	0,1	< 0.0001	0	0,1	< 0.0001	0.0001	test of homogeneity (equal odds): <0.0001
	% > 0		1171	41.8%	592	33.5%	< 0.001	651	33.7%	< 0.001		
6	Crisis services in past 6 mo (0- >=10)		0	0,1	0	0,1	0.0338	0	0,1	0.0862	0.4773	test of homogeneity (equal odds): 0.0732
	% > 0		781	27.9%	446	25.2%	0.06	498	25.7%	0.073		
7	Hospitalizations in past 6 mo (0- >=10)		0	0,1	0	0,1	< 0.0001	0	0,1	< 0.0001	0.0001	test of homogeneity (equal odds): <0.0001
	% > 0		1052	37.6%	517	29.2%	< 0.001	559	28.9%	< 0.001		
History												
8	Attacked while homeless		1154	41.2%	613	34.7%	< 0.001	689	35.6%	< 0.001	< 0.001	1.26608 0.0001

9	Harm self or others in past year	704	25.2%	375	21.2%	0.002	416	21.5%	0.004	0.038	1.22702	0.0036
10	Legal 'stuff' pending	1060	37.8%	566	32.0%	< 0.001	630	32.5%	< 0.001	0.003	1.26215	0.0002
11	Force or trick to do anything	534	19.1%	228	12.9%	< 0.001	267	13.8%	< 0.001	< 0.001	1.4689	<0.0001
12	Risk behaviors	659	23.5%	308	17.4%	< 0.001	344	17.8%	< 0.001	< 0.001	1.42268	<0.0001
Sleep most often												
13	Street, Sidewalk or Doorway	735	26.2%	515	29.1%	< 0.001	569	29.4%	< 0.001	< 0.001	1	
	Beach, Riverbed or Park	514	18.3%	218	12.3%		245	12.7%			1.62413	<0.0001
	Bus or Subway	28	1.0%	65	3.7%		69	3.6%			0.31415	<0.0001
	Car, Van or RV	454	16.2%	325	18.4%		353	18.2%			0.99565	0.9615
	Shelter	749	26.7%	502	28.4%		538	27.8%			1.07777	0.3459
	Other (Specify)	323	11.5%	146	8.2%		162	8.4%			1.54352	0.0001
(1pt)	Total % unsheltered	2054	73.3%	1269	71.7%	0.23	1398	72.2%	0.417	0.021	1.05534	0.4166
14	Anyone think you owe them money?	1353	48.3%	725	40.9%	< 0.001	813	42.0%	< 0.001	< 0.001	1.28775	<0.001
15	Any income source?	1203	42.9%	958	54.1%	< 0.001	1035	53.5%	< 0.001	< 0.001	0.65308	<0.001
16	Enough money to meet expenses?	361	12.9%	298	16.8%	< 0.001	319	16.5%	0.001	0.006	0.7498	0.0005
17	Activities that cause happiness or fulfillment?	1070	38.2%	705	39.9%	0.266	777	40.2%	0.172	0.251	0.92072	0.1724

18	People you don't like in your life?	1004	35.9%	653	37.0%	0.444	712	36.9%	0.467	0.166	0.9563	0.4673
19	Negative social influences?	928	33.2%	501	28.3%	0.001	572	29.6%	0.009	< 0.001	1.18102	0.0093
20	Signs of poor hygiene or negative ADLs?	1536	54.8%	861	48.6%	< 0.001	950	49.1%	< 0.001	0.003	1.25825	0.0001
Main healthcare location												
21	Does not go for care	680	24.3%	351	19.8%	0.001	404	20.9%	0.013	0.024	1.21461	0.0063
	Hospital	1078	38.5%	754	42.6%		810	41.8%			0.79069	0.0026
	VA	280	10.0%	205	11.6%		219	11.3%			0.7596	0.0123
	Clinic	737	26.3%	440	24.8%		479	24.7%			0.91412	0.2963
	Other (Specify)	28	1.0%	21	1.2%		24	1.2%			0.69314	0.1967
Med History												
22	Renal dialysis	151	5.4%	84	4.8%	0.335	90	4.7%	0.254	0.765	1.16855	0.2537
23	Frostbite /hypothermia	231	8.3%	109	6.2%	0.009	130	6.7%	0.051	< 0.001	1.24869	0.0508
24	Liver disease /cirrhosis	284	13.3%	106	7.5%	< 0.001	131	6.8%	< 0.001	< 0.001	2.18126	<0.001
25	HIV/ AIDS	126	4.5%	112	6.3%	0.006	121	6.3%	0.007	0.016	0.70499	0.0073
26	Heat stroke /exhaustion	935	33.4%	349	19.7%	< 0.001	402	20.8%	< 0.001	< 0.001	1.91103	<0.001
27	Heart Disease /Arrhythmia	703	25.1%	440	24.9%	0.85	480	24.8%	0.814	0.6	1.0162	0.8141
28	Emphysema	238	8.5%	67	3.8%	< 0.001	74	3.8%	< 0.001	< 0.001	2.33439	<0.001
29	Diabetes	350	12.5%	246	13.9%	0.166	269	13.9%	0.155	0.337	0.88351	0.1548
30	Asthma	664	23.7%	377	21.3%	0.061	415	21.5%	0.071	0.374	1.13676	0.071

31	Cancer	199	7.1%	75	4.2%	< 0.001	82	4.2%	< 0.001	0.004	1.72732	<0.001
32	Hepatitis C	629	22.5%	250	14.1%	< 0.001	277	14.3%	< 0.001	< 0.001	1.73314	<0.001
33	Tuberculosis	146	5.2%	130	7.3%	0.003	142	7.3%	0.003	0.04	0.695	0.0027
34	Signs of a serious health condition?	851	30.4%	432	24.4%	< 0.001	477	24.6%	< 0.001	< 0.001	1.33348	<0.001
35	Problematic drug or alcohol use	1842	65.8%	947	53.5%	< 0.001	1023	52.9%	< 0.001	< 0.001	1.71395	<0.001
36	Alcohol /drug use almost daily for past month	489	17.5%	245	13.8%	0.001	272	14.1%	0.002	0.004	1.29258	0.0018
37	IDU in past 6 months	295	10.5%	37	2.1%	< 0.001	52	2.7%	< 0.001	< 0.001	4.25933	<0.001
38	Treated and relapsed- Ever?	1158	41.3%	595	33.6%	< 0.001	637	32.9%	< 0.001	< 0.001	1.4353	<0.001
39	Non-beverage alcohol use past 6 mo?	108	3.9%	55	3.1%	0.184	62	3.2%	0.237	0.743	1.21128	0.2366
40	Blacked out in past month from drug /alcohol use	296	10.6%	103	5.8%	< 0.001	116	6.0%	< 0.001	< 0.001	1.85617	<0.001
41	Signs of serious /problematic drug /alcohol use?	647	23.1%	259	14.6%	< 0.001	290	15.0%	<0.001	< 0.001	1.70329	<0.001

42	Mental health hospital against will?	667	23.8%	311	17.6%	< 0.001	349	18.0%	<0.001	< 0.001	1.42106	<0.001
43	ED visit for emotions or nerves?	1128	40.3%	608	34.3%	< 0.001	678	35.0%	<0.001	0.002	1.25177	0.0002
44	Spoken with a mental health professional in last 6 months?	1362	48.6%	772	43.7%	0.001	841	43.5%	<0.001	0.019	1.22983	0.0005
45	Serious brain injury or head trauma ever?	1060	37.9%	472	26.7%	< 0.001	534	27.6%	<0.001	< 0.001	1.60311	<0.001
46	Learning disability / developmental disability ever?	915	32.7%	576	32.5%	0.924	636	32.9%	0.891	0.667	0.99143	0.8913
47	Problems concentrating or remembering things?	1881	67.1%	1039	58.7%	< 0.001	1153	59.6%	<0.001	<0.001	1.38518	<0.001
48	Signs or symptoms of severe, persistent mental illness or severly compromised cognitive functioning?	1120	40.0%	622	35.1%	0.001	692	35.7%	0.003	0.003	1.19632	0.0034

49	Medication non-adherence?	1216	43.4%	634	35.8%	<0.001	707	36.5%	<0.001	<0.001	1.33255	<0.001
50	Abuse or trauma - untreated or cause of homelessness?	1649	59.0%	853	48.2%	< 0.001	960	49.7%	<0.001	<0.001	1.46095	<0.001
	VI SPDAT at entry	9	7,12	8	6,11	< 0.001	9	6,11	< 0.001	0.0001	test of homogeneity (equal odds):	<0.0001
Recommendation											test of homogeneity (equal odds):	<0.0001
	PSH	1946	69.4%	1062	60.0%	< 0.001	1180	61.0%	< 0.001	< 0.001	1	
	RRH	764	27.3%	609	34.4%		649	33.5%			0.71382	<0.0001
	Self-Resolve	93	3.3%	100	5.7%		107	5.5%			0.52703	<0.0001
	Veteran status	544	19.6%	378	21.5%	0.12	405	21.1%	0.211	0.437	0.91209	0.211

Table 26: Results by Ethnicity (Hispanic vs non-Hispanic)

Hispanic (n=858)		Non-Hispanic (n=3881)		Diff	Diff p value
# or Median	% or IQR	# or Median	% or IQR		

Gender							
	Male	613	71.5%	2802	72.2%	0.8%	0.063
	Female	236	27.5%	1064	27.4%	-0.1%	
	Female to Male	2	23.0%	2	0.1%	-0.2%	
	Male to Female	7	0.8%	12	0.3%	-0.5%	
Race							
	White	748	87.2%	2055	53.0%	-34.2%	<0.001
	Black/AA	62	7.2%	1709	44.0%	36.8%	
	Asian	3	0.4%	26	0.7%	0.3%	
	American Indian	27	3.2%	60	1.6%	-1.6%	
	Hawaiian / Pacific Islander	4	0.5%	9	0.2%	-0.2%	
	Refused	14	1.6%	21	0.5%	-1.1%	
	White (compared to non-White)	748	87.2%	2055	53.0%	-34.2%	<0.001
Age		43	32,53	48	36,55	5	<0.001
	Age ≥ 65	24	2.80%	164	4.23%	1.4%	0.052
History							
	Number of times homeless in past 3 years	1	1,3	1	1,3	0	0.133
	% > 0	722	98.5%	3339	99.0%	0.5%	0.249
	% > 3	157	21.4%	784	23.2%	1.8%	0.289
	Months homeless in past 3 years	12	3,12	12	3,12	0	0.658
	% > 1	405	83.9%	1789	81.6%	-2.2%	0.217
	% >= 12	259	53.6%	1163	53.1%	-0.6%	0.821
	Street or Shelter Entry into Program	671	88.1%	3014	85.7%	-2.4%	0.088
	Chronic Homeless**	489	57.0%	2219	57.2%	0.2%	0.922

Homelessness								
1	< 2 years		383	0.4464	1613	0.4156	-3.1%	0.099
	>= 2 years		475	0.5536	2268	0.5844	3.1%	
2	Housed & homeless again in past 3 yrs		1	0,3	1	0,3	0	0.854
		<1	227	26.5%	1011	26.1%	-0.4%	0.819
		1	263	30.7%	1246	32.2%	1.4%	
		2	142	16.6%	586	15.1%	-1.5%	
		3	56	6.5%	306	7.9%	1.4%	
		4	61	7.1%	269	6.9%	-0.2%	
		5	37	4.3%	162	4.2%	-0.1%	
		6	20	2.3%	68	1.8%	-0.6%	
		7	7	0.8%	30	0.8%	-0.1%	
		8	4	0.5%	29	0.8%	0.3%	
		9	3	0.4%	8	0.2%	-0.1%	
		>=10	36	4.2%	159	4.1%	-0.1%	
Utilization								
3	ED in past 6 mo (0- >=10)		1	0,3	1	0,3	0	0.159
	% > 0		561	65.5%	2394	61.7%	-3.9%	0.038
4	Police interx in past 6 mo (0- >=10)		1	0,2	1	0,2	0	0.613
	% > 0		429	50.1%	2001	51.6%	1.5%	0.162
5	Ambulance in past 6 mo (0- >=10)		0	0,1	0	0,1	0	0.420
	% > 0		339	39.1%	1483	38.2%	-0.9%	0.827
6	Crisis services in past 6 mo (0- >=10)		0	0,1	0	0,1	0	0.366
	% > 0		238	27.8%	1041	26.9%	-0.9%	0.160
7	Hospitalizations in past 6 mo (0- >=10)		0	0,1	0	0,1	0	0.849
	% > 0		293	34.3%	1318	34.0%	-0.4%	0.809
History								

8	Attacked while homeless	337	39.3%	1506	38.8%	-0.5%	0.791
9	Harm self or others in past year	203	23.7%	917	23.7%	0.0%	0.983
10	Legal 'stuff' pending	320	37.3%	1370	35.3%	-2.0%	0.274
11	Force or trick to do anything	142	16.6%	659	17.0%	0.4%	0.760
12	Risk behaviors	177	20.6%	826	21.3%	0.7%	0.659
Sleep most often							
13	Street, Sidewalk or Doorway	237	27.6%	1067	27.5%	-0.1%	0.089
	Beach, Riverbed or Park	140	16.3%	619	16.0%	-0.4%	
	Bus or Subway	8	0.9%	89	2.3%	1.4%	
	Car, Van or RV	162	18.9%	645	16.6%	-2.3%	
	Shelter	220	25.6%	1067	27.5%	1.9%	
	Other (Specify)	91	10.6%	394	10.2%	-0.5%	
	Total % Unsheltered	638	74.4%	2814	72.5%	-1.9%	0.270
14	Anyone think you owe them money?	375	43.7%	1791	46.2%	2.5%	0.192
15	Any income source?	359	41.8%	1879	48.4%	6.6%	<0.001
16	Enough money to meet expenses?	97	11.3%	583	15.0%	3.7%	0.005
17	Activities that cause happiness or fulfillment?	339	39.6%	1508	38.9%	-0.7%	0.705
18	People you don’t like in your life?	319	37.2%	1397	36.1%	-1.2%	0.525
19	Negative social influences?	254	29.7%	1246	32.1%	2.5%	0.161
20	Signs of poor hygiene or negative ADLs?	424	49.4%	2062	53.1%	3.7%	0.049
Main healthcare location							
21	Does not go for care	197	23.0%	887	22.9%	-0.1%	0.133
	Hospital	356	41.5%	1532	39.5%	-2.0%	
	VA	74	8.6%	425	11.0%	2.3%	
	Clinic	226	26.3%	990	25.5%	-0.8%	
	Other (Specify)	5	0.6%	47	1.2%	0.6%	
Med History							
22	Renal dialysis	51	5.9%	190	4.9%	-1.0%	0.208

23	Frostbite /hypothermia	51	5.9%	310	8.0%	2.1%	0.041
24	Liver disease /cirrhosis	101	11.8%	413	10.7%	-1.1%	0.339
25	HIV/ AIDS	40	4.7%	207	5.3%	0.7%	0.423
26	Heat stroke /exhaustion	242	28.2%	1095	28.2%	0.0%	0.992
27	Heart Disease /Arrhythmia	186	21.7%	997	25.7%	4.0%	0.015
28	Emphysema	28	3.3%	284	7.3%	4.1%	<0.001
29	Diabetes	147	17.1%	472	12.2%	-5.0%	<0.001
30	Asthma	199	23.2%	880	22.7%	-0.5%	0.751
31	Cancer	36	4.2%	245	6.3%	2.1%	0.017
32	Hepatitis C	155	18.1%	751	19.4%	1.3%	0.377
33	Tuberculosis	44	5.1%	244	6.3%	1.2%	0.200
34	Signs of a serious health condition?	235	27.4%	1093	28.2%	0.8%	0.648
35	Problematic drug or alcohol use	479	55.8%	2386	61.6%	5.8%	0.002
36	Alcohol /drug use almost daily for past month	127	0.1%	634	16.3%	16.2%	0.266
37	IDU in past 6 months	57	6.6%	290	7.5%	0.8%	0.398
38	Treated and relapsed- Ever?	275	32.1%	1520	39.2%	7.1%	<0.001
39	Non-beverage alcohol use past 6 mo?	26	3.0%	144	3.7%	0.7%	0.332
40	Blacked out in past month from drug /alcohol use	78	9.1%	334	8.6%	-0.5%	0.656
41	Signs of serious /problematic drug /alcohol use?	171	19.9%	766	19.7%	-0.2%	0.898
42	Mental health hospital against will?	176	20.5%	840	21.7%	1.1%	0.468
43	ED visit for emotions or nerves?	308	35.9%	1498	38.6%	2.7%	0.136
44	Spoken with a mental health professional in last 6 months?	386	45.0%	1817	46.9%	1.9%	0.312
45	Serious brain injury or head trauma ever?	285	33.3%	1309	33.8%	0.5%	0.769
46	Learning disability / developmental disability ever?	302	35.3%	1249	32.2%	-3.1%	0.082
47	Problems concentrating or remembering things?	569	66.3%	2465	63.6%	-2.8%	0.126

48	Signs or symptoms of severe, persistent mental illness or severly compromised cognitive functioning?	310	36.1%	1502	38.7%	2.6%	0.161
49	Medication non-adherence?	371	43.3%	1552	40.0%	-3.3%	0.077
50	Abuse or trauma - untreated or cause of homelessness?	466	54.4%	2143	55.4%	0.9%	0.618
	VI SPDAT at entry	9	7,11	9	7,11		0.219
Recommendation							
	PSH	557	64.9%	2569	66.2%	1.3%	0.329
	RRH	257	30.0%	1156	29.8%	-0.2%	
	Self-Resolve	44	5.1%	156	4.0%	-1.1%	
	Veteran status	129	15.2%	820	21.3%	6.1%	<0.001

Table 27: Results by Gender (binary)

		Male (&FtM) (n=3,419)		Female (& MtF) (n=1,319)		M/F test for diff
		# or Median	% or IQR	# or Median	% or IQR	p value
Ethnicity						0.727
	Hispanic	615	18.0%	243	18.4%	
	Non-Hisp	2804	82.0%	1076	81.6%	
Race						
	White	2021	59.1%	782	59.3%	0.275
	Black/AA	1285	37.6%	486	36.9%	
	Asian	21	0.6%	8	0.6%	

	American Indian			55	1.6%	32	2.4%	
	Hawaiian / Pacific Islander			8	0.2%	5	0.4%	
	Refused			29	0.9%	6	0.5%	
	White (compared to non-White)			1398	40.9%	537	40.7%	0.912
Age				48	36,56	45	33,53	<0.0001
	Age ≥ 65			148	4.33%	39	2.96%	0.03
History								
	Number of times homeless in past 3 years			1	1,3	2	1,4	0.02
	% > 0			2948	98.9%	1113	98.9%	0.114
	% > 3			656	22.0%	285	25.3%	0.023
	Months homeless in past 3 years			12	3,12	10	2,12	0.0007
	% > 1			1556	82.4%	638	81.2%	0.005
	% >= 12			1049	55.5%	373	47.5%	<0.0001
	Street or Shelter Entry into Program			2669	85.9%	1015	86.7%	0.513
	Chronic Homeless**			1997	58.4%	710	53.8%	0.004
Homelessness								
1	< 2 years		0	1359	39.8%	636	48.2%	<0.001
	>= 2 years		1	2060	60.3%	683	51.8%	
2	Housed & homeless again in past 3 yrs							
		<1		953	27.9%	285	21.7%	<0.0001
		1		1086	31.8%	422	32.1%	
		2		518	15.2%	210	16.0%	
		3		264	7.7%	98	7.5%	
		4		224	6.6%	106	8.1%	
		5		132	3.9%	67	5.1%	

		6	62	1.8%	26	2.0%	
		7	32	0.9%	5	38.0%	
		8	25	0.7%	8	0.6%	
		9	7	0.2%	4	0.3%	
		>=10	112	3.3%	83	6.3%	
Utilization							
3	ED in past 6 mo (0- >=10)		1	0,3	2	0,4	<0.0001
	% > 0		2037	59.6%	917	69.5%	<0.001
4	Police interx in past 6 mo (0- >=10)		1	0,2	1	0,2	0.3046
	% > 0		1758	51.5%	671	50.9%	0.662
5	Ambulance in past 6 mo (0- >=10)		0	0,1	0	0,1	0.0155
	% > 0		1277	37.4%	545	41.4%	0.219
6	Crisis services in past 6 mo (0- >=10)		0	0,0	0	0,1	<0.0001
	% > 0		832	24.4%	447	33.9%	<0.001
7	Hospitalizations in past 6 mo (0- >=10)		0	0,1	0	0,1	0.2752
	% > 0		1175	34.4%	435	33.0%	0.726
History							
8	Attacked while homeless		1251	36.6%	592	45.0%	<0.001
9	Harm self or others in past year		797	23.4%	323	24.5%	0.407
10	Legal 'stuff' pending		1268	37.1%	421	31.9%	0.001
11	Force or trick to do anything		478	14.0%	322	24.4%	<0.001
12	Risk behaviors		734	21.5%	269	20.4%	0.423
Sleep most often							<0.001
13	Street, Sidewalk or Doorway		1012	29.6%	291	22.1%	
	Beach, Riverbed or Park		595	17.4%	164	12.4%	
	Bus or Subway		75	2.2%	22	1.7%	
	Car, Van or RV		490	14.3%	317	24.0%	
	Shelter		914	26.7%	373	28.3%	
	Other (Specify)		333	9.7%	152	11.5%	

	Total % Unsheltered	2505	73.3%	946	71.7%	0.284
14	Anyone think you owe them money?	1526	44.7%	639	48.5%	0.019
15	Any income source?	1589	46.5%	649	49.2%	0.095
16	Enough money to meet expenses?	514	15.1%	166	12.6%	0.031
17	Activities that cause happiness or fulfillment?	1352	39.6%	495	37.6%	0.194
18	People you don't like in your life?	1165	34.1%	550	41.8%	<0.001
19	Negative social influences?	1050	30.7%	449	34.1%	0.025
20	Signs of poor hygiene or negative ADLs?	1795	52.5%	690	52.3%	0.907
Main healthcare location						
21	Does not go for care	827	24.2%	256	19.4%	<0.001
	Hospital	1319	38.6%	569	43.1%	
	VA	454	13.3%	45	3.4%	
	Clinic	792	23.2%	424	32.2%	
	Other (Specify)	27	0.8%	25	1.9%	
Med History						
22	Renal dialysis	160	4.7%	81	6.2%	0.04
23	Frostbite /hypothermia	292	8.5%	68	5.2%	<0.001
24	Liver disease /cirrhosis	387	11.3%	127	9.6%	0.092
25	HIV/ AIDS	195	5.7%	52	4.0%	0.015
26	Heat stroke /exhaustion	958	28.0%	378	28.7%	0.666
27	Heart Disease /Arrhythmia	821	24.0%	362	27.5%	0.015
28	Emphysema	218	6.4%	94	7.1%	0.353
29	Diabetes	430	12.6%	189	14.3%	0.111
30	Asthma	634	18.6%	445	33.8%	<0.001
31	Cancer	153	4.5%	128	9.7%	<0.001
32	Hepatitis C	690	20.2%	216	16.4%	0.003
33	Tuberculosis	247	7.2%	41	3.1%	<0.001
34	Signs of a serious health condition?	920	26.9%	408	30.9%	0.006

35	Problematic drug or alcohol use	2171	63.6%	693	52.6%	<0.001
36	Alcohol /drug use almost daily for past month	616	18.0%	145	11.0%	<0.001
37	IDU in past 6 months	268	7.8%	79	6.0%	0.028
38	Treated and relapsed- Ever?	1400	41.0%	395	30.0%	<0.001
39	Non-beverage alcohol use past 6 mo?	137	4.0%	33	2.5%	0.013
40	Blacked out in past month from drug /alcohol use	330	9.7%	82	6.2%	<0.001
41	Signs of serious /problematic drug /alcohol use?	733	21.4%	204	15.5%	<0.001
42	Mental health hospital against will?	688	20.1%	328	24.9%	<0.001
43	ED visit for emotions or nerves?	1242	36.4%	564	42.8%	<0.001
44	Spoken with a mental health professional in last 6 months?	1515	44.4%	688	52.2%	<0.001
45	Serious brain injury or head trauma ever?	1188	34.8%	406	30.8%	0.01
46	Learning disability / developmental disability ever?	1119	32.8%	432	32.8%	0.99
47	Problems concentrating or remembering things?	2089	61.1%	944	71.6%	<0.001
48	Signs or symptoms of severe, persistent mental illness or severly compromised cognitive functioning?	1241	36.3%	571	43.3%	<0.001
49	Medication non-adherence?	1341	39.2%	582	44.2%	0.002
50	Abuse or trauma - untreated or cause of homelessness?	1691	49.6%	917	69.7%	<0.001
	VI SPDAT at entry	9	6,11	9	7,11	0.1452
Recommendation						0.17
	PSH	2237	65.4%	888	67.3%	
	RRH	1027	30.0%	386	29.3%	
	Self-Resolve	155	4.5%	45	3.4%	
	Veteran status	877	25.8%	72	5.5%	<0.001

Table 28: Results by Duration of Homelessness (>1yr)

		< 1 year of Homelessness (n=1,253)		>= 1 year of Homelessness (n=1,422)		Diff p value
		# or Median	% or IQR	# or Median	% or IQR	
Gender						
	Male	838	66.9%	1047	73.6%	0.001
	Female	409	32.6%	364	25.6%	
	Female to Male	2	16.0%	2	0.1%	
	Male to Female	4	0.3%	9	0.6%	
Race						
	White	753	60.1%	869	61.1%	0.576
	Black/AA	452	36.1%	503	35.4%	
	Asian	16	1.3%	9	6.3%	
	American Indian	20	1.6%	26	1.8%	
	Hawaiian / Pacific Islander	2	0.2%	4	0.3%	
	Refused	10	0.8%	11	0.8%	
	White (compared to non-White)	500	39.9%	553	38.9%	0.592
Ethnicity						
	Hispanic	224	17.9%	259	18.2%	0.821
	Non-Hisp	1029	82.1%	1163	81.8%	
Age		46	33,55	47	36,54	0.226
	Age ≥ 65	53	4.23%	51	3.59%	0.390

History							
	Number of times homeless in past 3 years		1	1,2	3	1,4	<0.001
	% > 0		1237	99.0%	1415	99.8%	<0.001
	% > 3		227	18.2%	665	46.9%	<0.001
	Months homeless in past 3 years		2	1,6	12	12,12	<0.001
	% > 1		772	61.6%	1422	100.0%	<0.001
	Street or Shelter Entry into Program		1142	91.1%	1275	89.7%	0.196
	Chronic Homeless**		198	15.8%	1181	83.1%	<0.001
Homelessness							
1	< 2 years		867	0.6919	206	0.1449	<0.001
	>= 2 years		386	0.3081	1216	0.8551	
2	Housed & homeless again in past 3 yrs		1	1,3	2	0,4	<0.001
		<1	287	22.9%	365	25.7%	<0.001
		1	452	36.1%	325	22.9%	
		2	199	15.9%	180	12.7%	
		3	102	8.2%	104	7.3%	
		4	77	6.2%	148	10.4%	
		5	52	4.2%	101	7.1%	
		6	25	2.0%	39	2.8%	
		7	12	1.0%	15	1.1%	
		8	6	0.5%	23	1.6%	
		9	1	0.1%	4	0.3%	
		>=10	39	3.1%	114	8.0%	
Utilization							
3	ED in past 6 mo (0- >=10)		1	0,3	1	0,4	<0.001
	% > 0		753	60.1%	941	66.2%	<0.001
4	Police interx in past 6 mo (0- >=10)		0	0,1	1	0,3	<0.001
	% > 0		565	45.1%	847	59.6%	<0.001

5	Ambulance in past 6 mo (0- >=10)	0	0,1	0	0,2	<0.001
	% > 0	424	33.8%	616	43.4%	<0.001
6	Crisis services in past 6 mo (0- >=10)	0	0,1	0	0,1	<0.001
	% > 0	323	25.8%	464	32.6%	<0.001
7	Hospitalizations in past 6 mo (0- >=10)	0	0,1	0	0,1	<0.001
	% > 0	369	29.5%	562	39.6%	<0.001
History						
8	Attacked while homeless	362	28.9%	754	53.0%	<0.001
9	Harm self or others in past year	242	19.3%	451	31.8%	<0.001
10	Legal 'stuff' pending	432	34.5%	568	39.9%	0.004
11	Force or trick to do anything	182	14.5%	315	22.2%	<0.001
12	Risk behaviors	216	17.2%	412	29.0%	<0.001
Sleep most often						
13	Street, Sidewalk or Doorway	249	19.9%	509	35.8%	<0.001
	Beach, Riverbed or Park	146	11.7%	267	18.8%	
	Bus or Subway	22	1.8%	35	2.5%	
	Car, Van or RV	274	21.9%	215	15.1%	
	Shelter	418	33.4%	251	17.7%	
	Other (Specify)	144	11.5%	145	10.2%	
	Total % Unsheltered	835	66.6%	1171	82.4%	<0.001
14	Anyone think you owe them money?	625	49.9%	707	49.8%	0.948
15	Any income source?	590	47.1%	656	46.2%	0.645
16	Enough money to meet expenses?	186	14.9%	163	11.5%	0.010
17	Activities that cause happiness or fulfillment?	500	40.0%	518	36.5%	0.068
18	People you don’t like in your life?	454	36.3%	564	39.8%	0.064
19	Negative social influences?	327	26.1%	560	39.5%	<0.001
20	Signs of poor hygiene or negative ADLs?	655	52.3%	852	59.9%	<0.001
Main healthcare location						

21	Does not go for care	(1pt)	293	23.4%	317	22.3%	<0.001
	Hospital		436	34.8%	605	42.6%	
	VA		173	13.8%	154	10.8%	
	Clinic		329	26.3%	338	23.8%	
	Other (Specify)		22	1.8%	8	0.6%	
Med History							
22	Renal dialysis		63	5.0%	81	5.7%	0.440
23	Frostbite /hypothermia		71	5.7%	154	10.8%	<0.001
24	Liver disease /cirrhosis		104	8.3%	188	13.2%	<0.001
25	HIV/ AIDS		67	5.4%	87	6.1%	0.386
26	Heat stroke /exhaustion		305	24.3%	494	34.8%	<0.001
27	Heart Disease /Arrhythmia		291	23.2%	395	27.8%	0.007
28	Emphysema		63	5.0%	108	7.6%	0.007
29	Diabetes		158	12.6%	182	12.8%	0.890
30	Asthma		278	22.2%	359	25.3%	0.061
31	Cancer		72	5.8%	92	6.5%	0.434
32	Hepatitis C		173	13.8%	337	23.7%	<0.001
33	Tuberculosis		65	5.2%	95	6.7%	0.102
34	Signs of a serious health condition?		361	28.8%	472	33.2%	0.015
35	Problematic drug or alcohol use		675	54.0%	995	70.1%	<0.001
36	Alcohol /drug use almost daily for past month		127	10.1%	327	23.0%	<0.001
37	IDU in past 6 months		59	4.7%	158	11.1%	<0.001
38	Treated and relapsed- Ever?		376	30.0%	665	46.8%	<0.001
39	Non-beverage alcohol use past 6 mo?		30	2.4%	75	5.3%	<0.001
40	Blacked out in past month from drug /alcohol use		68	5.4%	169	11.9%	<0.001
41	Signs of serious /problematic drug /alcohol use?		185	14.8%	387	27.2%	<0.001
42	Mental health hospital against will?		248	19.8%	373	26.3%	<0.001

43	ED visit for emotions or nerves?	420	33.5%	644	45.3%	<0.001
44	Spoken with a mental health professional in last 6 months?	530	42.3%	754	53.1%	<0.001
45	Serious brain injury or head trauma ever?	405	32.4%	548	38.5%	0.001
46	Learning disability / developmental disability ever?	379	30.3%	544	38.3%	<0.001
47	Problems concentrating or remembering things?	734	58.6%	1016	71.5%	<0.001
48	Signs or symptoms of severe, persistent mental illness or severly compromised cognitive functioning?	430	34.3%	642	45.2%	<0.001
49	Medication non-adherence?	447	35.7%	713	50.2%	<0.001
50	Abuse or trauma - untreated or cause of homelessness?	639	51.2%	890	62.7%	<0.001
	VI SPDAT at entry	8	6,10	10	8,13	<0.001
Recommendation						
	PSH	739	59.0%	1150	80.9%	<0.001
	RRH	460	36.7%	247	17.4%	
	Self-Resolve	54	4.3%	25	1.8%	
	Veteran status	293	23.6%	295	21.0%	0.112

Table 29: Results by Frequency of Homelessness (>3 episodes)

	≤3 episodes (n=3,166)		>3 episodes (n=941)		Diff	Diff p value
	# or Median	% or IQR	# or Median	% or IQR		
Gender						0.039

	Male	2324	73.4%	654	69.5%	-3.90%	0.023
	Female	828	26.2%	278	29.5%	3.39%	
	Female to Male	2	0.1%	2	0.2%	0.15%	
	Male to Female	12	0.4%	7	0.7%	0.36%	
Race							0.497
	White	1858	58.7%	563	59.8%	1.14%	
	Black/AA	1195	37.7%	350	37.2%	-0.55%	
	Asian	26	0.8%	2	0.2%	-0.61%	
	American Indian	56	1.8%	16	1.7%	-0.07%	
	Hawaiian / Pacific Islander	8	0.3%	2	0.2%	-0.04%	
	Refused	23	0.7%	8	0.9%	0.12%	
	White (compared to non-White)	1858	58.7%	563	59.8%	1.14%	0.531
Ethnicity							
	Hispanic	576	18.2%	157	16.7%	-1.51%	0.289
	Non-Hisp	2590	81.8%	784	83.3%	1.51%	
Age		48	37,55	45	33,53	-3	<0.0001
	Age ≥ 65	125	4.0%	28	3.0%	-0.97%	0.167
History							
	Number of times homeless in past 3 years	1	1,2	4	4,4	3	<0.0001
	% > 0	3120	98.5%	941	100.0%	1.45%	
	Months homeless in past 3 years	6	1,12	12	11,12	6	<0.001
	% > 1	1301	73.3%	888	99.6%	26.30%	
	% >= 12	753	42.4%	665	74.6%	32.15%	<0.001
	Street or Shelter Entry into Program	2717	85.8%	808	85.9%	0.05%	0.97

	Chronic homelessness		1291	40.8%	130	13.8%	-26.96%	<0.001
Homelessness								
1	< 2 years		1487	47.0%	260	27.6%	-19.34%	<0.001
	>= 2 years		1679	53.0%	681	72.4%	19.34%	
2	Housed & homeless again in past 3 yrs		1	0,2	4	2,6	3	<0.0001
		<1	983	31.1%	105	11.2%	-19.91%	<0.001
		1	1187	37.6%	110	11.7%	-25.82%	
		2	538	17.0%	94	10.0%	-7.00%	
		3	241	7.6%	83	8.9%	1.23%	
		4	93	2.9%	175	18.7%	15.72%	
		5	56	1.8%	124	13.2%	11.45%	
		6	17	0.5%	57	6.1%	5.54%	
		7	5	0.2%	25	2.7%	2.51%	
		8	3	0.1%	27	2.9%	2.79%	
		9	1	0.0%	5	0.5%	0.50%	
		>=10	37	1.2%	133	14.2%	13.01%	
Utilization								
3	ED in past 6 mo (0- >=10)		1	0,3	1	0,3	0	<0.0001
	% > 0		1920	60.7%	636	67.6%	6.92%	<0.001
4	Police interx in past 6 mo (0- >=10)		0	0,2	1	0,3	1	<0.0001
	% > 0		1512	47.8%	561	59.7%	11.89%	<0.001
5	Ambulance in past 6 mo (0- >=10)		0	0,1	0	0,1	0	0.0001
	% > 0		1173	37.1%	411	43.7%	6.64%	0.033
6	Crisis services in past 6 mo (0- >=10)		0	0,0	0	0,1	0	<0.0001
	% > 0		778	24.6%	339	36.0%	11.42%	<0.001

7	Hospitalizations in past 6 mo (0- >=10)	0	0,1	0	0,1	0	<0.0001
	% > 0	1010	31.9%	370	39.3%	7.38%	<0.001
History							
8	Attacked while homeless	1106	35.0%	464	49.3%	14.33%	<0.001
9	Harm self or others in past year	663	21.0%	311	33.1%	12.08%	<0.001
10	Legal 'stuff' pending	1014	32.1%	404	42.9%	10.88%	<0.001
11	Force or trick to do anything	476	15.1%	210	22.3%	7.26%	<0.001
12	Risk behaviors	580	18.3%	278	29.6%	11.27%	<0.001
Sleep most often							<0.001
13	Street, Sidewalk or Doorway	859	27.1%	262	27.8%	0.71%	
	Beach, Riverbed or Park	495	15.6%	160	17.0%	1.37%	
	Bus or Subway	55	1.7%	26	2.8%	1.02%	
	Car, Van or RV	493	15.6%	178	18.9%	3.35%	
	Shelter	956	30.2%	214	22.7%	-7.46%	
	Other (Specify)	308	9.7%	101	10.7%	1.00%	
	Total % Unsheltered	2210	69.8%	727	77.3%	7.46%	
14	Anyone think you owe them money?	1342	42.4%	487	51.8%	9.35%	<0.001
15	Any income source?	1514	47.8%	437	46.5%	-1.35%	0.468
16	Enough money to meet expenses?	493	15.6%	121	12.9%	-2.69%	0.042
17	Activities that cause happiness or fulfillment?	1300	41.1%	382	40.6%	-0.50%	0.784
18	People you don’t like in your life?	1080	34.2%	394	41.9%	7.74%	<0.001
19	Negative social influences?	880	27.8%	378	40.3%	12.48%	<0.001
20	Signs of poor hygiene or negative ADLs?	1591	50.3%	496	52.7%	2.46%	0.186
Main healthcare location							0.372
21	Does not go for care	655	20.7%	198	21.0%	0.35%	0.815
	Hospital	1266	40.0%	394	41.9%	1.88%	
	VA	342	10.8%	110	11.7%	0.89%	
	Clinic	863	27.3%	231	24.6%	-2.71%	

	Other (Specify)	40	1.3%	8	0.9%	-0.41%	
Med History							
22	Renal dialysis	153	4.8%	49	5.2%	0.37%	0.64
23	Frostbite /hypothermia	229	7.2%	72	7.7%	0.41%	0.669
24	Liver disease /cirrhosis	336	10.6%	110	11.7%	1.07%	0.356
25	HIV/ AIDS	161	5.1%	63	6.7%	1.61%	0.056
26	Heat stroke /exhaustion	872	27.5%	289	30.7%	3.20%	0.056
27	Heart Disease /Arrhythmia	767	24.3%	248	26.4%	2.13%	0.183
28	Emphysema	204	6.5%	60	6.4%	-0.07%	0.938
29	Diabetes	425	13.4%	102	10.8%	-2.60%	0.037
30	Asthma	727	23.0%	219	23.3%	0.32%	0.838
31	Cancer	182	5.8%	67	7.1%	1.38%	0.121
32	Hepatitis C	597	18.9%	188	20.0%	1.12%	0.444
33	Tuberculosis	189	6.0%	59	6.3%	0.29%	0.739
34	Signs of a serious health condition?	820	25.9%	302	32.1%	6.19%	<0.001
35	Problematic drug or alcohol use	1826	57.8%	667	71.1%	13.34%	<0.001
36	Alcohol /drug use almost daily for past month	456	14.4%	195	20.7%	6.31%	<0.001
37	IDU in past 6 months	177	5.6%	113	12.0%	6.42%	<0.001
38	Treated and relapsed- Ever?	1102	34.8%	463	49.2%	14.38%	<0.001
39	Non-beverage alcohol use past 6 mo?	88	2.8%	49	5.2%	2.43%	<0.001
40	Blacked out in past month from drug /alcohol use	236	7.5%	114	12.1%	4.67%	<0.001
41	Signs of serious /problematic drug /alcohol use?	523	16.5%	265	28.2%	11.64%	<0.001
42	Mental health hospital against will?	626	19.8%	267	28.4%	8.63%	<0.001
43	ED visit for emotions or nerves?	1148	36.3%	430	45.7%	9.41%	<0.001
44	Spoken with a mental health professional in last 6 months?	1449	45.8%	491	52.2%	6.39%	0.001
45	Serious brain injury or head trauma ever?	1038	32.9%	343	36.5%	3.64%	0.038
46	Learning disability / developmental disability ever?	1013	32.0%	343	36.5%	4.52%	0.01

47	Problems concentrating or remembering things?	1974	62.4%	666	70.8%	8.39%	<0.001
48	Signs or symptoms of severe, persistent mental illness or severly compromised cognitive functioning?	1093	34.5%	425	45.2%	10.64%	<0.001
49	Medication non-adherence?	1141	36.1%	463	49.3%	13.21%	<0.001
50	Abuse or trauma - untreated or cause of homelessness?	1614	51.1%	599	63.7%	12.58%	<0.001
	VI SPDAT at entry	8	6,11	10	8,12	2	<0.0001
Recommendation							<0.001
	PSH	1901	60.0%	761	80.9%	20.83%	
	RRH	1099	34.7%	159	16.9%	-17.81%	
	Self-Resolve	166	5.2%	21	2.2%	-3.01%	
	Veteran status	662	21.1%	191	20.5%	-0.59%	0.697

Table 30: Results by Chronic Homeless status

	Not Chronic (n=2,693)		Chronic Homelessness (n=2,046)		Diff	Diff p value
	# or Median	% or IQR	# or Median	% or IQR		
Gender						0.019
Male	1419	69.9%	1996	73.7%	3.86%	0.001
Female	600	29.5%	700	25.9%	-3.68%	
Female to Male	3	0.2%	1	0.0%	-0.11%	

	Male to Female	9	0.4%	10	0.4%	-0.07%	
Race							
	White	1213	59.7%	1590	58.7%	-1.01%	0.612
	Black/AA	747	36.8%	1024	37.8%	1.03%	
	Asian	16	0.8%	13	0.5%	-0.31%	
	American Indian	35	1.7%	52	1.9%	0.20%	
	Hawaiian / Pacific Islander	5	0.3%	8	0.3%	0.05%	
	Refused	15	0.7%	20	0.7%	0.00%	
	White (compared to non-White)	1213	59.7%	1590	58.7%	-1.01%	0.484
Ethnicity							
	Hispanic	487	18.1%	371	18.1%	0.05%	0.965
	Non-Hisp	2206	81.9%	1675	81.9%	-0.05%	
Age		46	34,55	48	37,55	2	<0.001
	Age ≥ 65	86	3.19%	102	4.99%	1.80%	0.002
History							
	Number of times homeless in past 3 years	1	1,2	2	1,4	1	<0.001
	% > 0	2004	98.8%	2057	98.9%	0.13%	<0.001
	% > 3	811	30.2%	130	9.2%	-21.04%	<0.001
	Months homeless in past 3 years	4	1,9	12	12,12	8	<0.001
	% > 1	911	70.3%	1283	93.0%	22.75%	<0.001
	% >= 12	241	18.6%	1181	85.6%	67.04%	<0.001
	Street or Shelter Entry into Program	1718	84.6%	1967	87.5%	2.91%	0.006
Homelessness							
1	< 2 years	1522	74.9%	474	17.5%	-57.44%	<0.001
	>= 2 years	509	25.1%	2234	82.5%	57.44%	

2	Housed & homeless again in past 3 yrs		1	1,2	1	0,4		0	0.003
		<1	390	19.2%	848		31.4%	12.20%	<0.001
		1	855	42.1%	654		24.2%	-17.90%	
		2	496	24.4%	232		8.6%	-15.84%	
		3	90	4.4%	272		10.1%	5.64%	
		4	71	3.5%	259		9.6%	6.09%	
		5	49	2.4%	150		5.6%	3.15%	
		6	23	1.1%	65		2.4%	1.28%	
		7	12	0.6%	25		0.9%	0.34%	
		8	6	0.3%	27		1.0%	0.70%	
		9	1	0.1%	10		0.4%	0.32%	
		>=10	37	1.8%	158		5.9%	4.03%	
Utilization									
3	ED in past 6 mo (0- >=10)		1	0,3	1	0,3		0	<0.001
	% > 0		1209	59.5%	1746		64.5%	5.00%	<0.001
4	Police interx in past 6 mo (0- >=10)		0	0,1	1	0,3		1	<0.001
	% > 0		939	46.2%	1491		55.1%	8.91%	<0.001
5	Ambulance in past 6 mo (0- >=10)		0	0,1	0	0,1		0	<0.001
	% > 0		706	34.8%	1116		41.3%	6.48%	<0.001
6	Crisis services in past 6 mo (0- >=10)		0	0,0	0	0,1		0	<0.001
	% > 0		476	23.5%	803		29.7%	6.20%	<0.001
7	Hospitalizations in past 6 mo (0- >=10)		0	0,1	0	0,1		0	<0.001
	% > 0		609	30.0%	1002		37.0%	7.03%	<0.001
History									
8	Attacked while homeless		549	27.1%	1294		47.8%	20.76%	<0.001
9	Harm self or others in past year		394	19.4%	726		26.8%	7.40%	<0.001
10	Legal 'stuff' pending		662	32.6%	1028		38.0%	5.33%	<0.001
11	Force or trick to do anything		267	13.2%	534		19.8%	6.61%	<0.001
12	Risk behaviors		314	15.5%	689		25.5%	10.01%	<0.001

Sleep most often							
13	Street, Sidewalk or Doorway	431	21.2%	873	32.2%	11.02%	<0.001
	Beach, Riverbed or Park	247	12.2%	512	18.9%	6.75%	
	Bus or Subway	32	1.6%	65	2.4%	0.82%	
	Car, Van or RV	397	19.6%	410	15.1%	-4.41%	
	Shelter	713	35.1%	574	21.2%	-13.91%	
	Other (Specify)	211	10.4%	274	10.1%	-0.27%	
	Total % Unsheltered	1318	64.9%	2134	78.8%	13.91%	<0.001
14	Anyone think you owe them money?	915	45.1%	1251	46.2%	1.16%	0.427
15	Any income source?	958	47.2%	1280	47.3%	0.13%	0.927
16	Enough money to meet expenses?	325	16.0%	355	13.1%	-2.90%	0.005
17	Activities that cause happiness or fulfillment?	882	43.5%	965	35.7%	-7.80%	<0.001
18	People you don't like in your life?	673	33.2%	1043	38.6%	5.45%	<0.001
19	Negative social influences?	499	24.6%	1001	37.0%	12.43%	<0.001
20	Signs of poor hygiene or negative ADLs?	924	45.5%	1562	57.7%	12.19%	<0.001
Main healthcare location							
21	Does not go for care	442	21.8%	642	23.7%	1.95%	<0.001
	Hospital	764	37.6%	1124	41.5%	3.89%	
	VA	258	12.7%	241	8.9%	-3.80%	
	Clinic	534	26.3%	682	25.2%	-1.11%	
	Other (Specify)	33	1.6%	19	0.7%	-0.92%	
Med History							
22	Renal dialysis	95	4.7%	146	5.4%	0.72%	0.263
23	Frostbite /hypothermia	106	5.2%	255	9.4%	4.20%	<0.001
24	Liver disease /cirrhosis	150	7.4%	364	13.5%	6.06%	<0.001
25	HIV/ AIDS	98	4.8%	149	5.5%	0.68%	0.294

26	Heat stroke /exhaustion	487	24.0%	850	31.4%	7.42%	<0.001
27	Heart Disease /Arrhythmia	457	22.5%	726	26.8%	4.31%	0.001
28	Emphysema	101	5.0%	211	7.8%	2.81%	<0.001
29	Diabetes	248	12.2%	371	13.7%	1.49%	0.131
30	Asthma	428	21.1%	651	24.1%	2.98%	0.016
31	Cancer	104	5.1%	177	6.5%	1.42%	0.041
32	Hepatitis C	274	13.5%	632	23.4%	9.86%	<0.001
33	Tuberculosis	90	4.4%	198	7.3%	2.87%	<0.001
34	Signs of a serious health condition?	496	24.4%	832	30.7%	6.30%	<0.001
35	Problematic drug or alcohol use	1062	52.3%	1803	66.7%	14.39%	<0.001
36	Alcohol /drug use almost daily for past month	225	11.1%	536	19.8%	8.72%	<0.001
37	IDU in past 6 months	92	4.5%	255	9.429.42%	#VALUE!	<0.001
38	Treated and relapsed- Ever?	619	30.5%	1176	43.4%	12.95%	<0.001
39	Non-beverage alcohol use past 6 mo?	43	2.1%	127	4.7%	2.57%	<0.001
40	Blacked out in past month from drug /alcohol use	128	6.3%	284	10.5%	4.19%	<0.001
41	Signs of serious /problematic drug /alcohol use?	297	14.6%	640	23.6%	9.01%	<0.001
42	Mental health hospital against will?	373	18.4%	643	23.8%	5.41%	<0.001
43	ED visit for emotions or nerves?	662	32.6%	1144	42.3%	9.70%	<0.001
44	Spoken with a mental health professional in last 6 months?	870	42.9%	1333	49.3%	6.42%	<0.001
45	Serious brain injury or head trauma ever?	598	29.5%	996	36.8%	7.34%	<0.001
46	Learning disability / developmental disability ever?	575	28.3%	976	36.1%	7.75%	<0.001
47	Problems concentrating or remembering things?	1177	58.0%	1857	68.6%	10.56%	<0.001
48	Signs or symptoms of severe, persistent mental illness or severely compromised cognitive functioning?	635	31.3%	1177	43.5%	12.19%	<0.001
49	Medication non-adherence?	686	33.8%	1237	45.7%	11.95%	<0.001

50	Abuse or trauma - untreated or cause of homelessness?	979	48.4%	1630	60.3%	11.96%	<0.001
	VI SPDAT at entry	8	6,10	10	8,12	2	<0.001
Recommendation							
	PSH	1049	51.7%	2077	76.7%	25.05%	<0.001
	RRH	827	40.7%	586	21.6%	-19.08%	
	Self-Resolve	155	76.3%	45	1.7%	-74.64%	
	Veteran status	445	22.1%	504	18.7%	-3.33%	0.005

Table 31: Stratification of Racial Differences by Gender, Ethnicity, and Chronic Homelessness

			MH Test for Homogeneity of stratified ORs		Unadjusted /Crude Racial Diff		Adjusted /Collapsed MH	
			chi2	p	OR	p	OR	p
Ethnicity								
	Hispanic		0.18	0.6681	6.042238	0	6.038799	0
	Non-Hisp							
Age			10.61	0.0011	Test of homogeneity (equal odds):	0.0409	1.000901	0.7008
	Age ≥ 65		0.31	0.5758	1.458777	0.0167	1.484545	0.0128
History								
	Number of times homeless in past 3 years		3.6	0.0578	Test of homogeneity (equal odds):	0.9598	1.01121	0.6645
	% > 3		1.7	0.1928	1.048525	0.5312	1.048782	0.529
	Months homeless in past 3 years		3.29	0.0695	Test of homogeneity (equal odds):	0.2746	1.009382	0.2713
	% >= 12		4.11	0.0426	1.043445	0.5918	1.044959	0.5802
	Street or Shelter Entry into Program		1.75	0.186	1.280028	0.0054	1.2807	0.0053
	Chronic Homeless**		0.15	0.7014	0.907943	0.1052	0.909095	0.1103
	Veteran status		8.12	0.0044	0.912086	0.211	0.909544	0.2084
Homelessness								
1	>= 2 years	1	2.37	0.1237	0.877439	0.0293	0.876056	0.0279
2	Housed & homeless again in past 3 yrs		0.08	0.7732	Test of homogeneity (equal odds):	0.1725	1.009133	0.4684
		<1			1	.		
		1			0.981001	0.8051		
		2			1.085623	0.3882		

				3		1.146575	0.2641
				4		1.142365	0.2945
				5		1.041141	0.7953
				6		2.019752	0.0041
				7		0.754386	0.3974
				8		0.969925	0.9318
				9		1.905817	0.3346
				>=10		0.905817	0.5243
Utilization							
3	ED in past 6 mo (0- >=10)	0	0.9823	Test of homogeneity (equal odds):	0.0008	1.040033	0.0006
4	Police interx in past 6 mo (0- >=10)	2.27	0.1318	Test of homogeneity (equal odds):	0.0034	1.038933	0.0003
5	Ambulance in past 6 mo (0- >=10)	0.45	0.5011	Test of homogeneity (equal odds):	0	1.081844	0
6	Crisis services in past 6 mo (0- >=10)	0.76	0.3833	Test of homogeneity (equal odds):	0.0732	1.039714	0.0399
7	Hospitalizations in past 6 mo (0- >=10)	0	0.9949	Test of homogeneity (equal odds):	0	1.082816	0
History							
8	Attacked while homeless	0.39	0.5348	1.266083	0.0001	1.266152	0.0001
9	Harm self or others in past year	0.98	0.321	1.227024	0.0036	1.226079	0.0038
10	Legal 'stuff' pending	0.01	0.9338	1.262146	0.0002	1.26521	0.0002
11	Force or trick to do anything	0.55	0.4582	1.468902	0	1.482952	0
12	Risk behaviors	1.58	0.2086	1.422681	0	1.422024	0
Sleep most often		0.08	0.7765	Test of homogeneity (equal odds):	0	1.01758	0.2831
13	Street, Sidewalk or Doorway			1	.		
	Beach, Riverbed or Park			1.624134	0		

	Bus or Subway			0.314148	0		
	Car, Van or RV			0.995649	0.9615		
	Shelter			1.077766	0.3459		
	Other (Specify)			1.543521	0.0001		
	Total % Unsheltered	8.12	0.0044	1.055343	0.4166	1.056124	0.4094
14	Anyone think you owe them money?	0.44	0.5065	1.287752	0	1.28947	0
15	Any income source?	1.15	0.2828	0.653078	0	0.652206	0
16	Enough money to meet expenses?	0.56	0.4531	0.749801	0.0005	0.749317	0.0005
17	Activities that cause happiness or fulfillment?	0.64	0.4223	0.920716	0.1724	0.919981	0.1685
18	People you don't like in your life?	3.59	0.0582	0.956301	0.4673	0.956992	0.4752
19	Negative social influences?	0.04	0.8453	1.181015	0.0093	1.18288	0.0087
20	Signs of poor hygiene or negative ADLs?	0.96	0.328	1.258253	0.0001	1.259533	0.0001
Main healthcare location		0.76	0.3829	Test of homogeneity (equal odds):	0.0133	0.981117	0.4663
21	Does not go for care (1pt)	0.01	0.934	1.214609	0.0063	1.218738	0.0055
	Hospital			0.79069	0.0026		
	VA			0.759602	0.0123		
	Clinic			0.914123	0.2963		
	Other (Specify)			0.693137	0.1967		
Med History							
22	Renal dialysis	1.5	0.2213	1.168554	0.2537	1.167658	0.2561
23	Frostbite /hypothermia	1.94	0.1639	1.248686	0.0508	1.259811	0.0428
24	Liver disease /cirrhosis	0.54	0.4641	2.181261	0	2.181946	0
25	HIV/ AIDS	0.03	0.8555	0.704985	0.0073	0.704821	0.0073
26	Heat stroke /exhaustion	0.77	0.3805	1.911026	0	1.91558	0
27	Heart Disease /Arrhythmia	0.14	0.7047	1.016199	0.8141	1.015283	0.8245

28	Emphysema	2.44	0.1182	2.334391	0	2.331687	0
29	Diabetes	1.24	0.2659	0.883506	0.1548	0.882779	0.1521
30	Asthma	0.83	0.3634	1.136763	0.071	1.13882	0.0705
31	Cancer	5.16	0.0231	1.72732	0	1.734463	0
32	Hepatitis C	2.71	0.1	1.73314	0	1.735022	0
33	Tuberculosis	0.61	0.4344	0.695002	0.0027	0.693946	0.0027
34	Signs of a serious health condition?	0.1	0.7494	1.33348	0	1.332811	0
35	Problematic drug or alcohol use	0.07	0.7977	1.713947	0	1.727016	0
36	Alcohol /drug use almost daily for past month	0.04	0.8511	1.292577	0.0018	1.295484	0.0017
37	IDU in past 6 months	0.9	0.3421	4.259332	0	4.26742	0
38	Treated and relapsed-Ever?	6.52	0.0107	1.435298	0	1.440895	0
39	Non-beverage alcohol use past 6 mo?	0.65	0.4204	1.211275	0.2366	1.211746	0.2361
40	Blacked out in past month from drug /alcohol use	0.04	0.8342	1.85617	0	1.859559	0
41	Signs of serious /problematic drug /alcohol use?	0.28	0.5987	1.703285	0	1.707515	0
42	Mental health hospital against will?	0.12	0.7329	1.421061	0	1.420847	0
43	ED visit for emotions or nerves?	1.28	0.2571	1.251768	0.0002	1.251087	0.0003
44	Spoken with a mental health professional in last 6 months?	0	0.961	1.229829	0.0005	1.229398	0.0005
45	Serious brain injury or head trauma ever?	0.11	0.7425	1.603108	0	1.603528	0
46	Learning disability / developmental disability ever?	0.43	0.5118	0.991429	0.8913	0.990666	0.8816
47	Problems concentrating or remembering things?	1.05	0.3059	1.385181	0	1.389987	0

48	Signs or symptoms of severe, persistent mental illness or severely compromised cognitive functioning?	0.54	0.462	1.196322	0.0034	1.195762	0.0035
49	Medication non-adherence?	0.59	0.4411	1.332549	0	1.331784	0
50	Abuse or trauma - untreated or cause of homelessness?	0.06	0.8066	1.460953	0	1.480225	0
	VI SPDAT at entry	0.16	0.6886	Test of homogeneity (equal odds):	0	1.083595	0
Recommendation		0.3	0.5854	Test of homogeneity (equal odds):	0	0.716178	0
	PSH			1	.		
	RRH			0.713819	0		
	Self-Resolve			0.527034	0		

		MH Test for Homogeneity of stratified ORs		Unadjusted /Crude Racial Diff		Adjusted /Collapsed MH	
		chi2	p	OR	p	OR	p
Gender		1.33	0.2482	Test of homogeneity (equal odds):	0.9077	0.998922	0.9866
	Male			1	.		
	Female			1.00575	0.9311		
	Female to Male			2.076809	0.5178		
	Male to Female			1.186748	0.7193		
	Binary Gender (%F)	0.2	0.6567	1.007334	0.9118	1.001229	0.9857

Age			5.04	0.0247	Test of homogeneity (equal odds):	0.0409	1.005516	0.0238
	Age ≥ 65		0.55	0.4594	1.458777	0.0167	1.607486	0.0029
History								
	Number of times homeless in past 3 years		0.06	0.8078	Test of homogeneity (equal odds):	0.9598	1.024186	0.3698
	% > 3		0.02	0.8827	1.048525	0.5312	1.077192	0.3434
	Months homeless in past 3 years		0.08	0.7775	Test of homogeneity (equal odds):	0.2746	1.008701	0.3227
	% >= 12		0.06	0.8118	1.043445	0.5918	1.041445	0.6208
	Street or Shelter Entry into Program		0.18	0.674	1.280028	0.0054	1.247693	0.0167
	Chronic Homeless**		0	0.9926	0.907943	0.1052	0.900461	0.0903
	Veteran status		1.5	0.2209	0.912086	0.211	0.986502	0.8572
Homelessness								
1	>= 2 years	1	0.3	0.5813	0.877439	0.0293	0.89376	0.0712
2	Housed & homeless again in past 3 yrs		1	0.3168	Test of homogeneity (equal odds):	0.1725	1.008981	0.4913
	<1				1	.		
	1				0.981001	0.8051		
	2				1.085623	0.3882		
	3				1.146575	0.2641		
	4				1.142365	0.2945		
	5				1.041141	0.7953		
	6				2.019752	0.0041		
	7				0.754386	0.3974		
	8				0.969925	0.9318		
	9				1.905817	0.3346		
	>=10				0.905817	0.5243		
Utilization								

3	ED in past 6 mo (0- >=10)	1.24	0.2653	Test of homogeneity (equal odds):	0.0008	1.040537	0.0008
4	Police interx in past 6 mo (0- >=10)	2.29	0.1299	Test of homogeneity (equal odds):	0.0034	1.042531	0.0002
5	Ambulance in past 6 mo (0- >=10)	1.66	0.1974	Test of homogeneity (equal odds):	0	1.086574	0
6	Crisis services in past 6 mo (0- >=10)	0.2	0.6576	Test of homogeneity (equal odds):	0.0732	1.031238	0.1227
7	Hospitalizations in past 6 mo (0- >=10)	1.22	0.2697	Test of homogeneity (equal odds):	0	1.089014	0
History							
8	Attacked while homeless	2.01	0.1564	1.266083	0.0001	1.282304	0.0001
9	Harm self or others in past year	9.29	0.0023	1.227024	0.0036	1.24194	0.0026
10	Legal 'stuff' pending	4.21	0.0401	1.262146	0.0002	1.258933	0.0003
11	Force or trick to do anything	4.89	0.0271	1.468902	0	1.511889	0
12	Risk behaviors	3.92	0.0476	1.422681	0	1.467134	0
Sleep most often		0.01	0.9139	Test of homogeneity (equal odds):	0	1.019845	0.2415
13	Street, Sidewalk or Doorway			1	.		
	Beach, Riverbed or Park			1.624134	0		
	Bus or Subway			0.314148	0		
	Car, Van or RV			0.995649	0.9615		
	Shelter			1.077766	0.3459		
	Other (Specify)			1.543521	0.0001		
	Total % Unsheltered	0.89	0.3452	1.055343	0.4166	1.037603	0.5926
14	Anyone think you owe them money?	2.91	0.0879	1.287752	0	1.342102	0

15	Any income source?	1.38	0.2399	0.653078	0	0.670962	0
16	Enough money to meet expenses?	0.85	0.357	0.749801	0.0005	0.785336	0.0053
17	Activities that cause happiness or fulfillment?	0.67	0.4117	0.920716	0.1724	0.908674	0.1281
18	People you don't like in your life?	0.75	0.3877	0.956301	0.4673	0.942107	0.3511
19	Negative social influences?	13.72	0.0002	1.181015	0.0093	1.223736	0.002
20	Signs of poor hygiene or negative ADLs?	9.65	0.0019	1.258253	0.0001	1.324765	0
Main healthcare location		0.89	0.3455	Test of homogeneity (equal odds):	0.0133	0.985192	0.5817
21	Does not go for care (1pt)	1.84	0.1747	1.214609	0.0063	1.229319	0.0048
	Hospital			0.79069	0.0026		
	VA			0.759602	0.0123		
	Clinic			0.914123	0.2963		
	Other (Specify)			0.693137	0.1967		
Med History							
22	Renal dialysis	0	0.9706	1.168554	0.2537	1.12694	0.3999
23	Frostbite /hypothermia	0.89	0.3446	1.248686	0.0508	1.346122	0.0102
24	Liver disease /cirrhosis	0.02	0.8855	2.181261	0	2.235956	0
25	HIV/ AIDS	0.01	0.9229	0.704985	0.0073	0.707742	0.0109
26	Heat stroke /exhaustion	10.37	0.0013	1.911026	0	1.984842	0
27	Heart Disease /Arrhythmia	2.58	0.1082	1.016199	0.8141	1.066429	0.3601
28	Emphysema	4.93	0.0264	2.334391	0	2.727915	0
29	Diabetes	4.01	0.0451	0.883506	0.1548	0.785146	0.0092
30	Asthma	0.91	0.3389	1.136763	0.071	1.14	0.0739
31	Cancer	8.51	0.0035	1.72732	0	1.895665	0
32	Hepatitis C	1.28	0.2578	1.73314	0	1.826201	0
33	Tuberculosis	0.04	0.8438	0.695002	0.0027	0.707418	0.0062

34	Signs of a serious health condition?	0.01	0.9168	1.33348	0	1.373962	0
35	Problematic drug or alcohol use	2.24	0.1344	1.713947	0	1.903796	0
36	Alcohol /drug use almost daily for past month	5.27	0.0217	1.292577	0.0018	1.3445	0.0004
37	IDU in past 6 months	21.65	0	4.259332	0	4.392743	0
38	Treated and relapsed-Ever?	0.42	0.5174	1.435298	0	1.578616	0
39	Non-beverage alcohol use past 6 mo?	0.22	0.6395	1.211275	0.2366	1.282499	0.1373
40	Blacked out in past month from drug /alcohol use	3.66	0.0558	1.85617	0	1.88911	0
41	Signs of serious /problematic drug /alcohol use?	7.08	0.0078	1.703285	0	1.7498	0
42	Mental health hospital against will?	12.09	0.0005	1.421061	0	1.469323	0
43	ED visit for emotions or nerves?	10.77	0.001	1.251768	0.0002	1.304294	0
44	Spoken with a mental health professional in last 6 months?	5.91	0.015	1.229829	0.0005	1.270701	0.0001
45	Serious brain injury or head trauma ever?	11.09	0.0009	1.603108	0	1.660683	0
46	Learning disability / developmental disability ever?	2.65	0.1033	0.991429	0.8913	0.95994	0.5311
47	Problems concentrating or remembering things?	0.24	0.6244	1.385181	0	1.382925	0
48	Signs or symptoms of severe, persistent mental illness or severely compromised cognitive functioning?	0.81	0.3679	1.196322	0.0034	1.242346	0.0006

49	Medication non-adherence?	13.82	0.0002	1.332549	0	1.31903	0
50	Abuse or trauma - untreated or cause of homelessness?	17.08	0	1.460953	0	1.517901	0
	VI SPDAT at entry	16.93	0	Test of homogeneity (equal odds):	0	1.094161	0
Recommendation		11.77	0.0006	Test of homogeneity (equal odds):	0	0.684686	0
	PSH			1	.		
	RRH			0.713819	0		
	Self-Resolve			0.527034	0		

		MH Test for Homogeneity of stratified ORs		Unadjusted /Crude Racial Diff		Adjusted /Collapsed MH	
		chi2	p	OR	p	OR	p
Gender		0.13	0.7217	Test of homogeneity (equal odds):	0.9077	1.011847	0.8484
	Male			1	.		
	Female			1.00575	0.9311		
	Female to Male			2.076809	0.5178		
	Male to Female			1.186748	0.7193		
	Binary Gender (%F)	0.15	0.7012	1.007334	0.9118	1.002167	0.9739
Ethnicity							
	Hispanic	0	0.9928	6.042238	0	6.048277	0
	Non-Hisp						

Age			0.16	0.693	Test of homogeneity (equal odds):	0.0409	1.001051	0.6538
	Age ≥ 65		0.35	0.5555	1.458777	0.0167	1.47732	0.0136
History								
	Number of times homeless in past 3 years		5.99	0.0143	Test of homogeneity (equal odds):	0.9598	0.99448	0.8368
	% > 3		4.1	0.0429	1.048525	0.5312	1.008687	0.9115
	Months homeless in past 3 years		0.43	0.5138	Test of homogeneity (equal odds):	0.2746	1.013124	0.1321
	% >= 12		2.45	0.1177	1.043445	0.5918	1.086517	0.3084
	Street or Shelter Entry into Program		0.04	0.8381	1.280028	0.0054	1.290897	0.0041
	Veteran status		0.08	0.7766	0.912086	0.211	0.906484	0.1827
Homelessness								
1	>= 2 years	1	1.25	0.2626	0.877439	0.0293	0.89631	0.1037
2	Housed & homeless again in past 3 yrs		0.11	0.7425	Test of homogeneity (equal odds):	0.1725	1.005756	0.6523
	<1				1	.		
	1				0.981001	0.8051		
	2				1.085623	0.3882		
	3				1.146575	0.2641		
	4				1.142365	0.2945		
	5				1.041141	0.7953		
	6				2.019752	0.0041		
	7				0.754386	0.3974		
	8				0.969925	0.9318		
	9				1.905817	0.3346		
	>=10				0.905817	0.5243		
Utilization								
3	ED in past 6 mo (0->=10)		0.01	0.9105	Test of homogeneity (equal odds):	0.0008	1.040515	0.0005

4	Police interx in past 6 mo (0- >=10)	0.51	0.4757	Test of homogeneity (equal odds):	0.0034	1.040043	0.0002
5	Ambulance in past 6 mo (0- >=10)	0.01	0.9353	Test of homogeneity (equal odds):	0	1.08366	0
6	Crisis services in past 6 mo (0- >=10)	1.76	0.1846	Test of homogeneity (equal odds):	0.0732	1.039715	0.0387
7	Hospitalizations in past 6 mo (0- >=10)	0.05	0.8216	Test of homogeneity (equal odds):	0	1.084173	0
History							
8	Attacked while homeless	0.55	0.4576	1.266083	0.0001	1.287016	0
9	Harm self or others in past year	0.38	0.5351	1.227024	0.0036	1.227851	0.0036
10	Legal 'stuff' pending	0.21	0.6429	1.262146	0.0002	1.265296	0.0002
11	Force or trick to do anything	0.35	0.5538	1.468902	0	1.475705	0
12	Risk behaviors	0.03	0.8546	1.422681	0	1.432577	0
Sleep most often		0	0.9607	Test of homogeneity (equal odds):	0	1.01475	0.369
13	Street, Sidewalk or Doorway			1	.		
	Beach, Riverbed or Park			1.624134	0		
	Bus or Subway			0.314148	0		
	Car, Van or RV			0.995649	0.9615		
	Shelter			1.077766	0.3459		
	Other (Specify)			1.543521	0.0001		
	Total % Unsheltered	6.68	0.0098	1.055343	0.4166	1.068805	0.318
14	Anyone think you owe them money?	1.13	0.2877	1.287752	0	1.284973	0
15	Any income source?	0.27	0.6027	0.653078	0	0.652872	0
16	Enough money to meet expenses?	0.19	0.6649	0.749801	0.0005	0.747691	0.0005

17	Activities that cause happiness or fulfillment?	0.02	0.8924	0.920716	0.1724	0.913475	0.1362
18	People you don't like in your life?	0	0.9815	0.956301	0.4673	0.956685	0.4715
19	Negative social influences?	1.11	0.2921	1.181015	0.0093	1.188657	0.007
20	Signs of poor hygiene or negative ADLs?	0.06	0.8093	1.258253	0.0001	1.274623	0
Main healthcare location		1.33	0.2484	Test of homogeneity (equal odds):	0.0133	0.980025	0.4402
21	Does not go for care	0.04	0.8499	1.214609	0.0063	1.220121	0.0052
	Hospital			0.79069	0.0026		
	VA			0.759602	0.0123		
	Clinic			0.914123	0.2963		
	Other (Specify)			0.693137	0.1967		
Med History							
22	Renal dialysis	0.02	0.8784	1.168554	0.2537	1.171697	0.2459
23	Frostbite /hypothermia	0.52	0.4727	1.248686	0.0508	1.265053	0.0389
24	Liver disease /cirrhosis	2.85	0.0914	2.181261	0	2.206486	0
25	HIV/ AIDS	1.51	0.2187	0.704985	0.0073	0.70493	0.0074
26	Heat stroke /exhaustion	0.05	0.827	1.911026	0	1.922806	0
27	Heart Disease /Arrhythmia	6.74	0.0094	1.016199	0.8141	1.019919	0.7725
28	Emphysema	0.58	0.4469	2.334391	0	2.352448	0
29	Diabetes	0.34	0.5589	0.883506	0.1548	0.88724	0.1695
30	Asthma	0.59	0.4422	1.136763	0.071	1.139805	0.0655
31	Cancer	0.28	0.5976	1.72732	0	1.733379	0
32	Hepatitis C	0.02	0.8796	1.73314	0	1.763943	0
33	Tuberculosis	0.54	0.4638	0.695002	0.0027	0.701091	0.0034
34	Signs of a serious health condition?	3.23	0.0724	1.33348	0	1.338173	0
35	Problematic drug or alcohol use	1.04	0.309	1.713947	0	1.732612	0

36	Alcohol /drug use almost daily for past month	2.79	0.0946	1.292577	0.0018	1.302521	0.0013
37	IDU in past 6 months	1.6	0.2055	4.259332	0	4.297917	0
38	Treated and relapsed-Ever?	0.03	0.8563	1.435298	0	1.446273	0
39	Non-beverage alcohol use past 6 mo?	0.91	0.341	1.211275	0.2366	1.222581	0.2158
40	Blacked out in past month from drug /alcohol use	0.97	0.3243	1.85617	0	1.864473	0
41	Signs of serious /problematic drug /alcohol use?	1.61	0.2047	1.703285	0	1.712081	0
42	Mental health hospital against will?	0.21	0.6483	1.421061	0	1.423736	0
43	ED visit for emotions or nerves?	0.23	0.628	1.251768	0.0002	1.256446	0.0002
44	Spoken with a mental health professional in last 6 months?	8.94	0.0028	1.229829	0.0005	1.230269	0.0005
45	Serious brain injury or head trauma ever?	0.03	0.8543	1.603108	0	1.614365	0
46	Learning disability / developmental disability ever?	1.58	0.2088	0.991429	0.8913	0.996539	0.9562
47	Problems concentrating or remembering things?	1	0.3185	1.385181	0	1.394169	0
48	Signs or symptoms of severe, persistent mental illness or severely compromised cognitive functioning?	1.61	0.2042	1.196322	0.0034	1.204235	0.0024
49	Medication non-adherence?	1.55	0.2134	1.332549	0	1.338718	0
50	Abuse or trauma - untreated or cause of homelessness?	0	0.9907	1.460953	0	1.47062	0

VI SPDAT at entry	0.56	0.4528	Test of homogeneity (equal odds):	0	1.090535	0
Recommendation	0.58	0.446	Test of homogeneity (equal odds):	0	0.6987	0
PSH			1	.		
RRH			0.713819	0		
Self-Resolve			0.527034	0		

Table 32: Stratification of Gender Differences by Gender, Ethnicity, and Chronic Homelessness

	MH Test for Homogeneity of stratified ORs		**Unadjusted /Crude Gender Diff**		**Adjusted /Collapsed MH**	
	chi2	p	OR	p	OR	p
Ethnicity						
Hispanic	0.2	0.6566	1.029667	0.7273	1.029195	0.7406
Non-Hisp						
Age	11.39	0.0007	test of homogeneity (equal odds):	0.0001	0.984733	<0.0001
Age ≥ 65	0.31	0.5757	0.673401	0.0297	0.672534	0.0294
History						
Number of times homeless in past 3 years	3.68	0.0551	test of homogeneity (equal odds):	0.114	1.074203	0.0115
% > 3	1.7	0.1928	1.203016	0.0234	1.20306	0.0233
Months homeless in past 3 years	3.19	0.074	test of homogeneity (equal odds):	0.0047	0.968872	0.0005
% >= 12	4.08	0.0433	0.723207	0.0001	0.723318	0.0001
Street or Shelter Entry into Program	1.76	0.1851	1.067744	0.5133	1.067634	0.5146
Chronic Homeless**	0.15	0.7015	0.801271	0.0008	0.801293	0.0008

	Veteran status	7.75	0.0054	0.166981	<0.0001	0.166893	<0.0001
Homelessness							
1	< 2 years						
	>= 2 years	2.35	0.1251	0.7084608	<0.0001	0.708665	<0.0001
2	Housed & homeless again in past 3 yrs	0.01	0.914	test of homogeneity (equal odds):	<0.0001	1.075337	<0.0001
	<1			1	.		
	1			1.299364	0.0031		
	2			1.355619	0.0041		
	3			1.241281	0.1122		
	4			1.582362	0.0007		
	5			1.697262	0.0012		
	6			1.402264	0.163		
	7			0.522478	0.1742		
	8			1.070035	0.8695		
	9			1.910777	0.2964		
	>=10			2.478039	0		
Utilization							
3	ED in past 6 mo (0- >=10)	0	0.9919	test of homogeneity (equal odds):	<0.0001	1.101327	<0.0001
4	Police interx in past 6 mo (0- >=10)	2.5	0.1138	test of homogeneity (equal odds):	0.6617	0.978164	0.0596
5	Ambulance in past 6 mo (0- >=10)	0.54	0.4623	test of homogeneity (equal odds):	0.2195	1.03152	0.082
6	Crisis services in past 6 mo (0- >=10)	1.13	0.2882	test of homogeneity (equal odds):	<0.0001	1.16774	<0.0001
7	Hospitalizations in past 6 mo (0- >=10)	0.01	0.9312	test of homogeneity (equal odds):	0.7259	0.977646	0.2697
History							
8	Attacked while homeless	0.38	0.5356	1.41901	<0.0001	1.419643	<0.0001

9	Harm self or others in past year	0.99	0.3208	1.06485	0.4068	1.064471	0.4095
10	Legal 'stuff' pending	0.01	0.9337	0.795809	0.0009	0.794988	0.0009
11	Force or trick to do anything	0.54	0.4608	1.985751	<0.00001	1.991678	<0.0001
12	Risk behaviors	1.59	0.207	0.937894	0.4231	0.936567	0.4146
Sleep most often							
13	Street, Sidewalk or Doorway Beach, Riverbed or Park Bus or Subway Car, Van or RV Shelter Other (Specify) Total % Unsheltered	8.12	0.0044	0.925381	0.2836	0.925435	0.283
14	Anyone think you owe them money?	0.44	0.5062	1.165088	0.0186	1.165183	0.0187
15	Any income source?	1.16	0.281	1.114351	0.0951	1.116142	0.0915
16	Enough money to meet expenses?	0.56	0.453	0.813561	0.0311	0.813629	0.0313
17	Activities that cause happiness or fulfillment?	0.64	0.4224	0.916868	0.1937	0.916964	0.1942
18	People you don't like in your life?	3.57	0.0587	1.385493	<0.0001	1.3852	<0.0001
19	Negative social influences?	0.04	0.8453	1.166951	0.0251	1.166667	0.0255
20	Signs of poor hygiene or negative ADLs?	0.96	0.3276	0.992476	0.9074	0.992054	0.9023
Main healthcare location							
21	Does not go for care Hospital VA Clinic Other (Specify)	0.01	0.9341	0.754807	0.0004	0.754202	0.0004
Med History							

22	Renal dialysis	1.5	0.2212	1.334026	0.0395	1.3339	0.0396
23	Frostbite /hypothermia	1.93	0.1645	0.582378	0.0001	0.582319	0.0001
24	Liver disease /cirrhosis	0.54	0.4612	0.833903	0.0918	0.830872	0.0876
25	HIV/ AIDS	0.03	0.8555	0.678788	0.0146	0.679013	0.0148
26	Heat stroke /exhaustion	0.78	0.3766	1.031506	0.6658	1.030834	0.6749
27	Heart Disease /Arrhythmia	0.14	0.7049	1.196864	0.0145	1.196838	0.0145
28	Emphysema	2.47	0.1158	1.126029	0.3531	1.125915	0.3564
29	Diabetes	1.24	0.266	1.161461	0.1111	1.161672	0.1106
30	Asthma	0.81	0.3689	2.237534	<0.0001	2.238662	<0.0001
31	Cancer	5.11	0.0238	2.291346	<0.0001	2.29382	<0.0001
32	Hepatitis C	2.74	0.098	0.774087	0.0028	0.770659	0.0025
33	Tuberculosis	0.61	0.4359	0.411603	<0.0001	0.411666	<0.0001
34	Signs of a serious health condition?	0.1	0.7491	1.216523	0.0057	1.216795	0.0057
35	Problematic drug or alcohol use	0.07	0.7969	0.635346	<0.0001	0.629387	<0.0001
36	Alcohol /drug use almost daily for past month	0.04	0.8515	0.562286	<0.0001	0.561397	<0.0001
37	IDU in past 6 months	0.92	0.337	0.748826	0.0284	0.742503	0.0257
38	Treated and relapsed- Ever?	6.52	0.0107	0.61589	<0.0001	0.612682	<0.0001
39	Non-beverage alcohol use past 6 mo?	0.65	0.4205	0.614739	0.0125	0.614382	0.0125
40	Blacked out in past month from drug /alcohol use	0.04	0.834	0.62091	0.0002	0.618549	0.0002
41	Signs of serious /problematic drug /alcohol use?	0.28	0.5976	0.670436	<0.0001	0.667039	<0.0001

42	Mental health hospital against will?	0.12	0.7324	1.317319	0.0003	1.318448	0.0003
43	ED visit for emotions or nerves?	1.29	0.2566	1.309922	<0.0001	1.31064	<0.0001
44	Spoken with a mental health professional in last 6 months?	0	0.961	1.371762	<0.0001	1.372349	<0.0001
45	Serious brain injury or head trauma ever?	0.11	0.7412	0.835057	0.0096	0.83257	0.0089
46	Learning disability / developmental disability ever?	0.43	0.5117	1.000878	0.9899	1.000892	0.9897
47	Problems concentrating or remembering things?	1.04	0.3077	1.600296	<0.0001	1.602689	<0.0001
48	Signs or symptoms of severe, persistent mental illness or severely compromised cognitive functioning?	0.54	0.4628	1.33974	<0.0001	1.339823	<0.0001
49	Medication non-adherence?	0.6	0.4399	1.224176	0.002	1.225022	0.002
50	Abuse or trauma - untreated or cause of homelessness?	0.06	0.8091	2.342171	<0.0001	2.357544	<0.0001
	VI SPDAT at entry	0	0.9982	test of homogeneity (equal odds):	0.0812	1.016358	0.1091
Recommendation	PSH	0.39	0.5327	test of homogeneity (equal odds): 1	0.1698	0.910017	0.1009

	RRH			0.946825	0.4459		
	Self-Resolve			0.731364	0.0711		

		MH Test for Homogeneity of stratified ORs		Unadjusted /Crude Gender Diff		Adjusted /Collapsed MH	
		chi2	p	OR	p	OR	p
Race		0.31	0.5778	test of homogeneity (equal odds):	0.2754	0.990606	0.7929
	White			1			
	Black/AA			0.977446	0.7369		
	Asian			0.984533	0.9702		
	American Indian			1.50365	0.0697		
	Hawaiian / Pacific Islander			1.615249	0.3972		
	Refused			0.534703	0.158		
	White vs Other	0.2	0.6567	1.007334	0.9118	1.001229	0.9857
Age		0	0.9565	test of homogeneity (equal odds):	0.0001	0.984667	<0.0001
	Age ≥ 65	0	0.9614	0.673401	0.0297	0.674294	0.0304
History							
	Number of times homeless in past 3 years	2.44	0.1182	test of homogeneity (equal odds):	0.114	1.074174	0.0116
	% > 3	1.97	0.1605	1.203016	0.0234	1.202934	0.0234
	Months homeless in past 3 years	1.49	0.2225	test of homogeneity (equal odds):	0.0047	0.968801	0.0005
	% >= 12	1.38	0.2393	0.723207	0.0001	0.722843	0.0001
	Street or Shelter Entry into Program	1.26	0.2613	1.067744	0.5133	1.067638	0.5138
	Chronic Homeless**	0.54	0.4609	0.801271	0.0008	0.801268	0.0008
	Veteran status	0.02	0.8824	0.166981	<0.0001	0.16644	<0.0001

Homelessness							
1	>= 2 years	0.54	0.4644	0.708461	<0.0001	0.708798	<0.0001
2	Housed & homeless again in past 3 yrs	0.13	0.7199	test of homogeneity (equal odds):	<0.0001	1.075327	<0.0001
	<1			1			
	1			1.299364	0.0031		
	2			1.355619	0.0041		
	3			1.241281	0.1122		
	4			1.582362	0.0007		
	5			1.697262	0.0012		
	6			1.402264	0.163		
	7			0.522478	0.1742		
	8			1.070035	0.8695		
	9			1.910777	0.2964		
	>=10			2.478039	<0.0001		
Utilization							
3	ED in past 6 mo (0- >=10)	2.39	0.1222	test of homogeneity (equal odds):	<0.0001	1.101107	<0.0001
4	Police interx in past 6 mo (0- >=10)	1.1	0.2944	test of homogeneity (equal odds):	0.6617	0.978316	0.0612
5	Ambulance in past 6 mo (0- >=10)	0.7	0.4029	test of homogeneity (equal odds):	0.2195	1.031526	0.0812
6	Crisis services in past 6 mo (0- >=10)	0.11	0.7426	test of homogeneity (equal odds):	<0.0001	1.167477	<0.0001
7	Hospitalizations in past 6 mo (0- >=10)	0.89	0.3465	test of homogeneity (equal odds):	0.7259	0.977884	0.274
History							
8	Attacked while homeless	0.1	0.7552	1.41901	<0.0001	1.418886	<0.0001
9	Harm self or others in past year	1.59	0.207	1.06485	0.4068	1.06483	0.4069
10	Legal 'stuff' pending	0.65	0.4213	0.795809	0.0009	0.79543	0.0009
11	Force or trick to do anything	0.36	0.5467	1.985751	<0.0001	1.986052	<0.0001

12	Risk behaviors	2.56	0.1094	0.937894	0.4231	0.938093	0.4245
Sleep most often							
13	Street, Sidewalk or Doorway Beach, Riverbed or Park Bus or Subway Car, Van or RV Shelter Other (Specify) Total % Unsheltered	0.04	0.8375	0.925381	0.2836	0.924985	0.2811
14	Anyone think you owe them money?	0.5	0.4799	1.165088	0.0186	1.165599	0.0183
15	Any income source?	0.91	0.3393	1.114351	0.0951	1.115829	0.0913
16	Enough money to meet expenses?	0.31	0.5781	0.813561	0.0311	0.814224	0.0319
17	Activities that cause happiness or fulfillment?	0.05	0.83	0.916868	0.1937	0.916768	0.1932
18	People you don't like in your life?	2.11	0.1468	1.385493	<0.0001	1.38517	<0.0001
19	Negative social influences?	0.26	0.6121	1.166951	0.0251	1.167732	0.0245
20	Signs of poor hygiene or negative ADLs?	0	0.971	0.992476	0.9074	0.993112	0.9152
Main healthcare location							
21	Does not go for care Hospital VA Clinic Other (Specify)	0.5	0.478	0.754807	0.0004	0.754819	0.0004
Med History							
22	Renal dialysis	0.02	0.8944	1.334026	0.0395	1.33284	0.0402
23	Frostbite /hypothermia	0.48	0.487	0.582378	0.0001	0.582836	0.0001
24	Liver disease /cirrhosis	3.01	0.0827	0.833903	0.0918	0.833676	0.0909

25	HIV/ AIDS	0.03	0.8586	0.678788	0.0146	0.679182	0.0148
26	Heat stroke /exhaustion	0.19	0.6607	1.031506	0.6658	1.031506	0.6659
27	Heart Disease /Arrhythmia	1.38	0.2394	1.196864	0.0145	1.197979	0.014
28	Emphysema	0.07	0.7871	1.126029	0.3531	1.129774	0.3409
29	Diabetes	0.1	0.7576	1.161461	0.1111	1.159853	0.115
30	Asthma	0.04	0.8395	2.237534	<0.0001	2.237268	<0.0001
31	Cancer	0.42	0.5146	2.291346	<0.0001	2.297443	<0.0001
32	Hepatitis C	0.64	0.4238	0.774087	0.0028	0.774345	0.0028
33	Tuberculosis	2.96	0.0851	0.411603	<0.0001	0.412117	<0.0001
34	Signs of a serious health condition?	0.01	0.9227	1.216745	0.0057	1.216523	0.0057
35	Problematic drug or alcohol use	3.39	0.0657	0.635346	<0.0001	0.63596	<0.0001
36	Alcohol /drug use almost daily for past month	0.17	0.6844	0.562286	<0.0001	0.562482	<0.0001
37	IDU in past 6 months	0.18	0.6706	0.748826	0.0284	0.749197	0.0287
38	Treated and relapsed- Ever?	2.06	0.1517	0.61589	<0.0001	0.616238	<0.0001
39	Non-beverage alcohol use past 6 mo?	1.02	0.3127	0.614739	0.0125	0.615231	0.0127
40	Blacked out in past month from drug /alcohol use	0.36	0.5487	0.62091	0.0002	0.620811	0.0002
41	Signs of serious /problematic drug /alcohol use?	0.46	0.4957	0.670436	<0.0001	0.67039	<0.0001
42	Mental health hospital against will?	0.02	0.8767	1.317319	0.0003	1.317723	0.0003
43	ED visit for emotions or nerves?	4.06	0.0438	1.309922	<0.0001	1.310281	<0.0001
44	Spoken with a mental health	2.26	0.1329	1.371762	<0.0001	1.371996	<0.0001

	professional in last 6 months?						
45	Serious brain injury or head trauma ever?	0.3	0.5819	0.835057	0.0096	0.835154	0.0097
46	Learning disability / developmental disability ever?	0.21	0.6456	1.000878	0.9899	1.000338	0.9961
47	Problems concentrating or remembering things?	0	0.9555	1.600296	<0.0001	1.599852	<0.0001
48	Signs or symptoms of severe, persistent mental illness or severely compromised cognitive functioning?	4.38	0.0364	1.33974	<0.0001	1.339992	<0.0001
49	Medication non-adherence?	1.23	0.2668	1.224176	0.002	1.223776	0.0021
50	Abuse or trauma - untreated or cause of homelessness?	2.84	0.092	2.342171	<0.0001	2.340791	<0.0001
	VI SPDAT at entry	2.33	0.1273	test of homogeneity (equal odds):	0.0812	1.016316	0.1072
Recommendation		6.06	0.0139	test of homogeneity (equal odds):	0.1698	0.909933	0.0991
	PSH			1			
	RRH			0.946825	0.4459		
	Self-Resolve			0.731364	0.0711		

	MH Test for Homogeneity of stratified ORs	Unadjusted /Crude Gender Diff	Adjusted /Collapsed MH

		chi2	p	OR	p	OR	p
Race		0.02	0.8811	test of homogeneity (equal odds):	0.2754	0.991653	0.8154
	White			1			
	Black/AA			0.977446	0.7369		
	Asian			0.984533	0.9702		
	American Indian			1.50365	0.0697		
	Hawaiian / Pacific Islander			1.615249	0.3972		
	Refused			0.534703	0.158		
	White vs Other	0.15	0.7012	1.007334	0.9118	1.002167	0.9739
Ethnicity							
	Hispanic	0.54	0.4606	1.029667	0.7273	1.029927	0.7251
Age		8.84	0.0029	test of homogeneity (equal odds):	0.0001	0.985465	<0.0001
	Age ≥ 65	1.56	0.2121	0.673401	0.0297	0.688655	0.0414
History							
	Number of times homeless in past 3 years	3.62	0.0572	test of homogeneity (equal odds):	0.114	1.036893	0.218
	% > 3	5.48	0.0192	1.203016	0.0234	1.103054	0.2378
	Months homeless in past 3 years	4.44	0.0352	test of homogeneity (equal odds):	0.0047	0.973982	0.0044
	% >= 12	2.04	0.1535	0.723207	0.0001	0.761727	0.0019
	Street or Shelter Entry into Program	6.87	0.0087	1.067744	0.5133	1.084443	0.4162
	Veteran status	0.34	0.5601	0.166981	<0.0001	0.162754	<0.0001
Homelessness							
1	< 2 years						
	>= 2 years	3.16	0.0756	0.708461	<0.0001	0.7379	<0.0001
2	Housed & homeless again in past 3 yrs	8.85	0.0029	test of homogeneity (equal odds):	<0.0001	1.068374	<0.0001

		<1			1		
		1			1.299364	0.0031	
		2			1.355619	0.0041	
		3			1.241281	0.1122	
		4			1.582362	0.0007	
		5			1.697262	0.0012	
		6			1.402264	0.163	
		7			0.522478	0.1742	
		8			1.070035	0.8695	
		9			1.910777	0.2964	
		>=10			2.478039	<0.0001	
Utilization							
3	ED in past 6 mo (0- >=10)	1.66	0.1976	test of homogeneity (equal odds):	<0.0001	1.103911	<0.0001
4	Police interx in past 6 mo (0- >=10)	0.96	0.327	test of homogeneity (equal odds):	0.6617	0.98126	0.1094
5	Ambulance in past 6 mo (0- >=10)	7.68	0.0056	test of homogeneity (equal odds):	0.2195	1.035123	0.0538
6	Crisis services in past 6 mo (0- >=10)	1.24	0.2663	test of homogeneity (equal odds):	<0.0001	1.168219	<0.0001
7	Hospitalizations in past 6 mo (0- >=10)	4.02	0.0449	test of homogeneity (equal odds):	0.7259	0.980858	0.3474
History							
8	Attacked while homeless	0.1	0.7508	1.41901	<0.0001	1.469391	<0.0001
9	Harm self or others in past year	0.12	0.7255	1.06485	0.4068	1.066283	0.3976
10	Legal 'stuff' pending	0.16	0.69	0.795809	0.0009	0.79932	0.0012
11	Force or trick to do anything	0.46	0.4979	1.985751	<0.0001	2.010454	<0.0001
12	Risk behaviors	0.2	0.6517	0.937894	0.4231	0.950364	0.5257
Sleep most often		0.52	0.4718	test of homogeneity (equal odds):	<0.0001		<0.0001

13	Street, Sidewalk or Doorway				1		1.114914	
	Beach, Riverbed or Park				0.958549	0.7016		
	Bus or Subway				1.020115	0.9369		
	Car, Van or RV				2.249835	<0.0001		
	Shelter				1.419221	0.0001		
	Other (Specify)				1.587402	0.0001		
	Total % Unsheltered	0.03	0.8578		0.925381	0.2836	0.950035	0.4815
14	Anyone think you owe them money?	2.32	0.128		1.165088	0.0186	1.15929	0.0231
15	Any income source?	0.07	0.7905		1.114351	0.0951	1.114454	0.0953
16	Enough money to meet expenses?	0.39	0.533		0.813561	0.0311	0.80817	0.0264
17	Activities that cause happiness or fulfillment?	0.03	0.8705		0.901335	0.1213	0.916868	0.1937
18	People you don't like in your life?	0.59	0.4417		1.385493	<0.0001	1.388017	<0.0001
19	Negative social influences?	0.68	0.4097		1.166951	0.0251	1.184068	0.0146
20	Signs of poor hygiene or negative ADLs?	0.02	0.8791		0.992476	0.9074	1.015524	0.8136
Main healthcare location		3.62	0.057	test of homogeneity (equal odds):		<0.0001	1.130471	<0.0001
21	Does not go for care	1.46	0.227		0.754807	0.0004	0.761377	0.0007
	Hospital				1.393584	0.0001		
	VA				0.320201	<0.0001		
	Clinic				1.729443	<0.0001		
	Other (Specify)				2.991175	0.0001		
Med History								
22	Renal dialysis	2.9	0.0884		1.334026	0.0395	1.344463	0.0355
23	Frostbite /hypothermia	9.02	0.0027		0.582378	0.0001	0.598265	0.0002
24	Liver disease /cirrhosis	0.54	0.4613		0.833903	0.0918	0.852648	0.14
25	HIV/ AIDS	0.67	0.4141		0.678788	0.0146	0.679799	0.0149

26	Heat stroke /exhaustion	0	0.9647	1.031506	0.6658	1.042228	0.5656
27	Heart Disease /Arrhythmia	0.5	0.4783	1.196864	0.0145	1.207919	0.0104
28	Emphysema	0.75	0.3866	1.126029	0.3531	1.145554	0.2879
29	Diabetes	0.53	0.4665	1.161461	0.1111	1.174125	0.0884
30	Asthma	0.53	0.4684	2.237534	<0.0001	2.257992	<0.0001
31	Cancer	0.64	0.4235	2.291346	<0.0001	2.30806	<0.0001
32	Hepatitis C	0.07	0.7907	0.774087	0.0028	0.793703	0.0073
33	Tuberculosis	1.59	0.2077	0.411603	<0.0001	0.418738	<0.0001
34	Signs of a serious health condition?	9.89	0.0017	1.216523	0.0057	1.226862	0.004
35	Problematic drug or alcohol use	0.33	0.5667	0.635346	<0.0001	0.644009	<0.0001
36	Alcohol /drug use almost daily for past month	0.3	0.5822	0.562286	<0.0001	0.570065	<0.0001
37	IDU in past 6 months	1.13	0.2888	0.748826	0.0284	0.756076	0.034
38	Treated and relapsed- Ever?	0.1	0.7531	0.61589	<0.0001	0.622816	<0.0001
39	Non-beverage alcohol use past 6 mo?	0.02	0.8885	0.614739	0.0125	0.626194	0.0165
40	Blacked out in past month from drug /alcohol use	0.95	0.3285	0.62091	0.0002	0.625328	0.0002
41	Signs of serious /problematic drug /alcohol use?	0.74	0.3891	0.670436	<0.0001	0.675667	<0.0001
42	Mental health hospital against will?	0.32	0.569	1.317319	0.0003	1.323417	0.0003
43	ED visit for emotions or nerves?	0.66	0.4172	1.309922	<0.0001	1.321254	<0.0001
44	Spoken with a mental health	0.24	0.6258	1.371762	<0.0001	1.374785	<0.0001

	professional in last 6 months?						
45	Serious brain injury or head trauma ever?	2.22	0.136	0.835057	0.0096	0.844592	0.0155
46	Learning disability / developmental disability ever?	0.01	0.925	1.000878	0.9899	1.012663	0.8558
47	Problems concentrating or remembering things?	0.47	0.4947	1.600296	<0.0001	1.624839	<0.0001
48	Signs or symptoms of severe, persistent mental illness or severely compromised cognitive functioning?	0.6	0.4387	1.33974	<0.0001	1.360313	<0.0001
49	Medication non-adherence?	0.01	0.9258	1.224176	0.002	1.23713	0.0012
50	Abuse or trauma - untreated or cause of homelessness?	0.07	0.7897	2.342171	<0.0001	2.384779	<0.0001
	VI SPDAT at entry	0.03	0.8719	test of homogeneity (equal odds):	0.0812	1.02423	0.0196
Recommendation		0.59	0.441	test of homogeneity (equal odds):	0.1698	0.87891	0.0256
	PSH			1			
	RRH			0.946825	0.4459		
	Self-Resolve			0.731364	0.0711		

Table 33: Univariate Negative Binomial Regression tests of total VI-SPDAT score

		Univariate Negative Binomial Model		
		Coeff	IRR (e^coeff)	p
Binary Gender				
	Female & MTF	0.018633	1.018807678	0.111
Gender	Male (ref)		1	
	Female	0.0174411	1.017594084	0.138
	Female to Male	0.0892274	1.093329251	0.61
	Male to Female	0.1039631	1.109559511	0.193
Ethnicity				
	Hispanic	-0.0194905	0.980698212	0.156
Race				
	White (ref)		1	
	Black/AA	-0.1024076	0.902661552	<0.001
	Asian	-0.2044151	0.815123943	0.004
	American Indian	0.0556154	1.05719101	0.138
	Hawaiian / Pacific Islander	-0.086166	0.917441923	0.397
	Refused	0.0008025	1.000802822	0.989
White vs Other	Other (ref)			
	White	0.0938456	1.098390141	<0.001
Age		0.000618	1.000618191	0.136
	>-=65			
Veteran status		-0.0629174	0.939021034	<0.001
History				
	Number of times homeless in past 3 years	0.0557754	1.057360174	<0.001
	>=4			
	Months homeless in past 3 years	0.0259403	1.026279678	<0.001
	% >= 12	0.222332	1.248985972	<0.001
	Street or Shelter Entry into Program	0.1243235	1.132382137	<0.001
	Chronic Homeless**	0.1461414	1.157359827	<0.001

Homelessness				
1	>= 2 years	0.2815191	1.325141306	<0.001
2	Housed & homeless again in past 3 yrs	0.0256876	1.02602037	<0.001
Utilization				
3	ED in past 6 mo (0- >=10)	0.0367481	1.037431659	<0.001
4	Police interx in past 6 mo (0- >=10)	0.0452287	1.046267114	<0.002
5	Ambulance in past 6 mo (0- >=10)	0.0470208	1.04814381	<0.003
6	Crisis services in past 6 mo (0- >=10)	0.0476367	1.048789561	<0.004
7	Hospitalizations in past 6 mo (0- >=10)	0.0524858	1.053887597	<0.005
History				
8	Attacked while homeless	0.3543124	1.42520035	<0.001
9	Harm self or others in past year	*backed up		
10	Legal 'stuff' pending	*not concave		
11	Force or trick to do anything	0.2879247	1.333656876	<0.001
12	Risk behaviors	*not concave		
Sleep most often				
13	Total % Unsheltered (sheltered(5)=ref)	*not concave		
14	Anyone think you owe them money?	0.2135656	1.238084714	<0.001
15	Any income source?	-0.0481579	0.952983299	<0.001
16	Enough money to meet expenses?	-0.2244937	0.79892061	<0.001
17	Activities that cause happiness or fulfillment?	-0.2388912	0.787500558	<0.001
18	People you don’t like in your life?	0.2153273	1.24026777	<0.001
19	Negative social influences?	*not concave		
20	Signs of poor hygiene or negative ADLs?	*not concave		
	Main healthcare location			
21	Does not go for care		1	
	Hospital	-0.07385	0.928811005	<0.001
	VA	-0.2043346	0.815189563	<0.001
	Clinic	-0.1592072	0.852819636	<0.001
	Other (Specify)	-0.2971006	0.742969266	<0.001
	Does not go for care (all other cats =ref)	0.1217464	1.129467632	<0.001
Med History				

22	Renal dialysis	0.2424372	1.274351217	<0.001
23	Frostbite /hypothermia	0.3370418	1.400797616	<0.001
24	Liver disease /cirrhosis	0.3144111	1.369452603	<0.001
25	HIV/ AIDS	0.2084187	1.231728786	<0.001
26	Heat stroke /exhaustion	0.2689283	1.308561314	<0.001
27	Heart Disease /Arrhythmia	0.1708189	1.186275895	<0.001
28	Emphysema	0.2010838	1.222727232	<0.001
29	Diabetes	0.0566434	1.058278361	<0.001
30	Asthma	0.125479	1.133691361	<0.001
31	Cancer	0.1399384	1.150202944	<0.001
32	Hepatitis C	0.2227454	1.24950241	<0.001
33	Tuberculosis	0.122416	1.130224177	<0.001
34	Signs of a serious health condition?	0.1745808	1.190746951	<0.001
35	Problematic drug or alcohol use	0.3807123	1.463326546	<0.001
36	Alcohol /drug use almost daily for past month	0.2885145	1.334443699	<0.001
37	IDU in past 6 months	0.29383	1.34155582	<0.001
38	Treated and relapsed- Ever?	*not concave		
39	Non-beverage alcohol use past 6 mo?	0.2994657	1.349137771	<0.001
40	Blacked out in past month from drug /alcohol use	0.3149703	1.370218615	<0.001
41	Signs of serious /problematic drug /alcohol use?	0.2834816	1.32774445	<0.001
42	Mental health hospital against will?	0.2351726	1.265127111	<0.001
43	ED visit for emotions or nerves?	0.259377	1.296122351	<0.001
44	Spoken with a mental health professional in last 6 months?	0.2116648	1.235733598	<0.001
45	Serious brain injury or head trauma ever?	0.2404357	1.271803154	<0.001
46	Learning disability / developmental disability ever?	0.1752774	1.191576714	<0.001
47	Problems concentrating or remembering things?	*not concave		
48	Signs or symptoms of severe, persistent mental illness or severly compromised cognitive functioning?	0.2111135	1.235052526	<0.001
49	Medication non-adherence?	*not concave		
50	Abuse or trauma - untreated or cause of homelessness?	0.3841298	1.468336019	<0.001

Table 34: Multivariate Negative Binomial Regression tests of total VI-SPDAT score

1) "XB" (demographics)
Final selected models

	n=2,643						n=2,643
	Multivariate GLM family(nbin), link(log)			Multivariate Generalized Neg Binomial Model		Multivariate GEE population averaged model: XT Neg Binomial Model	
	Coeff	IRR (e^coeff)	p	IRR (e^coeff)	p	IRR (e^coeff)	p
whitevother	0.097118	1.10199	0	1.105992	0	1.093794	0
hispyn	-0.05264	0.948723	0.002	0.945979	0.001	0.953768	0
sqrt_age						1.014494	0.017
bin_gender							
veteranyn	-0.06769	0.934549	0	0.936234	0	0.924088	0
numberoft~10	0.129476	1.138232	0	1.132617	0	1.156506	0
oneyearhom~s	0.155698	1.168474	0	1.169504	0	1.166143	0
chronichom~n	0.13443	1.143884	0	1.134941	0	1.143063	0
entryfroms~n	0.119494	1.126926	0	1.129317	0	1.075846	0.001
_cons	1.91406	6.780562	0	6.776616	0	6.300688	0
linktest (hat)		15.45141	0.187				
linktest (hatsq)		-1.43749	0.587				
Wald chi^2				542	0	539.57	0
AIC		17308.41		13151.81		n/a	
BIC		17355.44		13204.72		n/a	
QIC_u						298.9	
Pseudo R2				0.0349			

2) Factor Means from SEM model 3.2

	n=4,739			n=4,739		n=4,739	
Ascore	-0.79853	0.449991	0	0.41847	0	0.554096	0
Bscore	0.579303	1.784794	0	1.786658	0	1.538412	0
Cscore	2.428254	11.33907	0	11.4207	0	9.198185	0
Dscore	0.284957	1.329704	0	1.243963	0	1.356853	0
Escore	0.906785	2.476348	0	2.384413	0	2.276215	0
_cons	2.148207	8.56948	0	8.60918	0	8.396867	0
linktest (hat)		28.01302	0				
linktest (hatsq)		-4.26799	0				
Wald chi^2				6407.65	0	815.25	0
AIC		30417.7		21192.14		n/a	
BIC		30456.48		21237.38		n/a	
QIC_u						306.771	
Pseudo R2				0.1399			

3) Items with factor loadings >0.4 in SEM model 3.2

	n=4,690			n=4,690		n=4,694	
q08attacke~n	0.163674	1.177831	0	1.165732	0	1.169482	0
q26heatstr~n	0.066758	1.069036	0	1.065066	0	1.066697	0
q49medicat~n	0.168192	1.183164	0	1.177883	0	1.163203	0
q11forceor~n							
q19badinfl~e	0.098342	1.10334	0	1.099821	0	1.103077	0
q12anyrisk~n							
q35drugalc~n	0.211542	1.235582	0	1.228534	0	1.232963	0
q36dailyal~n	0.050707	1.052015	0	1.042777	0	1.055828	0
q37anyinje~o							
q38drugora~a						1.022248	0.022
q40blackou~o							
q41observe~s	0.081997	1.085452	0	1.07454	0	1.059721	0
q09harmsel~r	0.056592	1.058224	0	1.050015	0	1.057116	0
q42hospita~e							
q43edvisit~n	0.016091	1.016221	0.031	1.014329	0.04	1.021895	0.003
q44anyment~i	0.019932	1.020132	0.007	1.013884	0.045	1.024704	0.041
q47concent~n	0.116369	1.12341	0	1.114004	0	1.127507	0
q50untreat~n	0.165927	1.180487	0	1.173205	0	1.158414	0
_cons	1.616939	5.037646	0	5.19887	0	5.039081	0
linktest (hat)		11.89886	0				

linktest (hatsq)	-0.77032	0.002				
Wald chi^2			9288.04	0	5964.32	0
AIC	30086.85		20695.68		n/a	
BIC	30170.74		20779.57		n/a	
QIC_u					290.906	
Pseudo R2			0.1516			

Model 12

	n=2,643			n=2,643		n=2,668	
	Multivariate GLM family(nbin), link(log)			Multivariate Generalized Neg Binomial Model		Multivariate GEE population averaged model: XT Neg Binomial Model	
	Coeff	IRR (e^coeff)	p	IRR (e^coeff)	p	IRR (e^coeff)	p
whitevother							
hispyn							
sqrt_age							
veteranyn	-0.02531	0.975012	0.015	0.977707	0.018		
numberoft~10	0.052272	1.053663	0	1.053043	0	1.064039	0
oneyearhom~s	0.045847	1.046914	0	1.046806	0	1.055045	0
chronichom~n	0.081507	1.08492	0	1.075207	0	1.088513	0
entryfroms~n	0.079734	1.082998	0	1.074319	0	1.046717	0.01
Ascore	-0.71681	0.488305	0	0.448102	0	0.537844	0.001
Bscore	0.469373	1.598992	0	1.608487	0	1.500845	0
Cscore	2.179423	8.841203	0	9.0985	0	8.268225	0
Dscore	0.216499	1.241722	0	1.191292	0	1.256955	0
Escore	0.881882	2.415442	0	2.342766	0	2.322266	0
_cons	2.034285	7.646783	0	7.764897	0	7.479173	0
linktest (hat)		28.30073	0				
linktest (hatsq)		-4.25821	0				
Wald chi^2				4230.6	0	2977.09	0

AIC	17165.9	11735.51	n/a
BIC	17230.58	11806.07	n/a
QIC_u			158.036
Pseudo R2		0.1394	

Model 13

	n=2,640			n=2,640		n=2,640	
	Multivariate GLM family(nbin), link(log)			Multivariate Generalized Neg Binomial Model		Multivariate GEE population averaged model: XT Neg Binomial Model	
	Coeff	IRR (e^coeff)	p	IRR (e^coeff)	p	IRR (e^coeff)	p
whitevother							
hispyn							
sqrt_age						1.024176	0
veteranyn							
numberoft~10	0.043445	1.044403	0	1.04153	0	1.054816	0
oneyearhom~s	0.040258	1.041079	0	1.041078	0	1.047915	0
chronichom~n	0.081471	1.084882	0	1.077211	0	1.08219	0
entryfroms~n	0.06553	1.067724	0	1.061104	0		
q08attacke~n	0.133721	1.143074	0	1.132632	0	1.142918	0
q26heatstr~n	0.07826	1.081403	0	1.076727	0	1.075269	0
q49medicat~n	0.159599	1.173041	0	1.168415	0	1.166858	0
q19badinfl~e	0.081189	1.084576	0	1.078343	0	1.093378	0
q35drugalc~n	0.196116	1.216668	0	1.211359	0	1.216776	0
q36dailyal~n	0.025751	1.026085	0.014	1.023558	0.013	1.040826	0
q38drugora~a			only in xtnbreg model <---				
q41observe~s	0.067816	1.070169	0	1.061374	0	1.048093	0
q09harmsel~r	0.060524	1.062393	0	1.053722	0	1.069668	0
q43edvisit~n							
q44anyment~i	0.028827	1.029246	0.001	1.023221	0.004	1.035937	0.001
q47concent~n	0.1157	1.122659	0	1.11302	0	1.122896	0
q50untreat~n	0.150762	1.16272	0	1.156785	0	1.152601	0
_cons	1.560077	4.759188	0	4.94324	0	4.161949	0
linktest (hat)		12.80605	0	n/a		n/a	

linktest (hatsq)	-0.90702	0.005	n/a		n/a			
Wald chi^2			5967.38	0		4661.97		0
AIC	17146.5		11599.81		n/a			
BIC	17240.56		11693.86		n/a			
QIC_u						154.681		
Pseudo R2			0.1491					

Table 35B: Post-estimation tests of Negative Binomial Regression models

	Model 1: demographics	**Model 2: Factor means**	**Model 3: items with factor loadings >0.4**	**Model 12: Demos + Factor means**	**Model 13: Demos + items**
Log-likelihood					
Model	-6572.13	-10589.1	-10334.8	-5912.48	-5783.9
Intercept-only	-6804.54	-12311.3	-12181.6	-6871.86	-6797.07
Chi-square					
Deviance(df=2636)	13144.26	21178.14	20669.68	11824.96	11567.81
Wald(df=6)	523.271	6407.652	9288.037	4337.866	5967.382
p-value	0	0	0	0	0
R2					
McFadden	0.034	0.14	0.152	0.14	0.149
McFadden(adjusted)	0.033	0.139	0.151	0.138	0.147
Cox-Snell/ML	0.161	0.517	0.545	0.513	0.536
Cragg-Uhler/Nagelkerke	0.162	0.519	0.548	0.516	0.539
IC					
AIC	13158.26	21192.14	20695.68	11846.96	11599.81
AIC divided by N	4.979	4.472	4.413	4.44	4.394
BIC(df=7)	13199.42	21237.38	20779.57	11911.74	11693.86
Corr =	exc	exc	exc	exc	exc

Family =	nbinomial	nbinomial	nbinomial	nbinomial	nbinomial
Link =	log	log	log	log	log
p =	8	6	14	10	16
Trace =	1.809	1.687	1.93	1.04	1.171
QIC =	286.517	298.146	266.766	140.117	125.022
QIC_u =	298.9	306.771	290.906	158.036	154.681

Table 35: Multivariate Logistic Regression tests of Housing Placement

Table 35A: Multivariate Model of Housing Placement, reverse step-wise selection (RRH-recommended sample only)

Logistic regression		Number of obs =	1,376
LR chi2(9) =	88.66		
Prob > chi2 =	0		
Log likelihood =	-775.062	Pseudo R2 =	0.0541

housingass~d	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
q15anyregu~e	1.596671	0.200412	3.73	0	1.248458	2.042006
q46learnin~i	0.607586	0.100402	-3.02	0.003	0.439491	0.839975
q17activit~s	1.51129	0.190471	3.28	0.001	1.180508	1.934757
q49medicat~n	0.574188	0.105823	-3.01	0.003	0.400108	0.824006
q21nocare10	0.672138	0.120888	-2.21	0.027	0.47246	0.956208
q44anyment~i	1.807335	0.246767	4.33	0	1.382988	2.361885
q42hospita~e	0.548399	0.126153	-2.61	0.009	0.349371	0.860808
q14owemoney	1.67662	0.217877	3.98	0	1.299633	2.16296
_cons	0.228283	0.031403	-10.74	0	0.174334	0.298926

Table 35B: Multivariate Model of Negative Housing Exit, reverse step-wise selection (RRH-recommended sample only)

Logistic regression				Number of obs =		357
				LR chi2(9) =		12.05
				Prob > chi2 =		0.0024
Log likelihood =	-117.115			Pseudo R2 =		0.0489

negativeh~10	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
q49medicat~n	2.701828	1.160708	2.31	0.021	1.164074	6.27097
q34observe~n	0.246503	0.152123	-2.27	0.023	0.07354	0.826265
_cons	0.129331	0.025862	-10.23	0	0.087395	0.191387

Table 35C: Multivariate Model of Negative Housing Exit, reverse step-wise selection (RRH-placed sample only)

Logistic regression				Number of obs =		898
				LR chi2(9) =		17.37
				Prob > chi2 =		0.0006
Log likelihood =	-246.89			Pseudo R2 =		0.034

negativeh~10	Odds Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
q47concent~n	0.438064	0.109517	-3.3	0.001	0.268371	0.715054
q03edtimes~o	1.161594	0.078509	2.22	0.027	1.017475	1.326125
q05ambulan~o	0.725113	0.103872	-2.24	0.025	0.547611	0.960151
_cons	0.13029	0.023162	-11.46	0	0.091958	0.184601

General Information

Record ID _____

Values from VI-SPDAT as collected

Client ID _____

Date Of Birth _____

Age _____

Gender
◯ Male
◯ Female
◯ Other

Primary Race
◯ American Indian or Alaska Native
◯ Asian ◯ Black or African American
◯ Client Doesn't Know ◯ Client Refused
◯ Native Hawaiian or other Pacific Islander
◯ Refused ◯ White ◯ Blank

Secondary Race
◯ American Indian or Alaska Native
◯ Asian ◯ Black or African American
◯ Client Doesn't Know ◯ Client Refused
◯ Native Hawaiian or other Pacific Islander
◯ Refused ◯ White ◯ Blank
◯ Other ◯ Other-Multiracial
◯ Data not collect

Ethinicity
◯ Client Doesn't Know ◯ Client Refused
◯ Non-Hispanic/Non-Latino
◯ Refused ◯ Blank ◯ Unanswered

Date of VI-SPDAT _____

In the past six months, how many times have you been to the emergency department/room? (Column U) _____

In the past six months, how many times have you been taken to the hospital in an ambulance? (Column W) _____

In the past six months, how many times have you used a crisis service, including distress centers and suicide prevention hotlines? (Column X) _____

In the past six months, how many times have you been hospitalized as an in-patient, including hospitalizations in a mental health hospital?(Column Y) _____

Surveyor, do you detect signs of poor hygiene or daily living skills? (Column AZ)
◯ Yes
◯ No

Where do you usually go for healthcare or when you're not feeling well? (Column BA)
◯ Hospital
◯ Clinic
◯ VA
◯ Does not go for care
◯ Other

Other (Column BB) _____

Kidney disease/End Stage Renal Disease or Dialysis(Column BK)
◯ Yes
◯ No
◯ Refused

History of frostbite, Hypothermia, or Immersion Foot
◯ Yes
◯ No
◯ Refused

Liver disease, Cirrhosis, or End-Stage Liver Disease
◯ Yes
◯ No
◯ Refused

HIV+/AIDS
◯ Yes
◯ No
◯ Refused

History of Heat Stroke/Heat Exhaustion
◯ Yes
◯ No
◯ Refused

Heart disease, Arrhythmia, or Irregular Heartbeat
◯ Yes
◯ No
◯ Refused

Emphysema
◯ Yes
◯ No
◯ Refused

Diabetes
◯ Yes
◯ No
◯ Refused

Asthma
◯ Yes
◯ No
◯ Refused

Cancer
◯ Yes
◯ No
◯ Refused

Hepatitis C
◯ Yes
◯ No
◯ Refused

Tuberculosis
◯ Yes
◯ No
◯ Refused

Surveyor, do you observe signs or symptoms of a serious health condition?
◯ Yes
◯ No

Have you ever had problematic drug or alcohol use, abused drugs or alcohol, or told you do?
◯ Yes
◯ No
◯ Refused

Have you consumed alcohol and/or drugs almost every day or every day for the past month?
◯ Yes
◯ No
◯ Refused

Have you ever used injection drugs or shots in the last six months?
◯ Yes
◯ No
◯ Refused

Have you ever been treated for drug or alcohol problems and returned to drinking or using drugs?
- ◯ Yes
- ◯ No
- ◯ Refused

Have you used non-beverage alcohol like cough syrup, mouthwash, rubbing alcohol, cooking wine, or anything like that in the past six months?
- ◯ Yes
- ◯ No
- ◯ Refused

Have you blacked out because of your alcohol or drug use in the past month?
- ◯ Yes
- ◯ No
- ◯ Refused

Surveyor, do you observe signs or symptoms of problematic alcohol or drug use?
- ◯ Yes
- ◯ No

Ever been taken to a hospital against your will for a mental health reason?
- ◯ Yes
- ◯ No
- ◯ Refused

Gone to the emergency room because you weren't feeling 100% well emotionally or because of your nerves?
- ◯ Yes
- ◯ No
- ◯ Refused

Spoken with a psychiatrist, psychologist or other mental health professional in the last six months because of your mental health - whether that was voluntary or because someone insisted that you do so?
- ◯ Yes
- ◯ No
- ◯ Refused

Had a serious brain injury or head trauma?
- ◯ Yes
- ◯ No
- ◯ Refused

Ever been told you have a learning disability or developmental disability?
- ◯ Yes
- ◯ No
- ◯ Refused

Do you have any problems concentrating and/or remembering things?
- ◯ Yes
- ◯ No
- ◯ Refused

Surveyor, do you detect signs or symptoms of severe, persistent mental illness or severly compromised cognitive functioning?
- ◯ Yes
- ◯ No

Have you had any medicines prescribed to you by a doctor that you do not take, sell, had stolen, misplaced, or where the prescription was never filled?
- ◯ Yes
- ◯ No
- ◯ Refused

Yes or No - Have you experienced any emotional, physical, psychological, sexual or other type of abuse or trauma in your life which you have not sought help for, and/or which has caused your homelessness?
- ◯ Yes
- ◯ No
- ◯ Refused

VI-SPDAT at Entry (Column DQ) _____

Recommendation (Column DR)
- ◯ PSH
- ◯ RRH
- ◯ Self-Resolve

If Housed, Date Housed (Column DU) _____

Validate with Seton & ICare visit records:

How many times has the patient been to the ED in the past 6 months? _____

How many times has the patient been taken to the hospital in an ambulance in the past 6 months? _____

How many times has the patient been admitted to the hospital in the past 6 months? _____

How many days has the patient spent in the hospital the past 6 months? _____

Was the patient admitted to the ICU?
◯ Yes
◯ No

How many days did the patient spend in the ICU in the past 6 months? _____

Validate the diagnoses collected in VI-SPDAT using EMRs:

Any mention, allusion, reference to, or evidence of medication nonadherence, noncompliance? (eg medication refills declined, documentation of lapses in prescribed medication)
◯ Yes
◯ No

Does electronic record include any reference to risk behaviors such as those listed in the VI-SPDAT?
◯ Yes
◯ No

Any evidence of alcohol and what term is used
◯ No mention of alcohol
◯ Alcohol user but sub-clinical
◯ 'Problematic drinking'
◯ 'Alcohol abuse'
◯ Diagnosis of 'alcohol use disorder'

If level of alcohol usage is described in narrative, include it here: _____

AUDIT C assessment done at triage or after intake?
◯ Yes
◯ No

If ONLY the total score of AUDIT C is documented, enter it here: _____
(otherwise complete the 3 component questions below this)

AUDIT C
Q1. How often did you have a drink containing alcohol in the past year?
◯ Never
◯ Monthly or less
◯ Two to four times a month
◯ Two to three times per week
◯ 4 or more times per week
(https://www.mdcalc.com/audit-c-alcohol-use)

AUDIT C
Q2. How many drinks containing alcohol did you have on a typical day when you were drinking in the past year?
◯ 1or 2 drinks
◯ 3 or 4
◯ 5 or 6
◯ 7 to 9
◯ 10 or more
(https://www.mdcalc.com/audit-c-alcohol-use)

AUDIT C
Q3. How often did you have six or more drinks on one occasion in the past year?

◯ Never
◯ Less than monthly
◯ Monthly
◯ Weekly
◯ Daily or almost daily
(https://www.mdcalc.com/audit-c-alcohol-use)

AUDIT C (calculated) _____

Diagnosis of psychiatric condition of any kind?

◯ Yes
◯ No

What psychiatric diagnosis or diagnoses are documented? _____

ED Diagnosis of psychiatric condition of any kind?
(MUST be ED visit initiated encounter)
(the so called "because you weren't feeling 100% well emotionally or because of your nerves")

◯ Yes
◯ No

What diagnosis? _____

Any mention of the following cognitive conditions in the chart:
(check triage note, intake forms, and H&P)

☐ learning disability
☐ developmental disability
☐ cognitive deficit
☐ mental retardation
☐ "problems concentrating"

Diagnosis of Kidney disease /End stage renal disease or Dialysis services documented?

◯ Yes
◯ No

Which one(s) mentioned?

☐ Kidney disease
☐ End stage renal disease
☐ Dialysis services

Any history of frostbite, hypothermia, or 'immersion foot' documented?

◯ Yes
◯ No

Which one(s) mentioned?

☐ Frostbite
☐ Hypothermia
☐ 'Immersion foot'

Any liver disease, cirrhosis, or end-stage liver disease documented?

◯ Yes
◯ No

Which one(s) mentioned?

☐ Liver disease
☐ Cirrhosis,
☐ End stage liver disease

Any mention of HIV or AIDS documented in diagnoses or elsewhere in the chart?

◯ Yes
◯ No

HIV CD4 count

◯ >200
◯ < 200
◯ No history of HIV

Confirmed in diagnostic coding sheet or discharge summary?

◯ Yes
◯ No

Check all of the following additional diagnoses if positive history or current diagnosis is documented:

- ☐ History of Heat Stroke/ Heat Exhaustion
- ☐ Heart disease, Arrhythmia, or Irregular Heartbeat
- ☐ Emphysema
- ☐ Diabetes
- ☐ Asthma
- ☐ Hepatitis C
- ☐ Tuberculosis

Which one(s) mentioned?

- ☐ Heart disease
- ☐ Heart failure
- ☐ Arrhythmia or irregular heartbeat
- ☐ Atrial Fibrillation (specifically)

Any history of cancer documented?

- ◯ Yes
- ◯ No

Charlson Comorbidity Scoring System (not already collected in VI-SPDAT validation above)

http://touchcalc.com/calculators/cci_js

History of Tumors?

- ◯ Yes
- ◯ No

Tumor(s) without metastasis within previous 5 years?

- ◯ Yes
- ◯ No

History of or Current Metastatic Solid Tumor?

- ◯ Yes
- ◯ No

History of Leukemia?

- ◯ Yes
- ◯ No

History of Lymphoma?

- ◯ Yes
- ◯ No

History of Myocardial Infarction?

- ◯ Yes
- ◯ No

History of Congestive Heart Failure?

- ◯ Yes
- ◯ No

History of Peripheral Vascular Disease?

- ◯ Yes
- ◯ No

History of Cerebrovascular Disease?

- ◯ Yes
- ◯ No

History of Dementia?

- ◯ Yes
- ◯ No

History of Chronic pulmonary disease (Emphysema or Chronic bronchitis)?

- ◯ Yes
- ◯ No

History of Connective Tissue Disease?

- ◯ Yes
- ◯ No

History of Peptic Ulcer Disease?

- ◯ Yes
- ◯ No

Liver Disease

◯ Mild
◯ Moderate to severe
◯ None

History of Diabetes Mellitus?

◯ Yes- without End Organ Damage
◯ Yes- With End Organ Damage
◯ No

History of Hemiplegia?

◯ Yes
◯ No

History of Renal Disease (Chronic Kidney Disease)?

◯ Yes
◯ No

Charlson Comorbidity Score

_____
(http://touchcalc.com/calculators/cci_js)

VI-SPDAT Manual of Procedures

Updated: 11/05/18- Adetoriola Odetunde

PLEASE REVIEW following before extracting data from EMRs:

1. Use patient first and last name **AND** date of birth to find/verify EMR
    a. If the patient does not come up, use SSN to find/verify EMR.
    b. If you are still not able to find the patient EMR, leave the abstraction answers blank and make note of this at the end of the RedCap entry when asked for any concerns
    c. Confirm in the patient is alive by comparing their current age on the EMR to the calculated current age on the VI-SPDAT excel. If the age on the EMR is less than the age on the excel sheet the patient is deceased. Fill in the correct response on RedCap.
    d. If the ER visit date is
1. For BAC levels – list HIGHEST BAC PATIENT TESTED POSITIVE FOR
2. For toxicology – list EVERY DRUG PATIENT HAS TESTED POSITIVE FOR!
   *both will be categorized between 6 months pre/post VI-SPDAT date
3. For chronic diseases – check every visit record for mention.
    a. Use the 'chart search' function to look up diseases that are not explicitly stated in past records/you are unsure if there is a diagnosis*
4. For acute diseases – check visit records 6 months pre/post VI-SPDAT date.
    a. Use the chart search' function to look up diseases that are not explicitly stated in past records/you are unsure if there is a diagnosis*

FOR VI-SPDAT ENTRY:

1. Input fields B-BK into RedCap **exactly** as shown in the excel sheet, regardless of perceived discrepancies in data collection
2. Using the client ID (column B), cross-reference client ID under tab “With Housing Intervention” to answer, “Was client housed?”. If the client ID is present in the sheet and "Yes", input the fields into RedCap exactly as shown in the excel sheet
1. In tab “With Housing Intervention”, input fields B-K into RedCap as **exactly** shown in the excel sheet, regardless of perceived discrepancies in data collection.
2. For field E, copy and paste entries.

If not answered on VI-SPDAT/EMR, leave blank unless otherwise indicated.

Condition	Location in EMR
Any mention, allusion, reference to, or evidence of medication nonadherence, noncompliance? (eg medication refills declined, documentation of lapses in prescribed medication)	Triage/physician ED forms
Does electronic record include any reference to risk behaviors such as those listed in the VI-SPDAT?	Triage/physician ED forms; ED Triage view
Any evidence of alcohol and what term is used	Triage/physician ED forms; Diagnoses and Problems; ED Triage view
If level of alcohol usage is described in narrative, include it here:	Triage/physician ED forms; ED Triage view
Diagnosis of psychiatric condition of any kind?	Triage/physician ED forms; Diagnoses and Problems

What psychiatric diagnosis or diagnoses are documented?	
ED Diagnosis of psychiatric condition of any kind? (MUST be ED visit initiated encounter) (the so called "because you weren't feeling 100% well emotionally or because of your nerves")	Triage/physician ED forms; ED Triage view; patient information – visit list
What diagnosis?	Diagnoses and Problems
Any mention of the following cognitive conditions in the chart: (learning/developmental disability, cognitive deficit, mental retardation, concentration problems)	Triage/physician ED forms; History; Diagnoses and Problems
Diagnosis of Kidney disease /End stage renal disease or Dialysis services documented?	Diagnoses and Problems; Triage/physician ED forms
Any history of frostbite, hypothermia, or 'immersion foot' documented?	Diagnoses and Problems; Triage/physician ED forms
Any liver disease, cirrhosis, or end-stage liver disease documented?	Diagnoses and Problems; Triage/physician ED forms
Any mention of HIV or AIDS documented in diagnoses or elsewhere in the chart?	Diagnoses and Problems; Triage/physician ED forms
HIV CD4 count	Flowsheets
Confirmed in diagnostic coding sheet or discharge summary?	Diagnoses and Problems; Triage/physician ED forms;
History of Heat Stroke/ Heat Exhaustion Heart disease, Arrhythmia, or Irregular Heartbeat Emphysema Diabetes Asthma Hepatitis C Tuberculosis	Diagnoses and Problems; Triage/physician ED forms
Heart disease Heart failure Arrhythmia or irregular heartbeat Atrial Fibrillation (specifically)	Diagnoses and Problems; Triage/physician ED forms
Any history of cancer documented?	Diagnoses and Problems; Triage/physician ED forms
History of Tumors? Tumor(s) without metastasis within previous 5 years? History of or Current Metastatic Solid Tumor?	Diagnoses and Problems; Triage/physician ED forms
Leukemia	Diagnoses and Problems; Triage/physician ED forms
Lymphoma	Diagnoses and Problems; Triage/physician ED forms
Myocardial Infarction	Diagnoses and Problems; Triage/physician ED forms
Congestive Heart Failure	Diagnoses and Problems; Triage/physician ED forms
Peripheral Vascular Disease	Diagnoses and Problems; Triage/physician ED forms
Cerebrovascular Disease	Diagnoses and Problems; Triage/physician ED forms
Dementia	Diagnoses and Problems; Triage/physician ED forms
Chronic Pulmonary Disease (Emphysema or chronic bronchitis)	Diagnoses and Problems; Triage/physician ED forms
Connective tissue disease	Diagnoses and Problems; Triage/physician ED forms
Peptic ulcer disease	Diagnoses and Problems; Triage/physician ED forms
Lab results	Flow sheet (adjust for date)

To review all documents	"Documents" tab, adjust for date, filter by type of document

* if you are unsure if any of the conditions/diseases are present in the patient's chart utilize the CHART SEARCH function

- Type in the condition/diagnosis you are looking for. All mentions of this diagnosis will come up in the search.
- Look through relevant documents that are within the time frame you are looking at (filter the dates through the search) and determine if there is in fact a diagnosis of the condition

INTEGRATED CARE COLLABORATION

Statement of Work #1000 – Ben King | ECHO Population and Healthcare Data Extract.

THIS STATEMENT OF WORK #1001 is issued between the Integrated Care Collaboration ("ICC") and ECHO (Client).

Term/Period of Performance: Start Date: March 2018	End Date: upon completion
Statement of Work Type: *(Check One)* ☐ Fixed Price ☒ Time & Materials ☐ Other *(Please Describe)*	
Statement of Work Value: *(Check One)* ☐ Total Fixed Price: ☐ No Stated Value Bill Per Rates Below ☐ Other *(Please Describe)*	

Scope/Description of Work:

Deliverable

ICC, on behalf of client, will identify ECHO clients who have received inpatient or emergency room care within Travis County and provide the following data elements:

Red – Provided by ECHO
Blue – Provided by ICC

Date Range: April 2013 – January 2018

- HMIS ID – I assume you'll need this item
- Last Name
- First Name
- Middle Name
- Suffix
- DOB
- Gender
- Ethnicity
- Race
- Phone
- SSN
- Street Address
- Unique Identifier (De-identified)
- Encounter Identifier (De-identified)
- Encounter Start Date
- Encounter End Date
- Encounter Type: Inpatient, Emergency Room, Observation Stay
- Diagnosis_code*: All
- Diagnosis_description: All
- Diagnosis_priority: All (1-X)
- Chronic_Diagnosis: (Y/N)
- Patient Flags (Y/N)
  - Frequent ED Patient
  - Frequent Inpatient
  - Homeless

- Medical Home
- Outpatient
- Payor

**ICD9/ICD10 Mix Prior to 2016*

Additional Authorization Required:
- Personal Indenters
- Facilities/ Points of Care (Not Requested)
- Provider Names (Not Requested)
- Plan Name

Excluded Elements
- Patients who have not opted-in
- Facility and Point of Care Names
- Any identification of Behavioral Health treatment (excluding BH encounter types at Hospitals)

Fees: ICC will perform the services described herein on a Time & Materials basis at a rate of $200/per hour. ICC estimates in good faith that the services to be provided will require 5-6 hours for data extraction. All additional work and data elements will require a separate statement of work.

Payment Schedule: Payment terms shall be net 30 days upon receipt of invoice.

Invoice Address:
Ben King

benjamin.king@austin.utexas.edu

ACKNOWLEDGED AND ACCEPTED:

The undersigned have read, understand, and agree to the terms and conditions herein, including any attachments hereto.

For and on behalf of ICC:	For and on behalf of Client:
By: Edie L Morris	By: Ben King
Printed Name/Title: Edie L. Morris, Executive Director / CFO	Printed Name/Title: Ben King, Research Scientist
Date: 3/5/18	Date: 03/02/2018

Appendix D2. Diagnostic Code ranges

http://icd9.chrisendres.com/index.php

https://www.icd10data.com

MH dx	290.0-319.99	F00-F99.99
Substance use/abuse		
	303.0-305.99	F10-F19.99
Elevated BAC	790.3	
Blood Alc Level		Y90.0-Y90.9, R78.0 (alcohol in blood)

- Y90.0 - Blood alcohol level of less than 20 mg/100 ml
- Y90.1 - Blood alcohol level of 20-39 mg/100 ml
- Y90.2 - Blood alcohol level of 40-59 mg/100 ml
- Y90.3 - Blood alcohol level of 60-79 mg/100 ml
- Y90.4 - Blood alcohol level of 80-99 mg/100 ml
- Y90.5 - Blood alcohol level of 100-119 mg/100 ml
- Y90.6 - Blood alcohol level of 120-199 mg/100 ml
- Y90.7 - Blood alcohol level of 200-239 mg/100 ml
- Y90.8 - Blood alcohol level of 240 mg/100 ml or more
- Y90.9 - Presence of alcohol in blood, level not specified

Intellectual /Learning disability	
	317.0-319.9 F70.0-79.9
TBI	
	310.2, 850.0-854.9
	S00.0-S08.90, S09.20-S09.22, S09.8, S09.90, Z87.820 (personal history)
Do I need to worry about?:	S09.8XXA, S09.8XXD, S09.8XXS, S09.90XA, S09.90XD, S09.90XS
A-	Initial encounter, D- subsequent encounter, S- Sequela
Hepatitis NOS	
	070.0-070.9, 571.1, 571.40-571.49, 573.1-573.3
	B15-19.9, K70.1-K70.11, K73.0-K73.9, B94.2,
Hepatitis C	

070.41, 070.44, 070.51, 070.54, 070.70-070.71

B17.1-B17.11, B18.2, B19.2-B19.21

Tuberculosis

010.0-018.99, 137.0-137.4, V12.01

A15.0-A19.9, Z86.11, B90.8, O98.01-O98.03

Excluded: Z11.1 (Encounter for screening for respiratory tuberculosis), Z20.1 (Contact with and (suspected) exposure to tuberculosis), R76.11 (Nonspecific reaction to skin test w/o active tuberculosis

HIV/AIDS

042, 079.53, 795.71, V08, V65.44

B20, R75, Z71.7, O98.7

Diabetes

249.0-250.9, 253.5, 588.1, 648.0-648.9, 790.2 (abnormal glucose?)

E10-E13.9, E23.2,

Excluded: V77.1 & Z13.1 (screening only), V18.0 (family history);

Emphysema

V81.3, 491.2, 492.0-492.9, 518.1-518.2

J43-J43.99, J98.2, J98.3, J68.4, P25.0,

Asthma

V17.5, 493.0-493.9 J45.0-J45.998,

This does not include J44 & other COPD codes, which seems crazy, but COPD never mentioned…

Kidney disease, / End stage Renal disease or Dialysis

403.0-404.9, 580.0-588.9, 593.0-593.1, 593.9; V45.11-V45.12, V56.0-V56.8,

N17.0-N19, N28.9, N99.0, I12.0-I13.2, E08.2-E08.29, E09.2-E09.29, E10.2-E10.29, E11.2-E11.29, E11.2-E11.29, E13.2-E13.29, O26.830-O26.839, O10.2-O10.33,

(anything affecting the kidney, to cast broadest net definition of renal disease)

Q61 range and surrounding (renal cyst dxs),

Liver disease, cirrhosis, end stage liver disease

570.0-572.8, 573.0, 573.9, 794.8 (abnormal scan) V42.7, E878.0, 996.82 (liver transplant)

K70.0-K72.91, K74.0-K75.0, K75.80-K75.90, K76.0-K76.2, K76.80-K76.90, K77, R16.0-R16.2; Z48.23, Z94.4, T86.40-T86.49 (transplant)

(Pretty much anything affecting the liver, to cast broadest net definition of liver disease; even includes K77 "liver disorders in diseases classified elsewhere", just in case)

Heart disease, arrhythmia or irregular heartbeat

391.0-391.9, 393-398.99, 402.0-402.91, 404.0-404.9, 410.0-416.9, 420.0-429.9, 745.0-746.9 (congenital),

I01.0-I01.9, I05.0-I09.9, I11.0-I11.9, I13.0-I13.2, I20.0-I25.9, I27.22, I27.89-I27.9, I30.0-I52.0, M05.30-M05.39; O10.1-O10.13, O10.3-O10.33, R00.0-R01.2, Z86.74, Z86.79

(Pretty much anything affecting the cardiac muscle, to cast broadest net definition of heart disease)

Exclude: V17 (screening), V81 (family history)

Cancer

140-239.9, V67.2 (chemo f/u visit), 338.3 (cancer pain), 789.51, V12.41, V10.0-V10.9

C00-C96.9, C7A.0-C7A.8, C7B.0-C7B.8, D00-D49.9, D3A.0-D3A.8

All neoplasm categories, very broad net – they don't ask "do you have cancer with a malignant pathology"?

Excluded: V76.8 – screening visits; V84 range (genetic susceptibility),

Heatstroke, heat exhaustion

992.0-992.9, E900.0-E900.9, T67.0-T67.9,

Excludes: 276.51 & E86.0 Dehydration

Frostbite, Hypothermia, or Immersion Foot

991.0-991.3 (frostbite), 991.4 (immersion foot), 991.6 (hypothermia), E901.0-E901.9,

T33.0-T34.99 (frostbite), T68.0 (hypothermia), T69.0-T69.029, (immersion foot)

Excluded: chilblains, other specified effects of reduced temperature, & unspecified – too ambiguous

Stroke

430-438 Cerebrovascular Disease
http://icd9.chrisendres.com/index.php?action=child&recordid=4570

453 venous embolism & thrombosis

I60-I69 Cerebrovascular diseases, I81-I82.91 venous embolism & thrombosis

https://www.icd10data.com/ICD10CM/Codes/I00-I99/I60-I69

Z86.73

OFFICE OF RESEARCH SUPPORT & COMPLIANCE

THE UNIVERSITY OF TEXAS AT AUSTIN

P.O. Box 7426, Austin, Texas 78713 · Mail Code A3200
(512) 471-8871 · FAX (512) 471-8873

FWA # 00002030

Date: 10/31/2018
PI: Benjamin T King
Dept: Neurology (DMS)
Title: Evaluation of a HUD Continuum of Care's Coordinated Assessment and Entry Program

Re: IRB Expedited Continuing Review Approval for Protocol Number 2017-05-0050

Dear Benjamin T King,

In accordance with the Federal Regulations the Institutional Review Board (IRB) reviewed the above referenced research study continuing review report and found it met the requirements for approval under the Expedited category noted below for the following period of time: 12/01/2018 to 11/30/2019. Expires 12 a.m. [midnight] of this date.

☐ 1) Clinical studies of drugs and medical devices only when condition (a) or (b) is met. (a) Research on drugs for which an investigational new drug application (21 CFR Part 312) is not required. (Note: Research on marketed drugs that significantly increases the risks or decreases the acceptability of the risks associated with the use of the product is not eligible for expedited review). (b) Research on medical devices for which (i) an investigational device exemption application (21 CFR Part 812) is not required; or (ii) the medical device is cleared/approved for marketing and the medical device is being used in accordance with its cleared/approved labeling.

☐ 2) Collection of blood samples by finger stick, heel stick, ear stick, or venipuncture as follows: (a) from healthy, non-pregnant adults who weigh at least 110 pounds. For these subjects, the amounts drawn may not exceed 550 ml in an 8 week period and collection may not occur more frequently than 2 times per week; or (b) from other adults and children, considering the age, weight, and health of the subjects, the collection procedure, the amount of blood to be collected, and the frequency with which it will be collected. For these subjects, the amount drawn may not exceed the lesser of 50 ml or 3 ml per kg in an 8 week period and collection may not occur more frequently than 2 times per week.

☐ 3) Prospective collection of biological specimens for research purposes by non-invasive means.
Examples:
(a) Hair and nail clippings in a non-disfiguring manner.
(b) Deciduous teeth at time of exfoliation or if routine patient care indicates a need for extraction;
(c) Permanent teeth if routine patient care indicates a need for extraction.
(d) Excreta and external secretions (including sweat).
(e) Uncannulated saliva collected either in an un-stimulated fashion or stimulated by chewing gumbase or wax or by applying a dilute citric solution to the tongue.
(f) Placenta removed at delivery.
(g) Amniotic fluid obtained at the time of rupture of the membrane prior to or during labor.
(h) Supra- and subgingival dental plaque and calculus, provided the collection procedure is not more invasive than routine prophylactic scaling of the teeth and the process is accomplished in accordance with accepted prophylactic techniques.
(i) Mucosal and skin cells collected by buccal scraping or swab, skin swab, or mouth washings.
(j) Sputum collected after saline mist nebulization.

☐ 4) Collection of data through non-invasive procedures (not involving general anesthesia or sedation) routinely employed in clinical practice, excluding procedures involving x-rays or microwaves. Where medical devices are employed, they must be cleared/approved for marketing. (Studies intended to evaluate the safety and effectiveness of the medical device are not generally eligible for expedited review, including studies of cleared medical devices for new indications).
Examples:
(a) Physical sensors that are applied either to the surface of the body or at a distance and do not involve input of significant amounts of energy into the subject or an invasion of the subject's privacy.
(b) Weighing or testing sensory acuity.
(c) Magnetic resonance imaging.
(d) Electrocardiography, electroencephalography, thermography, detection of naturally occurring radioactivity, electroretinography, ultrasound, diagnostic infrared imaging, doppler blood flow, and echocardiography.
(e) Moderate exercise, muscular strength testing, body composition assessment, and flexibility testing where appropriate given the age, weight, and health of the individual.

☑ 5) Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for non-research purposes (such as medical treatment or diagnosis).
Note: Some research in this category may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b)(4). This listing refers only to research that is not exempt.

☐ 6) Collection of data from voice, video, digital, or image recordings made for research purposes.

☐ 7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.
Note: Some research in this category may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b)(2) and (b)(3). This listing refers only to research that is not exempt.

☐ Use the attached approved informed consent document(s).

☐ You have been granted a Waiver of Documentation of Consent according to 45 CFR 46.117 and/or 21 CFR 56.109(c)(1).

☑ You have been granted a Waiver of Informed Consent according to 45 CFR 46.116(d).

Responsibilities of the Principal Investigator:

1. Report immediately to the IRB any unanticipated problems.

2. Submit for review and approval by the IRB all modifications to the protocol or consent form(s). Ensure the proposed changes in the approved research are not applied without prior IRB review and approval, except when necessary to eliminate apparent immediate hazards to the subject. Changes in approved research implemented without IRB review and approval initiated to eliminate apparent immediate hazards to the subject must be promptly reported to the IRB, and will be reviewed under the unanticipated problems policy to determine whether the change was consistent with ensuring the subjects continued welfare.

3. Report any significant findings that become known in the course of the research that might affect the willingness of subjects to continue to participate.

4. Ensure that only persons formally approved by the IRB enroll subjects.

5. Use only a currently approved consent form, if applicable. Note: Approval periods are for 12 months or less.

6. Protect the confidentiality of all persons and personally identifiable data, and train your staff and collaborators on policies and procedures for ensuring the privacy and confidentiality of subjects and their information.

7. Submit a Continuing Review Application for continuing review by the IRB. Federal regulations require IRB review of on-going projects no less than once a year a reminder letter will be sent to you two months before your expiration date. If a reminder is not received from Office of Research Support and Compliance (RSC) about your upcoming continuing review, it is still the primary responsibility of the Principal Investigator not to conduct research activities on or after the expiration date. The Continuing Review Application must be submitted, reviewed and approved, before the expiration date.

8. Upon completion of the research study, a Closure Report must be submitted to the RSC.

9. Include the IRB study number on all future correspondence relating to this protocol.

If you have any questions contact the RSC by phone at (512) 471-8871 or via e-mail at orsc@uts.cc.utexas.edu.

Sincerely,

Möise L. Levy, M.D.
Health Science Institutional Review Board Chair

UTHealth
The University of Texas
Health Science Center at Houston

Committee for the Protection of Human Subjects
6410 Fannin Street, Suite 1100
Houston, Texas 77030

Benjamin King
UT-H - SPH – Center for Biosecurity & Public Health

May 07, 2018

NOTICE OF PERMISSION TO RELY ON THE UNIVERSITY OF TEXAS AUSTIN IRB

HSC-SPH-18-0362 - Assesment and Findings of the Vulnerability Index (VI-SPDAT) Survey of Individuals Experiencing Homelessness in Travis County, TX

CHAIRPERSON: L. Maximilian Buja,, MD 

PROVISIONS: This permission relates to the research to be conducted under the above referenced title.

CPHS has reviewed the above submission and determined that it meets the criteria for being reviewed by the University of Texas Austin IRB. Please submit an application to the University of Texas Austin IRB via their electronic system and await written approval.

Research participants must sign authorization for release of medical records unless such authorization is waived by the University of Texas Austin IRB or UT Houston CPHS.

The research should not be initiated until all necessary institutional approvals and signatures have been obtained including but not limited to a fully executed clinical trial agreement and Memorial Hermann Hospital approval (if the research is being conducted at a MHH facility).