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## Tobacco Control in U.S. Mental Health Delivery Systems: A Descriptive Analysis by Facility Characteristics

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## ABSTRACT

### **Introduction**

This study aims to provide an assessment of tobacco control methods (e.g., smoking ban policies and smoking cessation services) implemented in mental health facilities (MHFs) by characteristics such as facility type, ownership, Joint Commission Accreditation Healthcare Organization (JCAHO) status, and region in the United States.

### **Methods**

Secondary analysis was conducted using the 2010-2011 National Mental Health Services Survey (N-MHSS). Binomial frequency, chi-square, and logistic regression were used to determine the proportion of tobacco control methods, the relationship between characteristics and tobacco control methods, and predictors of facilities that use tobacco control methods, respectively.

### **Results**

Findings show smoking ban policies were in less than half of MHFs and smoking cessation services were offered in less than a quarter of all MHFs. Analyses revealed a strong association across all characteristics and tobacco control methods in MHFs. Multivariate analysis showed that when compared to inpatient facilities, residential treatment centers for adults were less likely to have a smoking ban policy,  $OR=0.050$ ,  $CI (0.039-0.065)$  and less likely to offer smoking cessation services,  $OR=0.072$   $CI (0.054-0.095)$ . Compared to MHFs accredited by JCAHO, MHFs unaccredited by JCAHO were less likely to have a smoking ban policy,  $OR =0.386$   $CI, (0.354-0.423)$  and less likely to offer smoking cessation services,  $OR =0.295$ ,  $CI, (0.267-0.327)$ .

### **Discussion**

There is a clear deficit in tobacco control methods that vary across facility characteristics of MHFs. Findings of facility characteristics and tobacco control methods may direct future researchers, program interventionists, policymakers to target facilities where tobacco control is needed the most.

TOBACCO CONTROL IN U.S. MENTAL HEALTH DELIVERY SYSTEMS: A  
DESCRIPTIVE ANALYSIS BY FACILITY CHARACTERISTICS

by

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B.S., UNIVERSITY OF GEORGIA

A Thesis Submitted to the Graduate Faculty  
of Georgia State University in Partial Fulfillment  
of the  
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APPROVAL PAGE

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## Author's Statement Page

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Veronica P. Mahathre

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## **Chapter 1.**

### **Introduction**

Marginalized populations, which include individuals in treatment for mental illnesses and substance abuse, have a disproportionate burden of tobacco-related diseases (Krauth & Appolino, 2015). It has been reported that 44% of all cigarettes consumed in the United States are by individuals who have been diagnosed with a mental illness or substance abuse disorder (Hackett, 2008). Individuals with serious mental illness (e.g., schizophrenia or bipolar disorder) are twice as likely to smoke tobacco and become addicted to nicotine compared to the general population.

Consequently, several studies have found that the proportion of tobacco-related illnesses in persons with schizophrenia is two to three times higher than those in general population (Hall & Prochaska, 2009; Schroeder & Morris, 2010). Additional studies across the literature have found that smokers with a mental disorder are more likely to die 12-25 years earlier than those without disorders (Bandiera, Anteneh, Le, Delucchi, & Guydish, 2015; Hall & Prochaska, 2009; Schroeder & Morris, 2010). A publication from the Annual Review of Public Health reported approximately 200,000 of 443,000 premature deaths from smoking occur in these marginalized populations (Schroeder & Morris, 2010). In a recent study, the Oregon Health Authority Addictions and Mental Health division used the statewide Client Process and Monitoring System (CPMS) to identify individuals who received publicly funded treatment for mental health and/or substance abuse problems from 1996-2005. From this, tobacco related mortality was assessed by matching records from CPMS with death records from vital statistics among grouped populations. These populations were grouped into four categories: populations



diagnosed with only substance disorders, populations diagnosed with only mental health problems, populations diagnosed with co-morbid substance abuse and mental health problems, and general populations (e.g., persons diagnosed with neither substance abuse and/or mental health problems). The findings showed that 53.6% of people diagnosed with only substance abuse died from tobacco related deaths, 46.8% of people with dual diagnosis (e.g., substance abuse and mental illness) died from tobacco-related deaths and 30.7% of individuals without diagnoses of mental or substance abuse disorder died from tobacco-related deaths (Bandiera, et al., 2015).

In another study, the National Association of State Mental Health Program Medical Directors Council reported smokers with addictions such as opiate dependency and alcoholism had higher tobacco related mortality rates than non-smokers with addictions. Among narcotic addicted individuals, smokers had had four times the death rate than non-smokers. Among alcoholics in recovery, 51% of mortality rate was due to smoking-related illness (Parks, Jewell, & Burke, 2006).

Due to the premature death rates among this marginalized population, there has been a movement to address tobacco use in these populations. Because many individuals with substance abuse and/or mental health problems typically seek out or are placed in mental health or substance treatment settings, there has been an attempt to reduce and/or eliminate smoking in mental health facilities (MHF) specifically. For example, many psychiatric hospitals are currently or in the process of transitioning to smoke free environments ("Hospitals & Healthcare Facilities," 2015), likely in response to the recommendations by the JCAHO on Accreditation of Healthcare Organizations (JCAHO) and the American Psychological Association (APA) that psychiatric settings adopt

smoke-free policies (Hackett, 2008). One recent study reported that smoking bans in general medical facilities, which can include psychiatric inpatient units, not only protect people from harmful effects of secondhand smoke exposure but can also increase smokers' motivation to quit (Hackett, 2008). However, the unique circumstances inherent in psychiatric facilities have caused apprehension from staff to implement smoking bans in these MHFs. Since smoking has been used as a coping mechanism for patients, there is fear among staff that smoking bans will interfere with patient recovery or create a potentially more aggressive environment (Hackett 2008; Parks, Jewell, & Burke, 2006)

In spite of some patients' and staff concerns, evidence suggests that tobacco availability in state psychiatric hospitals can (1) have iatrogenic effects of inducing tobacco-related issues for individuals while in treatment, which can interfere with mental illness treatment and increase tobacco related mortality and (2) create an aggressive environment in the form of physical violence, verbal threats and sexual favors (Keizer & Eytan, 2005). Several studies have demonstrated that smoking bans can be effective in these settings. For example, systematic review evidence suggests that the provision of nicotine replacement therapy (NRT) and smoking cessation counseling during smoke-free hospitalization can increase patient cessation rates by 54% at 12 months post discharge (Stockings et al., 2014). Thus, smoking bans used in conjunction with smoking cessation services have been found to have no adverse effect of treating tobacco dependence among smokers with mental health illnesses, and even increase tobacco abstinence among patients (Hackett, 2008; Hall & Prochaska, 2009).

In spite of evidence that smoking bans and smoking cessation services are effective for mental health facility patients, staff, and therapeutic milieu (Acquavita, S.,

McClure, E., Hargraves, D., & Stitzer, M., 2014 ; Keizer & Eytan, 2005; Patten et al., 1995 ), there has been little research conducted to date that investigates how these tobacco control methods vary by facility characteristics of mental health settings. This information could shed light on the extent and scope of tobacco control methods used in MHFs, which may be informative for future research and policy priorities. Therefore, this study seeks to provide a descriptive analysis of the tobacco control methods (e.g., smoking policies and smoking cessation services) used by MHFs in the United States and, specifically, examine whether these methods vary according to MHF characteristics such as facility type, ownership JCAHO accreditation status, and geographic region. This study has three objectives which include: (1) to determine the proportion of facilities with smoking policies and smoking cessation services (2) to determine any significant associations with characteristics of MHF and smoking policies and smoking cessation services (3) to determine predictor facility characteristics associated with presence of complete smoking ban policy and of smoking cessation services offered based on facility type, JCAHO status ownership, and geographical region.

Findings of facility characteristics and tobacco control methods may direct future researchers, program interventionists to target facilities where tobacco control is needed the most. These findings could shed light on the importance of facility characteristics of MHF and association to tobacco control methods for allocating resources and funding by Public Health personnel for implementation, enforcement, and maintenance of tobacco control methods based on the needs of MHFs. Additionally, findings from this study could be used as a source for legislators to potentially implement policy change.

## Chapter 2

### Literature Review

This literature review focuses on studies that have assessed the efficacy of tobacco control methods in various mental health settings. Most studies included in this literature review were conducted in the United States, however there are other studies from some other Western countries. Because this current study focused on several key characteristics of MHFs, studies included in this review addressed the facility characteristics of a MHF (facility type, ownership, JCAHO, and geographical region). Studies using only substance abuse centers were excluded in the literature review, however, co-treatment facilities (mental health and substance abuse) were included. This literature review examines the effectiveness of smoking ban policies and smoking cessation services from patient and staff perspectives, the outcomes of smoking related behaviors, the utilization of smoking cessation services in facilities, and the evaluation of patient health during smoking bans. Results from these studies provide an understanding on the advantages and disadvantages of tobacco control methods in MHF for staff and patients.

#### Attitudes towards Tobacco Control in Mental Health Facilities

##### *Staff*

Several studies have examined staff perspectives regarding smoking ban policies and report both positive and negative attitudes. For example, one study measured beliefs three months before and after a smoking ban policy was implemented in an inpatient psychiatric unit (Patten et al., 1995). The results indicated that staff had positive attitudes towards the smoking ban including the perceptions that (1) the environment was

healthier/cleaner, (2) there was increased patient interaction, (3) there was an increased involvement of smokers engaging in activities other than smoking, (4) there was more time for staff to build rapport, and (5) there was reinforcement of effective methods of coping and managing stress other than by smoking. However, there were also some negative effects reported by staff, which included (1) an increase in coveted smoking and smuggling cigarettes, matches, and lighters into the unit, (2) inconsistency in staff enforcement of the policy, (3) some patients leaving against medical advice prematurely so they could smoke, and (4) added anxiety due to smoking withdrawal.

A more recent study evaluated staff attitudes and perspectives on a complete smoking ban in an inpatient hospital setting through use of questionnaires and focus groups. Under this smoking ban, patients and staff were unable to smoke inside or outside the building. Results show that most staff preferred to work in a smoke free environment. And staff who identified as smokers were significantly less likely to prefer working in a smoke-free environment, compared to non-smokers. One third of staff felt the patients should not be forced to stop smoking, particularly in staff who were smokers. Slightly over a third of staff reported they believed most patients were prepared for smoking cessation prior to their admission. Further, half of staff respondents believed that patient care was easier with smoking ban policy. In general, staff who were smokers perceived more difficulties with the smoking ban regarding patient care and patient aggression (Hehir.,A.M., Indig, D., Prosser, S., & Archer, V., 2013). These studies demonstrate that there are mixed perspectives from staff regarding smoking bans. Especially from staff who identified as smokers because they were found to be more apprehensive to a smoking ban, compared to those who were non-smokers.

### Patients

Some studies also examined patient's attitudes on smoking policy bans through use of interviews and/or questionnaires. One study not only examined patient attitudes regarding the implementation of a complete smoking ban, but also assessed the current cigarette use in a Community Mental Health Center. Smoking questionnaires were administered to patients measuring smoking status, smoking behavior and reactions to a smoking ban. Findings show that 80% of the respondents were smokers. And differences were observed between smokers and nonsmokers. Those patients who were smokers reported more negative emotions and attitudes than non-smokers after a smoking ban was implemented. In this same study, most staff reported no negative consequences for their patients as a result of the ban (Mauiro, R.D., Michael, M.C., Vitaliano, P.P., Chiles, J.A., & Davis, P.M., 1989). These studies, albeit dated, were similar to the current studies in their findings about staff and patient attitudes regarding smoking bans.

In one recent study, researchers assessed patient perspectives about smoking bans in intermediate to long-term psychiatric hospital settings vs. acute settings in New York. Surveys were administered to both smokers and nonsmokers who were being treated for schizophrenia, schizoaffective disorder and/or depression. Respondents were questioned on the perceived effectiveness of the complete smoking ban and, specifically, how it affected their mental state and how they perceived difficulty of the smoking ban implementation process. Two-thirds of the respondents were classified as smokers prior to admission. Of those classified, 67% were current smokers (smoking still despite the ban), which suggests that one out of three smokers had quit since admittance. Among those who quit smoking, it was found that those who quit smoking smoked fewer

cigarettes prior to admittance into facility compared to those who did not quit. When measuring attitudes regarding effectiveness of the bans, almost half of respondents reported they were happy with the ban, while a third reported they were not (Smith et al., 2013). Based on perspectives of staff and patients regarding smoking ban policies, there seems to be both positive attitudes and negative attitudes towards the smoking ban policy. And similar to staff attitudes, the differences in attitudes depended on whether the patients were smokers or nonsmokers.

### The Impact of Tobacco Control on Smoking Behaviors in Mental Health Facilities

#### *Short Term vs. Long Term Smoking Behaviors*

Smoking behaviors affected by tobacco control methods included reduction in smoking behaviors, short-term and long-term tobacco abstinence, as well as utilization of smoking cessation services by patients. Of the studies that examined smoking behavior, one study examined differences in smoking behaviors during admission and post-discharge in an inpatient, university-owned mental health facility in Switzerland with a partial smoking bans. Based on the partial smoking ban, patients were found to have decrease iatrogenic effects while hospitalized and actually decreased their smoking by the third day post discharge (Keizer & Eytan, 2005). However, smoking behaviors resumed back to baseline 10 days after discharge from the hospital. Though patients returned to baseline, the iatrogenic effects observed of patients during hospital stay suggests that partial smoking bans result in improvement of patient's health.

A recent systematic review study examined the impact of smoking bans on patient smoking behaviors in acute facilities to long-term facilities. This systematic review included studies that examined changes in the smoking behaviors of patients and studies

that evaluated patient perspectives during or following admission to adult inpatient psychiatric facility with smoking bans in place. Also, several articles were included on adherence to smoking bans and provision of nicotine dependence treatment. Findings from this review show that there were increases in patient's motivation to quit, increases in quit attempts while admitted, and reductions in daily cigarette consumption post discharge from inpatient facilities of medical centers with smoking bans (Stockings et al., 2014). These results suggest that smoking bans might have potential to reduce patients smoking behaviors as well as influence smoking related motivations and beliefs to quit smoking.

In a previous aforementioned study, long-term smoking behaviors of patient smoking behaviors were assessed through phone interviews 16-18 months post discharge from hospital. Findings show that, during follow-up periods, all patients resumed to smoking cigarettes immediately post discharge and 95% of patients reported they were still smoking at the 16-18 month follow up period. This finding suggests the need to offer more intensive treatments to affect long-term tobacco abstinence (Patten et al., 1995).

A similar study measured the post-discharge smoking behaviors of patients admitted into an inpatient general medical facility with a complete smoking ban. Surveys were administered to patients during admission and 6-18 months post discharge on smoking behaviors (Jonas and Eagle, 1991). Findings show that there was no difference in number of cigarettes smoked from admission to discharge, suggesting that the majority of patients continued to smoke.

*Utilization of Smoking Cessation Services*



A more recent study collected data on smoking behaviors of patients prior to hospitalization, during hospitalization and post discharge in a university-based psychiatric unit facility that had a complete smoking ban. Questionnaires were administered to assess smoking history, nicotine dependence, use of post-discharge cessation supports, quit attempts, and abstinence from cigarettes. This study found 70% of patients used NRT hospitalization. These patients did return to smoking behaviors within 3 months of the study period with 76% of patients who resumed smoking the day after discharge. However, there was a statistically significant decline in number of cigarettes smoked from pre-admission to post discharge (Prochaska, J. J., Fletcher, L., Hall, S. E., & Hall, S. M., 2006).

Another recent study aimed to examine NRT prescribing patterns in an inpatient unit of a general medical hospital before and after a hospital wide smoking ban in Pennsylvania over a 5-year range (Scharf, et al., 2011). The patterns assessed were the number of NRT (e.g., oral medication and/or nicotine patch) units prescribed, trends in types of NRT prescribed and trends in doses prescribed before and after the complete smoking ban policy. This study targeted patients that were admitted under the diagnosis of psychotic disorder, substance abuse disorders, mood disorders, in addition to patients that were geriatric and who had personality disorders. This study found that rate of NRTs increased after the ban, which suggests that patients are continuously being treated for nicotine dependence after smoking was banned. It was also found that clinicians were more likely to prescribe NRT to psychiatric inpatients when smoking was banned from hospital (Scharf, et al., 2011). It can be inferred that once smoking is banned from

hospital, the demand for nicotine dependence treatment increases and the compliance is continued even years after the ban has been implemented.

In another similar study, researchers evaluated the efficacy of smoking cessation services at an inpatient hospital at the University of California (Prochaska, J. J., Hall, S. E., Delucchi, K., & Hall, S. M. 2014). This hospital had a 100% smoking ban policy in the hospital. Participants were randomized into the treatment group (who received a smoking cessation intervention) or to the control group (who received usual care). Participants in the treatment group received a comprehensive intervention, which included access to NRT, a completion of computer delivered intervention program based on the Transtheoretical Model, printed materials, and cessation counseling sessions, and a letter for participants' outpatient providers requesting smoking cessation support. The post hospitalization intervention delivered a computer intervention at 3 and 6 months post discharge based on the Transtheoretical Model and provided feedback on their progress in smoking cessation. Also nicotine patches were available for 10 weeks post discharge. The primary outcome was tobacco abstinence post discharge at 7 days because consensus guidelines recommend use of a 7-day point prevalence abstinence with smokers who may be unmotivated to quit. Findings indicate that participants in the intervention group were able to successfully quit smoking and had fewer re-hospitalizations compared to the control group. Furthermore, findings suggest that tobacco cessation treatments may even decrease re-hospitalization risk by providing broader therapeutic benefit (Prochaska et al., 2014). This study demonstrates the effectiveness of smoking bans in an inpatient psychiatric facility with a multicomponent intervention to promote tobacco cessation

among a marginalized population who may otherwise not have initiated tobacco cessation on their own accord.

### The Impact of Tobacco Control on Health Outcomes in Mental Health Facilities

#### *Mental Health*

Even though there have been studies that have demonstrated the efficacy of smoking bans on smoking behaviors, there seem to be few studies on patients' mental health condition following smoking bans. One randomized control study was implemented in an outpatient setting and tested the efficacy of a staged care intervention to change smoking behavior in all smokers (Hall et al., 2006). Patients were recruited from outpatient clinics and were randomized into a treatment group (receiving counseling sessions and nicotine patch based on Transtheoretical Model) or a control group (receiving brief cessation advice). Patients in the treatment group received an integrated computerized feedback system based on Transtheoretical Model, which provided feedback on smoking with face-to-face individual counseling and pharmacological treatment. The control condition was designed to model current practices in mental health clinics and included educational materials and a referral list. The researchers hypothesized that those who received the intervention would be more successful in tobacco cessation than those in control. Results suggest that patients with depression in the treatment group were more likely to attempt to quit, set goals for themselves, and be abstinent from tobacco use. Both treatment and control groups showed a decline in depressive symptoms and days with emotional problems over time (Prochaska et al., 2008). This study not only suggests that psychiatric patients will enter interventions while

in mental health treatment despite smoking ban implementation but also that their depression does not worsen as a result of doing so.

### *Physical Health*

Though physical symptoms were not assessed in the majority of these studies, one study did query patients overall health status. It was found that patients, particularly non-smokers and those motivated to stop smoking, reported that the complete smoking ban implemented in an inpatient facility improved health across all categories (Smith et al., 2013).

Among these studies, there were mixed findings on the outcomes of efficacy of smoking ban policies and/or smoking cessation strategies with respect to staff and patient perspectives, long-term smoking behaviors, and health outcomes. Despite the mixed findings, there appears to be a general consensus that smoking bans can be effective especially if used in conjunction with smoking cessation services at least for short-term benefits in inpatient facilities in the US and some Western countries. Also, the majority of the studies indicated that smoking bans can influence patient smoking behaviors and patient well-being and can potentially create a better therapeutic milieu for staff and patients. Though these studies largely focused on patients and staff, it has been found that mental health facilities are important settings for tobacco control (Mullen et al., 1995). Based on the significance of health care settings and the scarcity of literature on identification of facility characteristics in relation to tobacco control methods, the current study sought to describe the landscape of tobacco control methods in MHF in the U.S. and, to examine whether these methods vary by key facility characteristics (e.g, facility type, JCAHO accreditation status, ownership, and region). Based on the variability in

these tobacco control methods (smoking ban policies and smoking cessation services) implemented across facilities, more research is needed to understand the factors contributing to this variation. Therefore, this study seeks to examine associations between facility characteristics such as facility type, ownership and region, and the tobacco control methods of facilities in the United States.

## Chapter 3

### Methods and Procedures

#### Study Design and Measures

The Substance Abuse Mental Health Services Administration (SAMSHA) database provided the 2010-2011 National Mental Health Services Survey (N-MHSS) data source for secondary analysis. The N-MHSS survey collected statistical information on numbers and characteristics of all known MHF within the 50 states, the District of Columbia, and the U.S. territories. Data was collected through mail questionnaires, telephone interviews, and web-based surveys by administrative staff in MHFs. Data included location, characteristics, and utilization of organized mental health treatment. MHF was the unit of analysis and included psychiatric hospitals, non-federal general hospitals with a separate psychiatric unit, Veterans Affairs medical centers, outpatient or day treatment or partial hospitalization, residential centers for children, residential centers for adults and multi-setting hospitals (e.g., psychiatric and outpatient day treatment facilities). All known public and private facilities that provided mental health treatment as primary service were eligible to participate in the N-MHSS.

The initial N-MHSS included 15,562 known facilities (identified from the 2008 National Survey of Mental Health Treatment Facilities) in the SAMSHA facilities database. An additional 635 facilities were solicited from Centers for Medicare and Medicaid Services and national professional agencies, resulting in census total of 16,197 facilities. Of 16197, 24.8% were found to be ineligible for the survey because (1) they did not provide mental health treatment services, (2) had a primary treatment focus of substance abuse services or general healthcare, (3) or provided treatment for incarcerated

persons only, (4) were unlicensed as mental health center or clinic (individual or small group mental health practices). Therefore, a total of 12,186 facilities were recruited to participate in the voluntary N-MHSS survey. There was a 91.2% response rate (n=11,118) and, after receipt of the survey, an additional 744 surveys were excluded because the facility did not provide mental health care or were from duplicate facilities. This yielded a final dataset of 10,374 MHFs. The 8.8 % rate was not accounted for in this dataset (“Center for Behavioral Health Statistics and Quality”, 2014).

For purposes of this study, the dataset included 10,341 of facilities for secondary analysis after excluding facilities in U.S. territories. However, there was an approximately 87% response rate to the smoking policy and smoking cessation questions and thus approximately 13% of the data for these 2 questions were missing. The final dataset used for analysis was 9,033 facility respondents for smoking policy and 9,017 facility respondents for smoking cessation services offered. Each test performed analysis on the smoking policy and smoking cessation variables.

All of the variables were recoded into either dichotomous and multiple responses. The mental health characteristics variables included for secondary analysis were: facility types, ownership type, JCAHO, and geographical region. The tobacco control variables were: smoking policy and smoking cessation

#### *MHF Characteristic Variables*

There were a total of 7 facility type responses for the questionnaire and included ‘Psychiatric Hospitals’, ‘Separate Inpatient’ Psychiatric Unit of a General Hospital, ‘Residential Treatment Center for Children’, ‘Residential Treatment Center for Adults’, ‘Outpatient’, (day treatment or partial hospitalization mental health facility); ‘Multi-

Setting' (Outpatient and Residential Treatment Center for Adults), and other. The Veterans Affairs medical centers were dispersed in inpatient facilities, residential treatment centers for adults and outpatient settings. However, for the purposes of this research question only 6 facilities were analyzed by excluding other.

The ownership variable initially had 9 responses that were categorized into dichotomous outcomes: private and public. Private responses included facilities that were affiliated with a private non-profit organization and a private non-profit organization. Public responses included State Mental Agency, Other State governments, Regional District Authority; Local, county or municipal governments; U.S. Department of Veterans Affairs; and other. The JCAHO variable had dichotomous outcomes, in that facilities were either 'Accredited' or 'Unaccredited'. Geographical location variable was included, where states and the District of Columbia were categorized into regions based on the Census Bureau State Federal Information Processing Standards (FIPS) codes.

#### *MHF Tobacco Control Outcome Variables*

Initially, there were five responses for smoking policy. In this study, smoking policy was dichotomized into "Complete Ban" and "Partial/No Ban". In the "Complete Ban", the response included: smoking is not permitted on the property or within any building. In "Partial/No Ban", responses included: smoking is permitted only outdoors (partial smoking ban); smoking is permitted outdoors and in designated indoor area(s) (partial smoking ban); and smoking is permitted anywhere without restriction (no smoking ban).

#### *Statistical tests*



Binomial frequency procedure identified the proportion of tobacco control methods, chi-square tests determined the association between facility characteristics and tobacco control methods, and logistic regression was used to identify facility characteristics predictive of tobacco control methods, such as the presence of complete smoking ban and which characteristics offered of smoking cessation services.

## Chapter 4

### Manuscript

It is becoming more evident in the literature that individuals with mental illness or substance abuse disorders are disproportionately affected by tobacco use than the general population (Hall & Prochaska, 2009). Approximately 200,000 of 443,000 premature deaths from smoking occur in these marginalized populations (Schroeder & Morris, 2010). Individuals who smoke and diagnosed with mental disorders are more likely to die prematurely than smokers without mental disorders (Bandiera, et al., 2015; Hall & Prochaska, 2009; Schroeder & Morris, 2010).

Even still there have been arguments for smoking ban exemptions in facilities due to staff resistance and patient smoker rights to smoking ban policies. This resistance comes from fear of patient behavior outcomes such as increased violence or aggression. For patients, smoking can be used as a coping mechanism for stress; smokers who are battling mental illness or substance abuse tend to be more reliant on smoking during initial hospitalization for treatment due to the emotional distress involved with admittance into a mental health facility (Scharf et al., 2011).

Based on the high rates of resulting premature deaths of these marginalized individuals, and because these individuals will likely seek treatment in these MHF, there have been smoking regulations and a myriad of smoking cessation services created for clinical based populations to address this issue. The Agency for Healthcare Research and Quality (AHRQ) recommended that all hospitalized patients who smoke be provided effective cessation treatments and the American Psychiatric Association (APA) recognizes psychiatric hospitals as a setting for treating tobacco dependence (Hall &

Prochaska, 2009; Scharf et al., 2011). Evidence shows that treatment for tobacco dependence may improve addiction and mental health outcomes (Prochaska et al., 2008; Scharf et al., 2011). However, even though research suggests that there are effective smoking cessation programs, the National Mental Health Services Survey Report recently reported that smoking cessation services have been offered in only 1 in 4 facilities in the United States (“Center for Behavioral Health Statistics and Quality”, 2014). Based on the variability in these tobacco control methods (smoking ban policies and smoking cessation services) implemented across facilities, more research is needed to understand the factors contributing to this variation. Therefore, this study seeks to examine associations between facility characteristics such as facility type, ownership and region, and the tobacco control methods of facilities in the United States.

### Materials Methods

#### *Objectives*

The 2010 National Mental Health Services Survey (N-MHSS), a publicly available dataset from the Substance Abuse Mental Health Services Association (SAMSHA), was used to assess the landscape of tobacco control methods in MHF. Tobacco control methods have been defined as smoking policy including complete smoking ban and partial/no smoking ban and smoking cessation services as offered or not offered in MHF. The following objectives included: (1) to determine the proportion of MHF with smoking policy and smoking cessation services, respectively (2) to determine bivariate associations of MHF characteristics and smoking policy and smoking cessation, respectively (3) to determine predictor facility characteristics associated with respect to the presence of both complete smoking ban and of smoking cessation services offered.

*Dataset*

The initial N-MHSS included 15,562 known facilities (identified from the 2008 National Survey of Mental Health Treatment Facilities) in the SAMSHA facilities database. An additional 635 facilities were solicited from Centers for Medicare and Medicaid Services and national professional agencies, resulting in a census total of 16,197 facilities. Of 16197, 24.8% (4016.856) were found to be ineligible for the survey because (1) they did not provide mental health treatment services, (2) had a primary treatment focus of substance abuse services or general healthcare, (3) or provided treatment for incarcerated persons only (4) were unlicensed as mental health center or clinic (individual or small group mental health practices). Therefore, a total of 12,186 facilities were recruited to participate in the voluntary N-MHSS survey. There was a 91.2% response rate (n=11,118) and, after receipt of the survey, an additional 744 surveys were excluded because the facility did not provide mental health care or were from duplicate facilities. This yielded a final dataset of 10,374 facilities. The 8.8 % facility non-response rate was not accounted for in this dataset.

Based on previous literature on tobacco control methods in facility settings, the following characteristics chosen for this study: facility type, JCAHO accreditation status, ownership, and region. The six facility types examined were: ‘Psychiatric hospital’, ‘Inpatient facility’ of a general medical center, ‘Residential Treatment Center for Children’, ‘Residential Treatment Center for Adults’, ‘Outpatient’, and ‘Multi-settings’. The types of ownership included ‘Private’ (for-profit and non-profit) and ‘Public’ (state mental health agency, other state governments, regional or district authority, local government, and U.S. Department of Veteran Affairs). The regions assessed were

categorized as 'Northeast', 'Midwest', 'Southern', and 'Western' based on United States Census Bureau Federal Information Processing system.

### *Statistical Tests*

In order to determine the proportion of smoking policy and smoking cessation services outcomes in all MHF, a binomial test was used to measure the proportion of "Partial/No Ban" and "Complete Ban" in MHF (n=9033) in the dataset. This same test was repeated for the proportion of "Smoking Cessation services Offered" and "Smoking Cessation Services Not Offered" in MHF (n=9017). The 95% confidence interval was used to measure the statistical significance of proportion estimates for each dependent variable.

A chi-square test of independence was used to determine whether there was a bivariate association between characteristics (facility type, JCAHO accreditation status, ownership, and region) and tobacco control methods (smoking policy and smoking cessation services), respectively. The facility types tested for association with tobacco control methods included psychiatric, inpatient, residential treatment center for children, residential treatment center for adults, outpatient, multi-settings. The level of significance in this study was  $\alpha=.001$ . Similarly, the same procedure was conducted to examine the association between private or public ownership and tobacco control methods. Additionally, regional differences were measured by chi-square analysis. The four regions included 'Northeast', 'Midwest', 'Southern', and 'Western'. These regions were tested for independence between the tobacco control methods.

Logistic regression model(s) were used in order to determine which MHF characteristics predicted tobacco control methods. In this analysis, the outcomes

“Complete Smoking Ban” and “Smoking Cessation Services Offered” were used in two separate logistic regression models. These models determined which facility type, JCAHO accreditation status, ownership, and geographical regions were more likely to be predictive of having tobacco control methods. Referent groups were the same for both models and chosen based on their prevalence in literature review conducted for this study, specifically for their efficacy associated with tobacco control methods. The referent group for facility type was ‘inpatient’. The referent group for ownership was ‘public’. The referent group for JCAHO was ‘accredited’. And the referent group for region was the Northeast. All analyses were conducted using SAS, version 9.4.

### Results

Of 9,033 MHF, 41.86% (95%CI (0.4084, 0.4287)) had a “Complete Smoking Ban” and 58.14% (95% CI (0.5713, 0.5916)) of facilities had the “Partial/No Smoking Ban”. Of 9,017 MHF, 24.22% (95% CI (0.2334, 0.2511)) offered smoking cessation services while 75.78% (95% CI (0.7489, 0.7666)) of all MHF did not offer smoking cessation services. Refer to table 1 for Dataset Characteristics.

### *Bivariate Analysis Smoking Policy via chi-square test*

Of the 9,063 MHF, facility type was highly associated with smoking policy ( $\chi^2 = 1102.9654$   $\alpha=0.001$ ). To illustrate the differences in smoking policy, the following observed frequencies are presented in Table 2a. It was found that the “Complete Smoking Ban Policy” was in 75.02% of ‘Inpatient’ facilities, and 68.17% of ‘Residential Treatment Centers for Children’, and in only 13.06% of ‘Residential Treatment Centers for Adults’. Observed frequencies indicate that 65.03% of ‘Outpatient’ facilities and 68.90% of ‘Multi-Setting’ facilities had “Partial/No Smoking Ban”.

There was a significant association between JCAHO accreditation status and smoking policy, ( $X_5^2 = 447.0167$ ,  $\alpha=0.001$ ). Approximately 56.59% of accredited MHF had a “Complete Smoking Ban” and 33.56% of unaccredited MHF had a “Complete Smoking Ban”.

There was also a strong association between ownership and smoking policy among facilities, ( $X_1^2 = 58.3774$ ,  $\alpha=0.001$ ). Observed frequencies showed 44.06% of private had a “Complete Smoking Ban” and 34.69% of public MHF had a “Complete Smoking Ban”. Observed frequencies showed 65.31% of public MHF had “Partial/No Smoking Ban” which was higher than private facilities at 55.94%.

With respect to geographical location, there was also a strong association between region and smoking policy, ( $X_3^2 = 138.3271$ ,  $\alpha=0.001$ ). Observed regional differences showed 48.36% of MHF in the Northern Region had a “Complete Smoking Ban”, while 65.33% in the Southern region and 62.34% in the Western region had a “Partial/No Smoking Ban”.

*Bivariate Analysis Smoking Cessation Services via chi-square test*

Of the 9,048 facilities, there was significant association between smoking cessation services and facility type, ( $X_5^2 = 1107.4338$ ,  $\alpha=0.001$ ). Observed frequencies for smoking cessation services offered included 58.79% of inpatient facilities and 43.30% of psychiatric facilities, and only 9.29% of ‘Residential Treatment Center for Children’ and 17.30% ‘Outpatient’ settings.

There was a significant association between JCAHO and smoking cessation services offered, ( $X_1^2 = 598.6250$ ,  $\alpha=0.001$ ). There were a total of 39.13% of MHF accredited and only 15.96% of unaccredited MHF offered smoking cessation services.

There was also a strong significant association between ownership and smoking cessation services, ( $\chi^2_1 = 97.0060$ ,  $\alpha = 0.001$ ). Observed frequencies show 67.76% of public and 78.25% of private facilities did not offer smoking cessation services, and only 32.30% public and 21.71% of private facilities offered smoking cessation services.

There was also a significant association between geographical region and smoking cessation services, ( $\chi^2_3 = 29.9480$ ,  $\alpha = 0.001$ ). The observed frequencies of smoking cessation offered by region were consistently low across regions at Northeast (28.70%), Midwest (22.60), Southern (22.48), and Western (23.86). Refer to table 2b chi-square analysis values.

*Bivariate Analysis Smoking Policy via logistic regression*

Compared to ‘Inpatient’ facilities, all of the other facility types were less likely to have a “Complete Smoking Ban”. Among facility types, ‘Residential Treatment Center for Adults’ was the least likely to have a “Complete Smoking Ban”, OR = 0.050, CI (0.039-0.065), in addition to ‘Outpatient’, OR = 0.179 (0.155-0.207) and ‘Multi-Settings’, OR = 0.150 (0.113-0.200). Facilities with unaccredited JCAHO status were less likely to have a “Complete Smoking Ban”, OR = 0.386 (0.354-0.423). Compared to public facilities, private facilities were more likely to have a “Complete Smoking Ban”, OR = 1.483 CI, (1.340-1.641). There was no significant association when comparing Midwest to Northeast Region. However, the Southern region, OR = 0.567 (0.504-0.637) and Western region, OR = 0.646 (0.568-0.733) were less likely to have a “Complete Smoking Ban” compared to Northeast Region. Refer to table 3a.



Multivariate Analysis Smoking Policy via logistic regression

After controlling for ownership and region in the model, ‘Residential Treatment Centers for Adults’ were less likely to have a “Complete Smoking Ban” compared to ‘Inpatient’ facilities (OR=0.061, CI (0.046-0.079)). Compared to MHF accredited by JCAHO, MHF without accreditation were less likely to have a “Smoking Ban Policy”, OR =0.618 CI, (0.554-0.689). While private MHF were more likely to have a “Complete Smoking Ban”, compared to public MHF OR=1.364, CI (1.219-1.526). Compared to the Northeast, There was no significant association between Midwest region and likelihood of having “Complete Smoking Ban”, (OR=0.979, CI (0.861-1.112)). Compared to the Northeast, the Southern region was less likely (OR= 0.519 CI (0.456-0.519)) to have “Complete Smoking Ban” and the Western region were less likely, (OR=0.718 CI (0.624-0.826)). Refer to table 3a to see the adjusted odds ratio for tobacco control methods in MHF.

Bivariate Analysis Smoking Cessation Services via logistic regression

Compared to inpatient facilities, ‘Residential Treatment Center for Children’ were the least likely to offer smoking cessation services, (OR=0.072 CI, (0.054-0.095)) as well as ‘Residential Treatment Centers for Adults’, (OR =0.183 CI, (0.146-0.226)) and ‘Outpatient’ facilities, OR=0.147 CI, (0.128-0.168)). Compared to MHF accredited by JCAHO, MHF without accreditation were less likely to offer Smoking Cessation Services, (OR=0.295 CI, (0.267-0.327)). Compared to public facilities, private facilities were less likely to offer Smoking Cessation Services, (OR =0.584 CI (0.524-0.650)). Compared to Northeast Region, the Southern region was less likely to offer smoking

cessation services, (OR=0.723 CI, (0.634-0.825) as well as Midwest (OR=0.726 CI, (0.634-0.831) and Western, (OR=0.779 CI, (0.675-0.899). Refer to table 3b.

#### Multivariate Analysis Smoking Cessation Services via logistic regression

After controlling for all variables in the model, compared to the ‘Inpatient facility’, the ‘Residential treatment Centers for Children’ were significantly less likely to offer smoking cessation services (OR= 0.096, CI, 0.203-0.325). When compared to public facilities, the private facilities were less likely to offer smoking cessation services, (OR=0.546 CI, 0.484-0.616). Compared to the northeast region, the Southern region was less likely to offer smoking cessation services (OR=0.605, CI (0.522-0.700) as well as the Midwest region, (OR=0.677, CI (0.583-0.785). The Western region was not statistically significant after adjusting for odds ratio. Refer to table 3b.

#### Discussion

Despite progress over the last couple decades on tobacco control in medical hospitals, more attention needs to be directed to mental health facilities. Based on our findings, those facilities of which had more tobacco regulation, were short-term hospital based settings (Inpatient and Psychiatric facilities). However, those facilities with less tobacco regulation are long-term settings (residential treatment centers for adults). The variation between these types of facilities could be due to hospital standards and adequate funding to implement tobacco control methods. The short-term facilities, particularly inpatient facilities could be better equipped with resources (funds from insurance, state or local government) to provide smoking cessation services and particularly as a result implemented complete smoking bans.

With respect to hospital standards, though JCAHO is not legally required to enforce smoke bans in psychiatric or mental health facilities, there still needs to be rigorous efforts made to adhere to the standards and recommendations set forth because of their successful impact on medical hospital settings and their adoption of smoke free policies. In addition to JCAHO, other national organizations such as APA and AHQR have recommended smoke-free environments in psychiatric settings. Perhaps more efforts from these organizations should be made to encourage smoke-free environments in mental health settings. Based on socioecological model, smoking can be reduced and/or eliminated at the individual level by influence of the policy level and institutional level. For instance, JCAHO, as a national accrediting organization, should require mental health facilities to be smoke free. If there is more emphasis on this level, then there could potentially be a higher adoption rate of smoke free policies in mental health facilities, which would influence the provision of smoking cessation services and subsequently the utilization of these services (Sorensen, G., Barbeau, E., Hunt, M. K., & Emmons, K. 2004). However, funding for smoking cessation services may come from the ownership characteristic of mental health facilities and so ownership characteristic must also be addressed in order to get a comprehensive tobacco control program.

Similar to the JCAHO management characteristic, the findings related to ownership characteristic also highlighted the need for more tobacco control methods. Results show private facilities were more likely to have a complete smoking ban but also less likely to have smoking cessation services. The inverse relationship was seen in public MHF. Since private facilities are more likely to receive funding directly from patients and/or insurance companies, more research should examine insurance policies

and the ways in which they could impact the provision of smoking cessation services (Levit et al., 2013). Further, more public health efforts should address facilities that are owned by public entities, such as the State Mental Health agency, and US Department of Health and Human Services should (if possible) allocate funding to appropriate MHF, which may lack smoking ban policies. The attention and allocation of funding could influence more MHF provide smoking cessation services to facilitate transition of facility to be smoke-free.

The geographical location findings confirmed with what is known in the literature about regional differences. Because most of the facilities with smoking bans in the literature review have been identified in the Northeast, it is not surprising that this region has the lowest percentage of smoking permitted policy (partial /no smoking ban). It was also not surprising that there is less tobacco regulation in Southern facilities, due to the high smoking rates found in this region (Schroeder & Morris, 2010). However, according to the CDC, the western region has the lowest smoking rate, yet Western region was less likely to have a complete ban policy. The Midwest has the highest smoking rate, which may explain why Midwest Region has more facilities which not only permit smoking but also do not offer smoking cessation services services (CDC, 2015). Although this study did not look at individuals state differences, it would be beneficial for more research to focus at the state level so that public health officials and legislators can better understand the impact of smoking in MHF and undergo efforts to make changes. This geographical location characteristic can be applied to the social ecological model in that states in their regions may need to allocate resources to facilities that may need tobacco control methods (Sorensen, et al., 2004).

One strength of this study was the use of facility characteristics in relation to tobacco control methods. This study not only examined the facility characteristic relating to treatment characteristics (facility type), management characteristics (JCAHO and ownership) but also geographical location (regions). Findings from this study could be useful for SAMSHA to better understand the nature of the mental health facilities and it could also be useful for state governments to implement tobacco control policies. Moreover, this study is one of the few studies on facility characteristics and tobacco control methods, which is based on quantitative research.

Although this study had several strengths, it also had limitations in the dataset and study design. One limitation was that there were missing data for the tobacco control methods variables. There was an 8.8% facility non-response rate, and there was a 13% non-response rate for the tobacco control items used in the survey. Systematic errors could explain both the survey-level and item-level non-response. For example, some respondents that do not have smoking bans and/or do not offer smoking cessation services may have been less likely to respond to the survey or to the specific tobacco control questions due to social desirability bias.

Further, smoking cessation services were not defined in this dataset, which serves as a limitation in understanding the scope and extent of these supportive services offered. There is a wide range of smoking cessation services in addition to nicotine replacement strategies and smoking counseling cessations (Krauth & Appolino 2015; Prochaska & Hall 2009; Scharf, et al., 2011; Stockings et al., 2014). For instance, the use of e-cigarettes was not mentioned or specified under the smoking policy or smoking cessation items. Because of the recent increase in novel nicotine products and the use of e-

cigarettes as a harm reduction strategy in mental health settings, this should be further assessed in future studies (Ratchesen, 2014). Further, It would be beneficial for future researchers to assess variations of smoking cessation services offered in mental health facilities.

Also, the dataset excluded several MHF and thus cannot provide a comprehensive understanding of tobacco control methods in other MHF across the U.S. such as in military treatment facilities, some Native American health facilities, some private practitioners or small group practices, and jails or prisons. Research suggests that there is high rate of tobacco use in the Native American and prisoner populations as well (Whiteselle et al., 2012; Kauffman et al., 2011). There needs to be more research on tobacco control methods in facilities that treat these populations.

Another limitation was this study only measured smoking ban policy prevalence and could not explore the enforcement of these policies by staff, compliance of patients, and utilization of smoking cessation services by patients. However, based on the literature to date, there is overwhelming evidence that smoking bans more often than not can improve smoking behaviors among this marginalized population. More research should be done on the differences between facility characteristics and enforcement of tobacco control methods.

Findings from this study identified several areas needed for future research on implementation of interventions in facilities. Further, findings can assist SAMSHA and State and local governments in assessing prevalence and efficacy of tobacco control methods. Furthermore, these findings can give legislators and policymakers more understanding on the prevalence of smoking bans in MHFs and the availability of

smoking cessation services offered and lack thereof, and subsequently allocate resources to those MHFs that have a lack of tobacco control methods.

### Conclusion

Marginalized individuals are disproportionately affected by tobacco related diseases and are also more likely to seek public assistance and/or be involuntarily admitted into a particular mental health facility. Although there have been recent efforts to make MHF smoke-free, the analyses from this study shows that there are clear disparities in tobacco control methods implemented in MHF based on facility type, ownership, region, and JCAHO accreditation status. MHFs that are most likely to have a complete smoking ban are short-term facilities (psychiatric and inpatient facilities) and the facilities most likely to have partial bans or no smoking bans are long-term facilities (residential treatment centers for adults). It seems that people seeking treatment in long-term facilities could benefit more from smoke-free environments and from the provision of smoking cessation services. Though the studies in the literature supported a short-term benefit, there needs to be more research into the long-term implications of smoke-free psychiatric environments for patients and staff based on facility characteristics.

## **Chapter 5**

### **Discussion**

Research on facility characteristics and presence of tobacco control methods have been lacking in the extant literature. Most studies have evaluated smoking bans and its effectiveness primarily in inpatient hospital based settings and psychiatric settings (Keizer & Eytan, 2005; Lawrence et al. 2011, Patten et al., 1995, Scharf, et al., 2011, Stockings et al., 2014). Because there is a lack of research in the implementation of smoking bans across varying mental health settings, this study sought to examine the prevalence of tobacco control methods in MHF, and also the variability of these tobacco control methods by facility characteristics. Results show the vast majority of MHF have policies, which permit smoking (partial/no ban) either throughout the MHF or in designated areas. And, about three fourths of MHF do not offer smoking cessation services. To understand the differences further analyses were conducted.

Findings from chi-square analysis show a major difference between short-term facilities (psychiatric and inpatient) and long-term facilities (residential treatment center for adults, with the exception of residential treatment centers for children). At least half of the short-term facilities had a complete smoking ban and offered smoking cessation services. While less than a quarter of residential treatment centers for adults had a complete smoking ban and offered smoking cessation services. The variation between these types of facilities could be due to hospital standards and adequate funding needed to implement tobacco control methods. The short-term facilities, particularly inpatient facilities could be better equipped with resources (funds from insurance, state or local government) to provide smoking cessation services and as a result of an implemented



complete smoking ban. While those residential treatment centers for adults and multi-setting facilities may not be not equipped to provide a comprehensive tobacco control method due to limited resources. Furthermore, the focus of treatment in these long-term facilities could largely be on recovery of specific symptoms of mental illness and/substance abuse disorders not necessarily long-term implications of smoking, which could be explain the lack of tobacco control methods.

Furthermore, since JCAHO accreditation manages risk and enhances the quality and safety of care, treatment, and services in healthcare settings, the findings are reflective of MHFs which are accredited The findings illustrate that there is a clear deficit of tobacco control methods across mental health facilities based on recommendations set forth by JCAHO (“Accreditation, Health Care, Certification”, 2016). And though accredited MHF facilities implement tobacco control methods more than unaccredited, it is not to the degree as JCAHO would expect (“Accreditation, Health Care, Certification”, 2016). More research needs to assess the reasons for JCAHO and tobacco control methods. Moreover, Because JCAHO is in wide range of behavioral care settings including short-term and long-term facilities, it would be beneficial to examine the types of facility types associated with JCAHO (“Accreditation, Health Care, Certification”, 2016). JCAHO as the management facility characteristic could be a valuable component to ensure smoke-free MHF.

Another management facility characteristic studies that could be valuable to ensure smoke-free MHF are the ownership variables. The findings demonstrate that private MHF were most likely to have complete smoking ban and less likely to implement smoking cessation services compared to public facilities. Although public

facilities offered smoking cessation services more than private facilities. A number of reasons could explain the difference between the private and public operated MHF. An explanation as to why most MHF are private could be due to the defunding of public facilities in the last 10 years, and as a result there are more efforts to implement smoking ban policies (Appelbaum, 2003). A potential reason that public facilities may offer smoking cessation services more than private could be largely due to funding efforts from federal and state entities such as State Mental Health Agency, US department of Veterans. Future research should examine the funding and resources allocated to facilities based on ownership and its association with tobacco control methods.

Another facility characteristic that was assessed for variation was geographical location, since it has been documented wide geographic discrepancies exist with smoking, with rates generally lower in northern states, and higher in southern States (Schroeder & Morris, 2010). And because the dataset is useful for state and local governments, more research should address the state differences of MHF and tobacco control methods. In an article assessing state policies on smoking cessation services, only one Western state was found to have a smoking cessation policy, suggesting there are more efforts on the east coast (Krauth & Appolino, 2015). Moreover, specific state differences should be examined largely due to the smoking regulations enforced by state and municipal laws particularly in the Western region ("Hospitals & Healthcare Facilities," 2015).

These facility characteristics could serve as proxies to measure the distribution of tobacco control methods implemented across different settings. A strength of this study include that we used a national state-level data source, which is beneficial to state

governments and accreditation sources such as Department of Health and Human Services and JCAHO. Further, this is the first study to our knowledge that has to show variation the prevalence of tobacco control methods in MHF and has provided more information about the nature of the smoking ban policies and smoking cessation services by various facility characteristics of MHF.

There were several limitations to this study. One limitation was that there was unadjusted missing data for the tobacco control methods variables. There was a 8.8 non-response rate from MHF collection procedure, and there was a 13% missing item response for the tobacco control variables used in this study. Systematic errors could explain both the response rate of facility collection and item response. For example, those MHF that did not submit the N-MHSS survey or facilities that did not answer all the questions may have experienced social desirability bias.

Also, the specific definitions of tobacco products and of smoking cessation services were not mentioned in the questionnaire, which may not provide variation of tobacco products banned and smoking cessation services offered. For example, the use of e-cigarettes was not mentioned or specified under the smoking policy or smoking cessation items. Because of the recent increase in novel nicotine products and the use of e-cigarettes as a harm reduction strategy in mental health settings, this should be further assessed in future studies (Ratchesen, 2014). Further, smoking cessation services were not defined in this dataset, which serves as a limitation in understanding the scope and extent of these supportive services offered. There may be other smoking cessation strategies in addition to the range of smoking cessation services (e.g., NRT and smoking cessation sessions) (Hall & Prochaska 2009; Krauth & Appolino 2015; Prochaska et al., 2008;

Scharf, et al., 2011; Stockings et al., 2014). It would be beneficial for future researchers to assess for variation of smoking cessation services offered in mental health facilities.

Also, the dataset excluded several MHF and thus cannot provide a comprehensive understanding of tobacco control methods in other MHF across the US such as in military treatment facilities, some Native American health facilities, some private practitioners or small group practices, and jails or prisons. Research suggests that there is high rate of tobacco use in the Native American and prisoner populations as well (Kauffman et al., 2011; Whiteselle et al., 2012). There needs to be more research on tobacco control methods in facilities that treat these populations.

Another limitation was this study only measured smoking ban policy prevalence and could not explore the enforcement of these policies by staff and utilization of smoking cessation services from patients. However, based on the literature to date, there is overwhelming evidence that tobacco control methods more often than not can improve smoking behaviors among this marginalized population (Acquavita et al., 2014; Hackett, 2008; Krauth & Appolino 2015; Hall & Prochaska, 2009; Lawrence et al. 2011; Scharf, et al., 2011; Stockings et al., 2014). More research should be done on the differences between facility characteristics and enforcement of tobacco control methods.

Overall, these results can shed light on which tobacco control methods are used in MHF and can help to guide agencies such as SAMSHA in identifying needed resources. Findings may direct future research that will emphasize the need for more rigorous efforts to address smoking in all MHF because of its potential prevalence in these facilities and because the marginalized populations that seek this service are disproportionately affected by smoking. Additionally, the findings from this study can

could serve as a reference for researchers, interventionists, and policymakers to direct their attention and increase efforts in providing tobacco control methods in settings which may need them the most, based on facility characteristics including facility types (long-term facilities such as residential centers for adults), unaccredited JCAHO facilities, private and public, and MHF in Southern, Midwest, and Western region.

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## Tables

Table 1: Dataset Characteristics of Mental Health Facilities

Characteristics	N	Percentage
<b>Smoking Policy</b>		
Complete Smoking Ban	3781	41.86
Partial/No Ban	5252	58.14
Total	9033	100.00
<b>Smoking Cessation Services</b>		
Offered	2184	24.22
Not Offered	6833	75.78
Total	9017	100.00
<b>Facility Type</b>		
Psychiatric Hospital	651	6.30
Inpatient	1234	11.93
Residential Treatment Center for Children	778	7.52
Residential Treatment Center for Adults	877	8.48
Outpatient	6450	62.37
Multi-Setting	351	3.39
Total	10341	100.00
<b>Ownership</b>		
Public	2388	23.12
Private	7941	76.88
Total	10329	100.00
<b>Region</b>		
Northeast	2345	22.68
Midwest	2773	26.82
Southern	3087	29.85
Western	2136	20.66
Total	10341	100.00
<b>JCAHO</b>		
Accredited	3253	36.28
Unaccredited	5714	63.72
Total	8967	100.00

Note: Representative of dataset used for analysis

Table 2a Facility Characteristics and Smoking Policy Chi-Square Frequencies

<b>Smoking Policy</b>			
Characteristics	Complete Ban (%)	Partial/No Ban (%)	P-value
<b>Facility Types</b>			<.0001
Psychiatric Facility	52.84	47.16	
Inpatient Facilities	75.02	24.98	
Residential Treatment Center Children	68.17	31.83	
Residential Treatment Center Adult	13.06	86.94	
Outpatient	34.97	65.03	
Multi-Setting	31.10	68.90	
<b>JCAHO</b>			<.0001
Accredited	56.59	43.41	
Not Accredited	33.56	66.44	
<b>Ownership</b>			<.0001
Private	44.06	55.94	
Public	34.69	65.31	
<b>Region</b>			<.0001
Northeast	48.36	51.64	
Midwest	47.55	52.45	
Southern	34.67	65.33	
Western	37.68	62.32	

**Table 2b Facility Characteristics and Smoking Cessation Services Chi-Square Frequencies**

<b>Smoking Cessation Services</b>			
<b>Characteristics</b>	<b>Offered (%)</b>	<b>Not Offered (%)</b>	<b>P-value</b>
<b>Facility Types</b>			<b>&lt; .0001</b>
Psychiatric Facility	43.30	56.60	
Inpatient Facilities	58.79	41.21	
Residential Treatment Center Children	9.29	90.71	
Residential Treatment Center Adult	20.59	17.30	
Outpatient	17.30	82.70	
Multi-Setting	23.76	76.24	
<b>JCAHO</b>			<b>&lt;.0001</b>
Accredited	39.13	60.87	
Not Accredited	15.96	84.04	
<b>Ownership</b>			<b>&lt;.0001</b>
Private	21.75	78.25	
Public	32.24	67.76	
<b>Region</b>			<b>&lt;.0001</b>
Northeast	28.70	71.30	
Midwest	22.60	77.40	
Southern	22.54	77.46	
Western	23.86	76.14	

Table 3a: Bivariate and Multivariate Results for “Complete Smoking Ban Policy” by Facility Type, Ownership, Region, JCAHO

<b>Complete Smoking Ban</b>	Unadjusted OR (95% CI)	P-value	Adjusted OR, (95% CI)	P-value
<b>Facility Type (Inpatient, referent)</b>				
Psychiatric	0.373 (0.303-0.460)*	<.0001	0.420 (0.339-0.521)*	<.0001
Residential Treatment Center Children	0.713 (0.578-0.879)*	<.0001	0.850 (0.681-1.062)	.1528
Residential Treatment Center Adults	0.050 (0.039-0.065)*	<.0001	0.061 (0.046-0.079)*	<.0001
Outpatient	0.179 (0.155-0.207)*	<.0001	0.236 (0.201-0.278)*	<.0001
Multi-Setting	0.150 (0.113-0.200)*	<.0001	0.195 (0.144-0.264)*	<.0001
<b>Ownership (Public, referent)</b>				
Private	1.483 (1.340-1.641)*	<.0001	1.364 (1.219-1.526)*	<.0001
<b>Region (Northeast, referent)</b>				
Midwest	0.968 (0.860-1.089)	<.5884	0.979 (0.861-1.112)	.7379
Southern	0.567 (0.504-0.637)*	<.0001	0.519 (0.456-0.519)*	<.0001
Western	0.646 (0.568-0.733)*	<.0001	0.718 (0.624-0.826)*	<.0001
<b>JCAHO (Accreditation, referent)</b>				
Unaccredited	0.386 (0.354-0.423)*	<.0001	0.618 (0.554-0.689)*	<.0001

Note: Significant values are marked by asterisk (\*)



**Table 3b: Bivariate and Multivariate Results for Smoking Cessation Services Offered by Facility Type, Ownership, Region, and JCAHO**

<b>Smoking Cessation Services Offered</b>	Unadjusted OR (95% CI)	P-value	Adjusted OR (95% CI)	P-value
<b>Facility Type (Inpatient, referent)</b>				
Psychiatric	0.538 (0.441-0.656)*	<.0001	0.454 (0.369-0.558)*	<.0001
Residential Treatment Center Children	0.072 (0.054-0.095)*	<.0001	0.096 (0.071-0.129)*	<.0001
Residential Treatment Center Adults	0.183 (0.146-0.226)*	<.0001	0.257 (0.203-0.325)*	<.0001
Outpatient	0.147 (0.128-0.168)*	<.0001	0.193 (0.165-0.227)*	<.0001
Multi-Setting	0.218 (0.162-0.294)*	<.0001	0.317 (0.232-0.435)*	<.0001
<b>Ownership (Public, referent)</b>				
Private	0.584 (0.524-0.650)*	<.0001	0.546 (0.484-0.616)*	<.0001
<b>Region (Northeast, referent)</b>				
Midwest	0.726 (0.634-0.831)*	<.0001	0.677 (0.583-0.785)*	<.0001
Southern	0.723 (0.634-0.825)*	<.0001	0.605 (0.522-0.700)*	<.0001
Western	0.779 (0.675-0.899)*	0.0006	0.883 (0.754-1.035)	0.1251
<b>JCAHO (Accreditation, referent)</b>				
Unaccredited	0.295 (0.267-0.327)*	<.0001	0.531 (0.468-0.601)*	<.0001

Note: Significant values are marked by asterisk (\*)

## Appendix

### Definitions of Facility Type

- 1) Psychiatric hospitals: a facility licensed and operated as a state/public or private hospital licensed by the state which provides 24-hour inpatient care to persons with mental illness. It can also include 24-hour residential care and/or less than 24-hour care but these services are not requirements in the hospital setting.
- 2) Separate inpatient psychiatric unit of a general hospital: a licensed general hospital (public or private) that provide inpatient mental health services in at least one separate psychiatric living unit. The unit must have specific allocated staff and space for the treatment of persons with mental illness. It may be located in the hospital itself or in a separate building, either adjacent or remote that's owned by the hospital.
- 3) Residential Treatment Center for Children: not licensed as a psychiatric hospital. It provides a clinical program that is directed by a psychiatrist, psychologist, social worker, or psychiatric nurse who has a master's or a doctoral degree. Will most likely exclude from analysis or reported results.
- 4) Residential Treatment Center for Adults Only: a facility not licensed as a psychiatric hospital, whose primary purpose is to provide individually planned programs of mental health treatment services in a residential care setting for adults.
- 5) Outpatient, day treatment or partial hospitalization mental health facility: facility that provides non-institutionalized clients/patients with outpatient services for less than 3 hours at a single visit. Partial day/night or partial hospitalization provide mental health services in sessions of 3 or more hours on a regular schedule either in a clinic or similar facility.
- 6) Multi-Setting Mental Health Facility: This is a facility that provides mental health services in two settings (either residential or outpatient) and is not classified as a psychiatric hospital, general hospital, medical center or residential center)