EFFECT OF CHANGES IN THE OREGON HEALTH PLAN BETWEEN 2002-2004 ON ADULTS WITH SCHIZOPHRENIA

By

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CERTIFICATE OF APPROVAL

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ABSTRACT

CONTEXT:

Most individuals with schizophrenia and substance use disorders depend heavily on Medicaid benefits to fund the provision of mental health and addiction services. The Oregon Health Plan is an important health care program that provides outpatient mental health and chemical dependency benefits to the majority of persons diagnosed with schizophrenia.

OBJECTIVES:

The purpose of this study was to investigate whether there was an increase in the number of acute care hospitalizations for persons diagnosed with schizophrenia, who were enrolled in OHP Standard between August of 2003 and August of 2004 when, due to changes in OHP policy, access to mental health and addiction services was lost and increased barriers to care occurred to this population.

METHODS:

The project was a retrospective cohort study of 8,489 patients diagnosed with schizophrenia, who were between the ages of 18 and 65, and enrolled in either OHP Plus or OHP Standard between 2002 and 2004. Data files maintained by the State Addictions and Mental Health (AMH) Division were constructed to include patients' demographic, enrollment and claims information for acute care hospitalization stays. Negative binomial regression was used to determine whether changes to OHP policy had a significant impact in the rates of acute care hospitalization by comparing data one year before and after policy changes.

MAIN OUTCOME MEASURES:

Rate of acute care hospitalization in the one-year period before and after changes to OHP policy.

RESULTS:

The rate of acute care hospitalization was significantly less in the period after changes to OHP policy for both insurance groups. The rate of acute care hospitalization decreased by 34.6% and 58.4%, respectively for OHP Plus and OHP Standard. The magnitude of change in the rate of acute care hospitalization was significantly larger at 36% for the group enrolled in OHP Standard. Other significant predictors of rate of acute care hospitalization included time period of enrollment, age, gender, a co-occurring substance use diagnosis and number of previous hospitalizations.

CONCLUSION:

Between 2002 and 2004, the rates of acute care hospitalization declined for persons enrolled in both OHP Plus and OHP Standard. The magnitude of change was greater for OHP Standard, but it is uncertain whether this difference was secondary to policy changes which affected this group or to other unaccounted factors.

BACKGROUND

Over the life course, one in four adults in the United States will experience a mental health disorder, and one in seventeen will have a severe mental illness like schizophrenia, bipolar disorder, or major depression.[1] Persons with severe mental illness have a twenty-five year reduced life expectancy[2] and the annual economic, indirect cost of mental illnesses is estimated to be $79 billion. Most of this amount—approximately $63 billion—reflects the loss of productivity as a result of illnesses.[3] Schizophrenia has a prevalence rate of about 1% in the United States, but it is the most costly mental health disorder and among the costliest chronic illnesses in the United States[4].

People with schizophrenia rely heavily on Medicaid to fund the provision of health services and to purchase needed medications and have been shown to benefit greatly from the use of antipsychotic medication[5]. Without antipsychotic treatment, about 80% of patients experiencing a schizophrenic episode have a recurrence within a year[6].

The Oregon Health Plan (OHP) was created with the intent of expanding Medicaid to cover more people by offering fewer services (essentially "rationing health care"). Initially, the plan was very successful, reducing the uninsurance rate in Oregon from 18 percent in 1992 to 11 percent in 1996[7]. Due to its success, in 2002, the State of Oregon decided to expand coverage within the Oregon Health Plan (Table 1). The State did so by creating two distinct Medicaid benefit packages: OHP Plus and OHP Standard. OHP Plus remained largely unchanged, serving the categorically eligible Medicaid population. OHP Standard would expand the eligibility level of recipients to 185% of the Federal Poverty Level (FPL).

TABLE 1: A BRIEF OVERVIEW OF OHP PLUS AND OHP STANDARD[8]

	OHP Plus	**OHP Standard**
Eligibility	Children & pregnant women 0-185% FPL SSI recipients (0-74%) FPL Parents receiving TANF (0-52% FPL) Adults receiving GA (0-43% FPL)	Parents 0-100% FPL, except those receiving TANF Other adults 0-100% FPL, except those receiving GA
State can cap enrollment?	No	Yes Enrollment closed on July 1, 2004
Premiums	None	$6-$20 per month, based on income
Benefits	Comprehensive, but state could reduce	Substantially reduced
Copayments	$2-$3 (pregnant women, children, and managed care enrollees exempt)	$3-$250 (preventive services exempt) (As a result of a court order, the state stopped charging co-pays for OHP Standard enrollees on June 19, 2004.)

Table Notes: TANF is Temporary Assistance for Needy Families; GA is general assistance; FPL is Federal Poverty Level; FHIAP is Family Health Insurance Assistance Program

Unfortunately, these changes occurred during a time when Oregon's economy was on the decline, leading state officials to face significant budget cuts. As such, rather than expanding coverage as initially intended, in 2003, the State of Oregon was forced to reduce the benefit package of OHP Standard. The State never increased coverage to 185% FPL. Rather, the new plan, largely known as OHP2, reduced benefits by imposing increased premiums, stricter administrative requirements for the monthly premium payment, the addition of co-payments and tightened eligibility criteria, including a 6-month "lockout" for members who missed a monthly premium payment[9]. The plan still covered adults, ages 19-64 whose incomes did not exceed 100% of the Federal Poverty Level, but the changes implemented resulted in many Medicaid clients leaving the program.

In addition to adding co-payments and premiums, the implementation of the new OHP Standard benefit package in March of 2003 eliminated coverage for outpatient mental health and substance abuse treatment services, affecting providers as well as

patients. Fortunately, due to political pressure from providers, advocates and consumers regarding the adverse consequences of eliminating coverage for these services, outpatient mental health and substance abuse treatment services were reinstated in August of 2004 (See Table 2).

TABLE 2: OREGON MEDICAID COVERAGE GROUPS

	Medicaid Benefits Before Cutbacks		**Medicaid Benefits After Cutbacks**	
Group	**Mental Health, Chemical Dependency**	**Pharmacy**	**Mental Health, Chemical Dependency**	**Pharmacy**
OHP Plus – Traditional (Medicaid-mandatory)	Yes	Yes	Yes	Yes
OHP Standard - Expansion population (Medicaid-optional)	Yes	Yes	Interrupted between March 2003-August 2004	Yes

These changes may have particularly affected persons with co-occurring schizophrenia and substance abuse. The prevalence of co-occurring substance use disorders in individuals with schizophrenia has been estimated to range between 47%–70%[10]. The Epidemiological Catchment Area study found the lifetime risk of developing an alcohol use disorder was three times greater for people with a diagnosis of schizophrenia than for people without a mental illness. In addition, persons with schizophrenia were six times as likely to have other drug disorders compared to those without mental illness[11]. In previous studies, people with schizophrenia and a substance use disorder have been shown to be more likely to be homeless, younger, male, unmarried and have lower levels of educational and professional attainment[12,13]. Persons diagnosed with a co-occurring substance use disorder have also been shown to be more likely to require acute care hospitalization[14,15].

As such, studies that examine whether loss of benefits or changes to health policy influence health service utilization should be of significant interest to policymakers, researchers, mental health advocates, treatment providers, and consumers of services[16]. This study takes advantage of the natural experiment that occurred as a result of the policy changes that took effect in the Oregon Health Plan and looks at how loss of outpatient mental health and chemical dependency benefits affected persons with schizophrenia enrolled in OHP Standard and whether having a co-occurring substance use disorder affected rates of acute care hospitalization.

PREVIOUS STUDIES

Oregon Health Plan

The largest number of beneficiaries in OHP Standard were those in the zero-income FPL bracket, comprising approximately 41% of all expansion group clients prior to the implementation of OHP2. McConnell and Wallace[17,18] found that this group was also the most likely to be disenrolled from OHP Standard. In addition, they found that when looking at the overall OHP Standard population, the rate of new enrollments tended to return to prior enrollment levels for all income groups within a few months of the implementation of OHP changes in March of 2003, except for those people in the zero-income level group. This group was disproportionately affected, in spite of the fact that one would expect the poorest population to have the greatest need for assistance in access to health services.

A study by Carlson and Wright[9] investigated the impact of cost sharing and benefit changes on Oregon Health Plan beneficiaries. They found that those who left OHP had decreased access to health care and increased utilization of hospital Emergency

Departments (EDs). The loss of coverage also appears to be prolonged in that individuals seem to be without coverage for months if not years after leaving the program. Another study by Lowe et. al.[19], examined changes in emergency department use 24 months before and 24 months after changes to OHP policy. They found increases in ED use and hospitalizations by the uninsured and a decrease in ED use by those who remained on OHP or had commercial insurance.

McFarland et. al. has done an unpublished study looking at the impact of Medicaid cutbacks on patients with severe and persistent mental illness in Oregon in the one-year periods before and after Medicaid cutbacks (between 2002-2004). This study used State data and found an increase in psychiatric hospitalization rates after Medicaid clients lost anti-psychotic medication coverage.

Not surprisingly, enrollment in the Oregon Health Plan Standard program dropped from about 102,000 clients in 2002 to around 49,000 in December of 2003[20]. Currently, only about 24,000 enrollees remain in the state's Medicaid-expansion program and new enrollment has been closed since July 1, 2004.

Schizophrenia and co-occurring Substance Use Disorders

Co-occurring substance use disorders impose significant emotional and financial burdens on patients with schizophrenia, their families and the mental health system. It is estimated that nearly 50% of people with schizophrenia have a lifetime history of substance use disorders, most frequently alcohol and/or cannabis. This rate is at least three times as high as that seen in the general population. Co-occurring substance use disorders are associated with an elevated risk of developing psychosis[21] and can be great obstacles to effective treatment of persons with schizophrenia.

A study by Swofford et al. [22] found that persons diagnosed with schizophrenia and a substance use disorder had twice the rate of hospitalizations compared to those diagnosed with schizophrenia only. However, other studies have found no differences between abusers and non-abusers with respect to number of hospitalizations[23,24]. All of these studies had small sample sizes, however, and therefore, may have not had the power to detect differences between these two groups. Along these lines, the National Institute of Mental Health (NIMH) published a study in 1995 showing a monthly relapse rate of 3.5 percent per month for patients on maintenance neuroleptics[25].

There have been few studies investigating the impact of loss of chemical dependency benefits for persons enrolled in OHP Standard between March of 2003 and August of 2004. One such study conducted by Fuller et al. [26] investigated the impact of the elimination of methadone benefits in the Oregon Health Plan in this time period. They found that patients who left methadone treatment because they were unable to pay for methadone services showed substantially increased elevations in the Addiction Severity Index (ASI), which assessed alcohol use, drug use and legal issues, as well as employment, psychiatric, medical and family and social issues. In addition, the benefit cuts disproportionately affected the poor, the homeless, the unemployed and those with little social support. Patients who went through detoxification as a result of the benefit reduction used heroin to ease their withdrawal symptoms from the short detoxification taper and returned to using heroin upon leaving treatment.Therefore, research investigating differences in service use between persons diagnosed with schizophrenia only versus those who have co-occurring substance use disorders is important.

Theories on Increased Prevalence of Substance Abuse in Schizophrenia

Theories have been proposed to explain the elevated prevalence of substance use disorder in people with schizophrenia[27]. The neural diathesis-stress model[28] suggests that a neuro-biologic vulnerability[29] interacts with environmental stressors (such as substance use) in vulnerable individuals to precipitate the onset of schizophrenia or relapse of psychosis. Patients with schizophrenia are thought to have a heightened vulnerability to the effects of psychoactive substances. Support for this model has been found in studies indicating that substance abuse is associated with an earlier age at onset of schizophrenia[30].

The self-medication hypothesis suggests that persons with schizophrenia use specific drugs to counteract specific symptoms of schizophrenia and/or reduce medication side effects. However, evidence for this hypothesis is less consistent and studies showing elevated rates of substance use disorders among patients with first-episode psychosis before any exposure to anti-psychotic medication argue against this hypothesis[31].

Green et al. have proposed the reward circuitry dysfunction hypothesis, which suggests that substance use modulates dopamine-mediated brain reward circuitry. In patients with schizophrenia, this pathway is dysfunctional and substance use may be related to the difficulty patients have in experiencing "normal" levels of reward from the environment and the ability of substances of abuse to ameliorate this circuitry dysfunction[31].

Another theory suggests that anxiety and depression respond transiently to stimulants and/or depressants like alcohol and heroin, raising the possibility that co-occurring substance use disorders may actually represent a misdiagnosis of patients who

primarily suffer from other disorders, including psychotic affective (mood) disorders, anxiety disorders or schizoaffective disorders[32].

Researchers have looked at the cumulative effects of poor cognitive, social, educational, and vocational functioning as well as poverty, victimization, and exposure to deviant and/or substance-using familial and social environments and the increased the risk for substance abuse in this population. However, it is still unclear whether the accumulation of these risk factors underlies the higher rates of substance abuse in patients with schizophrenia[33].

METHODS

Study Design

We conducted a retrospective cohort study using enrollment and claims data from the State Medicaid Management Information System (MMIS) and the Oregon Patient Resident Care System (OP/RCS), maintained by the State Addictions and Mental Health (AMH) Division. The study cohort consisted of 8,489 patients between the ages of 18 and 65, who had a diagnosis of schizophrenia and/or a co-occurring substance use disorder, and who were enrolled in either OHP Plus or OHP Standard in the one-year periods before (01/01/2002 – 01/01/2003) and after (08/01/2003 - 08/01/2004) changes to OHP.

Excluded were persons enrolled for less than one year in the Oregon Health Plan in 2002, because reasons for disenrollment were likely not due to changes in policy as these changes did not take effect until 2003. We also excluded those who were admitted to a State Psychiatry Facility, including the Oregon State Hospital in Salem and Portland or the Blue Mountain Recovery Center in Pendleton, because state hospitalizations are

typically longer, averaging around 180 days, and patients admitted to these facilities are often sicker and have different access to outpatient services and medications. Also, this population would be more likely to be disenrolled from OHP, because re-enrollment was required every six months. In addition, persons residing in a nursing home during 2002, 2003, or 2004 and those who were eligible for Medicare were excluded from the study. The reason for this exclusion was that these patients would be more likely to have different patterns of utilization of services. (Table 3)

Matching Datasets

The State Addictions and Mental Health (AMH) Division matched subjects in the MMIS and OP/RCS databases by creating a new variable consisting of the second to fourth characters in the person's first name, second through fourth characters in the person's last name, date of birth and gender. This new variable was then de-identified and assigned a number in sequential order starting from "1". This approach ensured that the investigators were blinded to the identity of the subjects in this study.

Dichotomization

The cohort was dichotomized into two groups based on the type of insurance (OHP Plus versus OHP Standard). Ethnicity was dichotomized into Caucasian or non-Caucasian, given the relatively small number of persons of other ethnicities in Oregon. Substance use was dichotomized as having a co-occurring substance use disorder (SUD) or not having an SUD.

TABLE 3: SUMMARY OF INCLUSION/EXCLUSION CRITERIA

Inclusion Criteria	Exclusion Criteria
Diagnosis of schizophrenia or schizophrenia and a co-occurring substance disorder by either hospital discharge or two outpatient visits.	Were enrolled for less than one year in the Oregon Health Plan in the year 2002.
Were between the ages of 18 and 65 during the calendar year 2002.	Admitted to a State Psychiatric Facility, including the State Hospital in Salem and Portland or the Blue Mountain Recovery Center in Pendleton.
Enrolled in the Oregon Health Plan program (OHP Plus or OHP Standard) between January 1st, 2002 and January 1st, 2003.	Resided in a nursing home during 2002, 2003, or 2004.
Used outpatient mental health and/or chemical dependency services and/or received at least one anti-psychotic medication in 2002.	Medicare eligibility (dual coverage)

Predictors (Independent Variables)

Known risk factors and other variables hypothesized to be associated with increased rate of acute care hospitalization were included in the study analysis. The main predictor was period of enrollment (defined as the one-year period before and after changes to OHP policy; specifically as January 1, 2002 to January 1, 2003 in the before period, and August 1, 2003 to August 1, 2004 in the after period). Other predictors included were insurance type, age, gender, ethnicity, severity of illness (as measured by the number of previous hospitalizations since 1997) and a co-occurring substance use diagnosis. Predictors were drawn from the State Medicaid Management Information System (MMIS), which maintains a monthly listing of all persons who are enrolled and/or terminated from Medicaid and other demographic characteristics.

Outcome (Dependent Variable)

The primary outcome measure was rate of acute care hospitalization. Acute care hospitalization services are documented in the Oregon Patient / Resident Care System

(OP/RCS). Appendix A contains a sample of the OP/RCS form for acute/subacute care hospitalization. A clinician/physician who has evaluated the patient must fill out the form. Individuals are eligible to enroll in OP/RCS if they are detained (hold room), civilly committed, or medically indigent, or if the services they receive are paid for with public funds. For each patient enrolled on OP/RCS, the psychiatric facility must maintain a file that includes, but is not limited to, documentation of the primary diagnosis, a psychosocial work-up (which might include a family history, prior treatment information, etc.), and a treatment or training plan.

Statistical Analysis

Descriptive statistics were used to summarize population characteristics. We used negative binomial generalized estimating equation (GEE) regression model to analyze the count data while accounting for overdispersion and correlation for individual subjects. A variable which took into account the fraction of time each person was enrolled in OHP was created and used as the "offset".

Univariate analysis was conducted for the main predictors, which included insurance type and period. Other predictors included age, gender, ethnicity, a co-occurring substance use disorder, and number of previous hospitalizations between 1997 and 2002. We initially conducted t-tests of the continuous variables age and number of previous hospitalizations between 1997 and 2002. We also conducted chi-squared tests to evaluate the univariate significance of our categorical variables.

Negative binomial regression was performed using all the independent variables found to be significant in the univariate analysis. We included an interaction term between OHP and period in the multivariate analysis in order to determine whether there

was a difference in the *magnitude of change* in the rate of acute care hospitalizations for persons enrolled in OHP Standard compared to OHP Plus. This interaction term represents the relative change in the incidence rate ratio between the two insurance groups, which might suggest a difference in rates of hospitalization secondary to OHP policy changes or to another undetermined factor.

TABLE 4: STATA CODING OF VARIABLES

Variable Description	**Codes/Values**	**Name**
Age	Years	AGE
Gender	0 = female 1 = male	GENDER
OHP Enrollment Status	0 = OHP Plus 1 = OHP Standard	OHP
Time of Enrollment (Before vs After Changes to OHP)	0 = Before period 1 = After period	PERIOD
Ethnicity	0 = White 1 = Non-white	ETHNIC
Hospitalizations	# of Hospitalizations	HOSP
# of Hospitalizations betweem 1997-2002	Number of hospitalizations	HOSP_PREV
Co-occurring Substance Use Diagnosis	0 = No co-occurring substance use diagnosis 1 = Co-occurring substance use diagnosis	SUD
Enrollment in OHP Standard	0 = Dropped out from OHP Standard after changes took effect 1 = Remained Enrolled in OHP Standard after changes took effect	REMAIN

Subanalyses

We performed two separate negative binomial regression analyses to examine whether a co-occurring substance use diagnosis was a significant predictor of the rate of acute care hospitalization for the time period before and after changes to OHP for persons enrolled in OHP Standard only, and for those enrolled in OHP Plus only. In addition, a

separate negative binomial regression analysis was conducted to investigate characteristics of persons who remained enrolled in OHP Plus and OHP Standard during the entire period of the study. We also performed a logistic regression analysis to examine whether there were differences between persons who maintained OHP Standard insurance and those who were disenrolled from OHP Standard. To do so, we created a dichotomous variable called remain, which determined whether or not a person remained enrolled in OHP Standard in the period after changes to OHP. This variable was used as the outcome variable (dependent variable) and the predictor variables again included age, gender, ethnicity, a co-occurring substance use disorder, number of hospitalizations in the before period only (since we do not have information on hospitalizations for persons who disenrolled) and previous number of hospitalizations between 1997 and 2002.

RESULTS

I. Demographics

Our study included a total of N=8,489 participants with a diagnosis of schizophrenia or schizophrenia and a co-occurring substance use disorder, who were between the ages of 18 and 65, and enrolled in either OHP Plus or OHP Standard between 2002 and 2004. The majority of our population, n=7335 (86.4%), was Caucasian. There were n=370 (4.4%) Asians, n=537 (6.3%) African Americans, n=213 (2.5%) Hispanics, and n=34 (0.004%) of unknown race/ethnicity. There were more males than females in the study, with n=5194 (61.2%) males versus n=3295 (38.8%) females, respectively. The ethnic breakdown of the participants enrolled in OHP Plus versus OHP Standard was not significantly different, with the majority of participants being of Caucasian descent (Table 5). The mean age of those participants enrolled in OHP Plus was 47, and of OHP Standard was 42. The majority of the overall population, n=7461 (87.9%) did not have a co-occurring substance use diagnosis (See Prevalence of Co-occurring Substance Use Disorders for additional results). In addition, the majority of the participants, n=7,044 (83%) were enrolled in OHP Plus, while n=1445 (17%), were enrolled in OHP Standard.

TABLE 5: SUMMARY OF DEMOGRAPHIC CHARACTERISTICS BY INSURANCE TYPE AND PERIOD OF ENROLLMENT

Demographic Characteristics	**OHP Plus; Time Period Before Changes to OHP (N = 7044)**	**OHP Plus; Time Period After Changes to OHP (N = 6438)**	**OHP Standard; Time Period Before Changes to OHP (N= 1445)**	**OHP Standard; Time Period After Changes to OHP (N = 251)**
Age, mean (SD), y	47(10)	47 (10)	42 (10)	42 (11)
Male, No. (%)	4236 (60.14)	3824 (59.4)	958 (66.3)	136 (54.18)
Female, No. (%)	2808 (39.86)	2614 (40.6)	487 (33.7)	115(45.82)
White, No. (%)	6107 (86.7)	5553 (86.25)	1228 (84.98)	211 (84.06)
Non-White, No. (%)	937 (13.3)	885 (13.75)	217 (15.02)	40 (15.94)

Asian, No. (%)	298 (4.23)	285 (4.43)	72 (4.98)	17 (6.77)
Black, No.(%)	452 (6.42)	413 (6.42)	85 (5.88)	9 (3.59)
Hispanic, No. (%)	166 (2.36)	162 (2.52)	47 (3.25)	8 (3.19)
Other, No. (%)	21 (0.3)	25 (0.39)	13 (0.9)	6 (2.39)
No Substance Use Diagnosis (%)	6327 (89.82)	5770 (89.62)	1134 (78.48)	212 (84.45)
Substance Use Diagnosis (%)	717 (10.18)	668 (10.38)	311 (21.52)	39 (15.54)

II. Prevalence of Co-occurring Substance Use Disorders

For persons enrolled in OHP Plus, the prevalence of co-occurring substance use diagnosis was n=717 (10.2%). For persons enrolled in OHP Standard, the prevalence of co-occurring substance use diagnosis was n=311 (21.5%). The most likely co-occurring substance use diagnosis was alcohol (30% in the before period and 41% in the after period for OHP Standard, and 38% in the before period and 37% in the after period for OHP Plus). This was followed by a close three-way tie between amphetamine (21% and 18% for OHP Standard versus 13% and 16% for OHP Plus), cannabis (15% and 10% for OHP Standard versus 13% and 14% for OHP Plus) and opioids (16% and 18% for OHP Standard versus 12% and 11% for OHP Plus) (Table 6).

TABLE 6: SUMMARY OF SUBSTANCE USE DIAGNOSES BY INSURANCE TYPE AND PERIOD OF ENROLLMENT

Diagnosis	**OHP Plus; Time Period Before Changes to OHP (N = 717) (n, %)**	**OHP Plus; Time Period After Changes to OHP (N = 668) (n, %)**	**OHP Standard; Time Period Before Changes to OHP (N= 311) (n, %)**	**OHP Standard; Time Period After Changes to OHP (N = 39) (n, %)**
Alcohol	271 (38)	245 (37)	92 (30)	16 (41)
Amphetamine	94 (13)	105 (16)	65 (21)	7 (18)
Cannabis	93 (13)	95 (14)	48 (15)	4 (10)
Opioid	86 (12)	72 (11)	50 (16)	7 (18)
Cocaine	55 (8)	45 (7)	20 (6)	0
Other	48 (7)	52 (8)	19 (6)	4 (10)
Polysubstance	41 (6)	31 (5)	12 (4)	1 (3)
Nicotine	18 (3)	16 (2)	2 (0.6)	0
Hallucinogen	6 (0.8)	4 (0.6)	0	0
Sedative	4 (0.6)	3 (0.4)	3 (0.9)	0
Inhalant	1 (0.1)	0	0	0

III. Loss of Coverage

Loss of coverage, as expected, was much greater for the OHP Standard population. We found that 1194 out of 1445, or 82.6% of those initially enrolled in OHP Standard lost coverage. This compares with 606 out of 7044, or 8.6% of those enrolled in OHP Plus. This is a much higher disenrollment rate than that reported in previous studies, which showed a 51% drop in disenrollment during the same time period for the overall OHP Standard population.

IV. Acute Care Hospitalizations

Table 7 shows a tabulation of the number of acute care hospitalizations for persons enrolled in OHP Plus and OHP Standard, with and without a co-occurring substance use diagnosis, in the periods before and after changes were implemented to the Oregon Health Plan.

TABLE 7: SUMMARY OF ACUTE CARE HOSPITALIZATIONS BY PERIOD OF ENROLLMENT, INSURANCE TYPE AND SUBSTANCE USE DIAGNOSIS

Number of Acute Care Hospitalizations Before Changes to OHP (1/1/02-1/1/03)	**Schizophrenia and Substance Use Diagnosis; OHP Standard (N=311)**	**Schizophrenia and Substance Use Diagnosis; OHP Plus (N=717)**	**Schizophrenia and No Substance Use Diagnosis; OHP Standard (N = 1,134)**	**Schizophrenia and No Substance Use Diagnosis; OHP Plus (N=6,327)**
0	243 (78.14)	569 (79.36)	912 (80.42)	5,492 (86.8)
1	40 (12.86)	70 (9.76)	149 (13.14)	503 (7.95)
2	17 (5.47)	39 (5.44)	49 (4.32)	187 (2.96)
3	5 (1.61)	17 (2.37)	12 (1.06)	69 (1.09)
4	4 (1.29)	12 (1.67)	5 (.44)	43 (.68)
5	1 (.32)	3 (.42)	3 (.26)	11 (.17)
6-10	1 (.32)	5 (.7)	4 (.36)	19 (.31)
11-15	0	1 (.14)	0 (0)	3 (.06)
16+	0	1 (.14)	0 (0)	0 (0)
Number of Acute Care Hospitalizations After Changes to OHP (8/1/03-8/1-04)	**Schizophrenia and Substance Use Diagnosis; OHP Standard (N = 42)**	**Schizophrenia and Substance Use Diagnosis; OHP Plus (N =678)**	**Schizophrenia and No Substance Use Diagnosis; OHP Standard (N = 209)**	**Schizophrenia and No Substance Use Diagnosis; OHP Plus (N = 5,760)**
0	35 (83.33)	592 (87.32)	197 (94.26)	5,189 (90.09)
1	4 (9.52)	48 (7.08)	9 (4.31)	367 (6.37)
2	3 (7.14)	22 (3.24)	3 (1.44)	106 (1.06)
3	0 (0)	8 (1.18)	0 (0)	61 (.91)
4	0 (0)	5 (.74)	0 (0)	17 (.3)
5	0 (0)	2 (.29)	0 (0)	11 (.19)
6-10	0 (0)	1 (.15)	0 (0)	8 (.15)
11-15	0 (0)	0 (0)	0 (0)	0 (0)
16+	0 (0)	0	0 (0)	0 (0)

UNIVARIATE ANALYSIS

Univariate analysis was conducted for the main predictors insurance type and period. We found insurance type (p-value <0.001) and period (p-value <0.001) to be a significant predictor of hospitalization. In addition, gender (p-value = 0.018), a co-occurring substance use disorder (p-value<0.001) were also significant predictors. Ethnicity was not a significant predictor of hospitalization with a p-value = 0.709. However, we decided to include ethnicity in the multivariate analysis as a dichotomous because several studies have shown that ethnicity can play a significant role in the

incidence of schizophrenia, with black and minority populations disproportionately affected[34,35,36].

MULTIVARIABLE ANALYSES

1. *Primary Multivariable Regression Model*

The preliminary effects model is shown below:

$$\lambda(t,\mathbf{X}) = h_o(t)\, e^{\beta 1 hosp\_prev + \beta 2 ethnic + \beta 3 age + \beta 4 gender + \beta 5 sud + \beta 6 ohp + \beta 7 period + \beta 8 (ohp*period)}$$

where $\mathbf{X}=(X_1, X_2,\ldots,X_p)$; explanatory/predictor/independent variables

The primary multivariate model found all our independent variables to be significant predictors of rate of hospitalization, with the exception of ethnicity, which was not statistically significant (Table 8).

TABLE 8: PRIMARY MULTIVARIABLE REGRESSION MODEL

Variable	**IRR (95%CI)**	**P**
HOSP_PREV	1.27 (1.25, 1.28)	<0.001
ETHNIC	1.11 (0.98, 1.27)	0.465
AGE	0.98 (0.97, 0.99)	<0.001
GENDER	0.73 (0.67,0 .81)	<0.001
SUD	1.48 (1.31, 1.68)	<0.001
OHP	1.47 (1.31, 1.66)	<0.001
PERIOD	0.65 (0.61, 0.69)	<0.001
OHP*PERIOD	0.64* (0.43, 0.96)	0.032

*This is not an IRR, but the ratio of IRR (RR of OHP Standard vs. RR of OHP Plus)

Ethnicity was not a significant confounder in the association between insurance status and rate of acute care hospitalization for persons with schizophrenia (Table 8). The hospitalization rate of non-Caucasians was 1.11 times that of Caucasians. The 95% confidence interval (CI) was between 0.98 and 1.27. However, this was not statistically

significant with a p-value = 0.465. Older age was negatively associated with hospitalization. With every year of age, the incidence rate of acute care hospitalization decreased by 1.97%. The 95% CI was 1.6% and 2.4% and this was statistically significant with a p-value <0.001 (Table 8). Males with a diagnosis of schizophrenia were less likely to require hospitalization than females. The incidence rate of hospitalization for males was 0.73 times that of females. The 95% CI was between 0.67 and 0.81. This was statistically significant with a p-value = 0.001 (Table 8).

a. Effect of Time Period of Coverage

To determine whether the time period of coverage (before versus after changes to OHP were implemented) had a significant impact on the rate of acute care hospitalizations for each insurance group, we conducted linear combinations (Table 9) of the primary multivariate regression model (Table 8). For both insurance groups (OHP Plus and OHP Standard), the rate of acute care hospitalization appears to be lower in the period after changes to OHP policy took effect than in the period before these changes.

Looking at the magnitude of change in the rate of acute care hospitalization (as measured by the interaction term previously discussed in our model), we found that after adjusting for severity of illness, as measured by number of hospitalizations between 97-02, ethnicity, age, gender and having a co-occurring substance use diagnosis, OHP Standard had a 36% higher change in the relative incidence rate ratio compared to OHP Plus. The 95% CI was between 4% and 57%. This was statistically significant with a p-value = 0.032.

For persons enrolled in OHP Plus (who were essentially unaffected by the changes in OHP policy), the rate of acute care hospitalization was 34.6% less in the period after changes to OHP than in the period before changes. The 95% CI was between

29.8% and 39% and this was statistically significant with a p-value <0.001. For persons enrolled in OHP Standard (who received a reduced benefit package and lost outpatient mental health and chemical dependency benefits between 2003 and 2004), the rate of acute care hospitalization was 58% less during the period after changes to OHP. The 95% CI was between 36.7% and 72.7% and this was statistically significant with a p-value <0.001.

TABLE 9: LINEAR COMBINATIONS FOR TIME PERIOD OF COVERAGE FOR EACH INSURANCE GROUP

Variable	**IRR (95%CI)**	**P**
OHP PLUS	0.65 (0.61, 0.7)	<0.001
OHP STANDARD	0.42 (0.28, 0.64)	<0.001

b. Effect of Having a Co-occurring Substance Use Disorder for OHP Standard Enrollees

To examine whether a co-occurring substance use diagnosis was a significant predictor of the rate of acute care hospitalization for the time period before and after changes to OHP, we performed a separate multivariate regression model which included only OHP Standard enrollees and included an interaction term between sud and period (Table 10).

For persons enrolled in OHP Standard who had a diagnosis of schizophrenia, a co-occurring substance use diagnosis was a significant predictor of the rate of acute care hospitalization, but only in the period after changes to OHP (Table 11). Persons with a co-occurring substance use diagnosis were 2.7 times more likely to require acute care hospitalization as those who had a diagnosis of schizophrenia only between August 1, 2003 and August 1, 2004. The 95% CI was between 1.2 and 6.4 and this was statistically significant with a p-value=0.023 (Table 11).

TABLE 10: MULTIVARIABLE REGRESSION MODEL: OHP STANDARD ENROLLEES ONLY; EFFECT OF CO-OCCURRING SUD

Variable	**IRR (95%CI)**	**P**
HOSP_PREV	1.44 (1.37, 1.52)	<0.001
ETHNIC	0.99 (0.89, 1.1)	0.84
AGE	0.96 (0.95, 0.97)	<0.001
GENDER	1.02 (0.87, 1.42)	0.888
PERIOD	0.31 (0.19, 0.51)	<0.001
SUD	1.11 (0.87, 1.42)	0.387
PERXSUD*	2.43 (1.01, 5.87)	0.001

*This is not an IRR, but the ratio of IRR (RR of no SUD vs. RR of co-occurring SUD)

TABLE 11: LINEAR COMBINATIONS FOR TIME PERIOD OF COVERAGE FOR OHP STANDARD ENROLLEES ONLY

Variable	**IRR (95%CI)**	**P**
OHP STANDARD, BEFORE PERIOD	1.11 (0.87, 1.42)	0.387
OHP STANDARD, AFTER PERIOD	2.71 (1.15, 6.39)	0.023

c. Effect of Having a Co-occurring Substance Use Disorder for OHP Plus Enrollees

We also conducted a multivariate regression model which included only OHP Plus enrollees (Table 12) and examined whether a co-occurring substance use diagnosis was a significant predictor of the rate of acute care hospitalization for the time period before and after changes to OHP (Table 13).

TABLE 12: MULTIVARIABLE REGRESSION MODEL: OHP PLUS ENROLLEES ONLY; EFFECT OF CO-OCCURRING SUD

Variable	**IRR (95%CI)**	**P**
HOSP_PREV	1.26 (1.25, 1.27)	<0.001
ETHNIC	1.03 (0.98, 1.08)	0.269
AGE	0.98 (0.97, 0.98)	<0.001
GENDER	0.73	<0.001

	(0.67, 0.81)	
PERIOD	0.68 (0.63, 0.74)	<0.001
SUD	1.82 (1.57, 2.1)	<0.001
PERXSUD*	0.71 (0.58, 0.88)	0.002

*This is not an IRR, but the ratio of IRR (RR of no SUD vs. RR of co-occurring SUD)

TABLE 13: LINEAR COMBINATIONS FOR TIME PERIOD OF COVERAGE FOR EACH INSURANCE GROUP

Variable	**IRR (95%CI)**	**P**
OHP PLUS, BEFORE PERIOD	1.82 (1.57, 2.1)	<0.001
OHP PLUS, AFTER PERIOD	1.29 (1.07, 1.57)	0.004

For OHP Plus enrollees, we found that a co-occurring substance use diagnosis was a significant predictor of the rate of acute care hospitalization in both the period before and after changes to OHP. However, the incidence rate of acute care hospitalization was higher in the before period compared to the after period. (Of note, persons enrolled in OHP Plus had no significant change in their benefit package during both periods). (Table 12)

Between January 1, 2002 and January 1, 2003, persons with a co-occurring substance use diagnosis were 1.82 times more likely to require acute care hospitalization as those who had a diagnosis of schizophrenia only. The 95% CI was between 1.57 and 2.1 and this was statistically significant with a p-value<0.001. Between August 1, 2003 and August 1, 2004, persons with a co-occurring substance use diagnosis were 1.29 times more likely to require acute care hospitalization as those who had a diagnosis of schizophrenia only (Table 13). The 95% CI was between 1.07 and 1.57 and this was statistically significant with a p-value=0.004 (Table 13). Thus, persons with a co-occuring substance use diagnosis enrolled in OHP Plus had a relative decrease in the rate

of acute care hospitalization in the period after, compared to the period before changes to OHP.

d. Characteristics of Persons Who Remained Enrolled in OHP Plus and OHP Standard During the Entire Period of Study

We performed a separate multivariable regression analysis to test for differences in the rates of acute care hospitalization for persons who remained enrolled in OHP Plus and OHP Standard in both time periods before and after changes to OHP. In this analysis, we included only the persons who did not drop out of OHP Plus or OHP Standard in the period after changes to OHP were implemented and conducted a negative binomial regression using this sub-set population (Table 14).

TABLE 14: MULTIVARIABLE REGRESSION MODEL INCLUDING ONLY PERSONS WHO REMAINED ENROLLED IN BOTH PERIODS OF THE STUDY

Variable	**IRR (95%CI)**	**P**
HOSP_PREV	1.27 (1.25, 1.29)	<0.001
ETHNIC	1 (0.95, 1.06)	0.937
AGE	0.98 (0.97, 0.99)	<0.001
GENDER	0.76 (0.69, 0.84)	<0.001
SUD	1.56 (1.35, 1.79)	<0.001
OHP	1.55 (1.33, 1.78)	<0.001
PERIOD	0.68 (0.63, 0.73)	<0.001
OHP*PERIOD	0.62* (0.41, 0.93)	0.022

*This is not an IRR, but the ratio of IRR (RR of OHP Standard vs. RR of OHP Plus)

The results for the people who remained enrolled the entire study period (Table 14) were not different from the results drawn from the primary multivariate analysis (Table 8). All our predictor variables remained significant, with the exception of ethnicity.

e. Differences Between Persons Who Maintained versus Lost OHP Standard Enrollment

We found that persons who remained enrolled in OHP Standard tended to have less hospitalizations during the time period before changes to OHP and prior to the study, were less likely to have a co-occurring substance use diagnosis, and more likely to be female. Ethnicity and age were not significant predictors of whether a person remained enrolled or whether they dropped out of OHP Standard (Table 15).

TABLE 15: LOGISTIC REGRESSION MODEL: DIFFERENCES BETWEEN PERSONS WHO MAINTAINED VERSUS LOST OHP STANDARD ENROLLMENT

Variable	**OR (95%CI)**	**P**
HOSP_BF	0.85 (0.75, 0.97)	0.017
HOSP_PREV	0.92 (0.85, 0.99)	0.027
ETHNIC	1.11 (0.88, 1.4)	0.406
AGE	0.99 (0.99, 1)	0.296
GENDER	0.56 (0.46, 0.66)	0.000
SUD	0.79 (0.63, 0.98)	0.035

DISCUSSION

It is unclear why both insurance groups had a decrease in the rate of hospitalization when changes in OHP policy took effect between 2003 and 2004. We would have expected the rate of acute care hospitalization to have remained the same for persons enrolled in OHP Plus, because policy changes did not affect this group. With increased barriers in access to routine services and appropriate medication, we would also have expected individuals enrolled in OHP Standard to have higher rates of acute care hospitalization after changes to OHP, because they did not retain their mental health and chemical dependency benefits.

A potential explanation for the lower rates of hospitalization seen in the OHP Standard population is that in addition to secular trends, the persons who maintained enrollment in OHP Standard were less sick, had greater stability of psychotic symptoms and therefore, were less likely to use or require outpatient mental health and chemical dependency services. We did find that the persons who remained enrolled in OHP Standard after changes were implemented tended to be those who had less hospitalizations, were less likely to have a co-occurring substance use disorder and more likely to be female. The group that remained enrolled could also have decreased utilization due to fears of co-payments, or due to the fact that they did not understand how policy changes would actually affect them. Although data are not available showing whether utilization under the policy changes was affected by co-payments, other research has found that even relatively modest co-payments, when imposed on the very poor, can result in avoidance of needed medical care[37,38,39].

Despite the lower rates of acute care hospitalization in both groups, the magnitude of change is significantly larger for persons enrolled in OHP Standard. Therefore, we

could argue that the detected difference is secondary to the changes in OHP policy which affected the OHP Standard group only. Our results are consistent with a study done by Lowe et al. that investigated the impact of Medicaid cutbacks on Emergency Department use in the two-year periods before and after changes to OHP. Their study found a decline in the rate of ED visits, even after adjusting for secular trends, for persons enrolled in the Oregon Health Plan after changes to OHP policy took effect, with an increase in ED visits for the uninsured. An important limitation in our study was our inability to quantify the rate of acute care hospitalization for persons who became disenrolled from OHP Standard, or for those who never had insurance in the first place. This data would have helped us to determine whether the lower rates of acute care hospitalization were a result of random year-to-year variation, whether the persons who remained enrolled in OHP Standard were in fact less sick compared to those who were disenrolled, and whether policy changes increased the number of uninsured patients who required hospitalization. These investigations will have to be conducted in a future study.

We also wonder whether the persons who remained enrolled in OHP Standard had lower rates of acute care hospitalization because of greater financial means of paying for preventive services. Marcus and Olfson[40] found that non-adherence to antipsychotic medication accounted for a considerable proportion of inpatient treatment costs of California Medicaid patients with schizophrenia. They estimated that improving adherence to eliminate gaps in antipsychotic medication treatment could lower the number of acute care admissions by 12.3%. In addition, we know that the subpopulation most affected by the changes to the Oregon Health Plan were those beneficiaries with no reported income. This group had the largest number of enrollees prior to the changes to

OHP and the largest number of disenrollments, estimated at 58% by October of 2003[17]. As such, it would have been useful to have information on the change in the number of acute care hospitalizations within the zero-income bracket subgroup. Unfortunately, this was another limitation of our study because we were not able to gather information on income. We also do not know whether the people who remained enrolled in OHP Standard were in fact taking their medication.

We do know that age, gender, severity of illness as determined by the number of previous hospitalizations between 1997 and 2002, and a co-occurring substance use diagnosis are significant predictors of the rate of acute care hospitalization for both insurance groups. However, we would have liked to have had information on other medical co-morbidities, income, living arrangement, social support, adherence to medications, and global assessment of functioning (GAF) score, which may have also influenced the rate of acute care hospitalization.

Although we believe disenrollment from OHP Standard was primarily a result of increased premiums, stricter collection rules and the addition of co-payments, we cannot be certain that the reasons for disenrollment were not due to other factors. For example, we were unable to account for the effects which the recession might have had on persons with schizophrenia who were enrolled in OHP Standard. We do not know, for example, whether the large decrease in OHP Standard enrollees was secondary to unemployment, or whether it was due to unawareness about the new rules, or inability to conform to the tighter criteria necessary for continued enrollment.

Our study found a much lower prevalence of co-occurring substance use disorder in persons diagnosed with schizophrenia than the results of the Epidemiological

Catchment Area Study (13.78% versus 47-70%, respectively). This finding may be secondary to under-reporting by individuals, under-screening by physicians or a combination of the two. Due to the limited amount of objective information that is available and that is used routinely to screen for drug abuse, such as urine drug screens and blood alcohol levels, this prevalence rate is heavily based on voluntary reporting and is subject to reporting bias. Our study did find, as previous studies have, that persons who have a co-occurring substance use diagnosis are much more likely to require acute care hospitalization than those without a dual-diagnosis. As such, it may be prudent to continue to offer chemical dependency services and determine better ways of screening for this vulnerable population.

Our study was limited by subjects who were lost to follow-up (became disenrolled in OHP or left the State of Oregon). This deficiency limited our ability to quantify the rate of acute care hospitalization for persons who lost insurance, or who did not have insurance in the first place, and to make conclusions about how the policy changes affected those lost to follow-up. Also, we could not be sure whether worsening of psychosis led to loss of Medicaid and, eventually, hospitalization or if the loss of Medicaid led to worsening psychosis and eventual hospitalization. Regardless, it was still important to understand the extent to which impaired patients found it difficult to stay in the Medicaid system and the differences between patients who have mental illness only versus mental illness and a co-occurring substance disorder.

CONCLUSIONS AND PUBLIC HEALTH IMPLICATIONS

Our study found decreased rates of acute care hospitalization for persons enrolled in OHP Standard compared to those enrolled in OHP Plus in the time period before and after changes to the Oregon Health Plan, when mental health and chemical dependency benefits were lost. It is unclear whether the decreased rates of hospitalization for OHP Standard enrollees were secondary to OHP policy changes, random year-to-year variation or other undetermined factors.

We found that males were less likely to require hospitalization than females, older age was negatively associated with hospitalization, ethnicity was not a significant predictor of hospitalization, and a co-occurring substance use diagnosis and number of previous hospitalizations from 1997 to 2002 increased the likelihood of acute care hospitalization. We also found that persons who remained enrolled in OHP Standard tended to have less hospitalizations during the time period before changes to OHP and prior to the study, were less likely to have a co-occurring substance use diagnosis, and more likely to be female. Ethnicity and age were not significant predictors of whether a person remained enrolled or whether they dropped out of OHP Standard.

A major limitation of our study was that we could not determine what happened to the people who became disenrolled from OHP Standard or to those who never had insurance. Nevertheless, we do know that policy changes can be disastrous if states decide not to implement promised expansions, while following through with reductions. As such, it may be important to require execution of a minimum number of expansion promises, or to subsidize the most vulnerable population as a condition of implementing needed reductions.

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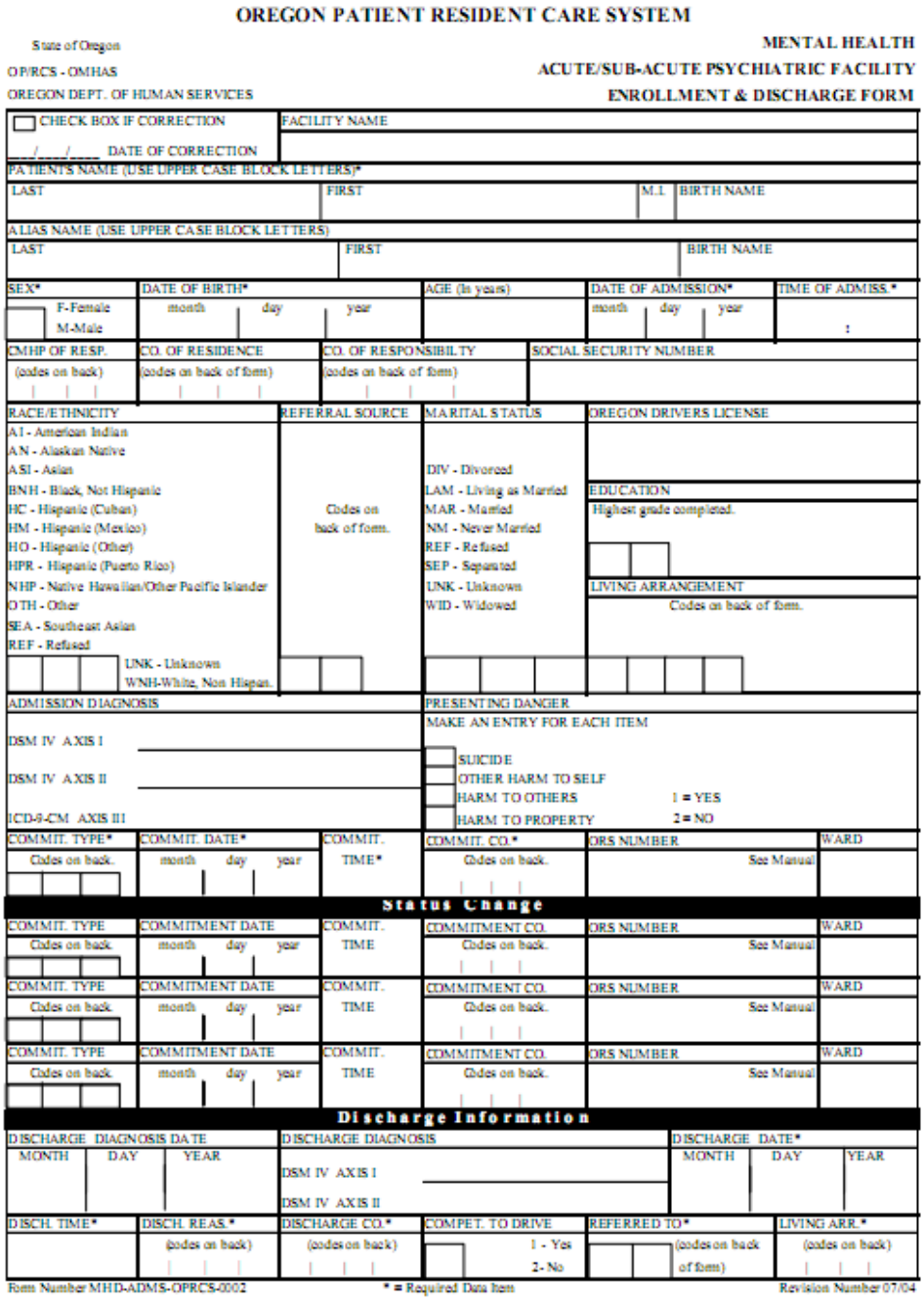
APPENDIX A

ACUTE/SUBACUTE CARE HOSPITALIZATION FORM FRONT/BACK:



OREGON PATIENT RESIDENT CARE SYSTEM

State of Oregon
OP/RCS - OMHAS
OREGON DEPT. OF HUMAN SERVICES

MENTAL HEALTH
ACUTE/SUB-ACUTE PSYCHIATRIC FACILITY
ENROLLMENT & DISCHARGE FORM

☐ CHECK BOX IF CORRECTION
__/____/____ DATE OF CORRECTION

FACILITY NAME

PATIENT'S NAME (USE UPPER CASE BLOCK LETTERS)*

LAST | FIRST | M.I. | BIRTH NAME

ALIAS NAME (USE UPPER CASE BLOCK LETTERS)

LAST | FIRST | BIRTH NAME

SEX* (F-Female, M-Male) | DATE OF BIRTH* (month day year) | AGE (In years) | DATE OF ADMISSION* (month day year) | TIME OF ADMISS.*

CMHP OF RESP. (codes on back) | CO. OF RESIDENCE (codes on back of form) | CO. OF RESPONSIBILTY (codes on back of form) | SOCIAL SECURITY NUMBER

RACE/ETHNICITY
AI - American Indian
AN - Alaskan Native
ASI - Asian
BNH - Black, Not Hispanic
HC - Hispanic (Cuban)
HM - Hispanic (Mexico)
HO - Hispanic (Other)
HPR - Hispanic (Puerto Rico)
NHP - Native Hawaiian/Other Pacific Islander
OTH - Other
SEA - Southeast Asian
REF - Refused
UNK - Unknown
WNH-White, Non Hispan.

REFERRAL SOURCE
Codes on back of form.

MARITAL STATUS
DIV - Divorced
LAM - Living as Married
MAR - Married
NM - Never Married
REF - Refused
SEP - Separated
UNK - Unknown
WID - Widowed

OREGON DRIVERS LICENSE

EDUCATION
Highest grade completed.

LIVING ARRANGEMENT
Codes on back of form.

ADMISSION DIAGNOSIS
DSM IV AXIS I
DSM IV AXIS II
ICD-9-CM AXIS III

PRESENTING DANGER
MAKE AN ENTRY FOR EACH ITEM
SUICIDE
OTHER HARM TO SELF
HARM TO OTHERS
HARM TO PROPERTY
1 = YES
2 = NO

COMMIT. TYPE* (Codes on back.) | COMMIT. DATE* (month day year) | COMMIT. TIME* | COMMIT. CO.* (Codes on back.) | ORS NUMBER (See Manual) | WARD

Status Change

COMMIT. TYPE (Codes on back.) | COMMITMENT DATE (month day year) | COMMIT. TIME | COMMITMENT CO. (Codes on back.) | ORS NUMBER (See Manual) | WARD

COMMIT. TYPE (Codes on back.) | COMMITMENT DATE (month day year) | COMMIT. TIME | COMMITMENT CO. (Codes on back.) | ORS NUMBER (See Manual) | WARD

COMMIT. TYPE (Codes on back.) | COMMITMENT DATE (month day year) | COMMIT. TIME | COMMITMENT CO. (Codes on back.) | ORS NUMBER (See Manual) | WARD

Discharge Information

DISCHARGE DIAGNOSIS DATE (MONTH DAY YEAR) | DISCHARGE DIAGNOSIS
DSM IV AXIS I
DSM IV AXIS II
| DISCHARGE DATE* (MONTH DAY YEAR)

DISCH. TIME* | DISCH. REAS.* (codes on back) | DISCHARGE CO.* (codes on back) | COMPET. TO DRIVE (1 - Yes, 2 - No) | REFERRED TO* (codes on back of form) | LIVING ARR.* (codes on back)

Form Number MHD-ADMS-OPRCS-0002 | * = Required Data Item | Revision Number 07/04

MENTAL HEALTH OP/RCS CODE LIST

CMHP AND COUNTY CODES

BAKE - BAKER
BENT - BENTON
CLAC - CLACKAMAS
CLAT - CLATSOP
COLU - COLUMBIA
COOS - COOS
CROO - CROOK
CURR - CURRY
DESC - DESCHUTES
DOUG - DOUGLAS
GILL - GILLIAM
GRAN - GRANT
HARN - HARNEY
HOOD - HOOD RIVER
JACK - JACKSON
JEFF - JEFFERSON
JOSE - JOSEPHINE
KLAM - KLAMATH
LAKE - LAKE
LANE - LANE
LINC - LINCOLN
LINN - LINN
MALH - MALHEUR
MARI - MARION
MORR - MORROW
MULT - MULTNOMAH
OTHE - OTHER (OUT OF STATE)
POLK - POLK
SHER - SHERMAN
TILL - TILLAMOOK
UMAT - UMATILLA
UNIO - UNION
WALL - WALLOWA
WASC - WASCO
WASH - WASHINGTON
WHEE - WHEELER
YAMH - YAMHILL

COMMITMENT TYPE

CC - Civil Commitment
CCC - Criminal Court Commitment
COS - Court Ordered Screening
SCF - Services to Children & Families
CT - Court Order
DIV - 14 Day Diversion
EMG - Emergency Commitment
HH - Hospital Hold
JCF - Juvenile Correction Facility
JCO - Juvenile Court Order
NHH - Non Hospital Hold
OYA - Oregon Youth Authority Voluntary
RVC - Revocation of Conditional Release
SCF - Serv. to Children/Families Voluntary
SCR - Screened, Not Admitted
TC - Transport Custody
VCF - Voluntary-Correctional Facility
VCP - Voluntary-Cond. Probation/Parole
VG - Voluntary by Guardian
VP - Voluntary-Parental
VOL - Voluntary
VRP - Voluntary Return of PSRB Client
WOD - Warrant of Detention

REFERRAL CODES

00	Unknown / None
04	Developmental Disabilities Serv.
05	School
06	Other Community Agency
07	Support Programs for Adults (TANF / Food Stamps)
08	Support Programs for Children (Child Welfare)
11	Vocational Rehabilitation Div.
16	Eastern Oregon Training Center
19	Primary Care Provider, Specialist, or Other Physical Health Provider
20	State Correctional Institution
21	Court
22	Jail (city/county)
23	Parole (County/State/Federal)
24	Police/Sherrif - Local, State
25	PSRB
26	Probation (Co./State/Federal) Includes Juveniles
31	Private Professional
32	Self
33	Family/Friend
35	Senior Services Division
87	Community Based Mental Health and/or Addiction Service Provider
88	State Psychiatric Facility
89	Acute or SubAcute Psychiatric Fac.
90	Mental Health Organization (MHO)
91	Youth/Child Social Service Agency, Center or Team
92	Fully Capitated Health Plan (FCHP)
93	Federal Correctional Institution
94	Employer / Employee Assistance Program (EAP)
99	Other

DISCHARGE REASON CODES

AMA - Against Medical Advice
DSCH - Discharged
EXP - Expired
JUEX - Legal Jurisdiction Expired
MB - Maximum Benefit
NH - No Hearing
PSRB - Conditional Release to PSRB
REP - Repatriated
REV - Revocation of Trial Visit
RTV - Trial Visit
TACF - Transfer to Acute Care Facility
TACP - Transfer to Adult Corrections Fac.
TCH - Transfer to Court for Hearing
TESH - Transfer to Eastern OR Hospital
TI - Treatment Intervention
TJCP - Transfer to Juvenile Corrections Fac.
TOH - Transfer to Other Hospital
TOSH - Transfer to Oregon State Hosp.
TPNA - Treatment Program No Longer Available
TSRF - Transfer to secure residential facility

LIVING ARRANGEMENT CODES

ACF	Acute Care Facility
CORR	Corrections Facility
EOPC	Eastern OR Psychiatric Center
EOTC	Eastern OR Training Center
FCNR	Non Relative Foster Care
FCR	Relative Foster Care
HH	Halfway House
HMLS	Homeless
INST	Institution
ITH	Intensive Training Home
MOSH	Oregon State Hospital
NF	Nursing Facility
OBS	Oregon School for the Blind
ODS	Oregon School for the Deaf
ORFG	Other Residential Fac./Group Home
OTHE	Other
PASS	Overnight Pass
PPH	Private Psychiatric Hospital
PRA	Private Residence - Alone
PRF	Private Residence - w/ Friend or Other Unrelated Person
PRP	Private Residence - W/ Parent, Relative, Adult Child(ren)
PRS	Private Residence - W/ Spouse or Significant Other
PTC	Private Training Center
RAB	Room and Board
REF	Refused
RESP	Respit Care
RFH	Relative Foster Home
RTC	Residential Treatment Center
SHEL	Shelter
TFCY	Treatment Foster Care (Youth)
UNK	Unknown