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Adult Vaccination Rates in the Severely Mentally Ill Population: An Improvement Project in an Outpatient Setting in Utah

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Adult Vaccination Rates in the Severely Mentally Ill Population:
An Improvement Project in an Outpatient Setting in Utah

Nathalia Williams

A project submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of

Master of Science

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ABSTRACT

Adult Vaccination Rates in the Severely Mentally Ill Population:
An Improvement Project in an Outpatient Setting in UtahNathalia Williams
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Background: Adults who suffer with severe and persistent mental illness (SPMI) rarely access medical care to address basic medical needs, so they are subsequently less likely to receive preventive vaccines. The aim of this project was to increase the rate of vaccines among the SPMI population. This project started in 2011 and still is ongoing. It took place in an outpatient community mental health center (CMHC) which serves about 4,200 SPMI clients. Personnel managing the project included registered nurses from the local health department, staff from the CMHC, and volunteer nursing students.

Methods: A review of the literature identified a gap between the general population and SPMI clients in preventive vaccinations. Researchers conducted an initial mixed-method convenience survey at Wasatch Mental Health (WMH), an outpatient CMHC in Utah County. SPMI clients who participated (n=392), provided information on current vaccination status, demographics, beliefs, and interest in receiving vaccines. After review of the data, a vaccination program was developed to address identified barriers and increase vaccination rates in the target population. Finally, post-intervention data were collected through a mixed method convenience survey of SPMI clients (n= 60) who participated in immunizations clinics to evaluate client satisfaction with the program.

Interventions: An intervention program was designed that included a collaborative partnership between the local health department and WMH, to deliver a vaccination program in non-traditional sites tailored to the target SPMI population. Vaccines administered included: annual influenza; hepatitis A; hepatitis B; herpes zoster; measles, mumps, and rubella (MMR); pneumococcal; and tetanus, diphtheria, and pertussis (Tdap).

Results: Eight months after the non-traditional site vaccination program was implemented over 1,000 vaccines were administered. Overall there was a significant increase in vaccination rates for individual vaccines ranging from 18.75% to 83% when compared to baseline. Herpes zoster vaccines were inconsistently available to participants at no cost, so these vaccines were not actively promoted. The post-intervention survey found a subject satisfaction rate of 95% with the program.

Conclusion: Implementation of a vaccination program in a non-traditional site that facilitates access for SPMI clients to vaccines can promote an overwhelming increase in the vaccination rates for this underserved population. It is expected that this increase will ultimately decrease the occurrence of preventable communicable diseases in the target population. The results from this project suggests that the integration of mental health and primary care services can have a profound positive effect on the health of the SPMI population.

Keywords: adult vaccinations, immunizations, severe mental illness, health disparities, improvement project, collaboration, improving rates.

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Adult Vaccination Rates in the Severely Mentally Ill Population:

An Improvement Project in an Outpatient Setting in Utah

About 50,000 adults die every year from vaccine preventable diseases (Centers for Medicare and Medicaid Services [CMS], 2014; Walter et al., 2016). In fact, influenza and pneumonia are the fifth leading cause of death in adults over the age of 65. In addition, other vaccine-preventable infections such as annual influenza, hepatitis A, hepatitis B, and human papillomavirus (HPV) can also cause a significant number of chronic morbidities, disabilities, and financial burdens (CMS, 2014; Ngamruengphong et al. 2015; Seminog & Goldacre, 2013; Walter et al., 2016). While national efforts to increase rates for routine childhood vaccinations have been successful in preventing many communicable and infectious diseases (Johnson, Nichol, & Lipczynski, 2008; National Foundation for Infectious Disease [NFID], 2008), adults of all ages are failing to meet national goals regarding their immunizations (Walter et al., 2016).

The Centers for Disease Control and Prevention (CDC) Advisory Committee on Immunization Practices [ACIP] (2012) recommends over a dozen vaccines for adults including: annual influenza; pneumococcal (PPV); tetanus, diphtheria, and pertussis (Tdap); zoster (shingles); hepatitis A; hepatitis B; measles, mumps, and rubella (MMR); and HPV. Unlike childhood immunization schedule, the schedule for adults varies depending on age, prior vaccination status, health condition, lifestyle, occupation, and travel history. These variations of the adult immunization schedule pose a barrier to increasing adult immunizations (Alpert, 2015; Breivik, 2015; Bridges & Coyne-Beasley, 201; Savoy, 2016). Nonetheless, the use of immunization information systems, educational programs, and pharmacies promoting the administration of adult immunizations, have only modestly increased the rate of adult immunizations (Alpert, 2015; Goad, Taitel, Fensterheim, & Cannon, 2013; Rittle, Lang, &

Wenskovitch, 2014; Rockwell, 2015). As difficult as it is for the general adult population to get vaccinated, it is even more challenging for certain vulnerable populations, such as individuals with severe persistent mental illness (SPMI) to be fully vaccinated.

About 4.2% of the U.S. population struggles with SPMI, which includes several mental illnesses: schizophrenia, bipolar disorder, recurrent depression, and other psychoses (National Institute of Mental Health, 2014). While this vulnerable population has a higher incidence of chronic physical comorbidities and mortality, they have significantly decreased access to non-psychiatric healthcare services (Kaufman et al., 2012; Lorenz, Norris, Norton, & Westrick, 2013; Tosh, Clifton, & Bachner, 2014; Wright-Berryman & Hea-Won, 2016). Correspondingly, the life expectancy of patients with SPMI is, on average, 25 years shorter than the general population (Carra et al., 2014; Kaufman et al., 2012; Tosh et al, 2014; Van Hasselt, Oud, & Loonen, 2013; Seminog & Goldacre, 2013).

The discrepancy in the physical health of the general population and the SPMI population is complex and multifactorial. Unhealthy lifestyle choices, addiction, poverty, homelessness, and side effects from psychotropic medications are thought to contribute to higher incidence of metabolic syndrome, diabetes, and infectious diseases in the SPMI population. (Kaufman et al., 2012, Van Hasselt, Oud, et al., 2013; Van Hasselt, Schorr, et al 2013; Tosh et al., 2014). As a result, physical illnesses prevalent among this vulnerable SPMI population are often unrecognized, untreated, or poorly treated (Carney, Jones, & Woolson, 2006; Castillo, Rosati, Williams, Pessin, & Lindy, 2015).

In addition to the difficulty of the schedule of adult immunizations, SPMI patients experience further barriers that prevent them from accessing all areas of non-psychiatric health care, including poverty and lack of providers who are comfortable caring for this population with

complex needs (Mangurian et al. 2013; Sowers, Arbuckle, & Shoyinka, 2016). This fragmentation of health services results in a lack of attention to preventive services, possibly causing the SPMI population to access medical services only in times of crisis (Decoux, 2005; Lin, Burgess, & Carey, 2012).

Project Goals

It is well established that vaccinations are a cost-effective way to prevent communicable diseases in the general population; however, very limited research has been done on the rates, barriers, and perceptions of receiving vaccinations in the SPMI population (Shefer et al., 1999; U.S. Department of Health and Human Services [USDHHS], 2017; Walter et al., 2016). With these concerns in mind, researchers developed a replicable, patient-centered, cost-efficient improvement project by implementing a vaccination program at a nontraditional site to increase vaccination rates in the SPMI population of Utah County. The end goal of this project was to increase the vaccination rates from baseline, and hopefully decrease the incidence of preventable diseases in this population.

Setting

The project was set in Utah County, the second largest county in the state of Utah, with a population of 516,564 (United States Census Bureau, 2010). It involved a collaboration between the Utah County Health Department (UCHD), which is responsible for all of Utah County residents' public health needs (UCHD, 2011), and Wasatch Mental Health (WMH), which is a community mental health center created to provide quality mental health services to individuals covered with Medicare and Medicaid (Wasatch Mental Health, n.d.). WMH provided services to over 4,200 SPMI patients a year between 2011 and 2012 when this project started (Wasatch Mental Health [WMH], 2010; WMH, 2011).

Methods

Ethical Considerations

Institutional Review Board (IRB) approval was obtained from Rush University and Brigham Young University.

Planning Intervention

The project was divided into three phases:

1. Gathering data on the rates, barriers, and perceptions for vaccinations in the Utah County SPMI population.
2. Addressing barriers to vaccinations in adults with SPMI by creating a partnership between WMH and UCHD to provide annual vaccination clinics at WMH sites.
3. Obtaining a service satisfaction score for the project at a minimum of 80%. Increasing self-reported intention to receive CDC recommended vaccines to 85%.

Phase I: Initial Survey

A 28-item mixed-method survey was conducted at WMH clinics over several days. The survey included questions on the patients' current vaccination status, demographics, interest in receiving vaccines, and perceived barriers to vaccinations. Subjects received one dollar for participating.

Analysis of Initial Survey. The survey was reviewed by experts in public health, research, and stakeholders to obtain consensus and ensure content validity. The questionnaire was pre-tested with a small group of 10 SPMI clients. Reliability of the survey was addressed by trained clinic assistants to ensure anonymity and consistency in survey administration. Participant responses were entered into the Statistical Package for Social Sciences (SPSS, Inc.,

Chicago, IL). Frequencies, measures of central tendency and dispersion, and reliability statistics were calculated for each item. Qualitative data analysis examined themes to identify barriers to immunizations.

Phase II: Project Implementation

The initial survey found that the main barriers to vaccines for the SPMI population include: lack of awareness and knowledge, accessibility, personal cost, and fears about immunizations. Strategies were developed and implemented during Phase II of the project to address those barriers. The lack of accessibility and cost was addressed by the initiation of a collaborative relationship between WMH and UCHD to create mobile vaccination clinics offering adult vaccinations, namely, the annual influenza, pneumococcal, Tdap, MMR booster, herpes zoster, hepatitis A, and hepatitis B for those who qualified depending on age, previous vaccination status, and other comorbidities.

Since Medicaid does not allow for billing of mental health and primary care services on the same day and from the same facility (Druss et al. 2008), UCHD had to be accountable for the financial costs and reimbursements of providing vaccinations. WMH was placed in a supportive role of supplying billing information and on-site space for the vaccination clinics. This new partnership resulted in nine vaccination clinics scheduled on high patient flow days at WMH. UCHD provided two nurses per clinic to complete the vaccination needs assessment and then administer any needed vaccines. Data were entered into the Utah Statewide Immunization Information System (USIIS) by non-nursing UCHD personnel to minimize clinic costs. All Medicaid and Medicare billing and reimbursement was completed through UCHD. In addition, WMH provided a computer linked to their billing system so that vital patient insurance

information could be easily obtained for UCHD billing. There was no cost to the 272 participants who received immunizations.

Besides WMH and UCHD staff, a few research assistants from a local university were utilized in all vaccination clinics to maintain continuity. In addition, two-to-three nursing student volunteers were recruited from the psychiatric mental health nursing course. For the clinics, the research assistants and volunteers helped with the intake paperwork, initial answering of immunization questions, collection of information for USIIS entry, and facilitating optimum flow of patients as they progressed through the clinic. The combination of UCHD staff, grant assistants, and nursing student volunteers worked well for the actual running of the clinics during the implementation phase.

To address the patients' lack of knowledge of vaccines needed, simple, low-cost marketing strategies were employed. Education on the importance of immunization was provided in five educational groups geared to teaching the benefits of immunizations during routine group activities at the WMH. Ongoing education continued during the vaccination clinics. Free adult immunization educational materials to promote adult vaccinations were readily available through several resources and included flyers and Vaccine Information Sheets (VIS) (Centers for Disease Control and Prevention (CDC) ,2010; 2011a; 2011b; 2011c). These resources were utilized for educational groups and vaccine promotion. To capitalize on local media promotion for vaccination for influenza, clinics started at the beginning of flu season in October.

Challenges to Implementation. Adjustments had to be made during the implementation phase. The goal of no-cost services had to be altered because Utah Medicaid would not pay for herpes zoster or HPV. Some limited free vaccines for herpes zoster and HPV were available and used in the project. Furthermore, providers accepting SPMI patients on Medicaid would not be

reimbursed if they provide psychiatric and medical health services (such as immunizations) on same day.

While the initial strategies were very successful for those clients in day treatment programs at WMH, meeting the needs of SPMI clients who do not require weekly services proved to be a challenge as transportation to the clinics was a barrier. A new strategy of providing an immunization voucher to clients that could be utilized at any UCHD sponsored immunization clinic was instituted. Initially the new vouchers were given out by WMH case managers and nurses. While both groups verbalized their support, the actual distribution of vouchers by WMH case managers and nurses was extremely low. After a one-month trial, the feedback from staff was that they did not have the time to promote immunizations and provide the vouchers given their current job responsibilities. The situation was analyzed, and the distribution of vouchers was discontinued.

Phase III: Post-Survey Assessment

A 17-item mixed-method survey was developed to measure changes in attitudes and behaviors as well as patient satisfaction with immunization services. Participants in the immunization clinics were offered the opportunity to participate in the survey when they had completed their immunizations. Participants received a \$1 compensation for their time completing the survey.

Analysis of Post Survey Assessment. Participant responses (n=60) were entered into SPSS (SPSS, Inc., Chicago, IL). Frequencies, measures of central tendency and dispersion, and reliability statistics were analyzed for each item. Data were gathered on satisfaction with services and intention to receive future vaccinations and then analyzed utilizing a two-sample design and descriptive statistics with a parametric t-test.

This article was written adhering to the SQUIRE guidelines, V2.0 (Goodman et al., 2016).

Results

Results of Phase I: Initial Survey

A total of 392 clients participated in the initial survey. Average age was 40, with an uneven sampling of females (55.8%) compared to males (44.2%). Around 69% of respondents reported being treated for multiple psychiatric disorders. Table 1 summarizes the distribution of mental health disorders of participants.

Data were gathered on the medical conditions of our target population. Smoking was reported in 39% of the participants, followed by lung disease (17%), diabetes (13%), heart disease (7.6 %), liver disease (4.6%), and kidney disease at (3.3%) (see Table 2).

The survey found that 84% of respondents believed vaccinations are safe, effective, and important. Nonetheless, the following barriers to immunizations were identified in the survey: lack of awareness and knowledge (42.22%), accessibility (16.29%), personal cost (13.3%), fears about immunizations (10.37%), and lack of recommendations by primary care providers (1.5%). The initial survey also gathered information on a self-reported baseline rate of adult vaccinations of participants. The data showed that 49.5% of participants had already received the Tdap/Td booster vaccine, 47.4% the influenza vaccine, 36.2% the pneumococcal vaccine (age 18-64), 7.7% the MMR vaccine, 6.1% the hepatitis A vaccine, 5.4 % the hepatitis B vaccine, and 2.8% the pneumococcal vaccine (> 65 of age). Table 3 illustrates the comparative vaccination rates between the general population (CDC, 2008) and the data found in the SPMI population in this project.

Results of Phase II: Implementation

Several benchmarks were utilized to measure the effectiveness of the program during phase II. Evaluation of increased immunization rates during the project implementation was completed by comparing pre-survey data and the USIIS (Utah Department of Health, 2007) data bank using descriptive statistics. Immunization rates for each vaccine were compared to baseline phase I survey data and National Survey benchmarks (CDC, 2008).

Over 1,000 vaccines were administered during the first nine immunization clinics. The approximate average of vaccines given per patient per clinic was 2.5 vaccines during the first two years of the project. The most frequent vaccinations given were the annual influenza, TDAP, and Twinrix (Hepatitis A & B). As clients received vaccinations for TDAP and Hep A and B (which provide lifelong immunity), the number of vaccines given per clinic dropped to 1.25 immunizations after the second year of the project. The goal of increasing SPMI adult immunizations by 25% above baseline was met for the following vaccines: hepatitis A, hepatitis B, MMR, and Tdap. Influenza and pneumococcal vaccines had a significant increase but was short of the goal. In addition to receiving immunizations, approximately 8.5% of the SPMI population of Utah County (374 participants) were enrolled in the USIIS system.

Results of Phase III: Post-survey Assessment

Sixty participants participated in the post-immunization survey with 93.6% strongly agreeing or agreeing that they were overall satisfied with the immunization services provided at WMH. Additionally, pre- and post-immunization survey results found a significant increase in reported intention to receive CDC recommended immunizations from 58.4% to 93.8%.

Discussion

The primary goal of this three-part project was to increase the immunization rates in the SPMI population in Utah County. Not only was this outcome achieved, but each phase of the

project yielded significant and unique data that can help practitioners and researchers understand barriers to preventive medicine faced by the SPMI population.

It is universally accepted that being up-to-date with adult vaccinations is a cost-effective way of preventing communicable diseases. Unfortunately, the SPMI population has not received the attention that should be warranted given the evidence in the literature. This population does not use primary and preventive care services nearly as often as the general population; even though this population is more likely to suffer from acute and chronic diseases compared to the general population, including vaccine preventable diseases (Kaufman et al., 2012; Lorenz et al., 2013; Tosh et al., 2014; Wright-Berryman & Hea-Won, 2016).

Discussion of Phase I

To test the hypothesis and understand the target population, during Phase I researchers administered a survey to collect data on demographics, current immunization status, beliefs, and interest in receiving vaccines. The results of the initial survey matched with the current literature indicating that the rate of diabetes, kidney and liver disease, and percentage of smokers in the SPMI population is higher than in the general population. Surprisingly the rate of reported heart disease was lower in this study than the general population (7.6% vs 11.5%). This could be attributed to the young age of the population being evaluated or a misunderstanding of what the term heart disease entails.

As expected, the analysis from the data collected in phase I matches our hypothesis that the immunization rates in the SPMI population are generally lower in comparison to the general population. An exception was found on the rates for the influenza and the pneumococcal vaccine for those between the ages of 18 to 65. The high reported rate of influenza vaccination could have been due a misunderstanding of the survey that was looking for rates of influenza for that

specific flu season and not from previous years. The higher rate of pneumococcal vaccines compared to the younger general population is not surprising, since those with SMPI are more likely to qualify for that vaccine before age 65 due to medical comorbidities.

The survey participants indicated barriers that differed from the little available research on the topic. Instead of not receiving immunizations due to negative attitudes and beliefs toward immunizations, the participants cited lack of awareness and knowledge, accessibility, personal cost, fears about immunizations, and lack of recommendations by primary care providers as the barriers to immunizations. From these results, we can infer that preventive medicine, including immunizations and patient education, has not been as critical for medical providers caring for patients with SPMI in the setting this project took place.

Discussion of Phase II

In the initial phase of the project, UCHD staff expressed concerns about working with the SPMI population in clinics. After receiving education from the project manager and support during the immunization clinics, UCHD staff reported that their stigmatized beliefs about the SPMI population were alleviated. Feedback from UCHD staff, is that they find working with the SPMI population personally rewarding. This reaffirms that stigma about mental illness still exists with medical providers and needs to be addressed as it presents a barrier to providing comprehensive care.

The initial survey results from Phase I were used to address barriers for immunizations to plan and implement this project. Since SMPI patients tend to seek mental health services more often than physical healthcare (Carra et al., 2014; Decoux, 2005), the premise of this project assumed that SPMI population would be more accessible to receive education about vaccines while seeking mental health services. During the planning phase we learned that Medicare and

Medicaid would not reimburse WMH for the vaccines, if clients received medical services on the same day they received mental health services from the same provider. The initial plan of WMH nurses providing immunization services had to be abandoned. This prompted our project manager to encourage the formation of a partnership between UCDH and WMH to ensure financial reimbursement. Given the insurance requirements, UCHD would need to be responsible for the financial costs of providing vaccines. Consequently, WMH was placed in a supportive role of supplying billing information and on-site space for the vaccination clinics. This shows that the fragmentation of physical and mental health for those clients participating in Medicare and Medicaid services can be a significant barrier to providing preventive health services for SPMI clients.

Vaccinations were provided during Phase II of the project, which was successful in increasing the overall immunization rate of SPMI clients. During the nine clinics, over 8.5% of the SPMI population in the county benefited from the program, with over 1000 vaccines administered. Documentation was entered into the UCHD and USIIS systems, which provides a venue for ongoing data collection and an accessible record for individuals. Some SPMI clients wanted to be enrolled but did not want immunizations at that time. This population can be transitory. As a result, many of the SPMI clients initially enrolled in USIIS are no longer WMH clients. Therefore, ongoing utilization of USIIS data will not accurately reflect current SPMI clients in Utah County.

The SPMI population is compliant in receiving preventive medicine services, such as vaccines, when there is an appropriate promotion combined with easy access to them (Van Hasselt, Krabbe, Postma, & Loonen, (2015). Ultimately, we would like to see a decrease in the incidence of vaccine preventable disease in the SPMI population; however, the numbers of

vaccine preventable disease incidences were too small to be statistically significant during the period of the project.

Discussion of Phase III

The purpose of Phase III of the project was twofold; first, to evaluate if the target population was satisfied with the services received at the clinics, and second, to learn if the education presented was adequate to motivate patients to receive other recommended immunizations in the future. 93 % of the post-assessment participants reported that they strongly agreed or agreed that they were overall satisfied with the provided immunization services at WMH. Astoundingly, the reported intention to receive CDC recommended immunizations increased from 58.4% to 93.8%. These data were important because it helped us evaluate not only the program's success, but SPMI patients' desire to receive preventive medical services.

Sustainability

The success of the initial project has motivated the stakeholders (WMH, UCHD, SPMI population, and project manager) to continue the immunization clinics as a yearly service. Additionally, the need for onsite medical services for all WMH clients was highlighted to the point that WMH sought out an outside contractor to provide an on-site medical clinic at their WMH main campus. A private, non-profit, federally funded clinic is now providing medical services on site.

Environmental Influences Affecting Outcomes

Pertussis outbreaks had been occurring nationwide, which increased awareness of the importance of adults being immunized. Whooping cough increased by fourfold in 2010, prior to the year the project started (CDC, 2012). In Utah that year, the incidence rate of pertussis was 21.7 cases per 100,000 persons compared to the national incidence rate of 6 per 100,000. Six

months later, the incidence rate had skyrocketed with an incidence rate of 40.1 cases per 100,000 (Utah Bureau of Epidemiology, 2012). This cluster of vaccine preventable diseases in the area where this project took place likely contributed to the awareness of the importance of adult vaccinations.

Future Research

Changes in restrictive insurance policies that limit a person's ability to receive preventive immunizations from a mental health provider would promote the integration of physical and mental health services, which would address the barriers to receiving preventive vaccines. It is important to keep in mind that vaccines improve the health of individuals and help to protect the entire community. More research on this type of approach to providing preventive immunizations could improve the quality of life for this vulnerable population and reduce the hidden costs brought on by inadequate preventive care.

Project Evolution

Immunization clinics have continued to be provided for the SPMI population several times a year since launch of the initial project. The USIIS system remains as the central record system so that SPMI clients can access their statewide immunization records regardless of their geographical location within the state. UCHD continues to operate the vaccination clinics at a high utilization site (Clubhouse) for SPMI clients. Clubhouse is a psychosocial rehabilitation and recovery models for SPMI clients that empowers its members towards recovery from mental illness (Clubhouse International, 2016).

The project team schedules the clinics with UCHD and provides the insurance information at each clinic. WMH clients assist each other in completing the forms. Volunteer SPMI clients help with flow of the clinics. No outside volunteers or paid staff, besides UCHD

nurses, are required to operate the mobile immunization clinics. Members of WMH Clubhouse have taken ownership of promoting immunizations to their peers as a way to improve their peers' overall health. Anecdotally, WMH supporting staff report a decrease in sickness related absences from WMH Clubhouse.

Application to Other Settings

This is a low cost replicable immunization program that targets an at-risk population. Salt Lake County Health Department has since adopted the collaborative concept for immunization clinics for the SPMI population in a few mental health sites. Nationwide, there are similar county health and mental health agencies that could adopt this model to be utilized in their area. This collaborative prevention intervention service can serve as a model for other health departments and mental health facilities to partner to provide this preventive service for the SPMI population.

Limitations

The data obtained on the initial survey were self-reported. The study results do not represent the whole SPMI population. Therefore, results cannot be generalized to other SPMI populations.

Conclusion

Clinicians need to be aware that SPMI clients have additional barriers to physical health services. The implementation of this project facilitated the integration of mental and physical health services and had a profound positive effect on this vulnerable population. The significant increase in the rates of immunized individuals has the potential to ultimately decrease the occurrence of preventable communicable diseases and reduce the burden of disease, especially if applied in a large scale.

The concept of integration of physical and mental health services could also be expanded to include other aspects of preventive care medicine, such as metabolic screening (Castillo, Rosati, Williams, Pessin, & Lindy, 2015). Barriers to health services for the SPMI population could have an impact in improving the overall well-being and quality of life for this population.

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Table 1. Self-Reported Mental Health Disorder in the SPMI Population of Utah County in 2011
n = 392

Mental Disorders	N	Percentage
Depression	228	58.5%
Anxiety	216	55.2%
Bipolar	141	36.1%
Schizophrenia	63	16.3%
Schizoaffective Disorder	58	14.7%
Substance Abuse	35	8.9%
PTSD	18	4.6%
Developmental Disorder	15	3.8%
ADD/ADHD	14	3.6%
Borderline Personality	11	2.8%
Other Mental Disorder	0	0%

Table 2. Self-Reported Medical Conditions of SPMI Population of Utah county in 2011 and CDC's National Rates in 2010
n = 392

Medical Condition	SPMI Rate	CDC National Rate (2010)
Smokers	39%	19%
Lung Disease including Asthma	17%	None
Diabetes	13%	8.8%
Heart Disease	7.6%	11.5%
Liver Disease	4.6%	1%
Kidney Disease	3.3%	2%

Table 3. Vaccination Rate Comparison Chart

Vaccines	SPMI Initial Data n = 392	Post Clinic Rates n = 272	CDC 2007 Rates
Td/Tdap	49.5%	83.1%	57.3%
Influenza	47.4%	50.4%	45.5%
Pneumovax by age			
18-64	36.20%	31.14%	32.8%
60+	2.8%	N/A	1.9%
65+	N/A	N/A	65.6%
MMR	7.7%	22%	N/A
Hepatitis A	6.1%	22.05%	12.1%
Hepatitis B	5.4%	18.75%	23.4%