

A Latent Class Analysis: Analyzing Factors Related to
Underutilization of Mental Health and Substance Abuse Services
Among a National Sample of Adults in the U.S.

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Table of Contents

1. EXECUTIVE SUMMARY	4
1.1 SUMMARY OF UTILIZATION OF TREATMENT– NSDUH 2012	5
1.2 SUMMARY OF CLASS CHARACTERISTICS.....	6
1.3 RECOMMENDATIONS FOR THE OFFICE OF COMMUNICATIONS:	7
1.4 TWO SCENARIOS: USING THIS ANALYSIS OF CLASS DIFFERENCES TO INCREASE TREATMENT UTILIZATION FOR THOSE WITH BEHAVIORAL HEALTH SYMPTOMS:	8
2. THE CURRENT MAGNITUDE OF MENTAL ILLNESS AND SUBSTANCE USE SYMPTOMS IN THE UNITED STATES	9
2.1 BACKGROUND ON AGENCY AND SITUATIONAL CONTEXT	12
3. INDIVIDUALS WITH MENTAL ILLNESS & SUBSTANCE ABUSE: HOW INSURANCE, ATTITUDES AND DEMOGRAPHICS SHAPE BEHAVIORAL HEALTH UTILIZATION	14
3.1 OVERVIEW OF ENABLING, PREDISPOSING, AND PERCEIVED NEED IN RELATION TO BEHAVIORAL HEALTH SERVICES UTILIZATION	14
3.2 ENABLING FACTORS: HEALTH INSURANCE STATUS AND COST OF TREATMENT	15
3.3 PREDISPOSING FACTORS: PREVALENCE RATES OF MENTAL HEALTH AND SUBSTANCE USE SYMPTOMS, BY ETHNIC/RACIAL BACKGROUND	17
3.4 PREDISPOSING FACTORS: ETHNIC/RACIAL VARIATIONS IN UNMET NEED FOR BEHAVIORAL HEALTH TREATMENT	22
3.5 PREDISPOSING FACTORS: PERCEPTIONS OF NEED AND TREATMENT PREFERENCES, ETHNIC/RACIAL VARIATIONS.....	27
3.6 NEED AND SEVERITY: INFLUENCE ON TREATMENT UTILIZATION.....	38
4. METHODS	45
4.1 STUDY BACKGROUND AND OVERVIEW OF CONCEPTUAL FRAMEWORK.....	45
4.2 PARTICIPANTS: NATIONAL SURVEY OF DRUG USE AND HEALTH 2009-2012 (POOLED SAMPLE)	50
4.3 MEASURES.....	53
4.4 MEASURES OF MENTAL HEALTH TREATMENT UTILIZATION AND ATTITUDES TOWARD TREATMENT ...	55
4.5 MEASURES OF SUBSTANCE USE TREATMENT UTILIZATION AND ALTITUDES TOWARD TREATMENT	56
4.6 DESIGN AND ANALYSIS	57
4.7 MODIFYING MEASURES (COVARIATES).....	58
4.8 LATENT CLASS VALIDATION MEASURES (REASONS FOR NOT SEEKING TREATMENT).....	59

5. RESULTS OF NATIONAL SURVEY OF DRUG USE AND HEALTH AND.....	60
LATENT CLASS ANALYSIS AUDIENCE ANALYSIS.....	60
5.1 PREVALENCE RATES FROM THE NSDUH 2009-2012	60
5.2 PERCEIVED NEED FOR TREATMENT AND ATTITUDES TOWARD TREATMENT UTILIZATION	62
5.3 AUDIENCE CHARACTERISTICS	63
5.4 CHARACTERISTICS OF LATENT CLASSES FOR THOSE WITH MENTAL HEALTH SYMPTOMS	64
5.5 CHARACTERISTICS OF LATENT CLASSES FOR THOSE WITH SUBSTANCE ABUSE SYMPTOMS	74
6. DISCUSSION AND CONCLUSION.....	82
6.1 HEALTH COMMUNICATIONS AND EDUCATION RECOMMENDATIONS FOR THE SUBSTANCE ABUSE AND MENTAL HEALTH SERVICES ADMINISTRATION.....	87
REFERENCES.....	1
APPENDIXES.....	1
APPENDIX A - OTHER NATIONAL SURVEYS, 12 MONTHS COMPARISONS.....	1
APPENDIX B: SUBSTANCE ABUSE AND MENTAL HEALTH SERVICES ADMINISTRATION.....	2
APPENDIX C: SUBSTANCE USE AND MENTAL HEALTH MEASURE - NSDUH 2009-2012	4
APPENDIX D: PREVALENCE OF BEHAVIORAL HEALTH SYMPTOMS, NEED, PERCEIVED NEED	7
AND TREATMENT RECIPE BY ETHNIC/RACIAL BACKGROUND, NSDUH 2009-2012	7
APPENDIX E: LATENT CLASS ANALYSIS STATISTICAL METHODOLOGY	8
APPENDIX F: FIT INDICES PLOTS	10
APPENDIX G: SUMMARY OF BASELINE POSITIVE RESPONSES TO REASONS FOR NOT USING SERVICES.....	11
APPENDIX H: DEFINITIONS AND ACRONYMS	1

1 Executive Summary

Objective. To analyze data from the 2009-2012 National Survey of Drug Use and Health to identify the relationship between behavioral health care utilization and mental health, substance use symptoms, insurance, attitudes toward treatment and socio-demographic characteristics. The identification of these relationships is intended to inform communication strategies of Substance Abuse and Mental Health Services Administration (SAMHSA) to increase treatment utilization for those with mental health or substance use symptoms.

Primary Research Question. What are the primary reasons for underutilization of Substance Use Disorder and Mental Illness treatment services among those with behavioral health symptoms? More specifically, how do demographics, behavioral health symptoms, and psychographics factor into treatment service utilization in this group of patients?

Methods. A secondary analysis of the National Survey of Drug Used and Health (NSDUH) years 2009-2012 was conducted using a latent class analysis (LCA). This analysis was restricted to only adults 18 years or older; this sample included a total of 227,310 observations and 154,328 adults. The NSDUH data does not include those in prisons, residential drug treatment, and the homeless. Due to the limited numbers of observations for those with co-occurring mental illness and substance dependence and abuse, those with co-occurring symptoms were excluded for this analysis. Two models were run in this analysis, one looked at adults with mental health needs only and the second analysis looked at adults with substance use needs.

To conceptualize the scope and breathe of the research question, a conceptual framework based on the “Health Belief Model” and “Stages of Change” were used to guide the analysis and interpretation. This included using three interrelated factors of treatment utilization for substance use disorders and mental health disorders. The first factor was behavioral health symptoms, including prevalence and severity of substance dependence/abuse and mental health/illness for adults. The second factor looked at demographic factors such as sex, age, race, gender, marital status, income, and education. The third factor, psychographics included attitudes and beliefs about substance use/abuse and mental health/illness, perceived need for treatment and attitudes toward treatment utilization for substance use or mental health. The dependent variable in this analysis was service use for adults, measured as those who did not seek treatment.

In addition to measuring prevalence rates for substance use and mental health, the NSDUH asks questions about attitudes toward treatment utilization for those with substance use disorders and/or mental illness. The dependent variables used in the analysis were individuals' attitudes on services use and were measured by asking 14 questions from individuals with substance use disorders and 15 questions from individuals with mental illness about why they did not seek treatment in the past 12 months. These measures were used to determine the class designations. The independent variables in the LCA analysis included demographics such as ethnicity/race, income and education, as well as mental health severity, and were used to determine the characteristics of the classes identified by reasons for not seeking care.

A LCA allows for identification of group characteristics of unidentified subgroups using factors such as attitudes and demographics. Given the undefined relationships between the three interrelated factors and treatment utilization studied, a LCA was especially applicable in answering the research question. The substance use and mental health models were each analyzed independently of each other. Underutilization of treatment was defined as those with a substance use or mental health symptoms that did not get treatment in the past year.

A LCA allows for a better understanding of the impact of exposure to patterns of multiple risk factors including complex behaviors, so that interventions can be tailored to target the subgroups that will benefit most. A class is characterized by the maximum likelihood estimations of the probability of each individual fitting in a class determined by their response as to why they did not seek treatment in the past year. The LCA identified 4-classes for the mental health and 3-classes for the substance use models, based on statistical fit indices and p-values.

1.1 Summary of Utilization of Treatment– NSDUH 2012

- Those with mental health symptoms are more likely to have health insurance (77.6%) compared those with substance use symptoms (69.0%),
- Individuals with mental health symptoms were more likely to not seek treatment due to cost (47.4 %) compared to those with substance use symptoms (38.2%),
- Individuals with substance use symptoms are less likely to seek treatment (10.8%), compared to those with mental health symptoms (41.0%),
- Substance use services were utilized by Whites, Latinos, and Blacks; those 18-25 years old,
- Whites, American Indians/Alaskan Natives, and multiracial individuals, those 25-44 years and 60 years or older are most likely utilized mental health treatment.

1.2 Summary of Class Characteristics

The baseline demographic characteristics did not show meaning full variations between latent classes so the odds ratios were calculated to used to summarize class characteristics.

- **Those who cited “cost” as the primary reason for not getting care:**
 - The mental health action groups’ (class 4) reasons for not getting care were **“cost”** (100%) and **“insurance did not pay enough”** (13.2%). They accounted for 29.1% of the latent classes sample and likely was male; married; White, Black, Hispanic/Latino, or Native American; not completed high school; and had severe psychological distress.
- **And didn’t know where to go:**
 - Class 2’s, mental health contemplation group reasons were **“cost”** (38.0%) and they **“did not knowing where to go”** (29.0%). The latent classes sample accounted for 28.7% and most likely was 26-34 years; married; White, Black, or Native American; not completed high school or a high school graduate; earned \$75 thousand or more and low rates of mental illness.
- **And “did not think I needed treatment”:**
 - Class 3 of the substance use groups’ reasons was **“cost”** (42.9%) and **“did not think I needed treatment”** (9.2%). They were most likely male, 18-24 years, White, Black, Asian/Pacific Islander or Hispanic/Latino; graduated high school; earned less then \$20 to 49 thousand; and overall mental distress.
- **Those who didn’t get care because they “weren’t ready to stop using”:**
 - **And cost:**
 - The substance use precontemplation group (class 1) was **“not ready to stop using”** (100%) and **“cost”** (6.9%) was an issue. Baseline characteristics show they were male, 18-25 years; White, Black or Latino, graduated high school; earned less than \$20 thousand, severe psychological distress and overall mental distress; was 23.4% of the sample and was the reference group.
 - **And stigma at job:**
 - Class 2of the substance use contemplation stage was **“not ready to stop using”** (68.4%) and **“feared effect on job”** (61.4%). They were 9.1% of the sample and were likely 18-34 years, married, White or Black; a high school graduate/had some college; earned \$50 to 75 thousand a year and high levels of all mental distress.

- **Those who didn't get care because they "could handle the problem"**
 - **And did not want others to know:**
 - The mental health precontemplation group (class 1) felt they **"could handle the problem"** (82.0%) and **"did not want other to know"** (51.0%). The baseline characteristics show that class 1 was female, 18-24 years, White or Hispanic/Latino; had completed some college and earned less than \$20 to 49 a thousand a year in income. This group had the highest rates of all measures of mental distress, accounted for 7.8% of the latent class sample and was the reference group
 - **And "did not have time":**
 - Factors for not seeking treatment from the mental health precontemplation group was **"could handle the problem"** (51.9%) and that **"did not have time"** (27.9%). Class 3 accounted for 31.0% of the latent class sample; were most likely female; 18-34 years; married; White or Native American; not graduated high school, earned less then \$20 to 49 thousand and low mental distress.

1.3 Recommendations for the Office of Communications:

- Share information with Director of Communications to identify ways that this analysis can inform current communications efforts to increase health insurance enrollment and future communications efforts around the Affordable Care Act (ACA).
- Use to inform Office of Behavioral Health Equity media campaigns for minorities with mental health or substance use symptoms based on trends related to attitudes among demographics.
- Use to inform strategies for future ACA toolkits to continue to work to enroll those in the ACA by prioritize groups of individuals who are further along in the Stages of Change and target them to make changes in behaviors related to insurance and treatment utilization.
- Use results to inform SAMHSA social media efforts to design an agency-wide communication strategy and objectives around the ACA.
- Additional consumer research is needed to identify and craft targeted communications strategy objectives

1.4 Two Scenarios: Using This Analysis of Class Differences to Increase Treatment Utilization for those with Behavioral Health Symptoms:

1. For the mental health group in the Action stage (class 4), the primary limitation to utilization was “**cost**” and they had no reservations about treatment. This group was chosen as it represents the largest mental health group (33.8%). This group being in the Action stage indicates that there likely to take action in the next six months and would be more opened to communications about treatment than other groups. Communications efforts could focus on educating about where and how to get insurance through Medicaid, as this group has an income of <\$20-49 thousand, qualifying them for Medicaid. A functional approach to improving knowledge, utilitarian function, and/or socially adjusted motivations would be to address a lack of efficacy in obtaining insurance. Additional analysis of perceptions of need for male, Black, Hispanic/Latino, or Native American who had not completed high school and had severe psychological distress is needed.
2. A substance use groups’ primary reason for not getting treatment was **stigma** and the majority “**felt treatment would work**”; they are in the Contemplation stage. This group was selected to as they are the largest group (71.2%) and have the worst overall mental health. They could be encouraged to seek treatment by addressing concerns about cost and helping them find where to get treatment. Additional analysis into treatment preferences for 18-24 years, married, White or Black; were a high school graduate, hand an income of \$50-75 thousand a year and high levels of mental distress for all mental health measures is needed.

2 The Current Magnitude of Mental Illness and Substance Use Symptoms in the United States

A hidden problem is the magnitude of mental illness and substance abuse in the U.S. and the effect these symptoms have on not only individuals, but also on their families and communities. Incidents of serious mental illness cost an “estimated \$193 billion dollars a year in lost earnings alone” (Robert Wood Johnson, 2013). A study on schizophrenia found that 25% of hospital admissions and disability payments, in the U.S., were for individuals with serious mental illness (SMI) (Eric Q. Wu, 2005). Life expectancy for individuals with serious mental illness is reduced by 8 years, compared to the general population (Druss, Zhao, Von Esenwein, Morrato, & Marcus, 2011). Within their lifetime, these individuals lose 15 years of productivity; this is the same loss of productivity as cancer (U.S. Department of Health and Human Services, 1999).

Current findings from the National Survey on Drug Use and Health 2012 (NSDUH) show that 43.7 million (18.6%) adults 18 years or older had any mental illness (AMI) in the past year (SAMHSA, 2013a). Of adults who had AMI in the past year, 9.6 million or 4.1% had SMI (SAMHSA, 2013c). And in the last year, 22.2 million (8.5%) persons 12 years or older had substance use (SU) symptoms (SAMHSA, 2013c, p. 13). These findings are similar to the findings of other national surveys such as the National Epidemiological Survey on Alcohol and Related Conditions (NESARC), and the National Comorbidity Survey – Replication (NCS-R) (SAMHSA, 2013c, p. 72) (See Appendix A).

The objective of analyzing the data from the 2009-2012 NSDUH was to identify the prevalence of MI and substance use (SU), and how the relationships to insurance, attitudes toward treatment, and demographics influence behavioral healthcare (BH) utilization. This paper sets out to answer questions about audience variations in utilization of MH or SA treatment and insurance enrollment for those with BH symptoms.

Behavioral healthcare (BH) is an umbrella term and refers to a continuum of services for individuals at risk of, or suffering from, mental, behavioral, or addictive disorders (Services, 2006). **Mental health** (MH) is a state of well being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community (WHO, 2010). **Mental illness** (MI) is a medical condition that disrupts a person's thinking, feeling, mood, ability to relate to others and daily functioning (National Alliance on Mental Illness, 2014). **Any mental illness** (AMI) is a medical condition including mild, moderate, and severe mental distress that disrupts a person's thinking, feeling, mood, ability to relate to others and daily functioning (NIH, 2014). **Severe mental illness** (SMI) includes symptoms that meet the criteria for major depression, schizophrenia, bipolar disorder, oppositional defiance disorder, post-traumatic stress disorder that is a major disruption for people and families as determined by the *Diagnostic and Statistical Manual of Mental Disorders V* (Institute of Medicine, 2014).

Substance use dependence (SD) is “when an individual persists in use of alcohol or other drugs despite problems related to use of the substance, may be diagnosed. Compulsive and repetitive use may result in tolerance to the effect of the drug and withdrawal symptoms when use is reduced or stopped.”(American Psychological Association, 2013). **Substance use (illicit) disorder** (SUD) “the essential feature is a cluster of cognitive, behavioral, and physiological symptoms indicating that the individual continues using the substance despite significant substance-related problems” (American Psychological Association, 2013, p. 483). **Alcohol use disorder** (AUD) “a problematic pattern of alcohol use leading to clinically significant impairment or distress, as manifest by ... at least two of 11 specified [diagnostic criteria] that occurred within a 12 month period ... and defined by a cluster of behavioral and physical

symptoms, which can include withdraw, tolerance, and cravings (American Psychological Association, 2013, pp. 490,492). **Substance abuse** (SA) is the overindulgence in or dependence on an addictive substance (esp. alcohol or drugs) (Dictionary, 2014).(Appendix G: Acronyms).

The World Health Organization (WHO) presented evidence documenting that BH is a considerable contributor to the global burden of disease (Commission on Social Determinants of Health, 2008). Eaton et al. found in their 2011 report that neuropsychiatric conditions were responsible for 21% of total global disease burden, third to infectious and parasitic disease (41%) and cardiovascular disease (26%) (Eaton et al., 2008).

Finding from the 2012 NSDUH indicate that those with mental health symptoms are more likely to have health insurance (77.6%) compared those with substance use symptoms (69%), and both were less likely to have insurance compare to those without BH symptoms (83%). Rates of having insurance was lower for minorities, only 59.3% of Latinos, 69.2% of other ethnicity/race, 75.8% of Blacks, and 81.8% of Asians had health insurance compared to Whites (86.9%) (Chou, Tulolo, Raver, Hsu, & Young, 2013). One in three Native Americans are without health insurance, a rate double that of Whites (Rieckmann et al., 2012). Past year utilization of BH was (14.5%), and individuals with substance use symptoms are less likely to seek treatment (10.8%), compared to those with mental health symptoms (41%), Given the magnitude of the disease burden of BH in the population, low rates of a having insurance and of BH utilization nationally, it is of great importance to increase insurance enrolment and treatment utilization.

The identification of audience characteristics and situational analysis is intended to inform communication strategies to promote increased health insurance enrollment and treatment utilization for those with BH symptoms. This is especially timely given the enactment of both the Affordable Care Act (ACA) and the final ruling on Mental Health Parity in insurance coverage.

This paper will explain the methods of Latent Class Analysis (LCA); provide background on the NSDUH, and the findings from the situational analysis as well as communications strategies that could be used to reach those who have traditionally not participated in BH treatment. A literature review and secondary analysis from NSDUH 2009-2012 using a LCA informed the findings. Communications frameworks used included the P-Process and the Stages of Change model to inform the interpretation of results from the LCA. Psychographic profiles were created from the results to address communications goals of the Substance Abuse and Mental Health Services Administration (SAMHSA) Office of Communications. The communications goals are to focus on increasing BH treatment utilization and health insurance enrollment and to understand new ways of working with national data.

2.1 Background on Agency and Situational Context

This paper arose out of needs expressed by Steve Wing and Kevin Malone, my supervisors in the Office of Policy, Planning, and Innovation at the Substance Abuse and Mental Health Services Administration (SAMHSA). SAMHSA is a federal agency within the Department of Health and Human Services whose mandate is to reduce the impact of mental health and substance abuse in the community (See Appendix B). Mr. Wing and Mr. Malone felt there was a need at the agency to identify individuals' attitudes toward behavioral health (BH) treatment utilization as well as identifying psychographic profiles for individuals with mental health (MH) and substance use (SU) symptoms. They wanted to identify attitudes those with BH had toward treatment beyond what has been available in the current literature. The literature looks only at the relationship between two of the four areas of analysis found in Table 1 of the methods section.

This project is relevant due to the recent enactment of the Patient Protection and Affordable Care Act (ACA) and the final ruling from the Federal government on Mental Health Parity.

Current studies on the expansion of Medicaid and the Health Insurance Exchanges (Exchanges) have varying estimates of how many uninsured individuals with BH needs will be able to get coverage under the ACA. One meta-analysis of 20 Medicaid expansion -related studies from 2010-2012 predicted that 17 million uninsured individuals will be able to get health coverage through Medicaid expansion and 18-25 million will be able to get coverage from the Exchanges (Miller, 2013). Of the uninsured, it is estimated that 13.4 million individuals with BH conditions will be eligible through Medicaid (6.6 mill.) and the Exchanges (6.8 mill.)(Miller, 2013).

The ACA provides additional coverage to those who already have health coverage by requiring health plans to cover 10 essential health benefits, including MH and SU services (Beronio Rosa Po, 2013). For all health plan providers who currently offer MH and or SU treatment or any new policy, the requirement will be to provide these services in parity with medical and surgical benefits (Beronio Rosa Po, 2013). The Office of Health and Human Services: Office of the Assistant Secretary of Policy and Evaluation (ASPE) reported that approximately one-third of those with insurance currently do not have coverage for substance use disorders and that about 20% do not have coverage for MH services (Beronio Rosa Po, 2013). With the release of the final ruling on Mental Health Parity on November 8th, 2013 those who already have coverage and those who will be newly enrolled will receive equal treatment related to cost and services provided for BH service as they do for medical and surgical services ("Mental Health Parity And Addiction Equity," 2014).

3 Individuals with Mental Illness & Substance Abuse: How Insurance, Attitudes and Demographics Shape Behavioral Health Utilization

3.1 Overview of Enabling, Predisposing, and Perceived Need in Relation to Behavioral Health Services Utilization

Access to health care is a function of individual attributes including enabling (socioeconomic, insurance status), predisposing factors (society, demographics) and perceived need for action (severity, health status, disability) (Roll, Kennedy, Tran, & Howell, 2013).

Enabling factors are factors that make it easier (or possible) for an individual or community to change or perform a specific health behavior (The Open University, a). Enabling factors fall into two categories, community enabling and personal or family enabling (The Open University, a).

Community enabling is changes in the environment or larger social system (The Open University, a). Personal or family enabling factors are having the skills or resources to perform a health behavior (The Open University, a). For behavioral health (BH) utilization, having insurance, money to pay for treatment and/or the knowledge about where and when to seek treatment would be enabling factors (The Open University, b).

Predisposing factors are characteristics of a person, community, or ethnic/racial group that motivate behavior before the need to perform the health behavior occurs, including an individual's or populations knowledge, beliefs, values and attitudes that affect the way they behave (The Open University, b). For BH utilization, this includes variations in a persons or communities attitudes or knowledge, about treatment and their perceived need for treatment. Factors of need or severity of BH symptoms comes from the "Health Belief Model" (note: This model was developed by Hochbaum in 1958 to understand the uptake of preventative health behaviors) and is defined as an individual's subjective view of "vulnerability to disease and disease severity combine to form a 'threat', and that threat perception motivates action"(Miles).

The impact of need on BH treatment utilization is that those who view their BH symptoms as severe are more likely to engage in behavior to prevent or address the health problem.

3.2 Enabling Factors: Health Insurance Status and Cost of Treatment

It has been well documented that not having health insurance and the high cost of mental health (MH) and substance use (SU) treatment are the primary reasons that individuals have reported not getting treatment. From the 2012 National Survey on Drug Use and Health (NSDUH) the primary reasons reported for not getting MH treatment were I “could not afford cost” (47.4%) and “insurance did not pay enough” (12.4%) (SAMHSA, 2013a). For those with SU symptoms the main reasons reported for not getting treatment was “did not have health coverage and could not afford cost” (38.2 %) or “had health coverage but insurance did not cover treatment” or “did not cover cost” (10.1 %) (SAMHSA, 2013c, p. 7).

These trends in the link between health insurance and behavioral health care (BH) utilization have persisted over the past decade. Behavioral health diseases have biological correlates that are subject to influence by modifiable social, economic, and environmental conditions that effect not only the individual but the whole community, neighborhood, and population (Shim, 2104). Individuals engaged in BH treatment are uninsured at higher rates, compared to the general public (McGuire & Miranda, 2008).

Research on overall health care utilization and enabling factors show that the uninsured and those 18-24 years old are 6 times more likely to forgo needed health care because of cost, compared to those whom are continually insured (U.S. Department of Health and Human Services, 2013). Individuals below poverty, defined as under 200% of the Federal poverty level, are at the highest risk of being uninsured; this accounts for 38% of all the uninsured (Kaiser Commission, 2013). Individuals below 400% of poverty account for 9 out of 10 of the uninsured

(Kaiser Commission, 2013). The Institute of Medicine (IOM) concluded in *America's Insurance Crisis* (2009), that health insurance coverage is an important predictor of access to care and prevention of chronic disease, hospitalization, and death (National Academies, 2009). Though the research on how income and insurance status influences healthcare utilization does not directly include BH utilization, these trends are important to consider as having insurance tends to increase any healthcare service utilization.

Of those who reported an unmet need for SU or MH treatments, 30.4% were uninsured, 18.5% had Medicaid, and 13.6% had private insurance (Wells, Sherbourne, Sturm, Young, & Burnam, 2002). The Healthcare for Communities Survey (HCC) was oversampled for persons with high psychological distress and income below the federal poverty level (Oversampling means that the study surveyed individuals in a particular target group more than the general public.). Findings from the HCC found that the uninsured had a greater perceived need for MH treatment (13.5%) compared to those with private insurance (9.8%) and that those on Medicaid (23.9%) had the greatest perceived need (Wells et al., 2002). Only 15.8% of Whites lacked health insurance, compared to 21.2% of Blacks (U.S. Census Bureau. (2010). Of those who are poor, the number of Blacks who were on Medicaid was more than the number of poor Whites (27.1% v. 10.7%) (Snowden, 2012). Those who reported the greatest unmet need for treatment from the NSDUH (1997-2010) are working individuals 18-64 years old (Roll et al., 2013).

The National Institute of Mental Health's 2012 report stated that 1 in 4 adults had a MH condition and 1 in 17 had serious mental illness (SMI) in the past year (National Alliance on Mental Illness, 2013). Adults with mental illness (MI) are more likely to be uninsured compared to those without MI (National Alliance on Mental Illness, 2013). A study using the 1997-2010 NSDUH on MH treatment found that unmet need for MH treatment increased from 4.3 million in

1997 to 7.2 million in 2011; and that those who are uninsured are 5 times more likely to have an unmet MH need, compare to those with private insurance (Roll et al., 2013).

The prevalence of SU disorders in the Medicaid population is 50%, much greater than the prevalence rate for those with private insurance (9%) (Bouchery, Harwood, Dilonardo, & Vandivort-Warren, 2012). An analysis of the NSDUH (2002-2007) found that the prevalence of SU disorders was greatest for the uninsured (13.6%), lower for recipients of Medicaid (8.8%) and private insurance (7.8%) and the lowest for individuals with Medicare (2.4%) (Bouchery et al., 2012). Those who had private insurance had higher rates of alcohol only dependence (9.6%) compared to those with Medicaid (5.1%) (Bouchery et al., 2012). The prevalence of illicit drug dependence was the opposite; with those on Medicaid having higher rates of illicit drug dependence (3.9%) compared to those with private insurance (1.3%) (Bouchery et al., 2012). The increased prevalence of SU in the uninsured population may explain why those with private insurance are the least likely to receive treatment for SU (Bouchery et al., 2012).

3.3 Predisposing Factors: Prevalence Rates of Mental Health and Substance Use Symptoms, by Ethnic/Racial Background

Predisposing factors related to access to health care include demographic differences and are often reported in the literature as unequal treatment or health disparities. In 2003 the Institute of Medicine (IOM) defined disparity as “a difference in health care quality not due to difference in both health care needs or preference of the patient” (Smedley, 2003). Insurance status and ethnicity/race are independently associated with treatment utilization, with the latter being the stronger association (Chou et al., 2013).

3.3.1 Prevalence Rates of Mental Illness for Ethnic/Racial Groups

A review of current literature found that all minority subgroups, except Puerto Ricans, had a lower rate of life time mental illness (MI) compared to Whites (McGuire & Miranda, 2008).

Latinos and Blacks rates of past year MI were close to that of Whites. Black were less likely to have major depression in their life times and more likely to have schizophrenia, compared to Whites (McGuire & Miranda, 2008). Native Americans had a lower risk of major depression and higher risk of post-traumatic stress disorder and alcohol dependence in the past year, compared to Whites (McGuire & Miranda, 2008). Latinos and Blacks have lower prevalence rates for psychological disorders compared to Whites, but those with MI tend have persistent and severe disorders (McGuire & Miranda, 2008).

Findings from the National Latino and Asian American Survey (NLAAS, 2003) found that overall lifetime prevalence for any psychological disorder for Asians was 17.3% lower than Latinos (30.2%) and Blacks (30.5%) (Sue, Yan Cheng, Saad, & Chu, 2012). The 2010 NSDUH demonstrated that Asian Americans had the lowest rates severe mental illness (SMI), and overall mental illness (MI) compared to all other ethnic/racial groups in the past year (Sue et al., 2012). Past year MI for those 18 years or older in 2010 was 15.8% for Asians, 18.3% for Latinos, 18.7% for Native American/Alaska Natives, 19.7% Blacks and 20.6% for Whites (Sue et al., 2012, p. 11). Overall research shows lower MI for Asian Americans, and higher rates for specific disorders in certain subgroups (Sue et al., 2012). Relationships between immigration and depression for Asians has mixed results, some report that risk of depression decreases as the length of residence in the U.S. increases (Sue et al., 2012). For Chinese immigrants the risk of depression is highest at the time of immigration and soon after, and the risk decreases as acculturation increases (Sue et al., 2012).

There were some variations in prevalence rates in analysis of the NLAAS (2003) related to MI for Asians by gender and age. Asian males with higher English proficiency had lower rates of lifetime and past year depression, anxiety, and psychological disorders (Sue et al., 2012).

Asian women born outside the U.S. were less likely to have lifetime depression, anxiety, SU or psychological distress, compared to those born in the U.S. (Sue et al., 2012). Nativity was associated with prevalence of anxiety in the past year only; and second generation Asian women were at the highest risk of lifetime and past year MH disorders (Sue et al., 2012). Elderly Asian women were at higher risk of suicide ideation compared to other ethnic/racial groups; and primary care patients (56.8%) had higher prevalence of suicide ideation and death ideation compared to African American elderly patients (27.0%) (Sue et al., 2012). U.S. born Asian men had lower rates of suicide ideation compared to foreign born men and women (Sue et al., 2012).

Latinos overall (29.7%) and Mexican Americans (36.7%) have lower lifetime prevalence rates for any mental illness (AMI), compared to Whites (51.2%). The lifetime prevalence rates for any MH disorder reported in NLAAS (2003) vary significantly across Latino subgroups; Puerto Ricans have the highest rates (37.4%), Mexicans had a rate of 29.5%, Cubans had a rate of 28.7% and other Latinos had the lowest rate at 27.0% (Alegria et al., 2008).

Many authors feel that Blacks are at greater risk for MI due to higher exposure to conditions that place them at an increased risk of depression due to increased rates of chronic illness, functional disability, and social structural barriers (Gitlin, 2012). Findings from a convince sample surveying Philadelphia seniors in 2009, found that depressed Blacks are more likely to have economic difficulties, more health conditions, greater functional difficulty and more pain compared to non-depressed Blacks (Gitlin, 2012). African Americans' lifetime rates of MI are less than Whites and the past year prevalence of MI was about the same as Whites (Gitlin, 2012).

Blacks who do experience MI experience more disabling forms of MI and experience them from longer periods compared to Whites (Snowden, 2012). The National Survey American Life (NSAL, 2003) found that of those suffering from major depressive disorder, African Americas

accounted for 57% of those with chronic major depression compared to Whites (39%) (Snowden, 2012). Hunt et al. found in a survey of primary care patients in 2008, that Blacks are more likely to have three or more anxiety disorders, to report depression comorbidity as well as the poorest physical health, compared to Whites (2013).

3.3.2 Prevalence Rates of Substance Abuse and Dependence for Ethnic/Racial Groups

In the 1990's, there was a shift in SU treatment from hospitals to other settings (Bouchery et al., 2012). This shift in funding led to an increase in public funding cost nationally that the U.S. put towards substance use (SU) treatment (Bouchery et al., 2012). For individuals who received any or specialty SU treatment (6.9%), those with private insurance had the lowest rate of treatment receipt (3.9%) (Bouchery et al., 2012). Those with public healthcare were 3 to 6 times more likely to receive any SU (27.9%) or specialty SU (23.6%) treatment compared to those with private insurance (Bouchery et al., 2012). For the uninsured, the rate of receiving any SU treatment (11.7%) or specialty treatment (7.9%) was 2 times greater than those with private insurance (Bouchery et al., 2012).

Comparing SU prevalence across racial groups from the National Epidemiological Survey of Alcohol and Related Conditions (NESARC, 2001-2002) found that overall 10.5% of the U.S. population meets the criteria for at least one life time drug use disorder (Perron et al., 2009). Lifetime prevalence rates for Black were 8.7%, Latinos were 7.2%, and Whites were the highest at 11.3% (Perron et al., 2009). Overall SU dependence prevalence for adults 18 years and older from the 2012 NSDUH, was 0.6% for both alcohol and illicit drug dependence, 2.8% for alcohol dependence and 1.9% illicit drug dependence (SAMHSA, 2013b).

The 2010 NSDUH demonstrated that Asian Americans had the lowest rates of drug or alcohol use (Sue et al., 2012). An analysis of the NSDUH from 2005-2009 found the overall SU

prevalence rates are similar for African Americans, Latinos and Whites, though Blacks tend to have higher rates of illicit drug use and similar rates of alcohol use compared to Whites (Cook & Alegria, 2011). Blacks were more likely to have alcohol dependence, illicit drug abuse, illicit drug dependence, and less likely to have alcohol abuse, compared to Whites (Cook & Alegria, 2011). Latinos were more likely to have alcohol dependence, illicit drug abuse, and less likely to have rates of alcohol abuse, compared to Whites (Cook & Alegria, 2011).

Research from the National Comorbidity Survey-Replication (NCS-R, 2003) found that overall Latinos have lower rates of SU disorders compared to Whites. Overall lifetime prevalence rates of alcohol abuse/dependence is 10.2% for Latinos compared to 16.0% for Whites and illicit drug abuse/dependence for Latinos was a prevalence rate of 5.1% compared to Whites (10.6%) (Alegria et al., 2008). Rates of SU for Latinos who have immigrated compared to non-Latino White immigrants continues to be lower for Latino immigrants for both alcohol and drug use, compared to non-Latino White immigrants (Alegria et al., 2008). Latino immigrants have an alcohol prevalence rate of 6.3% and 3.9% for SU, compared to alcohol prevalence rates of 9.9% and SU prevalence rates of 7.6% for non-Latino White immigrants (Alegria et al., 2008). When comparing prevalence rates for non-immigrant Latinos and Whites the prevalence rates for alcohol, the trends stay the same, with non-immigrant Latinos having an alcohol prevalence rate of 16.2% compared to non-Latino White prevalence rates of 22.2% (Alegria et al., 2008). Substance use prevalence rates are similar for non-immigrant Latinos (11.2%) compared to Whites (14.1%) (Alegria et al., 2008).

The trend of overall lower prevalence of SU disorders for Latinos compared to Whites for both native and immigrant individuals does not hold true when looking at subpopulations of Latinos compared to Whites (Alegria et al., 2008). Puerto Ricans had the highest rates of any SU

disorder (13.8%), Mexicans had the second highest rate of any SU disorder (11.8%), Cubans had a rate of 6.6%, and other Latinos had the lowest rates (9.8%) of any SU disorder (Alegria et al., 2008). When looking at differences in SU prevalence rates for Latinos, there are large variations by subpopulation and the prevalence rates by subpopulation are similar to Whites.

Though the overall rates of MI and SU for minorities are similar to that of Whites, the number of psychological symptoms for minorities is greater (McGuire & Miranda, 2008). Minorities present poorer functioning related to a greater number of symptoms that may not reach criteria for diagnosis as determined by the Diagnostic and Statistical Manual of Mental Disorders V (DSM-V), suggesting there may be disparities in need that are not captured by diagnosis (Chou et al., 2013).

3.4 Predisposing Factors: Ethnic/Racial Variations in Unmet Need for Behavioral Health Treatment

Overall utilization of health care differs by race after accounting for insurance coverage and income from analysis of the 2010 National Health Interview Survey (NHIS) (Chou et al., 2013).

Utilization of healthcare for the insured was highest for Whites (22.1%), Blacks' (20.1%), other ethnicity/races (19.1%), Latinos (17.5%), and lowest for Asians' (13.9%) (Chou et al., 2013).

These trends held true for the uninsured, 8.7% of Whites, 7.1% of Blacks, 7.7 % other ethnicity/races, 4.7% of Latinos, and only 4.1% of Asians unutilized healthcare services (Chou et al., 2013). Blacks are also over represented in the emergency room and inpatient services compared to Whites (Snowden, 2012). These trends in treatment utilization for Blacks are compounded by the low uptake of health insurance enrollment even when insurance is offered for Blacks (Snowden, 2012).

Roll et al. (2013) reported that the findings from the NSDUH (1997-2010) found that those who were not married and were women were (60% and 90% respectively) more likely to have

reported unmet need for BH treatment in 2010 (Roll et al., 2013). Interestingly, those who were non-white (0.7) and Latino (0.8) reported less unmet need compared to Whites (OR=1.0) (Roll et al., 2013). Those with lower incomes were 50% more likely to report unmet need and those with no health insurance coverage were 4 times more likely to report unmet need compared to those with private insurance (Roll et al., 2013).

The IOM defines disparities as “due to discriminatory behavior of providers (treating otherwise similar patients differentially according to race) and disparities due to access, insurance, and other factors associated with the operation of the healthcare system” (Smedley, 2003). There are major differences in the presentation of key symptoms of psychological disorders across ethnic/racial groups (McGuire & Miranda, 2008). Ethnicity/race may effect what they report to their clinician, what the clinician asks, and how this information is interpreted by the clinician (McGuire & Miranda, 2008).

3.4.1 Ethnic/Racial Variations in Unmet Need for Mental Health Treatment

Disparities in MH treatment exhibit different patterns from other kinds of health disparities (McGuire & Miranda, 2008). The U.S. Surgeons General Report on MH concluded that minorities have less access to MH treatment compared to Whites and that minorities are less likely to receive needed treatment, more likely to receive poor quality treatment and to delay or not seek MH treatment compared to Whites (The Surgeons General, 2001). Disparities related to receiving any mental health (MH) treatment for African Americans and Latinos has worsened between 2000 and 2004 (McGuire & Miranda, 2008). Over the past decade there has been no evidence found that there has been progress against disparities in depression and anxiety treatment in primary care settings (McGuire & Miranda, 2008). Overall rates of treatment for psychiatric disorders increased between 1990 and 2003, but Blacks were only 50% as likely to

receive treatment as Whites (McGuire & Miranda, 2008). Overall expenditures for MH outpatient treatment for Black and Latinos was about 60%, compared to 75% spent for Whites (McGuire & Miranda, 2008). Since 2007 Latinos were less likely to receive treatment for SU, and Blacks were more likely to receive SU treatment than Whites (U.S. Department of Health and Human Services, 2013).

In the National Latino and Asian American Study (NLAAS, 2002-2003) 17.9% of the general population used any mental health (MH) services in the past year, out of the 41.1% who meet the DMS IV criteria and only 31.9% of Blacks used some type of MH treatment services in the past year (Snowden, 2012). The 2003 National Co-Morbidity Survey –Replicate (NCS-R) found that nationally only 32.7% of those who received any type of behavioral health (BH) treatment received at least minimally adequate care, and that even less Blacks received the same quality of treatment (21.2%) (Snowden, 2012). Blacks are appreciably more likely than Whites to have untreated mental illness (MI) and are admitted to psychological hospitals at higher rates than Whites (Snowden, 2012).

From 2008-2010 Blacks are less likely to receive MH treatment compared to Whites (U.S. Department of Health and Human Services, 2013). Of adults who needed MH treatment 67% received treatment (Clancy, 2012). Only 8.6% of Asian Americans received any health services, 4.3% from a general medical provider, and 3.1% from a MH provider (Abe-Kim et al., 2007). Abe-Kim et al. (2007) found that the number of years in the U.S. and level of English proficiency was not associated with increased service use for Asian Americans.

Asian Americans have the lowest rates of service utilization among all ethnic/racial groups and are more likely to delay care for MH (Sue et al., 2012). They have a greater likelihood of choosing informal, alternative, or medical service providers over MH professionals (Sue et al.,

2012). The 2010 NSDUH found Asians accounted for only 5.3% of MH utilization in the past year, compared to Latinos (7.9%), Blacks (8.8%) and Whites (16.2%); this trend has held true over the past decade (Sue et al., 2012). Asians delay in recognizing symptoms of MI and seeking care may be due to differing perspectives on concepts of health and treatment that differ from the underlying Western belief about appropriate services (Sue et al., 2012).

A study of Latino youth (13-17 years of age) using three large national comparative studies of Latinos, African Americans, and Whites found that Latino children and adolescents (3.9% to 5.8%) were significantly less likely to use MH services in the past year compared to Whites (Kataoka, Zhang, & Wells, 2002). African American youth (6.7%) and White youth (8.1%) in the same study were the most likely to use MH compared to Latinos (Kataoka et al., 2002). Additionally, when controlling for need there were no changes in service utilization between the ethnic/racial groups; only 11.6% of Latino youth with the highest need received services compared to 24% of African American youth with the highest need (Kataoka et al., 2002).

System level MH treatment inadequacies create a lack of opportunities for patients to encounter welcoming outpatient treatment (Snowden, 2012). This is sometimes caused by shrinkages in overall outpatient treatment capacity (Snowden, 2012).

3.4.2 Ethnic/Racial Variations in Unmet Need for Substance Use Treatment

Reasons for low rates of substance use treatment and high levels of unmet need are only partly understood (Edlund, Booth, & Han, 2012). Positive predictors of SU treatment receipt for Whites, Black and Latinos include functional limitations at work, being 35 year or older, having a criminal history and being enrolled in Medicaid (Cook & Alegria, 2011). Negative predictive factors related to receiving SU treatment for all groups are having income at 400% above the federal poverty level, being female, married and employed (Cook & Alegria, 2011). A study

using the NSDUH years 2005-2009 found that those with the highest income and who were enrolled in Medicaid had significantly higher disparities in SU treatment for Blacks and Latinos compared to Whites (Cook & Alegria, 2011). When controlling for education, employment and being uninsured there were not significant disparities in SU treatment (Cook & Alegria, 2011).

A study on the impact of universal healthcare in Massachusetts found an estimated 35,000 individuals who are eligible for health insurance were not enrolled (Capoccia, Croze, Cohen, & O'Brien, 2013). Of those coming for BH treatment, 25-30% were uninsured and 25% of detox patients were 18-25 year old and uninsured (Capoccia et al., 2013). When clients were surveyed on reasons for not being enrolled in health insurance the responses included that the process of enrolling was confusing, time consuming, and that they were unaware of becoming uninsured (Capoccia et al., 2013). Most had not been notified that their insurance was going to lapse due to not opening, receiving or comprehending the notice (Capoccia et al., 2013). It is difficult to report on the magnitude of “churning” (cycling on and off of insurance) due to a lack of standard methods for measuring (Robert Wood Johnson, 2013). Churning is an important factor in sustaining health care coverage; affecting those with BH in prisons, experiencing homelessness, which are employed or have lost their job.

Barriers leading to low rates of behavioral health (BH) treatment are difficulty obtaining SU and MH treatment services from two fragmented systems and a lack of programs tailored to treat the needs of individuals with co-occurring disorders (Snowden, 2012). Mental health care often occurs in emergency rooms and psychiatric hospitals (Snowden, 2012). An article found that attitudes and evaluative behaviors were more commonly reported than financial barriers as obstacles to care (Mojtabai et al., 2011). The IOM concluded that health care disparities were genuine and problematic, but could not identify one single cause (Smedley, 2003).

3.5 Predisposing Factors: Perceptions of Need and Treatment Preferences, Ethnic/Racial Variations

If minorities are less likely to have health insurance and to have not received needed treatment, what factors related to minority attitudes and beliefs contribute to this trend? The World Health Organization's (WHO) Commission on Social Determinants of Health defines determinants of health as "differences in health which are not only unnecessary and avoidable, but in addition are considered unfair and unjust" (Commission on Social Determinants of Health, 2008, p. 34). Literature defines this further adding that determinants of health include conditions where people were born, grew up, and lived that impede health and wellbeing (Shim, 2104).

"Literature points to the role of cultural beliefs and attitudes within minorities toward health that lead to disparities in health care utilization for those with insurance" (Chou et al., 2013, p. 1361). These attitudes may possibly come from continually being treated unfairly and persistent racial stereotypes within the behavioral health (BH) system (Chou et al., 2013). Belief about illness and treatment preferences are typically an integral component of help seeking (Hunt, 2013). Help seeking may be imbedded in individuals beliefs about the natural of the cause of MI and the effectiveness of available treatment options (Hunt, 2013). Beliefs may also be influences on attitudes toward treatment, by having a shared view of ethnic/racial or cultural groups that shape attitudes and behaviors toward treatment (Hunt, 2013).

Differences in preferences in care seeking are not seen as technical contributing to disparities; they are important determinants of access even when cost and insurance are not an issue (Smedley, 2003). Attitudes and preferences strongly determine someone's acceptance of treatment as well as readiness to change (Schraufnagel, Wagner, Miranda, & Roy-Byrne, 2006). This influences the likelihood of an individual seeking treatment and adherence to treatment (Schraufnagel et al., 2006). Blacks and Latinos have been shown to feel more strongly that they

have less control over their own health compared to Whites (Schraufnagel et al., 2006). The belief in an "external locus of control" and fantastical beliefs' are the reason for ill health is more often associated with ethnicity/racial groups (Schraufnagel et al., 2006).

3.5.1 Ethnic/Racial Groups Perceived Need and Preferences for Mental Health Treatment

The Cultural Influences on Mental Health (CIMH) framework approaches this issue by looking at the characteristics of cultural factors that develop between patient and the mental health (MH) treatment system (Jimenez, Bartels, Cardenas, Dhaliwal, & Alegria, 2012).

"Variations in cultural influences continue the etiology and development of mental illness (MI) and effect how one personally defines his symptoms and illness" (Jimenez et al., 2012, p. 2). The Surgeons General found that disparities in MH treatment lead to less access to MH treatment, greater need, and receipt of poorer quality care when they receive care (The Surgeons General, 2001). The social determinants of MH can be conceptualize as root causes of social conditions that impede and underpin the social determinants and drive the individual level risks and protective factors of MH (Commision on Social Determinants of Health, 2008; Shim, 2104). The American domination of the MH field has provided leverage for America in setting the definitions of mental disorders and culture-bound syndromes which are exported to other cultures (Watters, 2010). Such a process can alter the expression of MI in other cultures (Sue et al., 2012) and influence the way MH professionals view the expressions of MI by minorities.

"Different cultural groups vary in their descriptions of disease symptom expression, and culture-based syndromes" (Sue et al., 2012, p. 537). Race has also been documented to be associated with differences in preferences for type of MH services treatment and provider characteristics (Jimenez et al., 2012). The accuracy of prevalence rates is affected when the cultural definition of MI applies unequally across ethnicity/race (Sue et al., 2012).

Those from ethnic/racial backgrounds, other than Native Americans, are less likely than Whites to attribute depression to biology, to feel psychological medications are less effective, and more likely to believe medications are addictive, and that counseling and prayer are effective treatments (Givens, Houston, Van Voorhees, Ford, & Cooper, 2007). When asked about what causes MI, Blacks felt that stress and loss of friends or family were the causes more than Whites (Jimenez et al., 2012). Asian Americans and Whites felt that family issues, physical illness, and cultural differences are what caused MI (Jimenez et al., 2012). Latinos believed that loss of family, friends, family issues, and moving caused MI (Jimenez et al., 2012).

A study investigating beliefs and treatment preferences for ethnic/racial groups using a multisite randomized trial, found that Asian Americans were less likely to report psychological distress in physical terms, and more likely to report symptoms in somatic terms (Jimenez et al., 2012). They were less willing to talk with anyone about MI or to seek out social support compared to any of the other ethnic/racial groups, and Asians preferred a health care provider that was of the same ethnicity (Jimenez et al., 2012).

Latinos felt that the effect of scattering the family was traumatic and that this led to poor health (Jimenez et al., 2012). Latinos were willing to speak to a psychologist and to use psychopharmacological medications (Jimenez et al., 2012). For Blacks, intergenerational family support was a common element in their health care and they perceived a strong social network as a protective factor and a place to get help (Jimenez et al., 2012). Blacks were willing to speak with family members or a medical doctor, but distrusted MH professionals and preferred to seek MH treatment services in primary care settings (Jimenez et al., 2012). Almost half of elderly African Americans felt that depression was a normal part of aging (46.7%) and 87.6% believed depression medications were beneficial (Gitlin, 2012). The ethnic/racial groups' differences in BH

treatment preferences from Whites can be legitimized by looking at beliefs related to treatment preferences (Snowden, 2012). Overall individuals from ethnic/racial groups tend to view psychopharmacological medications as less acceptable or effective and believe that they are addictive (Hunt, 2013). General preference for ethnic/racial groups is for psychotherapy or counseling and they feel that therapy is as effective as medications (Hunt, 2013). A survey of primary care adults with panic, generalized anxiety, social anxiety, and post traumatic stress disorders were enrolled in the study completed by Hunt et al. (2013) on beliefs and attitudes toward MH treatment. The participants were asked question from clinical measures about the past 6-months MH services use and asked to indicate their level of agreement for 4 questions (“Medications are important to the treatment of Anxiety.” “medication for anxiety does not help a person cope better.” “therapy can help an individual learn new ways of coping with problems” and “therapy patients are wasting money.”) (Hunt, 2013). Findings from Hunt et al. (2013) included that there were not significant differences between races on the 4 belief interaction items related to past 6-month use of MH counseling; the only differences were in the importance of medication in the management of MI (Hunt, 2013).

Additionally, Hunt et al (2013) asked 5 questions about comfort and beliefs about MH treatment from the NCS-R (2001-2003) (Hunt, 2013). They found that there were no significant differences between Blacks and Whites on all 9 of the belief items, and for the 3 stigma related items there were no significant differences between Whites and all other ethnic/racial groups (Hunt, 2013). These finding are supported by Edlund et al. (2012) that found that there were no structural or attitudinal barriers to treatment endorsed in their study.

There are, however, smaller differences in treatment preference between ethnic/racial groups. Latinos were less likely to believe that psychopharmacological medications for anxiety

were helpful and more likely to believe therapy was a waste of money compared to Whites. (Hunt, 2013). Asians differed in only one item compared to Whites, they believed therapy was a waste of money (Hunt, 2013). Native Americans were less likely to view psychotherapy as effective or that it improved coping skills, more likely to believe therapy was a waste of money; a greater percentage believed MI would get better without professional help (Hunt, 2013).

Preferences related to type of MH treatment varied between ethnic/racial groups; Blacks and Latinos were significantly more likely to prefer a provider of the same gender, compared to Whites (Givens, Houston, et al., 2007). Blacks were the only group that preferred a provider of the same ethnic/racial group; all other ethnic/racial groups were less likely to prefer a provider of the same ethnic/racial group (Givens, Houston, et al., 2007). When asked whom they would talk to about MI, Blacks said they would talk to a family member (non-spouse) and were less likely to talk with a psychologist (Jimenez et al., 2012). When Asians were asked about whom they would talk to about MI, they were unwilling to talk with family, friends, psychologist, or a doctor (Jimenez et al., 2012). Latinos were more likely to talk to a psychologist and not a medical doctor (Jimenez et al., 2012).

In a study, using a multisite randomized trial for older adults (65+), patients were asked, “If you were diagnosed with an MI, what would help?” Blacks responded that spiritual advice would help, Latinos preferred psychopharmacological medications, and there was not difference for Asians, compared to Whites (Jimenez et al., 2012). Overall 45% of primary care respondents who had anxiety or post-traumatic stress, had seen a therapist in the past 6-months, and there were no significant differences between groups in service utilization (Hunt, 2013). More Blacks would seek therapy and attend support groups, compared to seeking a medical doctor or taking psychopharmacological medications (Gitlin, 2012). Blacks were also the most likely to endorse

behavioral activities, such as cognitive reframing, and faith-based strategies to manage depressive symptoms (Gitlin, 2012). For Whites and Native Americans 70% had been taking medications for MI in the past 6-months, and 51-55% of Blacks and Latinos were taking medication in the same time period (Hunt, 2013). Only 42% of Asians have taken any medication in the past (Hunt, 2013).

For Asian Americans having good or excellent English proficiency and prior use of alternative MH services increased the likelihood of them utilizing specialty MH services (Sue et al., 2012). Of Asians with a probable MH disorder 28% used specialty MH services, 16% used primary health care, and 11% used alternative services for MH concerns, compared to 54% of the general populations that used specialty MH services (Sue et al., 2012). Latinos with greater social distancing scores were more likely to receive MH treatment (Interian et al., 2010). Social distancing was also significantly associated with current use of antidepressants for Latinos (18% more likely) (Interian et al., 2010). For older Blacks willingness to see a doctor or use medications was not associated with factors previously suggested as to why they did not seek care (Gitlin, 2012). Reasons that were reported for not utilizing MH treatment included religion based coping, stigma, and belief about causes of depression (Gitlin, 2012).

A study using a cross-sectional internet survey from 1999-2002 on attitudes toward depression treatment for Whites, African Americans, Asian Americans, Latinos, and Native Americans found that overall 40.4% preferred medications, 35.8% preferred counseling, and 23.8% preferred none of the treatment options (Givens, Houston, et al., 2007). Whites and Native Americans were the most likely to prefer medication (42.2% W v. 41.3% NA) compared to all other groups (Givens, Houston, et al., 2007). African Americans, Asian, and Latinos preferred counseling compared to medication (Givens, Houston, et al., 2007). Asian Americans were the

most likely group to prefer none of the treatment (26.5%) and Blacks were the least likely to prefer none of the treatments (19.6%) (Givens, Houston, et al., 2007).

3.5.2 Ethnic/Racial Groups Perceived Need and Preferences for Substance Use Treatment

Current knowledge of racial/ethnic differences and disparities is limited (Perron et al., 2009). Prior research has typically combined mental health (MH) with substance use (SU) treatment, masking differences in SU needs and utilization (Perron et al., 2009). The 2012 National Health Disparities Report found that in 2010, only 11% of individuals 12 years or older who had a need for treatment for illicit drug or alcohol problems received treatment (U.S. Department of Health and Human Services, 2013). Alegria et al. (2002) reported that when socioeconomic factors and culture were taken into account, Blacks had significantly lower levels of SU utilization compared to Whites (Perron et al., 2009).

Findings from the NESARC (2001-2002) report that for those with a lifetime SU disorder only 16.2% received at least one type of SU service (Perron et al., 2009). Blacks were the most likely to receive SU services (20.7%), 17.3% of Latinos and only 15.5% of Whites received SU services in their lifetime (Perron et al., 2009). The most commonly used SU services for the total study group was 12-step programs (62.6%), private/ professional MH services (55.2%), and drug/alcohol rehab programs (51.5%) (Perron et al., 2009). A multivariate analysis of the sample found that Blacks were 3 times more likely to use 12-step programs and 2-3 time more likely to use rehab, inpatient and clergy services compared to Whites (Perron et al., 2009). Whites were 2 times more likely to use private MH services, compared to African Americans; there were no significant difference between Whites and Latinos (Perron et al., 2009).

This contrast with an analysis of the National Epidemiological Survey on Alcohol and Related Condition (NESARC) form years 2001-2002 that found utilization rates for Blacks was

only lower for private physician, psychiatrist, psychologists, social worker, or other professional (55.1% overall v. 39.5% AA), compared to the overall SU utilization for Whites, Blacks and Latinos (Perron et al., 2009). The most used substance use services for Blacks were 12-step programs (79.7%), drug rehab programs (65.9%) outpatient clinic (including outreach and day programs) (54.8%) and drug/ alcohol detoxification clinics (48%) (Perron et al., 2009).

Unadjusted rates of receipt of any SU treatment for Blacks found that they were more likely to have received any SU service, compared to Whites (Cook & Alegria, 2011). There was no difference between White and Latino utilization of any SU services (Cook & Alegria, 2011). Adjusting for need and criminal history, the odds of Blacks and Latinos receiving SU services fell (0.75 AA v. 0.80 L), compared to Whites (Cook & Alegria, 2011). Those diagnosed with dependence on alcohol or illicit drugs were more likely to receive any SU treatment compared to those with only alcohol or illicit drug abuse (Cook & Alegria, 2011). When adjusting for highest income level and being enrolled in Medicaid, disparities between Blacks and Whites as well as between Latinos and Whites, significantly increased (Cook & Alegria, 2011). Other positive predictive factors for receiving SU treatment for all groups included having any functional limitation at work, being 35 years or older, a criminal history, and being enrolled in Medicaid (Cook & Alegria, 2011).

A literature review of SU, service use, and treatment utilization among Latino subgroups found that foreign-born Latinas were more likely to abstain from drug use and less likely to drink heavily compared to male Latinos (Guerrero, Marsh, Khachikian, Amaro, & Vega, 2013). Cultural norms associated with discouragement of SU of foreign-born Latinas may be the reason for the low prevalence rates of SU disorders for Latinas (Guerrero et al., 2013). Comparing Latinas to other ethnic/racial groups shows higher lifetime alcohol dependence rates and higher

rates of untreated SU at intake for Latinas, compared to male Latinos (Guerrero et al., 2013).

Latinos born in the U.S. or who immigrated at a young age are more likely to experiment with drugs and alcohol, compared to Latinos who immigrated as adults (Guerrero et al., 2013). Those who immigrated at a young age have higher prevalence rates of substance U.S. disorders (SUD). U.S. born Latinos are more likely to use marijuana and cocaine compared to Latinos born in Mexico or Puerto Rico (Guerrero et al., 2013). Caribbean's, Central Americans, and Cubans in the U.S. report low rates of drug use compared to Whites (Guerrero et al., 2013). Rates of drug use are highest for Mexican Americans and Puerto Ricans (Guerrero et al., 2013). Mexican Americans and Puerto Ricans report heavier, more consistent drinking and are more likely to binge-drink compared to Cubans, Central Americans, and South Americans (Guerrero et al., 2013).

Native Americans/Alaskan Natives are known to have higher rates of suicide, accidental death, and comorbid conditions (Rieckmann et al., 2012). Alcohol and drug use contribute and are influenced by mental health (MH), early trauma, abuse as a child, cultural displacement, unemployment and poverty (Rieckmann et al., 2012). In a study of two American Indian SU services, clients were surveyed about demographic characteristics, drug use patterns, and treatment needs between December 2007 and December 2008 (Rieckmann et al., 2012). Alcohol is the most commonly reported substance of abuse, 74% reported regular alcohol use, 68% reported regular methamphetamine use 60% reported cannabis use, 28% reported opioid use in the past year (Rieckmann et al., 2012).

The urban Native American SU treatment center reported that 96% of their admissions used more than one drug in any given day; in the rural Sample, they reported only 18% of admissions had used more than one drug in any given day (Rieckmann et al., 2012). Those who reported

opioid use (28.0%), were more likely to have chronic medical conditions compared to those who did not use opioids (59% vs. 42%), co-occurring methamphetamine use (82% vs. 62%), cannabis use (76% vs. 49%), cocaine use (42% vs. 22%), and more likely to use injection drugs (35% vs. 11%) (Rieckmann et al., 2012). Opioid users have increased lifetime history of severe depression and anxiety (84%), have used psychological medications (60%), had suicidal thoughts (54%), and had attempted suicide (34%) compare to no-opioid users (Rieckmann et al., 2012)

Reasons for underutilization of SU services for Asian Americans have not been systematically studied; research on SU disorders and barriers to SU treatment have emphasized the influences of immigration, acculturation and language proficiency (Yu & Warner, 2013). Asian Americans account for 4% of the U.S. population and only slightly more than 1% of all SU treatment admissions (Yu & Warner, 2013).

A study in New York state, where there is a higher density of Asians compared to the U.S. population 6.9%, use the Client Data System of New York State Office of Substance Abuse Services to conduct a retrospective study of services use from June 2005 to May 2008 (Yu & Warner, 2013). Yu and Warner found that the majority of the three admissions entry points into SU treatment were for Whites (42.5 to 47%), one-third less for Blacks (30.8 to 43.3%), one-fifth less for Latinos (18.5 to 20.7%), and the least for Asians (0.3 to 0.5%) (2013). Overall, three-fourths of those admitted at any of the three admission points were male; the most common reason for seeking treatment was for alcohol (41.1 to 45.1%), and 36 to 40% were referred from the criminal justice system (Yu & Warner, 2013).

3.5.3 Summary of Ethnic/Racial Perceptions of Behavioral Health Treatment

Though research on MH and SU prevalence rates and treatment utilization for ethnic/racial groups is not conclusive and often the National data that is available is more than five years old,

there are some trends overall. Consistently, overall ethnic/racial groups have lower prevalence rates of MH and SU disorders compared to Whites. However, there are differences in prevalence rates of MH and SU disorder for subpopulations of ethnic/cultural groups. Asians have the lowest prevalence rates of SU and MH for all groups and Asian women born outside of the U.S. had were less likely to have any lifetime depression, anxiety, and psychological distress compared to those born in the U.S. Blacks tend to have more illicit drug abuse and less alcohol abuse compared to Whites. African American also have similar rates of past year MI compared to whites and are less likely to have lifetime major depression and more likely to have schizophrenia. For Latinos, Mexicans and Puerto Ricans have the highest prevalence of SUD for all Latino groups, but still have lifetime prevalence rates of SU and MH below that of Whites.

In summary, disparities between ethnic/racial groups compared to Whites in treatment utilization continues to persist, potentially due to differences in cultural belief from experiences of migration or a lower perceived effectiveness of treatment from a cultural history of discrimination and distrust. Other potential factors influencing disparities include, differing cultural perspectives on causes of MI and SU disorders, variations in how symptoms are presented, as well as perspectives on appropriate, and preferred treatment types. These disparities in treatment utilization persist even after controlling for cost and health insurance status.

Studies completed on stigma and beliefs about BH treatment found that there are not differences between Whites and other ethnic/racial groups. There were differing preferences in treatment type and providers for all ethnic/racial groups. Blacks preferred to talk to family, ask for spiritual advice, and talk to a medical doctor over a mental health professional. They prefer a provider of the same ethnic/racial group, are less likely to accept medication for MI. Latinos preferred a provider of the same gender, not of the same ethnic/racial group, and preferred to talk

to a psychologist or use medications. Asians did not want to talk to anyone and or to take medications. Native Americans are more willing to take medications and to believe that psychotherapy would not work. Inconclusive evidence on attitudes toward treatment has led to questions about how perceptions of need and severity of BH influence treatment utilization.

3.6 Need and Severity: Influence on Treatment Utilization

Do the trends in preferences in treatment type and ethnic/racial disparities in behavioral health (BH) treatment vary by perceived need for treatment, the severity of mental illness (MI), or substance use disorder (SUD)? Of great public health concern is that untreated individuals with BH disorders relapse, have poor health outcomes, high health care consumption, and lead to excessive burdens of social harm and crime (Chan, Huang, Bradley, & Unutzer, 2014). Factors that impede treatment seeking include a lack of perceived need for treatment, stigma, pessimism about the effectiveness of treatment, lack of access due to cost, inconvenience and an inability to obtain an appointment (Mojtabai et al., 2011).

3.6.1 Severity of Behavioral Health Need Influences on Perceived Need for Treatment

Perceived need for treatment is described as one of the steps in the Stages of Change for addictions (Hedden, 2011). Those who do not perceive a need for treatment are in the Precontemplation stage, where concern for and sense of vulnerability due to substance use disorder (SUD) has not become apparent to the individual (Hedden, 2011).

Socioeconomic factors and severity of MI significantly predict low perceived need for treatment, but these factors do not predict attitudinal barriers for treatment among those who have a perceived need for treatment (Mojtabai et al., 2011). Disability increases with depression severity and Blacks experience more debilitating forms of MI and for longer compared to other groups (Snowden, 2012). Those with severe psychological distress (SPD) are more likely to

receive any substance use (SU) treatment, compared to those with out psychological distress (Cook & Alegria, 2011). A large number of adults with mental illness (MI) do not receive treatment even if the conditions are quite severe and disabling (Mojtabai et al., 2011).

Low perceived need was the most common reason for not seeking treatment (44.8%) in the 2003 National Comorbidity Survey – Replicate (NCS-R) (Mojtabai et al., 2011). This is more common with mild disorders compared to moderate or sever disorders (Mojtabai et al., 2011). Attitudinal/evaluative barriers were more important in both initiation (97.4% v. 22.2%) and continuing treatment (81.9% v. 31.8%), compared to structural barriers (Mojtabai et al., 2011). Data from the National Survey of Drug Use and Health (NSDUH) 2005-2009 found that of those 18 or older with a need for SU treatment, 8.3% needed illicit drug treatment, 12.4% needed both illicit drug and alcohol treatment, and only 3.3% perceived a need for treatment (Hedden, 2011).

3.6.2 Ethnic/Racial Variations in Perceived Need for Treatment

Overall, the reasons for not getting treatment did not differ between African Americans, Whites, and Latinos (Perron et al., 2009). Blacks were less likely to be afraid the boss, family, or friends would know (14.1%) compared to Whites (18.9%) and Latinos (20.3%) (Perron et al., 2009). Latinos were the most likely to feel they wanted to go, but did not get treatment because “health insurance did not cover” (17.2%) compared to Blacks (9.4%) and Whites (9.7%) (Perron et al., 2009). Whites were the least likely to feel that they “did not have time” (8.3%), “did not know where to go” (6.8%), and that they were afraid of the treatment they were going to get (6.5%) compared to Latinos (18.2%, 12.7%, 15.4%) and Blacks (12.6%, 13.3%, 12.2%) (Perron et al., 2009).

A national online survey found that overall African Americans, Whites, Asians, and Latinos were willing to accept a diagnosis of depression. Latinos compared to Whites were less likely to

accept a diagnosis of depression from a physician (AOR=0.86), and they were more likely to perceive a need for treatment for their depressive symptoms (AOR=1.20) (Givens, Houston, et al., 2007). Asians/Pacific Islanders were the least likely to accept a diagnosis of depression (AOR=0.83) and were less likely to perceive a need for treatment for their depressive symptoms (AOR=0.86) (Givens, Houston, et al., 2007).

A study of African Americans' willingness to seek treatment for depression found that those who were less educated, had better physical functioning, and felt that it would be okay if the community knew about their depression, were more willing to seek a physicians help (Gitlin, 2012). Overall, the primary reasons that respondents who recognize a need for treatment reported for dropping out of treatment included "wanting to handle the problem on my own" (42.2%) and perceived improvement in mental health (31.2%) (Mojtabai et al., 2011). Those who had severe MH disorders had the highest responses for attitudinal and evaluative barriers compared to those with moderate and mild disorders (Mojtabai et al., 2011). Of those with sever mental illness (SMI), 53.1% wanted to handle the problem on their own, 36.6% perceived stigma as a barrier, 35.0% perceived treatment as ineffective, and 24.4% felt the problem got better (Mojtabai et al., 2011). For individuals with moderate MI structural barriers were the greatest of all three groups, 25.3% dropped out because they found treatment inconvenient and 20.1% dropped out due to financial barriers (Mojtabai et al., 2011).

3.6.3 Influence of Insurance and Severity of Mental Health Symptoms

Earlier initiation of treatment referral is associated with depression improvement, and each 1 week delay in treatment is associated with a 3% decrease in the likelihood of depression improvement (Chan et al., 2014). Some factors related to access to health care and need for treatment include severity of BH need and perceived need for treatment. Individuals with SMI

are more likely to be uninsured (20.4%) compared to those with mild MI (18.2%) and those with no MI (11.4%) (McAlpine & Mechanic, 2000). The Healthcare for Communities Survey found that those with no MI are the most likely to have private insurance (63.2%), compared to those with mild MI (57.3%) and with SMI (34.5%) (McAlpine & Mechanic, 2000). Medicare and Medicaid recipients are more likely to have SMI (21.5% Medicare and 16% Medicaid), compared to those with no MI (19.7% Medicare and 2.3% Medicaid) and mild MI (14.4% Medicare and 7.1% Medicaid) (McAlpine & Mechanic, 2000). Those with SMI are more likely to perceive a need for treatment, the most economically and socially disadvantaged, younger, African American and less educated than those with no MI (McAlpine & Mechanic, 2000).

Recognition of need for treatment is typically higher for those with a psychiatric diagnosis and for those experiencing significant distress (Gitlin, 2012). For individuals with lifetime SUD the primary barriers for not getting treatment were “though I should be strong enough to handle alone” (41.7%), “thought the problem would get better by itself” (37.2%), was “to embarrassed to discuss with anyone” (25.8%), “could not afford to pay the bill” (20.8%), and “did not want to go” (20.7%) (NESARC, 2002) (Perron et al., 2009).

3.6.4 Differences in Perceived Need by Type of Substance Use Symptoms: Alcohol v. Illicit Drugs

It has been theorized that perceived need for alcohol use dependence (AUD) treatment may be a failure to recognize a need for SU treatment (Grant, 1997; Grella, Karno, Warda, Moore, & Niv, 2009). One in 10 individuals with AUD perceive a need for treatment and those with “pure” AUD perceive a need for MH treatment as often as those with AUD perceive a need for AUD treatment (Edlund et al., 2012). It is unknown if failure to perceive need for AUD is due to believing they do not have a problem, they do not want to stop, they feel treatment is not effective, or that they feel they can recover on their own (Edlund et al., 2012).

Individuals with AUD are less likely to perceive a need for treatment compared to those with drug dependence or those with both alcohol and drug dependence (Hedden, 2011). Analysis of the NSDUH 2005-2009 found that for every 5 year increase in age, the odds of perceived need for alcohol treatment increased by 20% (Hedden, 2011). Positive predictive factors for perceiving a need for alcohol treatment include being widowed, divorced, or separated (OR = 1.74), a history of arrest (OR = 2.40), prior history of SU treatment (OR = 3.46) and the overall number of symptoms of dependence or abuse (Hedden, 2011). Those with two or more symptoms of alcohol abuse are more likely to perceive a need for treatment, however, those with only one symptom of alcohol abuse did not perceive a need (Hedden, 2011). Only those with three to five symptoms of alcohol dependence had a perceived need for treatment, compared to those with one to two symptoms (Hedden, 2011).

Positive predictive factors of perceiving a need for illicit drug treatment include being older (OR = 1.17), having a history of arrest (OR = 3.19), history of previous SU treatment (OR = 8.52), and with every unit increase in psychological distress the odds of perceived need for treatment increased by 7% (Hedden, 2011). Negative predictive factors related to perceived need for treatment for drug use include never being married (OR = 0.56), and having an income of \$20,000 to \$49,999 or \$50,000 to \$74,999 (OR = 0.84) (Hedden, 2011).

Influence of Stigma on Perceived Need Stigma is a well-known barrier to seeking BH treatment and is defined as a “spoiled identity” and characterized as a perception of difference associated with undesirable traits (Givens, Houston, et al., 2007). Stigma presents a strong deterrent to receipt of treatment (Keyes et al., 2010). The Surgeons General’s report underscores stigmas entrenchment and power to thwart treatment seeking and recovery (The Surgeons General, 2001).

A study by Givens et al. found that the perception of stigma increased for all ethnic/racial groups as the social circle increased (2007). Stigma is a type of social labeling that negatively affects patients and their families (Interian et al., 2010). Stigma further affects individuals by reducing their interest in and adherence to depression treatment (Interian et al., 2010). Depressed patients with higher perceived stigma are less likely to adhere to pharmacological treatment and stigma may be a barrier to initiating other forms of treatment (Givens, Houston, et al., 2007). Delays in recognizing symptoms, in seeking help, and stigma, shame over using services, lack of financial resources, and differences in the concepts of health and treatment differ for racial/ethnic groups compared to Whites (Sue et al., 2012).

Some researchers found that Blacks sometime reject MH treatment due to considerable stigma associated with MI (Snowden, 2012), but others found that Blacks response to a depression diagnosis would be to agree with the doctor (90.2%); only 33% reported they would feel stigmatized (Gitlin, 2012). Black women were less likely to feel a diagnosis of depression is a sign of weakness compared to men (Gitlin, 2012). Blacks with a diagnosis of depression were 2 times more likely to be scared others would find out compared to those without a diagnosis (Gitlin, 2012). A survey mailed to Blacks and White primary care patients found that Whites had higher treatment stigma than Blacks (Givens, Katz, Bellamy, & Holmes, 2007).

A cross-sectional Internet survey measuring treatment preference, stigma and attitudes toward depression from January 1999 to April 2002, found that for all ethnic/racial groups studied that they were most concerned about being stigmatized by their employer (64%), their friends (44%), and family (26%) (Givens, Houston, et al., 2007). Asians/Pacific Islanders had the greatest perceived stigma from their employers (72%) friends (55%) and family (43%) of all ethnic/racial groups (Givens, Houston, et al., 2007). They were the only ethnic/racial group in

the adjusted analyses that had increased odds of agreement for all stigma items compared to Whites (Givens, Houston, et al., 2007).

3.6.5 Summary of Factors Related to Perceived Need for Care

In summary, to recognize a need for BH treatment is to admit that there is a need for concern and that you are vulnerable. The unwillingness of a large number of adults to perceive a need for treatment or initiate treatment may be due to socioeconomic factors, the severity of the MH or SU disorder, attitudinal barriers or just due to the individual's denial about the negative impact their BH disorder has on themselves and their families. It is interesting that attitudinal barriers influence on perceived need for treatment is not predictable using measures of socioeconomic status or severity of MI. Additional/evaluative barriers were predictive of initiation and continuation of BH treatment, but structural barriers were not predictive.

It was also found that those with psychiatric diagnosis and those experiencing moderate or severe distress were more likely to recognize a need for treatment. Other positive predictive factors related to perceived need for treatment were being older, widowed, divorced, or separated, having a history of arrest, the number of symptoms, and a history of prior receipt of treatment as well as having difficulty at work. Negative predictive factors included never being married, and having an income of \$20,000 or more. Overall, these trends in predictive factors and perceptions of stigma do not vary between African American, Latinos, and Whites.

4 Methods

4.1 Study Background and Overview of Conceptual Framework

The analytical theoretical framework was based on a table that was created by Kevin Malone (Table 1). I was asked to use the National Survey of Drug Use and Health (NSDUH) to identify characteristics of individuals who did not seek or receive services for behavioral health (BH) needs (i.e., care for mental health (MH) or substance use (SU)) within the past 12-month. This was accomplished by tackling the relationships between all factors found in Table 1 that are potential motivating factors in individuals seeking and/or receiving BH treatment.

Table 1 represents four factors that may influence care seeking and receipt of BH treatment in the U.S. The first block, Behavioral Health Symptoms, focuses on the role that severity of MH and/or SU disorders has on an individual's recognition to seek help and additional limitations due to the disorder that may prevent them seeking and receiving services. The Demographics box represents economic, geographic, and personal characteristics that may influence interest in seeking services and accessibility to services.

Table 1: Factors Related to Seeking or Receiving Behavioral Health Services

Behavioral Health Symptoms		Demographics	
<ul style="list-style-type: none"> • Substance Abuse/Dependence • Mental Health Symptoms 	<ul style="list-style-type: none"> • Age • Race • Education • Income 	<ul style="list-style-type: none"> • Gender • Immigration • Geography • Coverage Status • Other Disabilities 	
Psychographics		Service Use for those with Behavioral Health Symptoms	
<ul style="list-style-type: none"> • Attitudes/Beliefs About Substance Abuse/ Mental Health Services (Experiences, family, friends) • Attitudes/Beliefs About Health Insurance • Attitudes/Beliefs About Doctors • Perceive Need for Treatment 	<ul style="list-style-type: none"> • Seeking Care • Not Seeking Care • Seeking Care/Cannot Access 		

The second line of Table 1, Psychographics, points to the role personal, experiential and cultural context has on individual's beliefs and attitude toward BH services, health insurance,

medical and psychological doctors, as well as perceptions of a need for treatment. All three of these factors influence the final factor in Table 1 the service use of those with BH symptoms. The final factor is the individuals' interest in seeking out these services; this is represented in the services use for those with behavioral health symptoms box and was used as the dependent factor in the analysis.

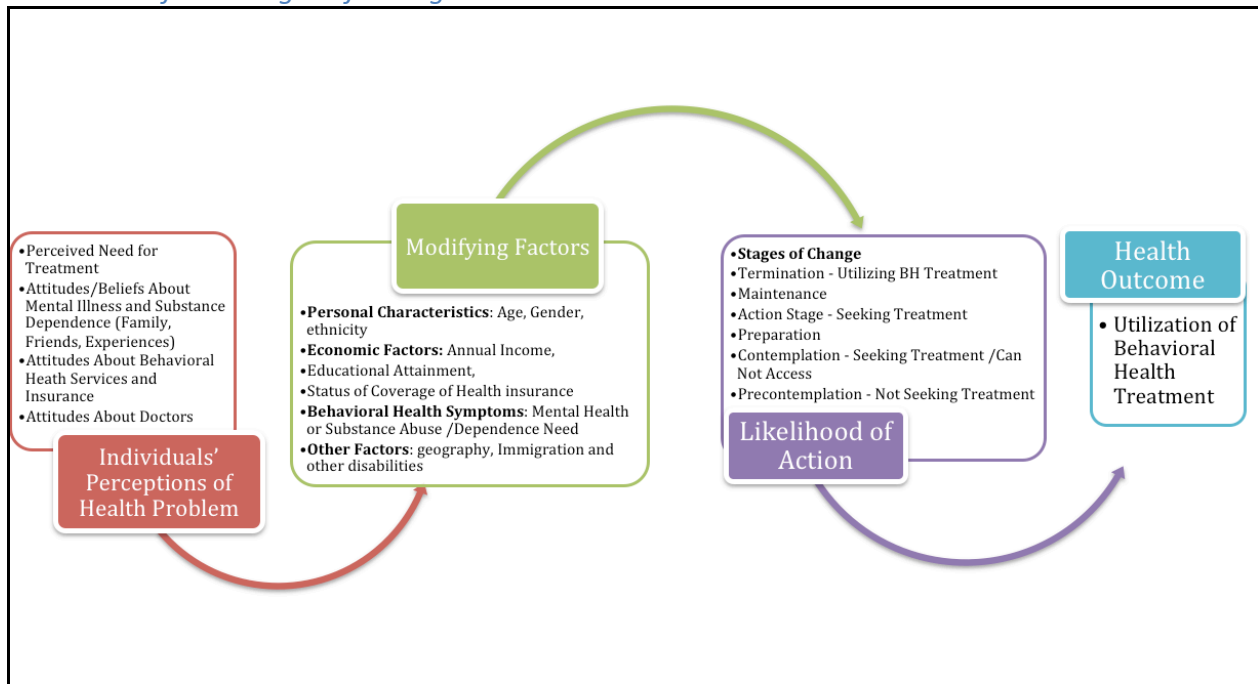
The primary research question that came from this framework that was based on Table 1 was “What are the primary reasons for underutilization of substance use disorders and mental illness services among those with behavioral health symptoms? More specifically, how do demographics, behavioral health symptoms, and psychographics factor into treatment service utilization in this group of patients?”

The three independent factors related to BH treatment utilization include severity and type of BH symptoms, demographics, and psychographics. These three factors and their relationships are further elaborated in a conceptual framework in Figure 1 below. The first factor in the conceptual framework is the individual's perceptions of severity or risk of the health problem; this is related to taking action towards BH treatment utilization. Perceptions of the health problem include the individual's perceived need for care as well as their perceived benefits and barriers to treatment. These factors of perception are consistent with the Health Belief Model (HBM), which was developed by Hochbaum in 1958 to understand the uptake of preventative and treatment related health behaviors based on personal beliefs or perceptions about a disease and the strategies used to address the disease (Hayden, 2014). The measures used in this analysis, include concepts of perceived severity, susceptibility, benefits and barriers to BH treatment utilization.

These perceptions can be influenced by internal and external motivations as well as structural barriers and are often influenced by family, friends, and experiences with the health care system.

Due to complexity in explaining health behaviors some constructs have been added to the HBM, including cues to action, modifying factors and self-efficacy. In this analysis, the HBM was adapted to highlight the effects of modifying factors in seeking and receiving BH services. In this context and in keeping with the HBM, modifying factors are defined as past experiences and/or cultural perceptions that modify personal perceptions and actions.

Figure 1: Conceptual Model: Factors that Influence Behavioral Health Service Use, Using the Health Belief and Stages of Change Models



The type of BH need, substance use versus mental health, impacts perception of need as well as patterns in service use; the more severe the MH symptoms, the more likely an individual is to utilize services. Other modifying factors include geography; those in rural areas tend to have greater barriers to utilizing treatment due to structural barriers such as a limited health care and transportation systems, compared to those in urban areas. Immigration status and disability also influence perception of need for treatment and attitudes toward the benefits of treatment.

The second factor in the model includes factors of personal characteristics of gender, age,

and race as well as economic factors of income and health insurance status. As shown in the current literature there are variations in treatment utilization by gender with women being more likely to seek treatment than men. Racial differences in prevalence rates for mental illness (MI) and types of substance use (SU) disorders influence care seeking, preferences and utilization. Blacks have overall lower rates of MI and SU disorders compared to Whites, but are more likely to have an illicit drug disorder. Some of the positive predictive factors for BH utilization include being 35 years or older for MH, and for SU those whom utilize care tend to be 18-25 years old.

The type of BH need, substance use versus mental health, affects perception of need as well as patterns in; the more severe the MH symptom, the more likely an individual is to utilize. Other modifying factors include geography; those in rural areas tend to have greater barriers to utilizing treatment due to structural barriers such as limited health care and transportation systems, compared to those in urban areas. Immigration status and disability also influence perception of need for treatment and attitudes toward the benefits of treatment. The third factor related to treatment utilization is the likelihood that an individual will take action to seek and/or use services. The likelihood that an individual will take action can be understood by using the Stages of Change model, which helps health educators and BH service providers understand where an individual is in the health behavior change process. From Precontemplation, having no intention to make change in the next six months, to Termination, having taken action to seek services, utilize services and maintain treatment. In this analysis, the first three Stages of Change (Precontemplation, Contemplation and Preparation) were applicable to the study population and aligned well with the attitudinal measures from the NSDUH. The questions asked in the NSDUH include questions about reasons for not getting treatment in the past year and were developed independently from the Stages of Change. In the first stage of change those in the

Precontemplation stage would be in line with the respondents of the NSDUH indicating that I “did not think treatment was needed”, I “felt I could handle the problem without treatment”, I “am not ready to stop using” and “did not think it would help.” The next stage of change is Contemplation. This is when individuals initially have the intention to take action in the next six months. In this stage, individuals are thinking about ways that they could take action and some of the barriers to making that change. Some examples of the Contemplation stage in the NSDUH measures are, I “do not know where to go”, transportation and convenience issues, concerns about effect on job, and neighbor’s opinions, as well as I “did not have time”. The third stage, Preparation, is when there is an intention to take action in the next 30 days and some behavioral steps have been taken. In this stage some concerns would include “could not afford treatment or no insurance”, “insurance did not pay enough“ or “insurance did not cover all”, “no openings in program”, and “no program had the type of treatment needed”. The last component of the conceptual framework is the health outcome, which is an increase use the of BH services.

An audience analysis is the first step in the five steps of the “P-Process: Steps in Strategic Communication”, referring to an analysis of the situation and target population. For the purpose of this analysis, only an analysis of the target group (audience analysis) was used to determine the scope of the health problem, factors inhibiting utilization of BH treatment, and to develop a description of the audience characteristics based on their attitudes toward BH treatment. For this audience analysis or audience segmentation, the independent variables used were behavioral health symptoms, demographics, and psychographics, which are expected to help to explain service use, for those with behavioral health symptoms. Service use variables include those who reported seeking care, seeking care but they cannot access it and not seeking care.

4.2 Participants: National Survey of Drug Use and Health 2009-2012 (Pooled Sample)

To answer the research questions about substance use (SU) and mental health (MH) service use, a secondary analysis of the National Survey of Drug Use and Health (NSDUH) for years 2009-2012 was conducted using a latent class analysis (LCA). The sample included 227,310 observations and 154,328 of these were adults. Of adults surveyed and questioned about BH symptoms, 31.5% had overall mental stress, 44.2% had alcohol dependence/abuse, and 27.9% had illicit drug dependence/abuse (Table 4). Despite the high level of MH and SU disorders, of those with MH and SU service needs only 32.8% with any mental illness (n=30,042) and 6.4% with any substance abuse (n=11,677) felt a need for treatment (Table 5).

The NSDUH measures the prevalence of SU (drugs, alcohol, and tobacco), MH, health insurance, treatment receipt, and unmet need for treatment among members of the non-institutionalized U.S. civilian population aged 12 or older (*2012 NSDUH PUBLIC USE FILE CODEBOOK*, 2013, p. 12). Institutionalized individuals not in this survey are those in prisons, residential drug treatment, and the homeless.

The NSDUH was designed to be generalizable to the U.S. population. This is achieved by sampling select households that allows the Center for Behavioral Health Statistics and Quality (CBHSQ) to estimate the population prevalence of SU and MI in the U.S. using sampling weights. (For more information on the NSDUH, sampling methods please see the NSDUH, 2012 Codebook, referenced in the citations). Table 2 below presents a comparison between the NSDUH 2009-2012 pooled sample and weighted population frequencies to the 2010 U.S. Census data and the 2010 Behavioral Risk Factor Surveillance System (BRFSS).

Table 2: Sample and Weighted Demographic Frequencies, NSDUH Years 2008-2012, Adults 18+, Compared to the 2010 U.S. Census and 2010 Behavioral Risk Factor Surveillance System

Independent Variables	Sample n- Adults Only ¹	%	Weighted n- Adults Only ²	Weighed %	U.S. Census 2010 Population ³	%
TOTAL ADULTS 18 Older	154,328	100	255,772,727	100	308,745,538	100
Gender	154,328	100	230,962,773	90.3	234,564,071	76
Male	72,341	46.9	111,516,909	43.6	113,836,190	36.9
Female	81,987	53.1	119,445,864	46.7	120,727,881	39.1
Age	154,328	100	230,962,773	90.3	234,564,071	76
18-25	76,118	49.3	34,017,773	13.3	30,672,088	10.0
26-34	22,652	14.7	36,575,500	14.3	41,063,948	13.3
35+	55,558	36.0	160,369,500	62.7	162,828,035	52.7
Ethnicity/Race	154,328	100	230,962,773	90.3	234,564,071	100% ⁴
White –REFF	97,446	63.1	155,509,818	60.8	157,100,990	67.0
Black	19,257	12.5	26,865,136	10.5	27,323,665	11.6
Latino/Hispanic	24,182	15.7	32,994,682	12.9	33,346,703	14.2
Asian/Pacific Islander	5,945	3.9	11,253,999	4.4	11,634,981	4.9
Native American/ Alaska Native	2,296	1.5	1,278,863	0.5	1,599,777	0.7
Multiracial	4,437	2.9	3,069,272	1.2	3,176,910	1.4
Marital Status	154,328	100	230,962,773	90.3	-----	-----
Married	54,230	35.1	107,936,091	42.2	-----	-----
Not Married	100,134	64.9	123,026,682	48.1	-----	-----
	Sample n	%	Weighted n	Weighed %	2010 BARFSS	Weighed %⁵
Income	154,328	100	230,962,773	90.3	450,600	86.7 ⁵
<\$20K	40,079	26.0	42,969,818	16.8	78,770	15.5
\$20-49 K	53,149	34.4	76,220,273	29.8	144,221	28.7
\$50-74K	23,995	15.6	39,133,227	15.3	60,495	13.6
\$75+ K	37,105	24.0	72,639,455	28.4	103,092	28.9
Education	154,328	100	230,962,773	90.3	450,792	99.7 ⁶
Less Than High school	24,899	16.1	34,017,773	13.3	43,295	10.2
High school Grad	50,453	32.7	70,081,727	27.4	134,470	27.7
Some College	45,295	29.4	59,595,045	23.3	119,390	26.1
College Grad	33,681	21.8	67,268,227	26.3	152,310	35.7

1. This table represents 67.9% of the total sample of 277,310 and represents adults 18 years and older only. For clarity the percent's were reported so the frequencies should all equal 1; a few had some small rounding error.
2. Weighted frequencies represent only adults' 18 years and older, equaling 90.3% of the total weighted population of 255,772,727. The percent's were reported so the frequencies should all equal 1; a few had some small rounding error.
3. The U.S. Censuses frequencies reported in this table include adults' only, or 76.0% of the total U.S. population of 308,745,538 and should add up to 76.0%. (U.S. Census Bureau, 2010a, 2010b)
4. The racial distribution of 18 years and older from the 2010 U.S. Censuses represents adults 18 year and older and should add up to 1. This table excludes those who are some other race alone; witch accounted for 0.002% or 381,045 individuals.
5. For the income question there were 64,022 who refused or were not sure what their income was (13.3%).(Center for Disease Control and Prevention, 2010)
6. There were 1,327 who refused to answer the education question (0.37%).

In comparing the NSDUH weighted sample from the 2009-2012 pooled sample to the 2010 U.S. Census, the NSDUH estimated the adult population closely to the 2010 U.S. Census. For sex, ethnicity/race and age the weighted frequencies reported by NSDUH closely approximated the true population for adults 18 years and older (U.S. CENSUS, 2011a). The weighted frequencies for education and income compared to the 2010 BRFSS were also closely aligned with NSDUH sample. The NSDUH overestimated the weighted population of females by 7.6% and males by 6.7%. The estimate of the population in the NSDUH only overestimated age compared to the 2010 U.S. Census, for ages 18-25 by 3.3%, 26-34 by 1.1% and by 10.0% for those 35 years and older.

The NSDUH weighted estimates for race/ethnicity for Whites was underestimated by 7.8%, Blacks by 1.1%, Latinos/Hispanics by 2.7%, Asians/Pacific Islanders by 0.5%, Native Americans /Alaska Natives were underestimated by 0.2% and multiracial individuals by 0.2% (U.S. CENSUS, 2011b). Comparing income and educational measures from the 2009-2012 NSDUH data to the 2010 Census findings was not as clear as gender, age, and ethnicity/race. The 2010 U.S. Census only reported high school and college graduates, and was not directly comparable to the 2009-2012 NSDUH pooled data (U.S. Census Bureau, 2012). Income levels reported from the 2010 U.S. Census were also incomparable to the NSDUH (U.S. Census Bureau, 2012). This is not surprising, as the NSDUH was designed to replicate the prevalence of SU and MI in the U.S. and therefore was not designed to replicate the economic and educational prevalence in the population.

The 2010 Behavioral Risk Factor Surveillance System (BARFSS) has comparable measures for income and education to the NSDUH. The weighted percentages of educational attainment and yearly income for the 2009-2012 NSDUH compared to 2010 BARFSS, is closely aligned for

all income categories. For education, the NSDUH underestimated high school graduate/GED by 0.3%, completion of some collage by 2.8%, and graduating from collage by 9.4%; those who did not complete high school were overestimated by 3.1%. Close approximation of the NSDUH sample to the 2010 U.S. Census and the 2010 BARFSS indicates that findings from the NSDUH can be generalized to the U.S. population.

4.3 Measures

Analysis was conducted on two subpopulations, first those with mental health (MH) symptoms and a second analysis for those with substance use (SU) symptoms. Analysis of both the substance use (SU) and mental health (MH) models from the NSDUH included three measures of mental illness (MI) and characteristics of age, gender, race, income, education, marital status, and attitudes toward behavioral health (BH) treatment for adults 18 year and older (Table 3). To restrict the analysis to the specified subpopulation (MH or SU) two-indicator variables were created from the questions about reasons for not seeking services. The SU indicator variable was recode to include those 18 year and older, as the SU prevalence questions were asked of youth and adults. For the MH indicator variable there was not need to recode to restrict the analysis to adults, as MH question were only asked of those 18 years and older. Specifying the indicator variables in the analysis guaranteed that the observations in the MH model included only the 10,251 asked about reasons for not seeking MH services and the 1,500 asked about SU services.

MH variables to measure the influence of MH severity on both MH and SU treatment utilization dummy coded variables of serious psychological distress (SPD), major depressive episode (MDE), and overall mental distress (K6Scale) were included. Measures of gender, marital status, race, educational attainment, and income were asked of all respondents including

youth 12-17 years old. The analysis was restricted to adults and variables were recoded to include adults 18 or older (n=154,328); those 12-17 years old were coded as missing.

Table 3: Demographic Measures Used in Analysis Using a Latent Class Analysis

Concepts	Variables	Measures ¹	Reference = No (unless otherwise noted)	
Behavioral Health Symptoms² (n=154,328)	Mental Health Symptoms	Past Year Serious Psychological Distress ¹	Y	N
		Overall Mental Stress (K6)	Y	N
		Past Year Major Depressive Episode ¹	Y	N
		Has Any Mental Illness Indicator No Mental Health	Y	N
	Substance Use Symptoms	Has Substance Use Disorder Indicator	Y	N
Demographic Characteristics² (n=154,328)	Sex	Female	Reference	
		Male	Reference	
	Age	18-25 Years Old	Y	N
		26-34 Years Old	Y	N
		35 Years or Older	Reference	
	Education	Less Than High School	Y	N
		High School graduate or GED	Y	N
		Some Collage	Y	N
		Collage Graduate	Reference	
	Income	Less Than \$20,000	Y	N
		\$21,000-49,000	Y	N
		\$50,000-74,000	Y	N
		\$75,000 +	Reference	
	Marital Status	Married	Reference	
		Not Married	Reference	
	Race	White	Reference	
		Black	Y	N
Native American/Alaskan Native		Y	N	
Asian/Pacific Islander		Y	N	
Multiracial		Y	N	
Hispanic		Y	N	
Reasons for Not Seeking Treatment in the Past 12 Months				
Psychographics Related to Services Use³	Attitudes/Beliefs About Mental Health Treatment (n=10,251)	Did not get treatment because		
		Could Not Afford Cost	Y	N
		Fear Neighbor's Opinion	Y	N
		Fear of Negative Effect on Job	Y	N
		Insurance Did Not Cover All	Y	N
		Insurance Did Not Pay Enough	Y	N
		Did Not Know Where to Go	Y	N
		Confidentiality Concerns	Y	N
		Fear of Being Committed	Y	N
		Did Not Think Treatment Was Needed	Y	N
		Thought I Could Handle Without Treatment	Y	N
		Did Not Think Treatment Would Help	Y	N
		Did Not Have Time	Y	N
Did Not Want Others to Know	Y	N		

Table continued on next page.

Attitudes/Beliefs about Substance Use Treatment (n=1,500) ⁴	Did not get treatment because	
	Could Not Afford or No Insurance	Y N
	Insurance Did Not Cover	Y N
	No Transportation	Y N
	No Program Had Type of Treatment Needed	Y N
	Not Ready to Stop Using	Y N
	No Openings in Programs	Y N
	Did Not Know Where to Go	Y N
	Neighbor's Would Have Negative Opinion	Y N
	Fear of Negative Effect on Job	Y N
	Did Not Think I Needed Treatment	Y N
	I Could Handle Problem without Treatment	Y N
	Did Not Think it Would Help	Y N
Did Not Have Time	Y N	
Did Not Want Others to Know	Y N	

1. For details on the creation of measures in the NSDUH for 2009-2012 please see Appendix C
2. The NSDUH data for year 2009-2012 had 154,328 adults out of the 227,310 total observations.
3. For the years 2009-2012 of the NSDUH, only 10,251 adults were asked about reasons for not seeking mental health services.
4. Those asked about seeking substance use services in the NSDUH 2009-2012 data totaled 1,500.

4.4 Measures of Mental Health Treatment Utilization and Attitudes toward Treatment

All adults in the NSDUH were asked if they had “Received inpatient mental health (MH) treatment in the past year?”(AMHINP2), “Received outpatient MH treatment in the past year?” (AMHOUTP3), “Received any MH treatment in the past year?” (AMHTXRC3) and “Had you perceived a need and did not receive MH treatment in the past year?” (AMHTXND2) (2012 NSDUH PUBLIC USE FILE CODEBOOK, 2013, p. 508). Perceived need for treatment and did not receive treatment was defined as “feeling a perceived need for MH treatment/counseling that was not received”, often referred to as "unmet need". All four of these variables had response options of (1) “yes” or (2) “no”(2012 NSDUH PUBLIC USE FILE CODEBOOK, 2013, p. 509). “A respondent must have reported not receiving MH treatment that was needed in the past year in order to be asked the [15] questions on the reason[s] for not receiving treatment” in the past year (2012 NSDUH PUBLIC USE FILE CODEBOOK, 2013, p. 512).

Out of the 154,328 adults surveyed between 2009 and 2012, the question about perceived

need for treatment and did not receive treatment was asked of 10,251 individuals who reported that they did not seek services or did not receive services in the past year. Respondents were asked to answer “yes” or “no” or "Some Other Reason" to each of the 15 possible reasons for not seeking services (*2012 NSDUH PUBLIC USE FILE CODEBOOK*, 2013). The questions asked about attitudes toward MH treatment included the 15 measures of attitudes and beliefs about mental health treatment listed in Table 3 above.

4.5 Measures of Substance Use Treatment Utilization and Attitudes toward Treatment

All respondents NSDUH were asked the question: “During the past 12 months, did you make an effort to get treatment or counseling for your use of [alcohol] [drugs]?” (NDTXEFTR). There were nine response options, (1) Yes, (2) No, (11) Yes (logical assigned), (12) No (logical assigned), (81) never used alcohol or drugs logically assigned, (91) never used alcohol or drugs, (97) refused, (98) blank, and (99) legitimate skip. Respondents were logical assigned “Yes” if they reported making an effort to obtain treatment, but one of the following occurred: (a) logically inferred to have gotten treatment; or (b) the respondent did not perceive a need for treatment (*2012 NSDUH PUBLIC USE FILE CODEBOOK*, 2013, p. 441). Respondents classified as feeling a need for substance use (SU) treatment and respondents classified as feeling need for AND NOT seeking SU treatment in the past year were asked 14 questions about the reasons they did not seek treatment (*2012 NSDUH PUBLIC USE FILE CODEBOOK*, 2013).

Between 2009 and 2012, out of the 154,328 adults surveyed 1,500 individuals were asked the reasons they did not seek SU services. Respondents were asked to respond to the 14 questions from Table 3 about why they did not seek treatment in the past year with a “yes” or “no” response. For more information on the treatment and attitudinal, measures see Appendix C.

4.6 Design and Analysis

Given the undefined relationships between the four interrelated factors studied (Table 1), a latent class analysis (LCA) was especially applicable in answering the research question. This modeling method is often used with longitudinal and categorical multivariate data when the number of classes is unknown and there is an interest in studying the heterogeneity of a sample (McCulloch, 2001). LCA permits the estimation of unidentified subpopulations by using maximum likelihood estimations and can accommodate longitudinal survey data, as well as categorical data (McCulloch, 2001). This is partly due to the assumption of a LCA that longitudinal outcomes are independent given the latent classes variable that generates the outcome (McCulloch, 2000).

LCA is a type of finite mixture modeling that uses a series of statistical methods, based on the measurement of latent class regression equations, that allows for analysis of complex relationships between one or more categorical independent variables. This is based on the measurement of regression equations for indicators structural model methods that describes three types of relationships in one set of multivariate regression equations (L. K. Muthén & Muthén, 1998-2012). LCA use conditional probability to determine the maximum likelihood of each case belonging to a specific class. Calculation of maximum likelihood is similar to funneling debris and assigning each case to the class that they have the maximum likelihood probability of belonging. Each group is represented by its maximum likelihood conditional probability of a positive response to each of the question on reasons for not seeking services given group membership. For this analysis, a three-step process was used to determine the most probable assignments of group membership for each case. Mixture models are known to converge on local solutions and not global ones; to address this, analysis is run using multiple start values (Nylund, 2007).

This analysis was run using Mplus 7 with a complex mixture analysis (also called latent class analysis) using a 3 step logistic regression, due to this analysis being a mixture model for categorical latent variables, it was specified that the convergence for the M step iteration termination be based on the number of iterations or convergence for categorical outcomes. A random start procedure of 5,000 and 1,000 random starts was used to control for the tendency of LCA to converge on global and not local outcomes. To control for the complex survey design of the NSDUH a combined weight for years 2009-2012, created from methods the specified in the NSDUH codebook, was used in the analysis. Two statistics obtained with LCA, the Bayesian information criterion (BIC) and Lo-Mendell-Rubin (LMR), have been found to be the most effective at correctly identifying the number of latent classes from the indicator variables in survey data. When both of these criteria were considered, a 3-class solution was identified for the substance use model and 4-classes was identified for the mental health model.

4.7 Modifying Measures (Covariates)

The indicators for substance use (SU) and mental health (MH) were used to distinguish the two subpopulations. The MH indicator variable represented those who were identified as having any mental illness (MI). The SU indicator was recoded to include only adults identified as having any SU disorders. The individual characteristic variables of gender, race, age, income, education, and marital status were recoded to include only the adults in the sample and then dummy coded. The independent variables, including individual demographic characteristics and the three MH severity measures, were used as qualifiers to provide a description of the characteristics of each of the classes identified using baseline measure and odds ratios. This was accomplished by interpreting the output from the analysis that provided baseline frequencies and odds ratios of someone with a specific characteristics being in class 2 versions class 1. A reference group is

used as the reference point to measure the association between an exposure and outcome. With the analysis this allows for calculation, measuring the association of someone with a given characteristic is more likely to be in class 2 versions class 1.

4.8 Latent Class Validation Measures (Reasons for Not Seeking Treatment)

As the dependent variables used for analysis were the attitudinal measures from the NSDUH, they were the driving frame work for class/group identification in the LCA. The substances use (SU) and mental health (MH) analyses were conducted independent of each other. To make this distinction the SU and MH subpopulations were specified by using the “use variables”, categorical and plot output variables commands lines in the Mplus input file to specify the corresponding, 14 for SU or 15 for MH, attitudinal indicator measures of “Did Not Receive Mental Health Treatment because...” from Table 3. This is done to instruct Mplus to use the specified variables (14 SU or 15 MH) as the categorical variables and plot variables when running the specified analysis. Therefore, for the MH subpopulation analysis, the 15 MH attitudinal measures were specified and for the SU subpopulation analysis the 14-attitudinal measures were specified.

5 Results of National Survey of Drug Use and Health and Latent Class Analysis Audience Analysis

5.1 Prevalence Rates from the NSDUH 2009-2012

Findings from the 2009-2012 NSDUH report that 48,605 (31.5%) adults were identified as having overall mental stress, 22,744 (14.7%) individuals had past year serious psychological distress (SPD), and 12,290 (8.0%) had a past year major depressive episode (MDE)(Table 4) (*National Survey on Drug Use and Health 2009-2012*). Of those with overall mental stress Whites had the highest rate (23%) of all racial groups; Latinos had a rate of 4.9%, Blacks had a rate of 3.7%, other races had a rate of 1.4%, Asians had rate of 1.1%, and Native American had a rate of 0.63% (*National Survey on Drug Use and Health 2009-2012*) (Appendix D). The trend of Whites having the highest rates of BH symptoms carried over to in the rates of past year serious psychological distress and past year major depressive episode held true for all races. Whites (3.0%) were the most likely to feel a need for MH treatment and also the most likely to have received treatment for MH out of all racial groups (10.6%) (*National Survey on Drug Use and Health 2009-2012*) (Appendix D). Latinos were the most likely of the subgroups to perceive a need for MH treatment (0.52%) and the second most likely to have received treatment (1.2%). Asians (0.09%) and Native Americans (0.08%) were the least likely to perceive a need for MH treatment and Asians were the least likely to receive MH treatment (0.2%); Native Americans were the most likely racial group, except Whites, to receive MH treatment (1.3%) (*National Survey on Drug Use and Health 2009-2012*) (Appendix D).

Table 4: Sample Frequencies of Behavioral Health Symptoms and Insurance Variables from the NSDUH 2009-2012 pooled data, Prevalence Rates for Adults 18+ in the Past Year

Variables	Sample n	%	Weighted n	Weighted %
Mental Health Prevalence Measures¹	154,328	%	255,772,727	Weighted %
Past Year Serious Psychological Distress	22,744	14.7		9.9
Past Year Major Depressive Episode	12,290	08.0		5.5
Any Mental Illness	30,042	19.5		13.2
			231,057,174	Weighted %
Overall Mental Stress (K6)	48,605	31.5		25.9
Substance Abuse Prevalence Measures, in the past year²	14,306	81.7%	11,959,571	81%
Alcohol Dependence/Abuse	6,327	44.3	6,904,260	57.7
Illicit Drug Dependence/Abuse	3,990	27.9	3,147,759	26.3
Co-Occurring Substance Dependence/Abuse	1,360	09.5	1,094,301	09.2
Needed Treatment for Substances or Mental Health³	154,328	31.1%	255,772,727	Weighted %
Treatment Alcohol Only	17,676	11.5		6.8
Treatment Illicit Drugs Only	8,135	05.3		2.6
Co-Occurring Treatment for Alcohol and Drugs	22,088	14.3		8.2
	153,795	%	230,435,055	Weighted %
Any Treatment for Mental Health	21,171	13.8	32,053,516	13.9
Health Insurance Status³			254,765,085	Weighted %
Any Insurance (n=225,496)	121,298	53.79	19,311,193	75.8
			255,251,874	
Tricare, CHAPVA, VA, Military (n=226,504)	5,552	2.45	11,026,881	4.3
			254,529,004	
Medicaid/CHIPS (n=225,436)	20,679	9.17	21,507,701	8.5
			255,240,878	
Medicare (n=226,494)	12,100	5.34	4,476,925	17.5
			254,934,269	
Private Insurance (n=225,799)	91,536	40.54	151,838,851	59.6

1. Questions about mental health were asked of adults 18 years and older and they are mutually exclusive; respondents could respond yes to one or all questions
2. Total respondents identified, as having alcohol and/or illicit drug dependence/abuse for youth and adults was 14,306; 11,677 adults had alcohol and/or illicit drug dependence/abuse or 81.7%.
3. A total of 47,899 adults were identified as having a need for alcohol and/or illicit drug dependence/abuse out of 154,328 adults, or 31.1%
4. Variations in the number of respondents asked about public insurance were due to differences in enrollment eligibility.

Overall 44.3% of adults in the 2009-2012 polled NSDUH, had alcohol abuse/dependence, 27.9% had an illicit drug abuse/dependence, and 9.5% had both alcohol and illicit drug abuse/dependence in the past year (*National Survey on Drug Use and Health 2009-2012*).

Substance abuse (SA) service trends, for 2009-2012, were similar to MH service trends across racial/ethnic groups. Alcohol only treatment in the last year for the 2009-2012 pooled sample,

was 0.67% for Whites, 0.16% for Latinos, 0.13% for Blacks, 0.5% for Native Americans/Alaskan Natives, and 0.01% for Asians (SAMHSA, 2013c, p. 82). These trends held true for all racial/ethnic groups for illicit drug treatment only and treatment for both alcohol and illicit drugs (*National Survey on Drug Use and Health 2009-2012*) (Appendix D).

Overall insurance status for adults in the 2009-2012 NSDUH was 53.8% for any insurance, 40.5% for private insurance, 9.2% for Medicaid/CHIPs, 5.3% for Medicare, 2.5% for Tricare/CHAPVA/VA/Military and 2.4% for other insurance (*National Survey on Drug Use and Health 2009-2012*). For all racial groups the type of insurance they were most likely to have was private insurance. Rates of having any insurance was greatest for Whites (36.1%), Latinos (6.5%), and Blacks (6.4%) and was lowest for Native Americans (0.85%), other (1.6%) and Asians (2.2%) (*National Survey on Drug Use and Health 2009-2012*) (Appendix D).

5.2 Perceived Need for Treatment and Attitudes Toward Treatment Utilization

Findings showed that overall the proportion of individuals who perceived a need (felt need) for mental health (MH), substance use (SU), or both MH and SU services was low. Only 4.2% of respondents felt a need for MH treatment, 0.36% felt a need for SU treatment, and only 0.21% felt a need for both in the past year (*National Survey on Drug Use and Health 2009-2012*).

Those with MH symptoms reasons for not seeking treatment in the past year included “could not afford cost (45.7%), though I could handle without treatment (26.2%), “did not know where to go” (18.0%), “did not have time” (15.3%), “fear of being committed” (11.5%), “did not think treatment would help”(10.6%) and “fear of neighbors opinion” (10.6%) (*National Survey on Drug Use and Health 2009-2012*). Reasons for not getting SU treatment in the past year included was “could not afford or had no insurance” (28.1%), “not ready to stop using” (27.7%), and a “fear of negative effect on job” (8.5%) (*National Survey on Drug Use and Health 2009-2012*).

Table 5: Sample and Weighted Frequencies of Attitudes toward Treatment, from the NSDUH 2009-2012, Prevalence for Adults 18+ in the Past Year

Variables	Sample n	%	Weighted n	%
TOTAL ADULTS 18+	154,328		255,772,727	
Felt Need for Mental Health and/or Substance Abuse Treatment	154,328		255,772,727	Weighted %
Felt Need for Mental Health Treatment Only	9,862	6.4	10,819,186	4.3
Felt Need for Substance Abuse Treatment Only	756	0.5	9,207,812	0.4
Felt Need for Mental Health & Substance Abuse Treatment	484	0.3	537,123	0.2
Reasons for Not Getting Mental Health Treatment	10,251		11,197,798	Weighted %
1. Could Not Afford Cost	4,687	45.7	5,329,032	47.6
2. Fear Neighbor's Opinion	1,089	10.6	965,250	8.6
3. Fear of Negative Effect on Job	743	7.3	807,361	7.2
4. Insurance Did Not Cover All	638	6.2	746,893	6.7
5. Insurance Did Not Pay Enough	946	9.3	1,358,293	12.1
6. Did Not Know Where to Go	1,847	18.0	1,782,689	15.9
7. Confidentiality Concerns	945	9.2	908,141	8.1
8. Fear of Being Committed	1,177	11.5	994,540	8.9
	10,250		11,196,012	Weighted %
9. Did Not Think Treatment Was Needed	1,014	9.9	866,571	7.7
10. Thought I Could Handle Without Treatment	2,687	26.2	2,717,272	24.3
11. Did Not Think Treatment Would Help	1,090	10.6	993,086	8.9
12. Did Not Have Time	1,571	15.3	1,623,423	14.5
13. Did Not Want Others to Know	845	8.2	714,306	6.4
14. No Transportation/Inconvenient	436	4.3	368,349	3.3
	10,249		11,198,307	Weighted %
15. Other Reason	762	7.4	839,873	7.5
Reasons for Not Getting Substance Abuse Treatment,	1,500		1,524,152	Weighted %
1. Could Not Afford or No Insurance	421	28.1	530,252	34.8
2. Insurance Did Not Cover	71	4.7	105,166	6.9
3. No Transportation	94	6.3	95,260	6.3
4. No Program Had Type of Treatment Needed	70	4.7	83,675	5.5
5. Not Ready to Stop Using	416	27.7	476,450	31.3
6. No Openings in Programs	43	2.9	51,212	3.4
7. Did Not Know Where to Go	115	7.7	115,683	7.6
8. Neighbor's Would Have Negative Opinion	119	7.9	162,170	10.6
9. Fear of Negative Effect on Job	127	8.5	142,356	9.3
10. Did Not Think I Needed Treatment	105	7.0	130,925	8.6
11. I Could Handle Problem without Treatment	109	7.3	114,464	7.5
12. Did Not Think it Would Help	37	2.5	43,743	2.9
13. Did Not Have Time	49	3.3	67,215	4.4
14. Did Not Want Others to Know	55	3.7	63,862	4.2

5.3 Audience Characteristics

Findings from the latent class analysis (LCA) showed that for those who have behavioral health (BH) symptoms, there are variations in utilization of services, perceived need for treatment, and stigma based on trends in attitudes and beliefs as well as demographics. These findings are similar to documented research in disparities in health insurance and unmet need for

treatment for high-risk groups compared to middle class white males (Singh & Siahpush, 2006).

In addition to trends in characteristics based on attitudes and beliefs identified in the LCA, there were also, structural barriers identified that influence seeking services. On a societal level it is known that coming from a particular racial, sexual, economic, and geographical background reduces one's life expectancy compared to middle class White males (Singh & Siahpush, 2006). The impact that social determinants of health play in to individuals' ability and attitudes toward accessing BH services is presented in the findings from the analysis of the NSDUH (2009-2012).

Analysis of the fit estimations from the LCA of a 2, 3, 4, 5, 6, 7 or 8 class solutions for the mental health (MH) model indicates that a 4-class model fits best. For the substance abuse (SA) LCA model a 3-class solution was indicated. Convention dictates that once the p-value from the log-likelihood calculation (LMR) indicates a non-significant difference in the p-value that the model has reached the maximum classes that are significant. Additionally, non-significance indicates that the correct model fit would possibly be one class less than the LMR indicates. The Bayesian Information Criterion (BIC) is considered optimal when the output begins to increase or the graph starts to flatten out (Appendix F).

5.4 Characteristics of Latent Classes for Those with Mental Health Symptoms

Looking at Table 6, the log likelihood measure indicated significance (p-value; probability that class k-1 v. class k is a better fit) for class models 1 to 6, only becoming non-significant at a 7-class model solution. The fit indices estimations (AIC, BIC, and ABIC) continue to fall for each successive class (1, 2, 3 ...) and when the lines are graphed the line begins to flatten out at class 4 (Appendix F). This flattening out indicates that the correct numeration of classes is most likely a 4-class or 5-class solution. To interpret the classes a graph with the probability of positive responses to the questions of why they did not get treatment for each class was used

(Graph 1). For more on the methodology of LCA see Appendix E.

Table 6: Latent Class Model Statistics: Mental Health Latent Class Analysis, NSDUH 2009-2012

Fit Statistic	Number of Classes						
	2	3	4	5	6	7	8
Log-Likelihood LMR p-value (k-1 vs. k)	<.001	<.001	<.001	0.0115	0.042	0.2229	0.3827
BIC	98574.16	96347.90	94682.96	94179.95	93891.28	93672.51	93488.6
AIC	98349.9	96007.8	94227.1	93608.3	93203.9	92869.4	92569.7
ABIC	98475.7	96198.5	94482.8	93928.9	93589.4	93319.8	93085.1

Using the guidelines provided by Nylund et al. (2007), as well as examples and guidelines of previous literature published on LCA, a 4-class enumeration showed four distinct groups based on the 15 attitude items asking about seeking treatment from the National Survey of Drug Use and Health (NSDUH). Graph 1 shows the responses to why individuals surveyed did not seek MH treatment in the last year from the pooled sample (2009-2012 NSDUH) based on each individual's responses to the 15 attitude items. Each of the potential 10,251 adults in the pooled sample was sorted into the class that they statistically had the maximum likelihood of belonging to based on the makeup of all of the items they answered positively in the NSDUH survey. The total individuals were asked why they did not get treatment in the past year for the combined years of the 2009-2012 NSDUH was 10,251.

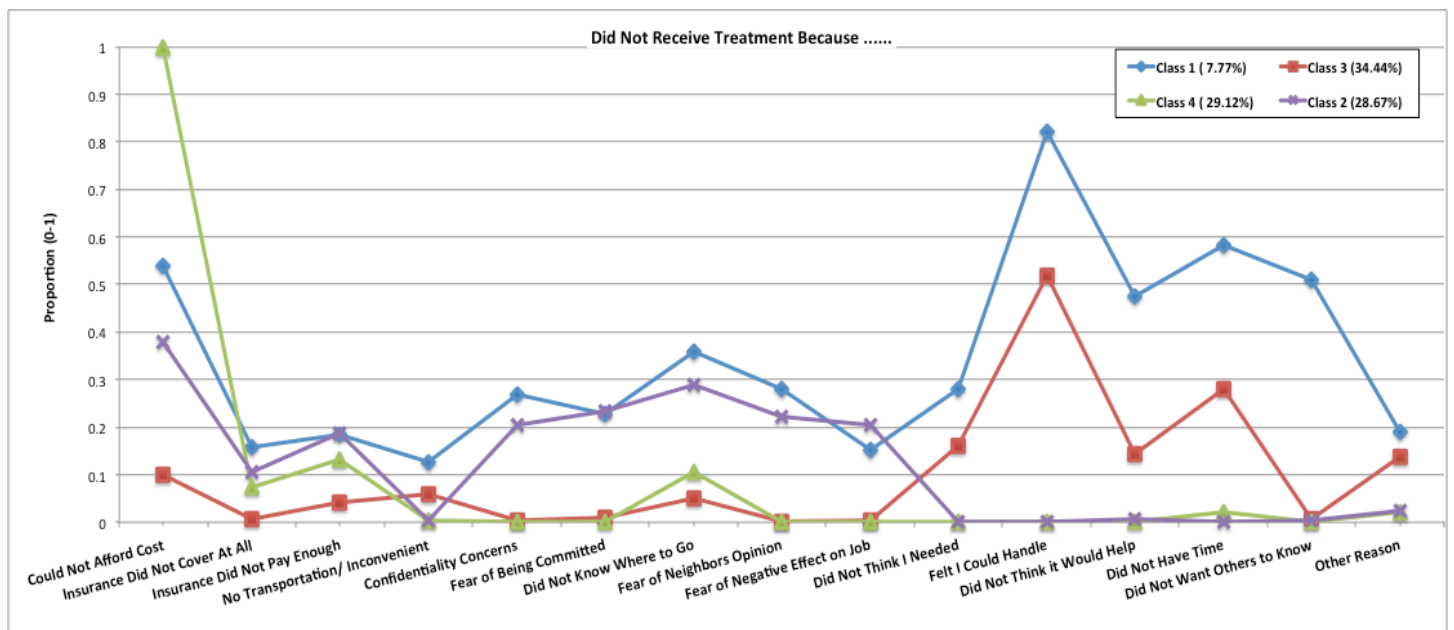
Table 7 reveals that the baseline characteristic of the total sample included 7,161 (69.8%) women, 5,922 individuals 18-24 years old (57.7%), and 2,602 individuals whom are 35 years or older (25.4%). The majority of the sample was not married (n=7,731, 75.4%) had completed some collage (3,364, 32.8%) and was White (n=7,140, 69.6%). Overall, the sample income was low with 68.5% of respondents having an income of \$49 thousand or less a year (n=7,024). The racial/ethnic makeup included 1,240 Latinos (12.1%), 993 Blacks (9.7%), 434 multiracial individuals (4.2%), 238 Asians or Pacific Islanders (2.3%), and 211 Native Americans/Alaskan

Natives (2.1%). The distribution of mental distress for the sample comprised of 8,676 (84.6%), individuals with overall mental health distress, 6,489 (63.3%) with severe psychological distress, and 4,375 (42.7%) individuals who had a major depressive episode in the past year.

For the total MH sample (n=10,251) the main reasons reported for not seeking treatment from the baseline response were “could not afford cost” with 4,687 (45.7%) positive responses, 2,687 (26.2%) felt that they could handle the problem, 1,571 (15.3%) said they did not have time, and 1,847 (18.0%) did not know where to go (Appendix G). The baseline characteristics of positive response are equivalent to the findings from the NSDUH 2009-2012 frequencies (Table 5).

Characteristics of class 1 from the baseline characteristics indicated that 72.5% were women, 69.0% were 18-24 years of age, and 69.5% were White, 12.0% or were Latino (Table 7). The majority had completed high school (27.5%) or some collage (38.1%), and earned less then \$20 thousand (33.1%) or \$20-49 thousand (34.1%) a year. In class 1, 79.4% were not married, and 91.4% were likely to have had overall mental distress in the past year.

Graph 1: Conditional Probability of Reasons for Those with Mental Health Symptoms not Seeking Treatment in the Last 12 Months, by Class Numeration



The conditional probabilities from the latent class analysis of positive responses found that class 1 accounted for only 7.8% of the latent class sample (n=797) (Table 8). The greatest indication as to why class 1 did not seek treatment was that “I felt I could handle the problem” 82.0%. Other reasons for not seeking treatment included “did not have time” (58.4%) “could not afford cost” (53.8%) and “did not want others to know” (51.0%). Less probable factors included not knowing where to get treatment (36.0%), “fear of neighbors opinion” (27.9%), “confidentiality concerns” (26.9%), and “fear of being committed” (22.9%).

Those in class 1 were most likely in the precontemplation or contemplation stage as indicated from the indication that the main reason for not getting care is “I felt I could handle the problem”. This suggest that individuals in class 1 would not be interested in taking action to get treatment in the next 6 months. Though there were some elements of the contemplation stage, where they may have thought about getting treatment, but they were discouraged by the cost of treatment, had some reservations they may be stigmatized by friends or neighbors, and of being committed, it is unlikely that this group would be willing to change in the next 6 months. Class 1 was used as the reference group to calculate the parameters of those in classes 2, 3, and 4 not being the same as the reference characteristics.

Characteristics of class 2 included the second largest proportion of females (71.4%) of all groups, and the second largest proportion of individuals 18-24 years old (58.4%) (Table 7). Individuals were not married (73.5%), had graduated high school (20.6%) or had completed some collage (33.6%), and had an income of less than \$20 thousand (32.0%) or \$20-49 thousand (30.3%). The majority was White (69.0%), Latino (10.8%), Black (10.7%) and 81.6% experienced overall mental distress in the past year.

The conditional probability of a positive response for class 2 illustrates that they had

concerns about affordability (38.0%) (Table 8). The latent class designation for class 2 accounted for 28.7% of the sample and this group lack of efficacy related to not knowing where to go (29.0%), fear of being stigmatized by neighbors (22.3%) or their job (20.5%) and of being committed (23.5%). This indicates that they have thought about treatment and many take action in the next 6 months. This group has a high likelihood of feeling that treatment would help (99.2%), they also thought they could not handle the problem on their own (100%) and 99.8% felt that they did need treatment, putting them most likely in the Contemplation stage.

In Table 9, Class 2 is 21% more likely to be female and 12.9 times more likely to be 18-24 years old, and 14.0 times more likely to be 25-34 compared to class 1. They are about 68.0% more likely to be Black and about 3 times more likely to be Native American/Alaskan Native. Class 2 is 42.0% more likely to be married and 14.0% times more likely to have completed high school and 32.0% more likely to have not graduated high school compared the reference class 1. This class has a 44.0% decrease in the odds of making less than \$20 thousand dollars and a 55.0% decrease in the odds of making \$50-74 thousand dollars. This MH group is 45.0% less likely to have serious psychological distress (SPD) 23.0% less likely to have a major depressive episode (MDE) and 60% less likely to have overall mental distress compared class 1.

The baseline characteristics for class 3 were made up of 70.0% women, 52.8% Whites, 12.0% Latinos, and 8.2% Blacks and those who were not married (74.9%)(Table 7). The majority of individuals had an income of less then \$20 thousand (35.7%), or \$20-49 thousand (39.1%) and this class had the smallest proportion of individuals who made \$75 thousand or more (13.0%). Those in class 3 had completed some collage (32.1%) or had graduated high school (30.8%), were 18-24 years old (52.8%) or 35 years or older (29.1%) and 84.0% had overall mental distress in the past year.

Table 7: Summary of Baseline Characteristics of Those with Mental Health by Likely Stage of Change from the National Survey of Drug Use and Health 2009-2012 Latent Class Analysis

Characteristics	Total Sample		Likely Stage of Change ¹							
			Class 3		Class 1		Class 2		Class 4	
	(n= 10,256)		Precontemplation		Precontemplation Contemplation		Contemplation		Action	
	No.	%	No.	%	No.	%	No.	%	No.	%
Sex										
Male	3,095	30.2	953	28.9	255	27.5	967	28.6	920	32.2
Female	7,161	69.8	2,226	70.0	671	72.5	2,413	71.4	1,851	66.8
Age										
18-24 years	5,922	57.7	1,678	52.8	639	69.0	1,979	58.4	1,626	58.7
25-34 years	1,732	16.9	575	18.1	144	15.6	539	16.0	474	17.1
35 years or older	2,602	25.4	926	29.1	143	15.4	862	25.5	671	24.2
Race										
White	7,140	69.6	2,298	72.3	644	69.5	2,331	69.0	1,867	67.3
Black	993	9.7	260	8.2	60	6.5	361	10.7	312	11.3
Hispanic/Latino	1,240	12.1	381	12.0	111	12.0	367	10.8	381	13.7
Asian/Pacific Incl.	238	2.3	54	1.7	37	4.0	83	2.5	64	2.4
N. American/ Alaskan Native	211	2.1	45	1.4	15	1.6	94	2.7	57	2.1
Multiracial	434	4.2	141	4.4	59	6.4	144	4.3	90	3.2
Marital Status										
Married	2,525	4.6	798	25.1	191	20.6	897	26.5	639	23.1
Not Married	7,731	75.4	2,381	74.9	735	79.4	2,483	73.5	2,132	76.9
Education										
< High School	1,707	16.6	586	18.4	107	11.6	507	15.0	507	18.3
HS Grad. /GRE	2,984	29.1	979	30.8	255	27.5	901	20.6	840	30.3
Some Collage	3,364	32.8	1,021	32.1	353	38.1	1,136	33.6	854	30.8
College Grad	2,201	21.5	593	18.7	211	22.8	827	24.5	570	25.6
Income										
<\$20 K	3,491	34.0	1,134	35.7	306	33.1	1,083	32.0	968	34.9
\$20-\$49K	3,533	34.5	1,243	39.1	316	34.1	1,025	30.3	949	34.3
\$50-\$74K	1,348	13.1	389	12.2	133	14.4	469	13.9	357	12.9
\$75K or More	1,884	18.4	413	13.0	171	18.5	803	23.8	497	17.9
Mental Health ²										
Severe Psychological Distress	6,489	63.3	2,017	63.5	683	73.8	1,896	56.1	1,893	68.3
Major Depressive Episode	4,375	42.7	1,338	42.1	478	51.6	1,260	37.4	1,299	46.9
Overall Mental Distress	8,676	84.6	2668	84.0	846	91.4	2,758	81.6	2,404	86.8

1. The baseline frequencies are based on the un-weighted calculation of class designation and will not be equal to the conditional probabilities and odd ratio frequencies.
2. For the mental health measures individuals could have responded positively for more than one question on past year mental health status; the mental health measures should not equal 100%.

The latent class designation of class 3 accounted for 34.4% of the sample and cost was not a concern for this class; there was only a 9.9% likelihood that I “could not afford cost” was the reason they did not seek treatment (Table 8). This also held true for insurance measures as only 0.8% of individuals in this group reported that “insurance did not cover at all” and 4.2% indicated that “insurance did not pay enough” as the reason they did not seek treatment. The primary reason someone in class 3 did not seek treatment was that they had 51.9% likelihood that they “felt they could handle the problem”. This was reinforced by 27.9% reporting they felt they “did not have time” and that 14.3% thought treatment “would not help”. This class is most likely in the precontemplation stage as the primary reason for not getting care is that they were not able to admit they had a problem or need for care.

Table 8: Conditional Probability of Giving a Positive Response to Each Question of Reasons for Not Getting Mental Health Treatment in the Past Year (Scale 0-1 probability)

Indicator Variable	Likely Stage of Change			
	Class 3	Class 1	Class 2	Class 4
	Precontemplation	Precontemplation Contemplation	Contemplation	Action
Did Not Receive Treatment Because,	3,533 (34.4%)	797 (7.8%)	2,940 (28.7%)	2,940 (29.1%)
Could Not Afford Cost	0.099	0.538	0.380	1.00
Insurance Did Not Cover At All	0.008	0.157	0.106	0.073
Insurance Did Not Pay Enough	0.042	0.185	0.188	0.132
No Transportation/ Inconvenient	0.060	0.127	0.005	0.003
Confidentiality Concerns	0.003	0.269	0.206	0.000
Fear of Being Committed	0.011	0.229	0.235	0.000
Did Not Know Where to Go	0.051	0.360	0.290	0.105
Fear of Neighbor’s Opinion	0.002	0.279	0.223	0.000
Fear of Negative Effect on Job	0.003	0.153	0.205	0.001
Did Not Think I Needed Treatment	0.160	0.279	0.002	0.000
Felt I Could Handle the Problem	0.519	0.820	0.000	0.000
Did Not Think it Would Help	0.143	0.475	0.008	0.001
Did Not Have Time	0.279	0.584	0.000	0.021
Did Not Want Others to Know	0.006	0.510	0.005	0.000
Other Reason	0.137	0.191	0.025	0.021

Compared to the reference group (Table 9), Class 3 had an 26% increased odds of being female, and was 2.58 times more likely to be 18-25 and a 5.02 times increase in the odds of being 26-34 years of age, compared to class 1. Those in class 3 had decreased odds of being

Hispanic (OR=0.83), Asian (OR=0.54), or Multiracial (OR=0.57). . There was an 1.01 times increase in the odds of being Black and a 16% increase in being Native American/Alaskan Native. Class 3 was 22.0% more likely to be married, had a 48.0% increase in the odds of having graduated from high school and a 2.14 times more likely to having less than a high school degree. Compared to the reference, those in Class 3 were 36.0% more likely to have an income of less than \$20 thousand dollars and 43.0% less likely to have an income of \$50- \$75 thousand. Class 3 is 28 times less likely to have SPD, 3.0% less likely to have had a MDE, and 60.0% less likely to have overall mental distress in the past year.

Table 9: Odds ratio of Latent Class Membership for Those with Mental Health Symptoms, by Demographic Characteristics

Class 1 – Reference Group	Likely Stage of Change								
	Class 3 V 1			Class 2 V 1			Class 4 v 1		
	Precontemplation			Contemplation			Action		
	3,533(34.4%)			2,940 (28.7%)			2,986(29.1%)		
Characteristics	95% CI			95% CI			95% CI		
	OR	Lower	Upper	OR	Lower	Upper	OR	Lower	Upper
Female (v. male)	1.26	1.80	3.69	1.21	0.86	1.69	0.83	0.61	1.14
18-25 (v. 35+)	2.58*	3.32	7.60	12.9*	8.82	18.8	5.71*	3.98	8.21
26-34 (v. 35+)	5.02*	0.82	1.81	14.0*	9.02	21.7	7.21*	4.76	10.9
Married (vs. not married)	1.22	0.59	1.74	1.42*	0.98	2.05	1.31	0.92	1.87
Black (v. White)	1.01	0.39	3.46	1.68	0.97	2.91	1.90	1.14	3.17
Native American (v. White)	1.16	0.22	1.33	3.03	0.91	10.1	1.49*	0.50	4.44
Asian/Pacific Islander (v. White)	0.54	0.30	1.08	0.80	0.37	1.70	0.73	0.34	1.56
Multiracial (v. White)	0.57	0.53	1.31	0.82	0.42	1.61	0.54	0.28	1.02
Hispanic (v. White)	0.83	1.22	3.76	0.81	0.50	1.33	1.60*	1.05	2.44
Less than HS (v. college graduate)	2.14*	0.97	2.26	1.32*	0.72	2.42	1.68	0.96	2.92
HS graduate (v. college graduate)	1.48	0.80	1.80	1.14	0.72	1.78	1.19	0.83	1.71
Some college (v. college graduate)	1.20	0.49	1.04	1.00	0.66	1.53	0.86	0.58	1.27
Serious Psychological Distress (v. not)	0.72	0.70	1.33	0.55*	0.37	0.80	1.04	0.72	1.49
Major Depressive Episode (v. not)	0.97	0.22	0.72	0.77	0.55	1.08	0.93	0.68	1.27
Any Mental Distress (v. not)	0.40*	0.85	2.17	0.40*	0.27	0.59	0.45*	0.25	0.81
Less Than \$20k (v. \$75k+)	1.36	0.92	2.24	0.56*	0.36	0.88	0.86	0.56	1.32
\$20k-49k (v. \$75k+)	1.43	0.56	1.64	0.45*	0.29	0.69	0.76	0.51	1.14
\$50k-74k (v. \$75k+)	0.96	1.80	3.69	0.50*	0.30	0.84	0.70	0.42	1.15

*Indicates a statistical significance at 95% or better confidence based on the calculated p-value.

From the baseline characteristics, 32.2% of class 4 were male, the largest proportion of males from all groups, and younger than the other groups with 58.7% being 18-24 years old (Table 7).

Like the other groups, they were not married (76.9%) and White (67.3%), Latino (13.7%) or Black (11.3%). Individuals were most likely to have a completed some collage (30.8%) or graduated high school (30.3%) and hand an income of less than \$20 thousand (34.9%) or \$20-49 thousand (34.3%) a year. In the past 12 months 46.9% of those in class 4 had a major depressive episode, 68.3% had sever psychological distress, and 86.8% had overall mental distress.

The last latent class, class 4 had no reservations that they needed treatment (0.00%), concerns about being stigmatized by neighbors (0.00%) or that treatment would work (0.1%) (Table 8). The biggest limitation for class 4 in getting treatment in the past year was that they “could not afford the cost” (100%). Other factors that increased the probability that individuals in this group would not get treatment included “not knowing where to go” (10.5%) and that “insurance did not pay enough” (13.2%). Class four’s greatest limitation to getting treatment is not being able to afford treatment. This class accounted for 29.1% of the sample (n=2,940). The likelihood that affordability was the only limitation to getting treatment suggests they are in the action stage.

Class 4 had a 17.0% decrease in the odds of being male, 31.0% more likely to be married, was 5.71 times more likely to be age 18-25 and 7.21 times more likely to be ages 26-34, indicating that class 4 was primarily younger than 35 years, compared to class 1. Class 4 was 90.0% more likely to be Black, 49.0% Native American/Alaskan Native and 60.0% Latino. Individuals in class 4 were 27.0% less likely to be Asian/Pacific Islander and 46.0% less likely to be Multiracial. Respondents were 14.0% less likely to have some college, 19.0% more likely to be a high school graduate, and a 68.0% to not having completed high school, compared to those in class 1 (Table 9). Class 4 was less 7.0% likely to have reported MDE, 55.0% less likely to have overall mental distress and has a 1.04 times increase in the odds of having had a SPD last year compared class 1.

5.4.1 A Summary of Class Characteristics for those with Mental Health Symptoms:

The baseline demographic characteristics did not show meaning full variations between latent classes so odds ratios were calculated and used to summarize class characteristics.

- **Those who cited “cost” as the primary reason for not getting care:**
 - The mental health action groups’ (class 4) reasons for not getting care were “**cost**” (100%) and “**insurance did not pay enough**” (13.2%). They accounted for 29.1% of the latent classes sample and likely was male; married; White, Black, Hispanic/Latino, or Native American; not completed high school; and had severe psychological distress.
- **And didn’t know where to go:**
 - Class 2’s, mental health contemplation group reasons were “**cost**” (38.0%) and they “**did not knowing where to go**” (29.0%). The latent classes sample accounted for 28.7% and most likely was 26-34 years; married; White, Black, or Native American; not completed high school or a high school graduate; earned \$75 thousand or more and low rates of mental illness.
- **Those who didn’t get care because they “could handle the problem”**
 - **And did not want others to know:**
 - The mental health precontemplation group (class 1) felt they “**could handle the problem**” (82.0%) and “**did not want other to know**” (51.0%). The baseline characteristics show that class 1 was female, 18-24 years, White or Hispanic/Latino; had completed some college and earned less than \$20 to 49 a thousand a year in income. This group had the highest rates of all measures of mental distress, accounted for 7.8% of the latent class sample and was the reference group
 - **And “did not have time”:**
 - Factors for not seeking treatment from the mental health precontemplation group was “**could handle the problem**” (51.9%) and that “**did not have time**” (27.9%). Class 3 accounted for 31.0% of the latent class sample; were most likely female; 18-34 years; married; White or Native American; not graduated high school, earned less then \$20 to 49 thousand and low mental distress.

5.5 Characteristics of Latent Classes for Those with Substance Abuse Symptoms

For the substance use, (SU) Latent Class Analysis (LCA) a 3-class solution was indicated. Looking at Table 10, the log likelihood measure found that not all classes when compared to the previous class were statically significant at a p-value of 0.18 or greater. The BIC fit indices indicates that at 2 or 3 classes model fits best, as the BIC fit indicia begins to flatten out at this pint indicating a increase in model fit compared to a 4-class solution (Appendix F). When comparing the 2nd and 3rd class model fit, out of the 1,500 observations the 2nd class had only 65 observations in class 2 and 1,435 in class 1. Class 3 had a distribution of the observations that provided more useful information on reasons why those with SU did not get care in the previous year (Graph 2). Given that the distribution of observation for class 3 was more informative than class 2, a 3-class solution was selected.

Table 10: Fit Indices, Latent Class Analysis Substance Abuse Model, NSDUH 2009-2012

Fit Statistic	Number of Classes						
	2	3	4	5	6	7	8
Log-Likelihood LMR P-value (k-1 vs. k)	0.1872	0.4346	0.484	0.7823	0.8422	0.6381	0.7822
BIC	11668.3	11394.1	11150.2	10916.8	10819.5	10741.3	11299.3
AIC	11822.4	11627.9	11463.7	11310.0	11292.4	11293.9	10667.0
AIBC	11730.3	11488.1	11276.3	11074.9	11009.7	10963.5	10921.3

The principal reasons for not getting treatment, from the baseline characteristics, for a SU disorder for class 1 was they felt they were not ready to stop using (100%); they are in the precontemplation stage. For class 2 they were also not ready to stop using (68.4%) cost was also a deterrent to seeking care (44.1%) as well as being stigmatized at their job (61.4%); they are in the contemplation stage. For class 3 costs was the primary reason they did not seek care (42.9%) and stigma was a deterrent; they are in the precontemplation stage.

Graph 2 shows the responses to why individuals surveyed did not seek SU treatment in the

last year from the 2009-2012 NSDUH based on each individual's responses to the 14 attitude items. Each of the potential 154,328 adults in the combined sample was sorted into the class that they statistically had the maximum likelihood of belonging to based on the items they positively answered in the combined 2009-2012 NSDUH.

Table 11 indicates that the baseline characteristic of the total SU sample included 734 men (48.9%), 684 individual 18-24 years old (45.9%) and 341 individuals whom are 35 years or older (22.7%). The majority of the sample was not married (n=1,016, 67.7%) and had a high school education (n=430, 28.7%). Overall, the sample income was low with 61.2% of respondents earning less than \$20 to \$49 thousand a year. The racial/ethnic makeup included 753 Whites (50.2%), 201 Latinos (13.4%), 163 Blacks (10.9%), 63 Native Americans/Alaskan Natives (4.2%), 44 multiracial individuals (2.9%), and 36 Asians/ Pacific Islanders (2.4%). The distribution of mental distress for the sample comprised of 872 individuals with overall mental distress (58.1%), 641 with severe psychological distress (42.7%), and 347 individuals who had a major depressive episode in the past year (32.1%). For the total sample the main reasons reported for not seeking treatment from the baseline response included "not ready to stop using" (n=493, 32.9%), "cost" with 448 (29.9%) positive responses, 154 (10.3%) were afraid of their neighbors opinion, and 136 (9.1%) felt that they could handle the problem (Appendix G).

For class 1 the baseline characteristics indicated that they were male (47.6%), 18-25 years old (45.3%) or over 34 years old (24.2%), were not married (68.4%), and White (53.3%), Latino (12.5%) or Black (10.0%) (Table 11). This group included the greatest proportion of married individuals (16.0%) and high school graduates (30.2%) in the SU sample. They most likely had an income of less than \$20 – 49 thousand a year (59.2%). Class 1 reported that 59.5% had overall mental distress, 152 individuals had severe psychological distress (43.3%), and 81 had a

major depressive episode (23.1%) in the past year.

Table 11: Summary of Baseline Characteristics of Those with Substance Use Symptoms by Likely Stage of Change from the National Survey of Drug Use and Health 2009-2012 Latent Class Analysis

Characteristics	Likely Stage of Change ¹							
	Total Sample (n= 1,500) ²		Class 1 Precontemplation 351 (23.4%)		Class Contemplation 1,000 (66.7%)		Class Cost/Stigma 149 (9.9%)	
	No.	%	No.	%	No.	%	No.	%
Total Sample: Excluding Missing Observations	1,242	82.8	296	84.3	821	82.1	125	83.9
Sex								
Male	734	48.9	167	47.6	502	50.2	65	43.6
Female	508	33.9	129	36.8	319	31.9	60	40.3
Age								
18-24 years	689	45.9	159	45.3	451	45.1	79	53.0
25-34 years	212	14.1	52	14.8	139	13.9	21	14.1
35 years or older	341	22.7	85	24.2	231	23.1	25	16.8
Race								
White	753	50.2	187	53.3	471	47.1	96	64.4
Black	163	10.9	35	10.0	117	11.7	11	7.4
Latino	201	13.4	44	12.5	147	14.7	10	6.7
Asian/Pacific Isl.	36	2.4	3	0.9	13	1.3	1	0.6
Native Alaskan/ Native American	63	4.2	16	4.6	45	4.5	2	1.3
Multiracial	44	2.9	11	3.1	28	2.8	5	3.4
Marital Status								
Married	226	15.1	56	16.0	149	14.9	21	14.1
Not Married	1,016	67.7	240	68.4	672	67.2	104	69.8
Education								
< High School	368	24.5	80	22.8	269	26.9	19	12.8
High School Edu. /GRE	430	28.7	106	30.2	284	28.4	40	26.8
Some Collage	315	21.0	75	21.4	198	19.8	42	28.2
College Graduate	129	8.6	35	10.0	70	7.0	24	16.1
Income								
<\$20 K	491	32.7	110	31.3	338	33.8	43	28.9
\$20-\$49K	428	28.5	98	27.9	287	28.7	43	28.9
\$50-\$74K	148	9.9	36	10.3	95	9.5	17	11.4
\$75K or More	175	11.7	52	14.8	101	10.1	22	14.8
Mental Health								
Severe Psychological Distress	641	42.7	152	43.3	398	39.8	91	61.1
Major Depressive Episode	347	23.1	81	23.1	204	20.4	62	41.6
Any Mental Distress	872	58.1	209	59.5	552	55.2	111	74.5

1. The baseline frequencies are based on the un-weighted calculation of class designation and will not be equal to the conditional probabilities and odd ratio frequencies.
2. There were 258 observations that were missing; leaving 1,242 responses and 82.2% of the sample.

Class 1 of the substance abuse only model accounted for 22.0% of the latent class sample (Table 12). For Class 1 the only reason reported for not seeking treatment in the past year was

that they were “not ready to stop using” (100%). The only other measure that could help explain why they did not get treatment is that they “could not afford the cost” at 6.9% and they “did not know where to go” (3.1%). This class appears to be in the Precontemplation stage due to the overwhelming sentiment that they were not ready to stop their behavior. There is no indication as to what would motivate them to seek treatment outside of making treatment more affordable or accessible. Class 1 was used as the reference group to calculate parameters of the characteristics (covariates) of those in class 2 and 3 not being the same as the referenced characteristics.

The baseline characteristics for class 2 demonstrated that this group had the greatest number of males (50.2%), and was 18-24 years old (45.1%) or over 35 years old (23.1%). This group had the greatest proportion of married individuals (14.9%), and was the most racially diverse of the SU groups (Table 11). This group had the greatest proportion of Latinos (14.7%), Blacks (11.7%) and Asians (1.3%). Class 2 had the highest proportion of respondents that had not completed high school (26.9%) and not surprisingly also had the lowest income with 33.8% having an income of less than \$20 thousand or 28.7% who had an income of \$20-49 thousand. Class 2 also had the lowest rates of mental distress proportionately with only 20.4% having had a major depressive episode in the past year and only 55.2% had overall mental distress.

Class 2 also indicated that their primary reason for not seeking treatment is that they were “not ready to stop using” (68.4%)(Table 12). Stigma was also a deterrent for this class; 61.4% said that they were afraid treatment would have a negative effect on their job, 54.7% were afraid of what their neighbors would think, and 35.5% did not want others to know. In addition to stigma and lack of willingness to stop using, this class had some efficacy concerns. Primarily 45.8% “felt they could handle the problem”, 24.7% felt that they “did not need treatment” and

27.7% felt they “did not have time”. Despite this groups’ reluctance to seek SU treatment, the majority felt that treatment would help (75.3%), putting them in the contemplation stage.

Table 12: Conditional Probability of Giving a Positive Response to Reasons for Not Getting Substance Dependence/Abuse Treatment in the Past Year (scale 0-1 probability)

Indicator Variable	Likely Stage of Change		
	Class 1	Class 2	Class 3
	Precontemplation	Contemplation	Could Not Afford/ Stigma
Did Not Receive Treatment Because,	330 (22.0%)	137 (9.1%)	1,032 (68.8%)
1. Could Not Afford Cost	0.069	0.441	0.429
2. Insurance Did Not Cover At All	0.000	0.161	0.080
3. No Transportation/ Inconvenient	0.011	0.104	0.074
4. No Program Had Treatment	0.011	0.168	0.054
5. No Ready to Stop Using	1.000	0.684	0.043
6. No Program Openings	0.000	0.008	0.048
7. Did Not Know Where to Go	0.031	0.312	0.059
8. Fear of Neighbor’s Opinion	0.004	0.547	0.081
9. Fear of Negative Effect on Job	0.000	0.614	0.054
10. Did Not Think I Needed Treatment	0.000	0.247	0.092
11. Felt I Could Handle the Problem	0.000	0.458	0.048
12. Did Not Think it Would Help	0.004	0.208	0.013
13. Did Not Have Time	0.000	0.277	0.027
14. Did Not Want Others to Know	0.000	0.355	0.014

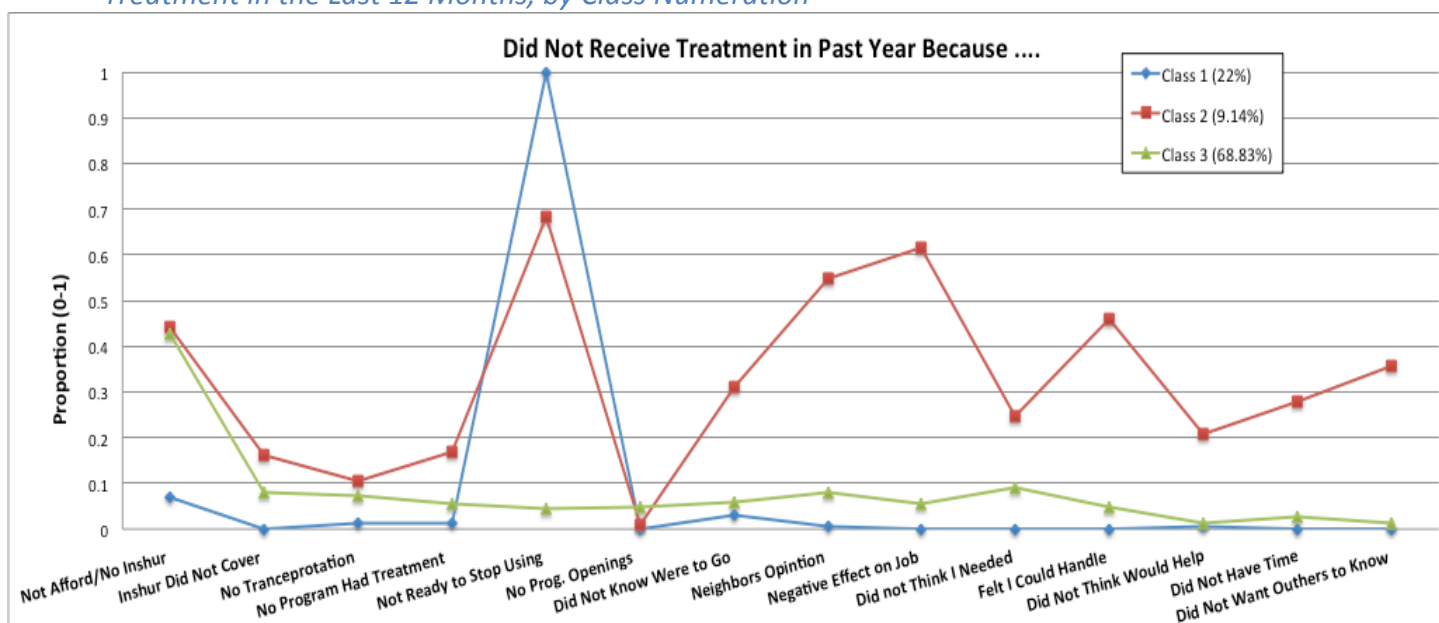
This class accounted for 9.1% of latent class respondents and is 9.0% more likely to be male, and 9.77 times more likely to be 18-34 or 6.33 times more likely to be 26-34 years old. This suggested that Class 2 is male and less than 35 years older. Those in Class 2 have a 8.0% increase in the odds of being married compared to class 1. Racially those in Class 2 are 2.02 times more likely to be Black, and 98.0% less likely to be Asian/Pacific Islander, 96.0% less likely to be Native American/ Alaskan Native, 81.0% less likely to be Multiracial or 60.0% less likely to be Latino, compared to class 1. This class had a 12.0% increased in the odds of being a high school graduate or 24.0% increase in odds of completing some collage. They also had 11.0% greater odds of having an income of \$20-49 thousand or 24.0% increased odds of an income of \$50-74 thousand. Individuals in this group were at an 28.0% increased odds of having sever psychological distress, 58.0% increase of having a major depressive episode or were 2.9

times more likely to have had overall mental distress in the past year compared class 1.

Class 2 is most likely in the contemplation stage and may be encouraged to seek treatment if their perception of stigma related to admitting that one needs treatment and their concern about others' opinions can be addressed.

Class 3 of the latent class analysis revealed from the baseline characteristics that they had the greatest proportion of women (40.3%) of all classes were not married (69.8%) and was the group with the greatest proportion of those 18-24 years old (53.0%). This group was the least diverse racially with 64.4% being White, and only 6.7% Latino or 7.4% Black; this group also has the highest proportion of those who identify as multiracial (3.4%). Those in class 3 were more educated than the other classes with 28.2% having completed some collage and 16.1% having graduated from collage. Although this class was highly educated, there income was low with 57.8% having an income of less than \$20 – 49 thousand a year. This group had the high rates of overall mental distress (74.5%), 61.1% had severe psychological distress, and 41.6% had a major depressive episode.

Graph 2: Conditional Probability, Reasons for Those with Substance Use Symptoms not Seeking Treatment in the Last 12 Months, by Class Numeration



The greatest concern for class 3 to seeking treatment was “could not afford cost” (42.9%) of treatment; this is also the only class within the substance abuse model where affordability of treatment had the highest probability of all of the answers as to why the respondents did not get treatment. For class 3 stigmas is not a concern; concerns about effect on job, neighbor’s opinions, and others finding out were all under the probability of 10%. It is also interesting that for those in this class only a few of the respondents indicated “not wanting to stop using” (4.3%) as the reason for not getting treatment; only 1.3% felt that treatment would not work. The only insight into reasons for not getting treatment is cost (42.9%).

Table 12: Odds ratio of Latent Class Membership for Those with Substance Use Symptoms, by Demographic Characteristics

Characteristic	Likely Stage of Change						
	Class 1 – Reference Group	Class 2 V 1			Class 3 V 1		
	Precontemplation	Contemplation			Could Not Afford/Stigma		
	330 (22.0%)	137 (9.1%)			1,032 (68.8%)		
	95% Confidence			95% Confidence			
	OR	Lower	Upper	OR	Lower	Upper	
Female (vs. male)	0.91	0.40	2.06	0.74	0.44	1.26	
18-25 (vs. 35+)	9.77*	3.53	27.01	1.11	0.65	1.88	
26-34 (vs. 35+)	6.33*	2.15	18.65	1.03	0.55	1.90	
Married (vs. not married)	1.08*	0.40	2.95	0.94	0.52	1.71	
Black (vs. White)	2.02	0.46	8.80	2.19*	1.04	4.61	
Native American (vs. White)	0.04	0.01	0.31	0.36	0.10	1.29	
Asian/Pacific Islander (vs. White)	0.02	0.00	44.04	1.45	0.18	11.95	
Multiracial (vs. White)	0.19	0.03	1.42	0.55	0.11	2.76	
Hispanic (vs. White)	0.40	0.08	1.90	1.10	0.53	2.25	
Less than HS (vs. college graduate)	0.64	0.15	2.64	1.05	0.45	2.47	
HS graduate (vs. college graduate)	1.12	0.35	3.54	1.15	0.53	2.53	
Some college (vs. college graduate)	1.24	0.41	3.75	1.05	0.46	2.39	
Serious Psychological Distress (vs. not)	1.28*	0.51	3.23	0.85	0.47	1.52	
Major Depressive Episode (vs. not)	1.58	0.73	3.40	0.65	0.35	1.23	
Overall Mental Distress (vs. not)	2.9*	0.63	13.51	1.38	0.77	2.47	
Less Than \$20k (vs. \$75k+)	0.97*	0.33	2.79	1.74	0.86	3.54	
\$20k-49k (vs. \$75k+)	1.11*	0.40	3.11	2.32*	1.16	4.66	
\$50k-74k (vs. \$75k+)	1.24*	0.41	3.75	1.45	0.63	3.36	

* Indicates a statistical significance at 95% or better confidence based on the calculated p-value.

Individuals in Class 3 were 26.0% less likely to be male, 6.0% decrease in the odds of being married, and had 11.0% greater odds of being 18-25 years old and a 3.0% increase in the odds of being 26-34 years old. There was a 2.19 times increase in the odds of being Black, 43.0% of

being Asian, and a 10.0% of being Latino, compared to class 1. They were 5.0% more likely to have completed some college or 15.0% increasing in have graduated high school. This class was most likely to likely to have an income of \$20-49 (OR=2.32) a year. Class 3 was less likely to have a major depressive episode (OR=0.65) or severe psychological distress (OR= 0.85); but was more likely to have greater odds of overall mental distress (OR=1.38.).

5.5.1 A Summary of Key Finding of class Characteristics for the Substance Use Model:

The baseline demographic characteristics did not show meaning full variations between latent classes so odds ratios were calculated and used to summarize class characteristics.

- **Those who cited “cost” as the primary reason for not getting care:**
 - **And “did not think I needed treatment”:**
 - Class 3 of the substance use groups’ reasons was “**cost**” (42.9%) and “**did not think I needed treatment**” (9.2%). They were most likely male, 18-24 years, White, Black, Asian/Pacific Islander or Hispanic/Latino; graduated high school; earned less then \$20 to 49 thousand; and overall mental distress.
- **Those who didn’t get care because they “weren’t ready to stop using”:**
 - **And cost:**
 - The substance use precontemplation group (class 1) was “**not ready to stop using**” (100%) and “**cost**” (6.9%) was an issue. Baseline characteristics show they were male, 18-25 years; White, Black or Latino, graduated high school; earned less than \$20 thousand, severe psychological distress and overall mental distress; was 23.4% of the sample and was the reference group.
 - **And stigma at job:**
 - Class 2of the substance use contemplation stage was “**not ready to stop using**” (68.4%) and “**feared effect on job**” (61.4%). They were 9.1% of the sample and were likely 18-34 years, married, White or Black; a high school graduate/had some college; earned \$50 to 75 thousand a year and high levels of all mental distress.

6 Discussion and Conclusion

The objective of this paper was to use data from the 2009-2012 National Survey of Drug Use and Health (NSDUH) to answer a primary research question: “What are the primary reasons for underutilization of services and what are the trends related to attitudes toward treatment among demographics?” The purpose of identifying audience factors was to inform communication strategies in an effort to increase treatment utilization and insurance enrollment for the Substance Abuse and Mental Health Services Administration (SAMHSA) Office of Communications and the Office of Policy Planning and Innovation. Ultimately these findings are intended to guide strategy around targeted marketing and public awareness efforts on health coverage and enrollment toward populations based on a more empirical basis.

The most recent findings on mental health (MH) and substance use (SU) prevalence rates in 2012 were that 43.7 million (18.6%) adults 18 years or older had any mental illness (AMI) and of adults who had AMI in the past year, 9.6 million (4.1%) had severe mental illness (SMI) (SAMHSA, 2013c). Last year 22.2 million (8.5%) persons 12 years or older had substance use (SU) symptoms; 1.7 million reported heavy drinking of alcohol (6.5%) and 23.9 million had used any illicit drug in the past month (9.2%) (SAMHSA, 2013c, p. 13). In 2012, 1 in 4 adults had a MH condition and 1 in 17 had serious mental illness (SMI) (National Alliance on Mental Illness, 2013). Adults with mental illness (MI) are more likely to be uninsured compared to those without MI (National Alliance on Mental Illness, 2013). A study using the NSDUH years 1997-2010 found that unmet need for MH treatment increased from 4.3 million in 1997 to 7.2 million in 2011; the uninsured are 5 times more likely to have an unmet MH need, compare to those with private insurance (Roll et al., 2013).

Access to health care is a function of individual attributes including enabling

(socioeconomic, insurance status), predisposing factors (society, demographics) and need (severity, health status, disability) (Roll et al., 2013). Trends in the link between health insurance and behavioral health (BH) treatment underutilization are well documented and have persisted over the past decade. These trends are especially important as behavioral health (BH) diseases are subject to influence by modifiable social, economic, and environmental conditions that effect not only the individual but the whole community, neighborhood, and population (Shim, 2104).

Reasons for low rates of treatment and high levels of unmet need are only partly understood (Edlund et al., 2012). Blacks are appreciably more likely than Whites to have untreated MI and are admitted to psychological hospitals at higher rates than Whites (Snowden, 2012). Asian Americans have the lowest rates of any health service utilization among all ethnic/racial groups and are more likely to delay care for MH (Sue et al., 2012). The 2010 NSDUH found that Asians accounted for only 5.3% of MH utilization in the past year, compared to Latinos (7.9%), Blacks (8.8%) and Whites (16.2%), this trend has held true over the past decade (Sue et al., 2012).

The IOM concluded in a 2003 report that health care disparities were genuine and problematic, but could not identify one single cause (Smedley, 2003). System level MH treatment inadequacies create a lack of opportunities for patients to encounter treatment, sometimes caused by shrinkages in outpatient treatment capacity (Snowden, 2012). Major barriers leading to low rates of treatment in the U.S. include difficulty-obtaining SU and MH treatment services from two systems that are fragmented and the lack of programs to treat individuals with co-occurring disorders (Snowden, 2012).

Attitudes and evaluative behaviors were more commonly reported than financial barriers as obstacles to treatment (Mojtabai et al., 2011). “Variations in cultural influences continue the etiology and development of MI and effect how one personally defines his/her symptoms and

illness” (Jimenez et al., 2012, p. 2). Differences in preferences for treatment are not technical contributors to disparities, but they are important determinants of access even when cost and insurance are not an issue (Smedley, 2003). Treatment preferences, attitudes and evaluative behaviors may impact individuals understanding of when to seek care, identification of symptoms for MI or substance abuse (SA), and ability to communicate their symptoms to their doctor. Rates of MI and SU for minorities is similar that of Whites, but the number of psychological symptoms for minorities is greater (McGuire & Miranda, 2008), suggesting there may be disparities in need that are not captured by diagnosis (Chou et al., 2013).

One study found that of the 5 comfort and beliefs questions about MH treatment that there were no significant differences between Blacks and Whites, and for the 3 stigma questions there were no significant differences between Whites and all other ethnic/racial groups (Hunt, 2013). These finding are supported by Edlund et al. (2012) that found that there were no structural or attitudinal barriers to treatment endorsed in their study. There are however smaller differences in treatment preference between ethnic/racial groups that may influence utilization.

The “literature points to the role of cultural beliefs and attitudes within minorities toward health that lead to disparities in health care utilization for those with insurance” (Chou et al., 2013, p. 1361). If attitudes and preferences do strongly determine someone’s acceptance of treatment as well as readiness to change (Schraufnagel et al., 2006) understanding attitudes and beliefs of ethnic/racial subpopulations is an important factor in improving utilization of BH treatment in the U.S.. Some examples of findings in the U.S. by ethnic/racial subgroups include the influence of MH severity on insurance enrollment, difference in MH prevalence rates for Asians by age and gender, as well as differing SU prevalence rates for Latinos by age of immigration as well as cultural background (Mexican, Cuban, Central American, Puerto Rican).

For Blacks, trends in MI prevalence differ from other ethnic/racial groups. Blacks have similar rates of past year MI as Whites but they also have higher rates of chronic major depression compared to Whites (57% B v. 39% W) (NLAAS, 2003).

Those from ethnic/racial backgrounds, other than Native Americans, are less likely than Whites to attribute depression to biology, feel psychological medications are less effective, more likely to believe medications are addictive and that counseling and prayer are effective treatments (Givens, Houston, et al., 2007). The differences in ethnic/racial BH treatment preferences from the dominant White culture can be legitimized by looking at beliefs related to treatment preferences (Snowden, 2012). The general preference of ethnic/racial groups is for psychotherapy or counseling; most feel that therapy is as effective as medications (Hunt, 2013).

Latinos were less likely to believe that psychopharmacological medications for anxiety were helpful and more likely to believe therapy was a waste of money compared to Whites. (Hunt, 2013). Asians differed in only one item compared to Whites, they believed therapy was a waste of money (Hunt, 2013). Native Americans were less likely to view psychotherapy as effective, or that therapy would improved coping skills, more likely to believe therapy was a waste of money, and a greater percentage believed MI would get better without professional help (Hunt, 2013).

A study using a cross-sectional internet survey from 1999-2002 on attitudes toward depression treatment for Whites, African Americans, Asian Americans, Latinos, and Native Americans found that overall 40.4% preferred medications, 35.8% preferred counseling, and 23.8% preferred none of the treatment options (Givens, Houston, et al., 2007). Whites and Native Americans were the most likely to prefer medication (42.2% W v. 41.3% NA) compared to all other groups (Givens, Houston, et al., 2007). Blacks, Asians and Latinos preferred counseling compared to medication (Givens, Houston, et al., 2007). Asian Americans were the most likely

group to prefer none of the treatments (26.5%) and Blacks were the least likely to prefer none of the treatments (19.6%) (Givens, Houston, et al., 2007).

In summary, though research on MH and SU prevalence rates and treatment utilization for ethnic/racial groups is not conclusive and often the national data that is available is more than five years old, there are some trends overall. Consistently ethnic/racial groups have lower prevalence rates of MH and SU disorders compared to Whites. There are differences in prevalence rates of MH and SU disorder for subpopulations of ethnic/cultural groups. Asians have the lowest prevalence rates of SU and MH for all groups and Asian women born outside of the U.S. were less likely to have any lifetime depression, anxiety, and psychological distress compared to those born in the U.S. For Blacks, they tend to have more illicit drug abuse and less alcohol abuse compared to Whites. Blacks also have similar rates of past year MI compared to Whites, are less likely to have lifetime major depression and more likely to have schizophrenia. For Latinos, Mexicans, and Puerto Ricans they have the highest prevalence of SUD for all Latino groups, but still have lifetime prevalence rates of SU and MH below that of Whites.

There is research indicating which predictors related to age, gender, employment, and such are positive and negative actors that influence treatment receipt. Positive predictors of SU treatment receipt for Whites, Blacks and Latinos include functional limitations at work, being 35 year or older, having a criminal history, being enrolled in Medicaid (Cook & Alegria, 2011) and educational attainment. Negative predictive factors related to receiving SU treatment for all groups include having income at 400% or above.

Current knowledge of racial/ethnic differences and disparities is limited (Perron et al., 2009). Prior research has typically combined MH with SU treatment, masking differences in SU needs and utilization (Perron et al., 2009). The findings from the review of the literature expose the

limitations of our current ability to effectively measure ethnic/racial prevalence rates of BH, utilization of treatment, and attitudes and beliefs toward MI or SA and BH treatment. This limitation is due to our limited and outdated research and data on the ways ethnic/racially diverse individuals conceptualize BH and the lack of sufficiently strong data on Asians, Black, and Latino subgroups, as well as Native Americans. On a large system wide scale the current national data limits analysis of variations on prevalence and utilization rates of ethnic/racial groups due to a lag in collection of data, limitations of sampling sizes for subpopulations and the questions not being asked. Some of the national representative surveys that address MH and SU, have over sampled for Latinos, Asians, Blacks and those with alcohol, drug use or mental health symptoms were conducted from 2000-2003, over ten years ago.

6.1 Health Communications and Education Recommendations for the Substance Abuse and Mental Health Services Administration

This analysis was an example of applied statistics or the practical application of statistics, as opposed to the study of its theoretical basis. Stage of Change was used to identify the classes who would be most likely to move from not utilizing behavioral health (BH) care to seeking treatment and enrolling in insurance. Overall, one group that was in the Action stage; this was the mental health group where 100% indicated they did not get care due to “cost” and none of those in this group had reservations about needing treatment. The action group was most likely female, married, 35 years or older, White, was not graduates of high school and they had an income of \$20-49 thousand last year. These findings are consistent with the literature that those with any of the factors including, mental health, being White, 25-44 years old, with less education and an income under 400% of Federal poverty are more likely to seek treatment.

Understanding where those with SA or MH need are in the Stages of Change will help the Substance Abuse and Mental Health Services Administration (SAMHSA) design

communications efforts to move individuals into the final three stages of change. Some behavior change outcomes may focus on moving individuals into the Action stage (changing overt behavior) from the Preparation stage. Finding ways to encourage individuals who are not seeking treatment for SA or MH (Precontemplation stage) to take small steps toward treatment could include informing them about where to get treatment or to enroll in health insurance, and about the changes that would make treatment more affordable. This could lead to greater enrollment in health insurance, increased treatment utilization and eventually to the Termination stage (to utilize treatment for behavioral health needs and to maintain treatment).

Two groups out of the seven identified in the analysis were in the Contemplation stage, one from the mental health, and one from the substance use groups. For the mental health group in the Contemplation stage they did not get treatment because of “cost” and those they “did not know where to go”. They were likely male, 18-34 years old, Hispanic, Asian, or multicultural, not married, completed college, had an income of \$20-49 thousand a year and had the worst psychological and overall mental distress of all mental health groups. Again these findings are in line with the literature, in that those who have a college degree, are not married, and are Asian or Hispanic are less likely to seek treatment. On the other side, positive predictive factors include having a mental health need and being 18-34, an income of \$20-49 thousand, as well as having severe psychological distress and overall mental distress in the past year.

For the one substance use group in the Contemplation stage, the primary reason for not getting treatment was “cost” and they “did not feel they needed treatment”. They were most likely male, 35 year or older, married, Black, multiracial, or Asian, had some college, and income of \$20-49 thousand, and were the least likely to have co-occurring substance use and mental health symptoms. The literature supports these findings as those who are 35 years or

older, married, and have an income of below 400% poverty are more likely to seek treatment.

Negative factors include being male, having higher educational attainment, being Asian, and not having co-occurring MI.

The final four groups that were identified were in the Precontemplation stage. For the two mental health groups that were in the Precontemplation stage their primary reason for not getting treatment was that “I could handle the problem” and they were both most likely male. For one of these groups efficacy was an issue as they felt that they “did not have time”. This group was 35 years or older, married, White, a college graduate, and made \$75 thousand plus a year in income. Negative predictive factors for this group included an income of \$75 thousand or more, being male, and being a collage graduate. Positive factors include being married and 35 years or older.

The other mental health group in the Precontemplation stage was most likely 26-34 years old, Latino, not married, not graduated high school, and an income of less that \$20 –49 thousand, had severe psychological distress and/or major depressive episode in the past year, and also felt that “treatment would not help”. Positive predicative factors are being 26-34 years old, an income below 400% poverty, not graduating high school, and severe metal illness. Negative factors for BH treatment are not being married, being Latino and a negative attitude toward treatment.

For the two substance use groups that were in the Precontemplation stage both felt that they “were not ready to stop using”, were 35 years or older and married. One of these groups was most likely male, White, had a college degree, and made \$75 thousand plus a year. Positive predictive factors include being married, 35 years or older and White. Negative factors include having higher educational achievement and an income above the 400% Federal poverty level.

The second substance use group that was in the Precontemplation stage were most likely to be female, Black, Asian, multiracial, have completed some college and had the highest rates of

co-occurring serious psychological distress in the past year. For this group 57.8% felt stigma was, a deterrent and 86.4% also felt that treatment would help. Positive predicative factor for treatment include being female, 35 years or older, married, and having severe MI. Negative factors are being Asian and having completed some college.

As of the date of this report there has been no meeting with the director of the Office of Communications at Substance Abuse and Mental Health Services Administration (SAMHSA). For this analysis, I will present two theoretical scenarios that will demonstrate how this information could be used by SAMHSA to increase enrollment in health insurance and behavioral health utilization in the U.S. as well as recommendations that I will present to the Office of Communications Director mid March.

6.1.1 Two Scenarios Using the Analysis of Class Differences to Increase Treatment Utilization for those with Behavioral Health Symptoms:

- For the mental health group in the Action stage, the primary limitation to utilization was “cost” and they had not reservations about treatment. Communications efforts could focus on educating about where and how to get insurance through Medicaid, as they have an income of <20-49 thousand qualifying them for Medicaid (income under 400% poverty). A more functional approach to improving knowledge, utilitarian function, and/or socially adjusted motivations in communication strategies would address lack of efficacy in obtaining insurance or getting supplemental insurance. Additional analysis into perceptions of need and treatment preferences for White married females, 35 years or older who have not completed high school is needed.
- For the substance use groups in the Contemplation stage, the primary reason for not getting treatment was stigma and the majority “felt treatment would work”. This group could be encouraged to seek treatment buy addressing their concerns about being stigmatized and their

need to defend their perceptions of themselves. This need to maintain perception of self suggest that behavior change theories based on consistency theories and using the example of role models would help to shift this Classes' locus of control from external to internal motivation to seek treatment. Additional analysis into perceptions of need and treatment preferences for married, female, Blacks, Asians, and multiracial individuals, with some college who also have severe psychological distress is needed.

6.1.2 Other Key Findings:

- Those with mental health symptoms are more likely to have health insurance (77.6%) compared those with substance use symptoms (69%),
- Individuals with mental health symptoms were more likely to not seek treatment due to cost (47.4 %) compared to those with substance use symptoms (38.2%),
- Individuals with substance use symptoms are less likely to seek treatment (10.8%), compared to those with mental health symptoms (41%),
- Substance use treatment was most likely utilized by Whites, Latinos, and Blacks, those 18-25 years old,
- Whites, American Indians/Alaskan Natives, and multiracial individuals, and those 25-44 years and those 60 or older most likely utilized mental health treatment.

6.1.3 Recommendations for SAMHSA's Office of Communications:

- Share information with Director of Communications to identify ways that this analysis can inform current communications efforts to increase health insurance enrollment and future communications efforts around the Affordable Care Act (ACA).
- Use results to inform Office of Behavioral Health Equity media campaigns for minorities with mental health or substance use symptoms that did NOT seek treatment in the past year,

based on findings of trends related to attitudes among demographics.

- Use to inform distribution strategies for future ACA toolkits to continue to work to enroll those in ACA, by using this analysis of consumer research to prioritize groups of individuals who are further along in the Stages of Change and to target those that are most likely to make a change in behavior related to insurance enrollment and treatment utilization.
- Use results to inform SAMHSA social media efforts to design an agency-wide communication strategy and objectives around the ACA.
- The intended audience is individuals with mental health or substance use symptoms who did NOT seek treatment in the past year, classified by attitudes and demographics. Now that the audiences have been defined by attitudes and demographics, additional consumer research is needed to identify and design targeted communications strategy objectives.

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Appendixes

Appendix A - Other National Surveys, 12 months Comparisons

	SMI	AMI	MDE	Ages	Excluded Populations
1990's URS	5.40%			18+	
2002 National Epidemiological Survey Alcohol and Related Conditions (NESARC)		9.20%	7.10%	18+	Institutionalized
2001-2003 National Comorbidity Survey – Replication (NCS-R)	5.80%	24.80%	7.60%	18+	Hawaii and Alaska
1992 National Comorbidity Survey (NCS)		29.50%		18-54	
2012 National Survey of Drug Uses and Health (NSDUH)	4.10%	18.60%	6.90%	12+	Institutionalized

Appendix B: Substance Abuse and Mental Health Services Administration

The Substance Abuse and Mental Health Services Administration (SAMHSA) is the agency within the U.S. Department of Health and Human Services that leads public health efforts to advance the behavioral health of the nation. SAMHSA's mission is to reduce the impact of substance abuse and mental illness on America's communities. Congress established the Substance Abuse and Mental Health Services Administration (SAMHSA) in 1992 to make substance use and mental disorder information, services, and research more accessible.

SAMHSA is a public agency within the U.S. Department of Health and Human Services (HHS).

Prevention, treatment, and recovery support services for behavioral health are important parts of the health service systems for the community. The services work to improve our health and minimize costs to individuals, families, businesses, and governments. However, people suffering from either substance use and mental disorders, or both, because of their illness are often excluded from the current health care system and instead have to rely on "public safety net" programs. Last year alone, approximately 20 million people in need of substance abuse treatment did not receive it. Further, an estimated 10.6 million people reported an unmet need for mental health care. The gap in service to this population unnecessarily jeopardizes the health and wellness of people and causes a ripple effect in costs to American communities.

Vision

SAMHSA provides leadership and devotes its resources, including programs, policies, information and data, contracts and grants, to help the United States act on the knowledge that:

- 1 Behavioral Health is essential for overall wellbeing
- 2 Prevention works
- 3 Treatment is effective
- 4 People recover from mental and substance use disorders

Mission

It is SAMHSA's mission to reduce the impact of substance abuse and mental illness on America's communities.

The Office of Policy, Planning, and Innovation (OPPI):

The Office of Policy, Planning, and Innovation provide an integrated and structured approach for the identification and adoption of policies and innovative practices that improve behavioral health services outcomes.

- Represents SAMHSA at meetings and raises SAMHSA's profile in health research
- Facilitates the adoption of data-driven policies and practices by collaborating with other departments and agencies in behavioral health, including NIH, CDC, and the Centers for Medicare and Medicaid Services
- Encourages partners and allies to adopt policy initiatives that support and improve behavioral health
- Responds to Freedom of Information Act requests

Office of Communications

The Office of Communications gathers, compiles, and disseminates news and information about SAMHSA.

- Engages in communications project development
 - Performs media and constituency outreach

Appendix C: Substance use and Mental Health Measure - NSDUH 2009-2012

Substance Use Measures

Three variables from the NSDUH were used to create the recoded substance use measures that contain respondent information about reasons for not receiving substance treatment in the past year or not receiving additional substance treatment in the past year (*2012 NSDUH PUBLIC USE FILE CODEBOOK*, 2013, p. 474). These 13 recoded variables were created using variables FLNDILAL, NDMRNHCV, and NDTXNHCV (*2012 NSDUH PUBLIC USE FILE CODEBOOK*, 2013, p. 474). The first variable (FLNDILAL) was for respondents who were classified as feeling a need for substance use treatment and making an effort to get substance use treatment in the past year. They were coded as having a felt need and making an effort to get treatment, if they felt a need for treatment for their substance use and if they met either of the following conditions: (1) reported making an effort to get treatment, or (2) reported making an effort to get additional treatment” (*2012 NSDUH PUBLIC USE FILE CODEBOOK*, 2013).

The second and third variables asked about why respondents did not get treatment you need for you use of alcohol or drugs and why they did not get additional treatment for alcohol or drugs. The second variable was: “Which of these statements explain why you did not get the treatment or counseling you needed for your use of alcohol or drugs”(NDTXNHCV) (*2012 NSDUH PUBLIC USE FILE CODEBOOK*, 2013, p. 441). The third variable was: “Which of these statements explain why you did not get the additional treatment or counseling you needed for your use of alcohol or drugs?” (NDMRNHCV) (*2012 NSDUH PUBLIC USE FILE CODEBOOK*, 2013, p. 444). For both questions, there were eight response options, (1) response entered, (6) response not entered, (81) never used alcohol or drugs logically assigned, (91) never used alcohol or drugs, (94) don’t know, (97) refused, (98) blank, and (99) legitimate skip (*2012 NSDUH PUBLIC USE FILE CODEBOOK*, 2013, p. 444).

Mental Health Measures

In 2008, the NSDUH expanded to include mental health prevalence rates for adults 18 years or older. In 2008, the clinical follow-up using approximately 750 cases was used to create the “2008 mental health prevalence rates model”. This model was used to estimate mental health prevalence from years 2009 to 2011 (*2012 NSDUH PUBLIC USE FILE CODEBOOK*, 2013). The “2012 model” introduced in 2012 for MH was revised to produce more accurate estimates and was used to produce mental illness (MI) estimates for 2012. This change was made after analysis of the prevalence rates produced using the “2008 model” for years 2008-2011 was found

to overestimate the prevalence of MI in the U.S. population. Due to this change from the old “2008 model”, the MI from variables 2008-2011 is not recommended to be used in conjunction with the new 2012 MI variables.

This change in the measures limited the number of MH indicators that could be used in the latent class analysis (LCA). Table 2 is from the “2012 Public Use Codebook” Appendix I, it lists what MH measures can be used for comparisons for years 2002-2012. The far right column of Table 2 for years 2009-2012, displays the relevant MH measures that can be used for this analysis.

Table: Comparable Versions of Key Mental Health Measures for Persons Aged 18 or Older: National Survey of Drug Use and Health, years 2002–2012

Mental Health Measure	Years Available				
	2002-2003	2004	2005-2007	2008	2009-2012
Past Year Major Depressive Episode			AJAMDEYR	AJAMDEYR	AMDEYR
Worst K6 Total Score in Past Year			K6SMXADJ	K6SCMAX	K6SCMAX
Past Year Serious Psychological Distress Indicator Based on Worst K6 Total Score			SPDYRADJ	SPDYR	SPDYR

K6 = six-item nonspecific psychological distress scale.

NOTE: All variables within a row are comparable across the years indicated, even if they have different names. The standard analysis weight, ANALWT_C, should be used for all measures and years. This table lists only the mental health measures with adjusted versions for comparability across years. In the 2002 and 2003 NSDUH, serious psychological distress was referred to as serious mental illness.

This table was finalized on October 23, 2013. Source: (SAMHSA, 2013c)

The only MH variables that could be used in this analysis included: (1) “Past year Major Depressive Episode” (AMDEYR)(2) “(2) “Worst K6 total score in past year” (K6SCMAX) and (3) “Past year serious psychological distress indicator based on worst K6 total score” (SPDYR). The NSDUH estimates the prevalence rates of mental illness by using two validated measures of mental illness. These measures are the Kessler-6 (K6) distress scale, the World Health Organizations Trained MH professionals administer these measures, and findings from their assessment do not constitute a diagnosis, just an estimate of psychological distress with in the population.

Respondents who have reported that they had a period of depression lasting 2 weeks or longer, while also having some of the nine attributes (symptoms) mentioned for lifetime depression during the past 12 months were classified as having a “Past year Major Depressive Episode” (AMDEYR). Questions asked to assess those with at least two weeks they felt depressed included a question phrased as “In the past 12 months, did you have a period of time when you felt [FEELNOUN] for two weeks or longer while also having some of the other problems we asked about?”

The two six-item K6 scales gather information on respondents experienced of psychological

distress in the past 30 days and were used to create the “Past year serious psychological distress indicator” (SPDYR), and “Worst K6 total score in past year”. The six questions asked in the K6 scale were “During the past 30 days (12 months), how often did you feel” (1) nervous, (2) hopeless, (3) restless or fidgety, (4) so sad or depressed that nothing could cheer you up, (5) that everything was an effort, and (6) down on yourself, no good, or worthless.

The K6 month measures were summed to create the past month distress score (K6SCMON). Using the past month distress score, adults are considered to have past month distress (K6SCMON) if their distress score is 13 or greater on a scale of 0- 24. The past year SPD (SPDYR) is defined the same way as the past month K6 using the total past year score (K6SCMAX).

Appendix D: Prevalence of Behavioral Health Symptoms, Need, Perceived Need And Treatment Recipe by Ethnic/Racial Background, NSDUH 2009-2012

Variables	Total	White	Black	Latino	Asian	Nat.Amr	Other	
	n	%	%	%	%	%	%	
Mental Health Prevalence, in the past year (n=154,328)								
Past Year Serious Physiological Distress ¹	22,744	14.74	9.56	1.67	2.11	0.46	0.26	0.60
Overall Mental Stress (K6)	48,605	31.49	23.06	3.67	4.90	1.11	0.63	1.44
Past Year Major Depressive Episode ¹	12,290	8.03	5.49	0.81	1.06	0.23	0.12	0.33
Substance Abuse Prevalence, in the past year (n=14,306)								
Alcohol Dependence/Abuse	6,327	44.23	27.91	4.63	7.19	1.10	1.50	1.59
Illicit Drug Dependence/Abuse	3,990	27.89	17.90	4.08	3.57	0.43	0.67	1.13
Co-Occurring Substance Dependence/Abuse	1,360	9.51	5.79	1.19	1.57	0.15	0.34	0.41
Needed Treatment for Substances (n=14,306)								
Treatment Alcohol Only	17,676	7.78	5.11	0.77	1.19	0.17	0.21	0.27
Treatment Illicit Drugs Only	8,135	3.58	2.23	0.51	0.52	0.06	0.10	0.15
Co-Occurring Treatment for Alcohol and Drugs	22,088	9.72	6.34	1.07	1.45	0.20	0.25	0.36
Felt Need for Behavioral Health Treatment (n=154,328)								
Substance Use Treatment	756	0.49	0.91	0.05	0.06	0.00	0.02	0.01
Both Substance Use and Mental Health	484	0.30	0.14	0.03	0.03	0.00	0.01	1.95
Treatment for Mental Health	9,862	6.39	3.03	0.42	0.52	0.09	0.08	0.19
Received Behavioral Health Treatment (n=154,328)								
Alcohol Treatment	2,401	1.06	0.67	0.13	0.16	0.01	0.05	0.04
Illicit Drug Treatment	2,155	0.95	0.62	0.12	0.12	0.01	0.03	0.04
Both Alcohol and Illicit Drug Treatment	1,225	0.54	0.32	0.09	0.08	0.01	0.02	1.93
Any Treatment for Mental Health (n=153,795)	21,171	13.77	10.63	1.00	1.20	0.21	1.29	0.47
Unmet Need for Behavioral Health Treatment (n=154,328)								
Alcohol Treatment	16,306	7.17	4.72	0.70	1.12	0.61	0.81	0.25
Illicit Drug Treatment	20,060	8.82	5.72	0.97	1.36	0.20	0.22	0.31
Both Alcohol and Illicit Drug Treatment	19,758	8.69	5.64	0.95	1.34	0.19	0.21	0.31
Treatment for Mental Health (n=153,883)	10,346	6.72	4.68	0.66	0.81	0.13	0.14	0.28
Health Insurance Status²								
Any Insurance (n=225,496)	121,298	53.79	36.09	6.41	6.45	2.18	0.85	1.55
Tricare, CHAPVA, VA, Military (n=226,504)	5,552	2.45	1.70	0.30	0.24	0.06	0.03	0.11
Medicaid/CHIPS (n=225,436)	20,679	9.17	4.04	2.30	1.94	0.19	0.26	0.37
Medicare (n=226,494)	12,100	5.34	4.02	0.60	0.40	0.11	0.06	0.14
Private Insurance (n=225,799)	91,536	40.54	29.53	3.66	4.02	1.84	0.33	0.99
Other Insurance	1,346	2.44	—	—	—	—	—	—

Appendix E: Latent Class Analysis Statistical Methodology

To determine if the p-value of the current class compared to the previous class (K-1 v. K) is above or below 5%, the Lo-Mendell-Rubin adjusted likelihood ratio test (LRT) would indicate if the null hypothesis should be rejected or accepted (Nylund, 2007). “The ability of the analysis models to recover the population parameters can be summarized by looking at the number of replications with confidence intervals that contain the true population parameter (Nylund, 2007) (Note: The null hypothesis in a statistical test of the hypothesis that there is no significant difference between specified populations). One rule of thumb is that coverage estimates for 95% confidence estimates (p-value) should fall between .91 and .98 (Nylund, 2007).

Nylund, Asparouhov, Muthén, and Bengt used a Monte Carlo Simulation to provide guidance on the identification of the correct fit indices for latent class LCA (2007). They reported on three likelihood-based tests (NCS, LMR, and BLRT), and the ability of the information criterion test (AIC, CAIC, BIC and ABIC) to pick the correct model fit (L. K. M. Muthén, B.O. , 2002). Nylund et al. (2007) reported that the predictions of the LMR and Bootstrap Likelihood Ratio Test (BLRT) for larger sample sizes (1,000) and with unequal classes (as in survey data) performed well at comparing neighboring classes compared to the NCS. The LMR has a higher Type I error (being the probability of rejecting the true model mean) rate (8-item $p = .12$) than the BLRT (8-item $p = .05$) when predicting models with unequal classes and categorical outcomes (Nylund, 2007). Both LMR and BLRT have significant power to detect the correct class model, at .98 LMR and 1.0 BLRT for 10-item complex structure with unequal classes and a sample size of 1,000 (Nylund, 2007). The LMR performed well in correctly predicting all continuous outcome models ($p = .94 - .97$) and the NCS performed the worst with the highest predictability for all models only $p = .67$ (Nylund, 2007).

Reported by Nylund et al. (2007) the information criteria measures (AIC, CAIC, BIC and ABIC) correctly performed at varying levels in predicting the correct class model. The probability of both the Akaike Information Criterion test (AIC) and the Consistent Akaike Information Criterion (CAIC) to predict the correct class model was lower than the Bayesian Information Criterion (BIC) and the adjusted Bayesian Information Criterion (ABIC) for both simple and unequal models with 8-items. Nylund et al. (2007) reported that the BIC and ABIC fared better at correctly predicting the correct number of classes in the model. They both show improvement in predictability as the sample size increases. The ABIC performed better than the BIC in predicting the correct class for the 8-item simple unequal model with a sample of 1,000

(BIC = 88%; ABIC=100%) (Nylund, 2007). Both performed well for the 10-item complex unequal models with a sample size of 1,000 (BIC=100%; ABIC = 100%) (Nylund, 2007). The BIC and ABIC performed well at 100% predictability for all item models with both continuous and categorical outcomes (Nylund, 2007).

Nylund et al. (2007) concludes that the LMR and BLRT are better predictors compared to NCS, which rejects the true population too frequently (Type I Error) and gets worse as sample size increases for LCA. The LMR and BLNR have only slight differences in power between all tests (Nylund, 2007). The LMR tends to incorrectly overestimate the number of classes, “when the p-value indicates a non-significant difference for the LMR one can feel somewhat confident that there is, at most, that number of classes, but that there might, in fact be fewer” (Nylund, 2007). Based on the findings of this study the first time the LMR p-value is non-significant might be a good indication of not raising the number of classes (Nylund, 2007, p. 562).

For the information criteria measures AIC, CAIC, BIC and ABIC, the AIC is not a good measure for predicting class enumeration in categorical LCA or any models in this study. The CAIC was better than the AIC, but was sensitive to the combination of unequal class sizes and a small sample size (Nylund, 2007). In conclusion, the authors found that the BIC is better than any of the other information criteria especially at more consistently correctly predicting categorical LCA. The BLRT performed better in almost all models than the LMR, but it takes 5 to 35 times to compute output and depends on distributional and model assumptions and therefore cannot accommodate survey data (Nylund, 2007). The LMR is based on a variance of parameter estimates and can accommodate survey data. The authors recommend for practice to use the BIC and LMR p-values as a guide to identifying possible class numerations (Nylund, 2007). This can be determined by plotting the AIC, BIC and ABIC to identify at which point the graph starts to flatten out, indicating that the information criteria are increasing and that the class fit is not significant, and also by referencing the p-value from the LMR test (Nylund, 2007)

Appendix F: Fit Indices Plots

Figure1: Fit Indices Plot, Latent Class Analysis Mental Health Model, NSDUH 2009-2012

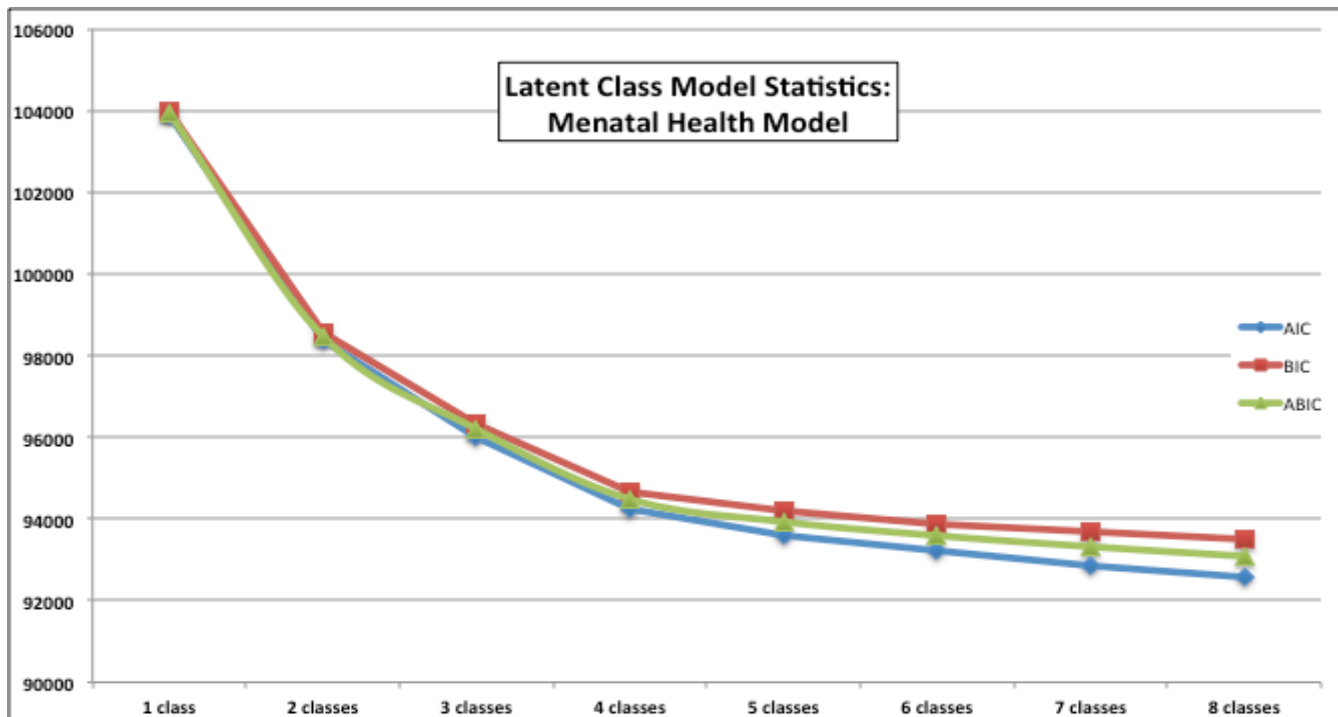
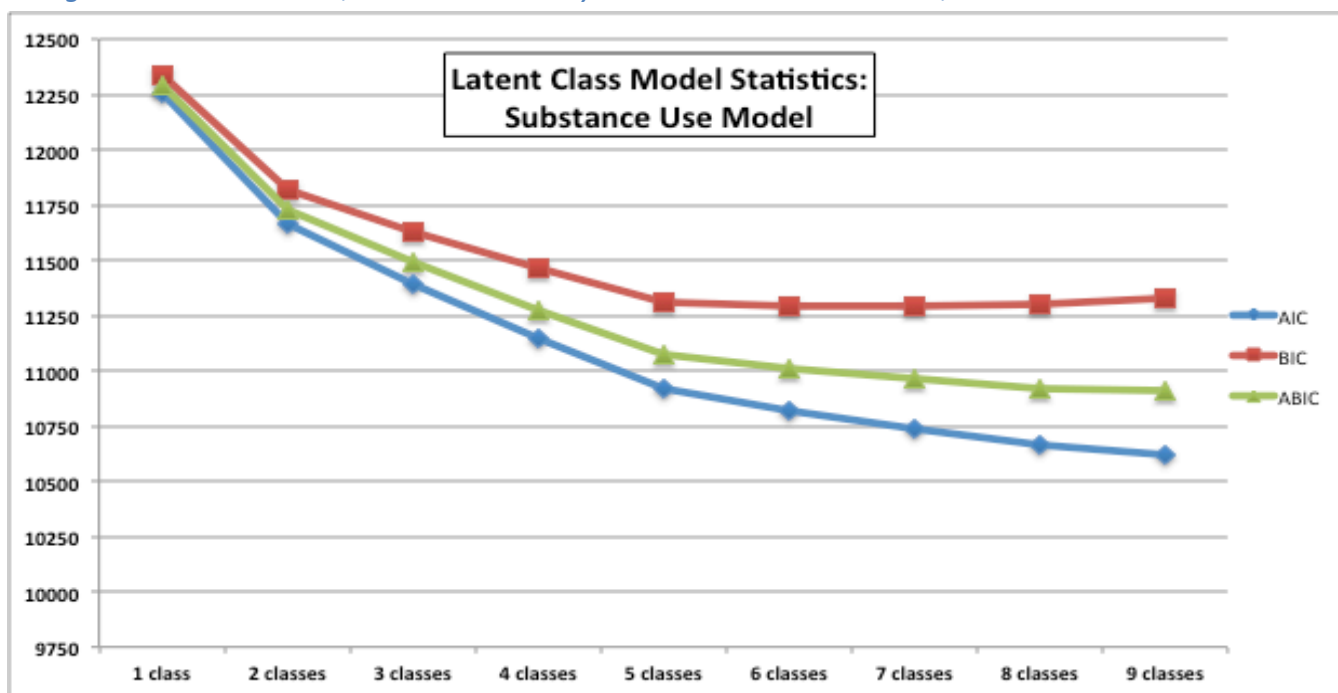


Figure2: Fit Indices Plot, Latent Class Analysis Substance Abuse Model, NSDUH 2009-2012



Appendix G: Summary of Baseline Positive Responses to Reasons for Not Using Services

Summary of Baseline Positive Responses to Reasons for Not Getting Mental Health Services in the Past year, NSDUH 2009-2012

Indicator Variable	Likely Stage of Change									
	Total Sample (n= 10,256)		Class 1				Class 4			
			Precontemplation Contemplation n=926 (9.0%)		Contemplation n=2,771 (27%)		Precontemplation n=3,380 (33%)		Action n=3,179(31%)	
	No.	%	No.	%	No.	%	No.	%	No.	%
Did Not Receive Treatment Because,										
Could Not Afford Cost	4,687	45.7	489	52.8	746	26.9	273	8.1	3,179	100
Insurance Did Not Cover At All	638	6.2	134	14.5	266	9.6	13	0.3	225	0.7
Insurance Did Not Pay Enough	946	9.2	141	15.2	407	14.7	58	1.5	340	10.7
No Transportation/ Inconvenient	436	4.3	161	17.4	14	0.5	246	7.3	14	0.4
Confidentiality Concerns	919	9.0	266	28.7	675	24.4	4	0.1	0	0.0
Fear of Being Committed	1,177	11.5	295	31.9	848	30.6	34	1.0	0	0.0
Did Not Know Where to Go	1,847	18.0	367	39.6	919	33.2	118	3.5	443	13.9
Fear of Neighbor's Opinion	1,089	10.6	273	29.5	812	29.3	4	0.1	0	0.0
Fear of Negative Effect on Job	743	7.2	168	18.1	575	20.8	0	0.0	0	0.0
Did Not Think I Needed Treatment	1,014	9.9	297	2.1	5	0.2	712	21.1	0	0.0
Felt I Could Handle the Problem	2,687	26.2	784	84.7	0	0.0	1,903	56.3	0	0.0
Did Not Think it Would Help	1,090	10.6	493	53.2	13	0.5	582	17.2	2	00.1
Did Not Have Time	1,571	15.3	546	59.0	0	0.0	981	29.0	44	01.4
Did Not Want Others to Know	845	8.2	530	57.2	25	0.9	290	08.6	0	00.0
Other Reason	762	7.4	180	19.4	29	1.0	474	14.0	79	02.4

Summary of Baseline Positive Responses to Reasons for Not Getting Substance Use Services in the Past year, NSDUH 2009-2012

Indicator Variable	Likely Stage of Change							
	Total Sample (n= 1,500)*		Class 1		Class 2		Class 3	
			Precontemplation (n=351, 23.4%)		Contemplation (n=1,000, 66.7%)		Cost/Stigma (n=149, 9.93%)	
	No.	%	No.	%	No.	%	No.	%
Did Not Receive Treatment Because,								
Could Not Afford Cost	448	29.9	27	07.7	372	37.2	49	32.9
Insurance Did Not Cover At All	86	05.7	0	00.0	71	07.1	15	10.1
No Transportation/ Inconvenient	104	06.9	4	01.0	84	08.4	16	10.7
No Program Had Treatment	79	05.7	7	02.0	48	04.8	24	16.1
No Ready to Stop Using	493	32.9	351	100	32	03.2	110	73.8
No Program Openings	54	03.6	0	00.0	52	05.2	2	01.3
Did Not Know Where to Go	144	0.96	10	02.9	79	07.9	55	36.9
Fear of Neighbor's Opinion	154	10.3	0	00.0	75	07.5	79	53.0
Fear of Negative Effect on Job	139	09.2	0	00.0	61	06.1	78	52.3
Did Not Think I Needed Treatment	141	09.4	0	00.0	94	09.4	47	31.5
Felt I Could Handle the Problem	136	09.1	0	00.0	63	06.3	73	49.0
Did Not Think it Would Help	46	03.1	2	00.6	12	01.2	32	21.5
Did Not Have Time	54	03.6	0	00.0	24	02.4	30	20.1
Did Not Want Others to Know	82	05.5	0	00.0	24	02.4	58	38.9

Appendix H: Definitions and Acronyms

ABIC	Adjusted Bayesian Information Criterion	
ACA	Affordable Care Act	The Affordable Care Act actually refers to two separate pieces of legislation — the Patient Protection and Affordable Care Act (P.L. 111-148) and the Health Care and Education Reconciliation Act of 2010 (P.L. 111-152) — that, together expand Medicaid coverage to millions of low-income Americans and makes numerous improvements to both Medicaid and the Children's Health Insurance Program (CHIP) .(Medicaid.gov, 2014)
AIC	Akaike Information Criterion test	Is a measure of the relative quality of a statistical model , for a given set of data. As such, AIC provides a means for model selection .
AMDEYR	Past year Major Depressive Episode	Name of an indicator from the NSDUH survey indicating the K6 Total Score in Worst Month of Past Year Based on Long Form Module.(2012 NSDUH PUBLIC USE FILE CODEBOOK, 2013)
AMI	Any Mental Illness	Medical condition including mild, moderate, and severe mental stress that disrupts a person's thinking, feeling, mood, ability to relate to others and daily functioning (NIH, 2014)
ASPE	Assistant Secretary of Policy and Evaluation	A branch of the U.S. Department of Labor created within the Office of the Assistant Secretary for Policy to implement, manage, and coordinate the Department's evaluation program. (U.S. Department of Labor, 2014)
AUD	Alcohol Use Disorder	Problem pattern of alcohol use leading to clinically significant impairment or distress, as manifest by having 2 or more of the 11 specified criteria occurring in the past 12 months. (American Psychological Association, 2013)
BIC	Bayesian Information Criterion	Also known as the Schwarz criterion (also SBC, SBIC) is a criterion for model selection among a finite set of models. It is based, in part, on the likelihood function.
BH	Behavioral health	Is typically categorized into three main types, those with: (1) mental health symptoms or impairment, (2) drug abuse or dependency and (3) those with co-occurring mental health and drug abuse symptoms
BLRT	Bootstrap Likelihood Ratio Test	Is a method for assigning measures of accuracy (defined in terms of variance, confidence intervals, prediction) to sample estimates. This technique allows estimation of the sampling distribution of almost any statistic using only very simple methods
CAIC	Consistent Akaike Information Criterion	
CIMH	Cultural Influences on Mental Health	
CoOc	Co-occurring symptoms of Mental Health and Substance Use	Is having both any mental health and any substance use disorder at the same time
DSM V	Diagnostic and Statistical Manual of Mental Disorders Edition 5	Is published by the American Psychiatric Association, offers a common language and standard criteria for the classification of mental disorders.
DSTWORST		A name of an indicator from the NSDUH survey indicating a measure of the months in the Past 12 Months you felt worse than the past 30 days (2012 NSDUH PUBLIC USE FILE CODEBOOK, 2013)
Euclidean	Euclidean geometry	Assuming a small set of intuitively appealing means, and deducing many other theories from these.
Exchanges	Affordable Care Act - Health Insurance Exchanges	A resource where individuals, families, and small businesses can: learn about their health coverage options; compare health insurance plans based on costs, benefits, and other important features; choose a plan; and enroll in coverage. The Marketplace also provides information on programs that help people with low to moderate income and resources pay for coverage. (Medicare & Medicaid Services, 2013)

2 | Factors Underutilization Behavioral Health Services

HCC	Healthcare for Communities Survey	This is the second wave of the Healthcare for Communities household survey, conducted from 2000-2001. HCC is a component of the Robert Wood Johnson Foundation's Health Tracking Initiative and was designed to provide information about the care and treatment of substance abuse and mental health conditions. The survey was completed by the RAND/UCLA Research Center on Managed Care for Psychiatric Disorders.
K6SCMAX	Total K6 score for the past month plus the worst month in the past year.	A name of an indicator from the NSDUH survey indicating Past Year Serious Psychological Distress Indicator Based on Long Form Module (2012 NSDUH PUBLIC USE FILE CODEBOOK, 2013)
K6SCMON	Total K6 score for the past month.	A name of an indicator from the NSDUH survey indicating the K6 TOTAL SCORE IN PAST MONTH (2012 NSDUH PUBLIC USE FILE CODEBOOK, 2013)
K-cluster		Is a process of mapping a large set of input values to a countable or smaller set by dividing a large set of points into groups having approximately the same number of points closest to them. Similar to funneling or sifting out debris and keeping only the best. Each group is represented by its central point (k-means) and the K-means cluster all observations into <i>k</i> clusters (classes) in which each individual observation belongs to the cluster with the nearest mean .
LCA	Latent Class Analysis	Relates a set of observed (usually discrete) multivariate variables to a set of latent variables . It is a type of latent variable model . It is called a latent class model because the latent variable is discrete. A class is characterized by a pattern of conditional probabilities that indicate the chance that variables take on certain values.
LMR	Lo-Mendell-Rubin	Is an adjusted likelihood ration test.
MDE	Past year major depressive episode	Is characterized by a combination of symptoms that interfere with a person's ability to work, sleep, study, eat, and enjoy once-pleasurable activities. Major depression is disabling and prevents a person from functioning normally. Some people may experience only a single episode within their lifetime, but more often, a person may have multiple episodes. (NIH, 2014)
MH	Mental Health	A state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community (WHO, 2010)
MI	Mental Illness	Medical condition that disrupts a person's thinking, feeling, mood,, ability to relate to others and daily functioning.
NESARC	National Epidemiological Survey on Alcohol and Related Conditions	From 2001 too 2002, the National Institute on Alcohol Abuse and Alcoholism (NIAAA) conducted a national representative survey of non-institutionalized adults 18 or older oversampling for Black and Latinos.
NCS-R	National Comorbidity Survey – Replication	was a follow-up to the original NCS (1990-1992) that was the first nationally representative mental health survey in the U.S. to use a diagnostic interview to assess the prevalence and correlates of DSM-III-R disorders; the NCS-R was conducted form 2001 to 2002
NHIS	National Health Interview Survey	Is an annual survey of US households conducted by the National Center for Health Statistics
NLAAS	National Latino and Asian American Survey	A national survey on the similarities and differences in mental illness and service use of Latinos and Asian Americans. Data was collected from 2002-2003
NSDUH	National Survey on Drug Use and Health	National Survey of Drug Use and Health (NSDUH) began in 1971 and have been measuring the prevalence and correlates of drug use in the United States annually. This survey series provides information about the prevalence of illicit drugs, alcohol, tobacco, mental health, health insurance, treatment recipe, and unmeet need for treatment among members of the non-institutionalized U.S. civilian population aged 12 or older. (2012 NSDUH PUBLIC USE FILE CODEBOOK, 2013)(2012 NSDUH PUBLIC USE FILE CODEBOOK, 2013)(2012 NSDUH PUBLIC USE FILE CODEBOOK, 2013)(2012 NSDUH PUBLIC USE FILE CODEBOOK, 2013 USE FILE CODEBOOK, 2013
Null Hypothesis		In a statistical test the null hypothesis is that there is no significant difference between specified populations, any observed difference being due to sampling or experimental error)
P-Process		Is a framework designed to guide communication professionals as they develop strategic communication programs.

3 | Factors Underutilization Behavioral Health Services

SA	Substance abuse	Overindulgence in or dependence on an addictive substance, esp. alcohol or drugs.
SD	Substance dependence	Persistent use of alcohol or other drugs despite problems related to use of the substance
SMI	Serious mental illness	Having symptoms that meet the criteria for major depression, schizophrenia, bipolar disorder, oppositional defiance disorder, post-traumatic stress disorder that is a major disruption for people and families as determined by the Diagnostic S Manual V
SPD	Serious psychological distress	Past Year Serious Psychological Distress Indicator Based on Worst K6 Total Score.(2012 <i>NSDUH PUBLIC USE FILE CODEBOOK</i> , 2013)
SPDYR	Past year serious psychological distress indicator.	A name of an indicator from the NSDUH survey indicating serious psychological distress in the past year
SoCM	Stages of Change model	James Prochaska and Carlo DiClemente at the University of Rhode Island developed this model in the late 1970's and early 1980's).
SU	Substance Use	Individual meets criteria for either or both substance dependence and/or abuse as determined by the Diagnostic S Manual V
SAMHSA	Substance Abuse and Mental Health Services Administration	
US	United States	US
WHO	World Health Organization	An agency of the United Nations, established in 1948, concerned with improving the health of the world's people and preventing or controlling communicable diseases on a worldwide basis through various technical projects and programs.