# Long-Term Outcomes of Public Mental Health Clients: Two-Year Follow-Up

Wei Yen, Ph.D.

February 2006

*Washington State Institute for Public Policy*

# Long-Term Outcomes of Public Mental Health Clients: Two-Year Follow-Up

Wei Yen, Ph.D.

February 2006

**WASHINGTON STATE INSTITUTE FOR PUBLIC POLICY**
110 Fifth Avenue Southeast, Suite 214
PO Box 40999
Olympia, Washington 98504-0999

Telephone: (360) 586-2677
FAX: (360) 586-2793
URL: http://www.wsipp.wa.gov

Document Number: 06-02-3401

# WASHINGTON STATE INSTITUTE FOR PUBLIC POLICY

## Mission

The Washington Legislature created the Washington State Institute for Public Policy in 1983. A Board of Directors—representing the legislature, the governor, and public universities—governs the Institute, hires the director, and guides the development of all activities.

The Institute's mission is to carry out practical research, at legislative direction, on issues of importance to Washington State. The Institute conducts research activities using its own policy analysts, academic specialists from universities, and consultants. New activities grow out of requests from the Washington legislature and executive branch agencies, often directed through legislation. Institute staff work closely with legislators, as well as legislative, executive, and state agency staff to define and conduct research on appropriate state public policy topics.

Current assignments include projects in welfare reform, criminal justice, education, youth violence, and social services.

## Board of Directors


Senator Karen Fraser
Senator Jeanne Kohl-Welles
Senator Pam Roach
Representative Don Cox
Representative Fred Jarrett
Representative Phyllis Kenney
Representative Helen Sommers
*Senate position pending*

Robin Arnold-Williams, Department of Social and Health Services
Victor Moore, Office of Financial Management
Sandra Archibald, University of Washington
Andrew Bodman, Western Washington University
Thomas L. "Les" Purce, The Evergreen State College
Robby Rosenman, Washington State University
Ken Conte, House Office of Program Research
Stan Pynch, Senate Committee Services


## Staff

Roxanne Lieb, Director
Steve Aos, Associate Director

# CONTENTS

Executive Summary ..... 1

Section I: Introduction ..... 5

Section II: Methods ..... 7

Section III: Profiles of Baseline Cohort and Clients at the Two-year Follow-up ..... 11

Section IV: Outcomes and Associated Characteristics of Adult Clients ..... 21

Section V: Summary and Next Steps ..... 31

Appendices

Appendix A: Regional Support Networks ..... 37

Appendix B: Logistic Analyses and Results ..... 39

Appendix C: Long-Term Outcomes of Public Mental Health Clients: Institute Publications ..... 45

# EXECUTIVE SUMMARY

Following a Joint Legislative Audit and Review Committee (JLARC) report on public mental health services in the state,[1] the 2001 Legislature directed the Washington State Institute for Public Policy (Institute) to…

> *"…conduct a longitudinal study of long-term client outcomes to assess any changes in client status at two, five, and ten years. The measures tracked shall include client change as a result of services, employment and/or education, housing stability, criminal justice involvement, and level of services needed."*[2]

This report includes the following analyses:

1) We examine all persons who received publicly funded mental health services in 2002 through Regional Support Networks (RSN) and hospitals, and we compare this "baseline" group with those who continued to receive services in 2004; and

2) We examine four outcomes in 2004 for all adult clients from the baseline:
   - ✓ Use of public mental health services,
   - ✓ Use of other public medical services,
   - ✓ Employment, and
   - ✓ Criminal justice involvement.

Unfortunately, existing administrative data from the baseline year do not allow us to measure education, housing stability, and level of services needed.

Because of these data limitations in existing state databases, the next phase of the study will require a new focus. We will be convening an advisory group to review the findings to date, examine the strengths and weaknesses of existing data systems, and redesign the study.

## Findings

### 1) Baseline and Clients at the Two-year Follow-up

- ✓ Of the 127,784 baseline clients in 2002, slightly more than one-third continued to use public mental health services in 2004.
- ✓ Adults accounted for 70 percent of the baseline group and 76.5 percent of those who continued to use public mental health services in 2004.
- ✓ Adults and children who continued to use public mental health services in 2004 had longer hospital stays, more outpatient service hours, a larger proportion enrolled in Medicaid, and more encounters with other public medical services than those in the 2002 baseline.

[1] R. Perry, L. Brubaker, & V. Whitener (2000). *Mental health system performance audit* (Document No. 00-8). Olympia, WA: Joint Legislative Audit and Review Committee.
[2] Section 5, Chapter 334, Laws of 2001.

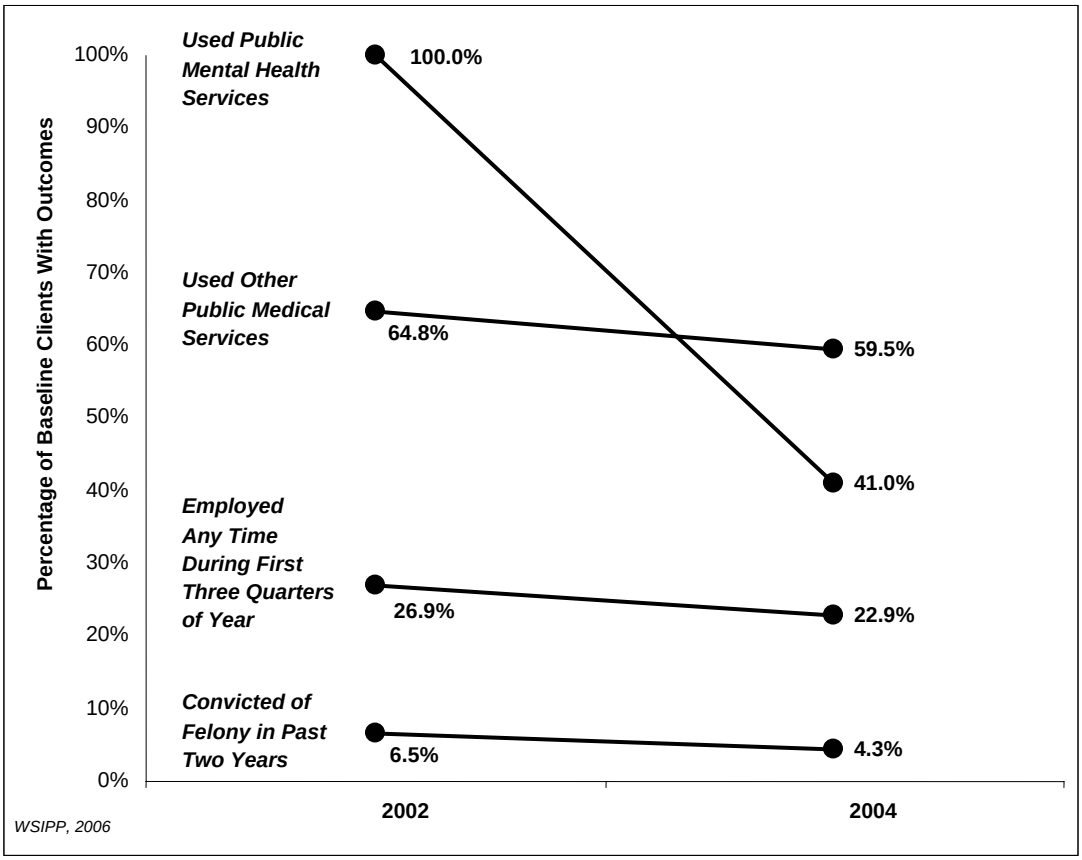
## 2) Outcomes and Associated Client Characteristics: Adult Clients

Analyses in this section were conducted for all baseline adult clients. The analyses first examined changes in outcomes from 2002 to 2004 among these clients, and then identified client characteristics that are significantly associated with these outcomes in 2004.

### Outcome Changes—2002 to 2004

- ✓ *Public mental health services*: Only 41 percent of baseline adults continued to use these services in 2004.
- ✓ *Other public medical services*: 65 percent of all baseline adults used these services in 2002 compared with 60 percent in 2004.
- ✓ *Employment*: The rate of employment at anytime during the first three months of the year declined from 27 percent in 2002 to 23 percent in 2004.
- ✓ *Criminal justice involvement*: The felony conviction rate declined from 6.5 percent in 2001–2002 to 4.3 percent in 2003–2004.

***Exhibit 1***
**Outcome Changes for Adults: 2002–2004**



A number of client characteristics were associated with the outcomes tracked in this study. The following characteristics were particularly significant.

### Client Characteristics Associated With Use of Public Mental Health Services in 2004

↑ Clients who used other public medical services in 2004 were over five times more likely to use public mental health services in 2004 than those who did not.

↑ The probability of using public mental health services in 2004 increased if clients used more hours of Mental Health Division (MHD) outpatient services in 2002 or had bipolar, major depression, schizophrenia, substance dependence, or anxiety disorders.

↓ The probability of using public mental health services decreased if the client received services from Pierce or Northeast RSN or was living in a 24-hour-care setting in 2002.

### Client Characteristics Associated With Use of Other Public Medical Services in 2004

↑ Use of other public medical services and public mental health services in 2002 increased the probabilities of using other medical services in 2004 by 20 times and 7 times, respectively.

↑ The probability also increased for female clients, clients with childhood disorders in 2002, and clients in the Northeast, Grays Harbor, and Pierce RSNs.

↓ The probability decreased if the client used mental health inpatient services in 2002.

### Client Characteristics Associated With Employment in 2004

↑ The probability of being employed in 2004 was nearly 11 times greater for clients employed in 2002 than for those not employed in 2002.

↓ Decreased probabilities were found in older clients, those in all living situations except private residences in 2002, and clients with dementia in 2002.

### Client Characteristics Associated With Felony Convictions in 2003–2004

↑ Clients with a felony history were six times more likely to have felony convictions during 2003–2004.

↑ Higher probabilities were also found in clients who used public mental health services in 2004; Black clients; those with substance dependence disorders; homeless clients or those living in shelters, jail/corrections facilities, and other-situations; and clients in Chelan-Douglas, Clark, Southwest, Greater Columbia, Peninsula, Pierce, and Thurston-Mason RSNs in 2002.

↓ The probability was lower if the client was employed in 2004, female, Asian, older, had schizophrenia, was in Northeast RSN, or whose primary living situation was a 24-hour-care setting.

# SECTION I: INTRODUCTION

The 1999 Legislature directed the Joint Legislative Audit and Review Committee (JLARC) to perform an audit of Washington State's public mental health system.[3] The audit recommended the Department of Social and Health Services (DSHS) Mental Health Division (MHD) use outcome information to identify best practices in providing public mental health services.[4] Outcome information on public mental health clients was then and still is scarce. The 2001 Legislature, while directing MHD to adopt JLARC's recommendations, also directed that the Washington State Institute for Public Policy (Institute)…

> *"…conduct a longitudinal study of long-term client outcomes to assess any changes at two, five, and ten years. The measures tracked shall include client change as a result of services, employment and/or education, housing stability, criminal justice involvement, and level of services needed."* [5]

The Institute designed the study to track, rather than evaluate, long-term outcomes.[6] Information from this study can be useful for future efforts in designing outcome evaluations of the public mental health system. The Institute study examines MHD client characteristics and outcomes at the three follow-up periods. Calendar year 2002 was chosen to be the baseline year. The baseline client cohort consists of all individuals who used MHD services in 2002.

The current report describes findings from the two-year follow-up and contains two sets of analyses. One set examines characteristics of clients at the baseline year and characteristics of those baseline clients still in the MHD system at the end of the two-year follow-up period. The second investigates changes in selected outcomes at the end of the two-year follow-up period among all baseline adult clients and identifies client characteristics associated with these outcomes. Subsequent reports will track changes in these outcomes at the five-year and ten-year follow-up periods.

Analyses in this report are based on administrative information systems from several state agencies. Administrative data have great appeal for studies like this, because data are inexpensive to collect and provide information on the entire population of interest. However, administrative data have limitations that can affect the scope of analysis and the interpretation of results. The most relevant limitation of using the administrative data available to this study is the lack of information on some outcomes of legislative interest.[7]

---

[3] Section 103, Chapter 309, Laws of 1999.
[4] Perry et al., (2000). *Mental health system performance audit*.
[5] ESSB 5583, Chapter 334, Laws of 2001.
[6] An outcome evaluation addresses whether a policy/program intervention results in changes in an outcome. Such studies require a design in which individuals experiencing the intervention are compared with a control group not experiencing the intervention. The intent of ESSB 5583, however, is to track outcomes of mental health clients over time rather than to evaluate the effectiveness of a particular program or service.
[7] While MHD does collect information on some of these outcomes, it does so only while the client is in the public mental health system. MHD clients have high attrition rates. At the two-year follow-up more than 60 percent of the baseline clients were no longer in the system. For these clients, although the outcome information collected by MHD is available for the baseline, it is not available for the follow-up.

As a result, we can only reliably track two of five outcome measures directed by the Legislature: employment and criminal justice involvement.

Available administrative information systems allow us, however, to track other important outcomes. In addition to employment and criminal justice involvement, we tracked use of MHD services and use of other public medical services provided by DSHS Medical Assistance Administration (MAA). Thus, four outcomes are presented in this report.

To track all outcome measures the Legislature requested, an alternative research design and/or new data sources are necessary. The Institute will convene an advisory group to review findings to date, assess the strengths and weaknesses of existing data systems, and identify appropriate alternative designs and/or new data sources that will enable tracking all outcome measures of interest to the Legislature.

# SECTION II: METHODS

This section describes this study's sample selection, data sources, select definitions, research questions, and outcome measures.

## Sample Selection and Data Sources

This study includes all MHD clients who received any services from MHD in calendar year 2002. These clients form the study's Baseline Cohort. We selected 2002 because it is the first year following enactment of the legislation authorizing this study.[8]

Institute staff collected administrative data from a number of state agencies. The data systems include the following:

- DSHS Mental Health Division (MHD): Service Utilization File;
- DSHS Medical Assistance Administration (MAA): Medicaid Management Information System;
- Washington State Institute for Public Policy Criminal Justice System Database (CJS): Synthesized criminal charge data from the Department of Corrections, the Administrative Office of the Courts, and the State Patrol;
- Department of Health (DOH): Vital Records; and
- Employment Security Department (ESD): Unemployment Insurance Wage File.

## Select Definitions

For ease of writing and to avoid confusion, the following terms are adopted in this report:

- Baseline Cohort: All MHD clients receiving services during baseline year of 2002;
- Clients at the Two-year Follow-up: All clients from the Baseline Cohort who remained in the MHD system in 2004 (i.e., those clients from the baseline who continued to receive MHD services two years later);
- Adults: Clients 19 years of age or older on December 31, 2002; and
- Children: Clients younger than 19 years of age on December 31, 2002.

[8] ESSB 5583, Chapter 334, Laws of 2001.

## Research Questions

The objective of this study is to examine the long-term outcomes of an MHD client cohort at three follow-up points: two, five, and ten years after the baseline. In learning about the long-term outcomes, it is useful to identify client characteristics meaningfully associated with the outcomes.

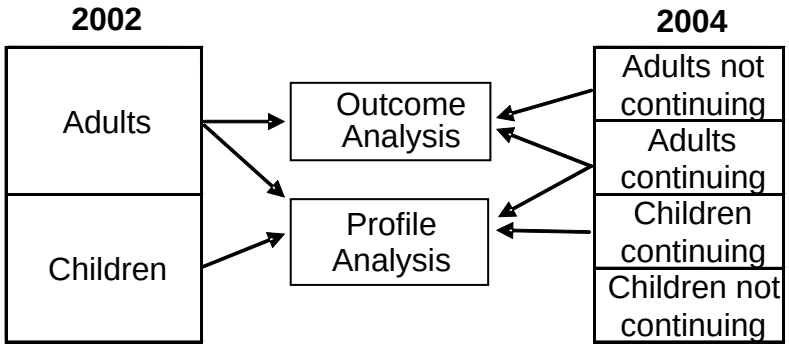
Throughout the study period, members of the Baseline Cohort may exit and re-enter the MHD system. However, many members will exit permanently from the system and thus the cohort will decrease in size over time. This study offers a unique opportunity to learn about the "Clients at the Follow-up" (clients who remain in the MHD system at each follow-up point): who are they, what are their health conditions, what are their patterns of service utilization, etc. A useful analysis in learning about the Clients at the Follow-up is a comparison of their characteristics with those of the entire cohort at the baseline.

This study thus addresses the following two questions:

1) What are the profiles of the Baseline Cohort and the Clients at the Follow-up?
2) What are the outcomes of the Baseline Cohort at the follow-up period, and which client characteristics are associated with variations in these outcomes?

This report examines client profiles and outcomes from the baseline to the two-year follow-up. To answer the two questions above, we performed two sets of analyses. One set compares the profile of Clients at the Two-Year Follow-up with the Baseline Cohort's profile. Clients are grouped into adults and children for these analyses. The second set consists of multivariate logistic analyses examining client characteristics associated with variations in the outcomes in 2004. This analysis is conducted for all adult clients from the baseline (see Exhibit 2).

***Exhibit 2***
**Clients Included in Profile Analysis and Outcome Analysis**




WSIPP, 2006

## Outcome Measures

ESSB 5583 stipulates that the Institute track the following outcome measures: employment/ education, housing stability, criminal justice involvement, and level of services needed. To track outcomes over time, two conditions are necessary. First, the same outcome measures must be available over time. Second, the same outcome measure must be available for all members of the study cohort. Our review of available data sources shows that outcome measure data for education, housing stability, and level of services needed are either non-existent or inconsistent.

**Education**. Education is generally measured in one of two ways: educational attainment and enrollment in educational institutions. With regard to clients' educational attainment (highest degree in education), none of the data sources reviewed contain this information. For education enrollment status, the data review shows there is no centralized source of person-level enrollment data for adults. The Office of Superintendent of Public Instruction (OSPI) maintains statewide first grade to high school enrollment data. However, linking the MHD data with the OSPI enrollment data resulted in an overall matching rate of half the school-age MHD clients, making it a questionable source for this study.

**Housing stability**. The only data source reviewed that contains housing information is the MHD service utilization file. It contains a measure called living situations with categories such as private residence, foster homes, 24-hour care, jail, homeless, etc. However, the measure of living situations is only available for clients currently in the MHD system. It is, therefore, not a suitable longitudinal measure for housing stability for all clients of this study.

**Level of services needed**. The determination of level of services needed depends on diagnoses of mental health conditions. The MHD service utilization file contains mental disorder diagnoses for clients only while they are in the system. Therefore, tracking the level of services needed over time for all clients of this study is not possible using the administrative data sources. In the absence of the outcome measure "level of services needed," Institute staff identified two related measures that are available over time and show actual usage of public health services. One measures the use of MHD services; the other measures the use of other public medical services provided by DSHS Medical Assistance Administration (MAA).

In addition to the use of MHD and MAA services, two of the requested outcomes, employment status and criminal justice involvement, can be tracked using available administrative data sources. The four outcome measures examined in this report are constructed as follows:

- **Utilization of public mental health services.** This measures whether a client used any MHD services in a year. At the baseline, all clients used the MHD services based on the selection criterion.

- **Utilization of other public medical services**. The term "other public medical services" refers to medical services other than MHD services provided by DSHS Medical Assistance Administration under the Medicaid program. To use these services, one must be eligible for and enrolled in Medicaid. In both 2002 and 2004,

if the client used any of these other public medical services, she or he is considered a user.

- **Employment**. This measure is based on the ESD unemployment insurance wage file. At the time of the analysis, the latest available period of data from ESD was the third quarter of 2004. This measure was constructed as the status of annual employment using data from the first three quarters of the year. In both 2002 and 2004, if a client was employed at any time during the first three quarters, she or he is considered employed.

- **Criminal justice involvement**. Based on the Institute's CJS database, this measure records client convictions for any felony crimes during a past two-year period. The crime information in the CJS database includes both misdemeanor and felony crimes. It also includes both charges and convictions. We selected felony convictions because this information is more accurate. For the baseline year, the criminal justice involvement measure records whether the client was convicted of any felony during the 2001–2002 period and, for 2004, it records whether the client was convicted of any felony during the 2003–2004 period.

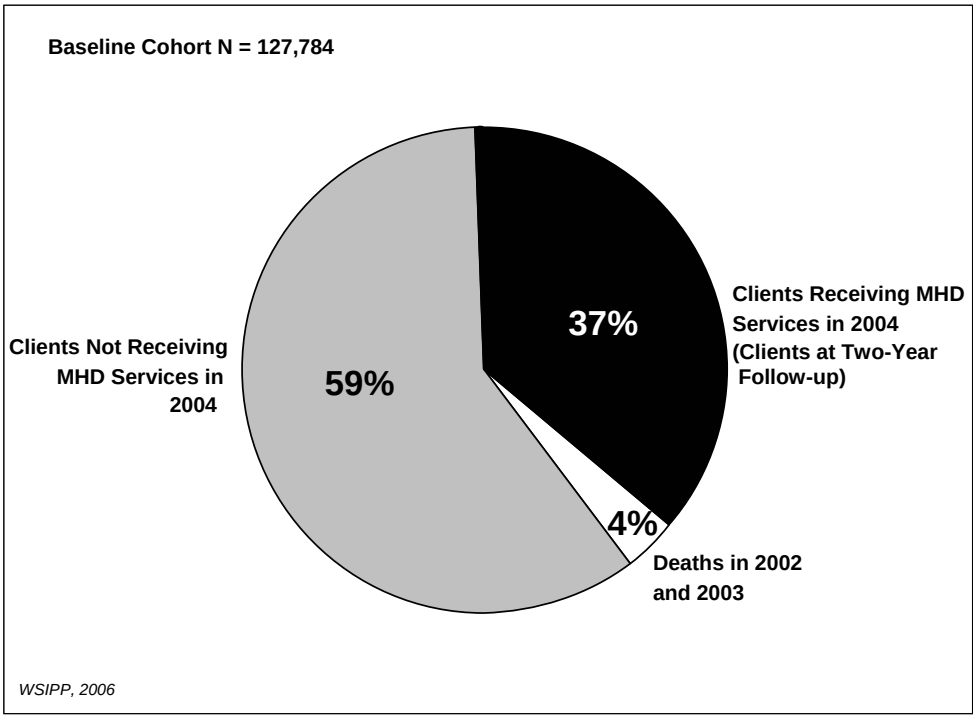
# SECTION III: PROFILES OF BASELINE COHORT AND CLIENTS AT THE TWO-YEAR FOLLOW-UP

This section compares characteristics of adults and children who received MHD services in 2002 with characteristics of those clients from the baseline who continued to receive MHD services in 2004. The next section follows selected outcomes of all baseline adult clients into 2004 and examines client characteristics associated with variations in those outcomes.

Client characteristics examined in this section include demographics, the Regional Support Network (RSN) where a client received MHD services, mental health conditions, public mental health service utilization, other public medical service utilization, employment status, and criminal justice involvement.

While the Baseline Cohort consists of all individuals who used any public mental health services in 2002 provided by MHD, Clients at the Two-year Follow-up are those baseline clients who continued to use MHD services in 2004. Exhibit 3 shows Baseline Cohort attrition from 2002 to 2004. In 2002, there were 127,784 clients recorded in the MHD service utilization data system.[9] Of these clients, 37 percent (or 46,756 clients) continued to receive MHD services in 2004, 4 percent died in 2002 and 2003, and the remaining 59 percent of Baseline Cohort clients received no MHD services in 2004.

***Exhibit 3***
**Attrition of Baseline Cohort in 2004**




[9] This figure is slightly different than the figure in previous Institute reports, because it is based on revised MHD encounter data and some minor adjustments in selection criteria. These changes have little impact on the client characteristics reported earlier.

## Age, Gender, and Race/Ethnicity

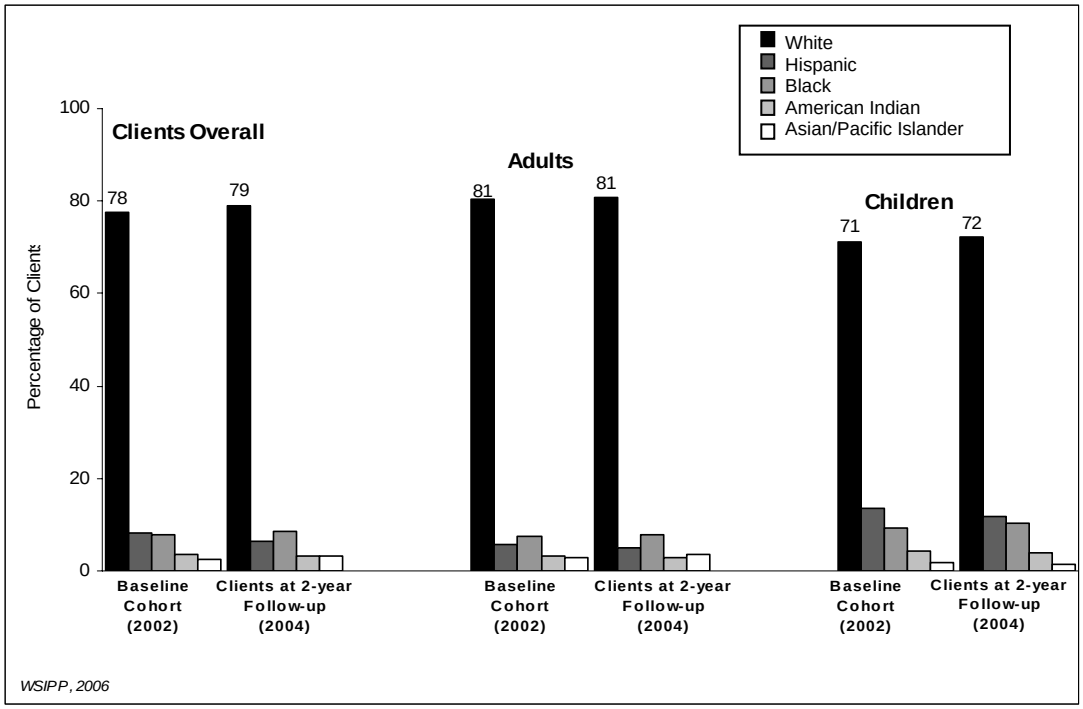
Clients at the Two-year Follow-up were slightly older than the Baseline Cohort but were similar in gender mix and racial/ethnic makeup.

**Age**. The average age of Clients at the Two-year Follow-up was 37 compared with age 34 of the Baseline Cohort clients, a difference of three years. Considering the two-year time lapse between 2002 and 2004, Clients at the Two-year Follow-up were, on average, one year older than the Baseline Cohort clients. Adults (ages 19 and above) accounted for 70 percent of the Baseline Cohort and 76.5 percent of Clients at the Two-Year Follow-up.

**Gender**. There is little difference in the proportion of female clients between the Baseline Cohort and Clients at the Two-year Follow-up. This is true among adults, children, and clients overall. Among clients overall, the proportion of females was approximately 52 percent for both the Baseline Cohort and Clients at the Two-year Follow-up. Among adults, female clients comprised about 56 percent for both groups. Finally, among children, the percentage of female Clients at the Two-year Follow-up was slightly smaller (40.9 percent) than the Baseline Cohort (43.3 percent). Compared with female adult clients, girls comprised a considerably smaller share of children receiving MHD services among both the Baseline Cohort and Clients at the Two-year Follow-up.

**Race/ethnicity**. Exhibit 4 shows that White clients constituted about 80 percent of the racial/ethnic makeup in both the Baseline Cohort and in Clients at the Two-year Follow-up for adults as well as clients overall. Among children, White clients constituted slightly more than 70 percent of both the Baseline Cohort and Clients at the Two-year Follow-up. Compared with adults, there were fewer White children, but more Hispanic children.

***Exhibit 4***
**Percentage of Clients by Race/Ethnicity**



## Regional Support Networks

An RSN is a mental health provider contracted with MHD to provide services to public mental health clients. There were 14 RSNs in both 2002 and 2004. Each RSN covered either one county or a group of counties.[10] Exhibit 5 shows the distribution of clients across the RSNs. Four of the 14 RSNs had 10 percent or more of both the Baseline Cohort and Clients at the Two-year Follow-up among adults, children, and clients overall: Greater Columbia, King, North Sound, and Pierce. For clients of all age groups, King RSN's share of Clients at the Two-year Follow-up was about 10 percentage points higher than its share of the Baseline Cohort, while Pierce RSN's share of Clients at the Two-year Follow-up was about 4 percentage points lower than its share of the Baseline Cohort.

***Exhibit 5***
**Percentage of Clients by RSN**

| | Total Clients | | Adults | | Children | |
|---|---|---|---|---|---|---|
| **RSN** | **Baseline Cohort (2002)** | **Clients at the Two-year Follow-up (2004)** | **Baseline Cohort (2002)** | **Clients at the Two-year Follow-up (2004)** | **Baseline Cohort (2002)** | **Clients at the Two-year Follow-up (2004)** |
| Chelan-Douglas | 2.1 | 1.4 | 2.1 | 1.4 | 2.0 | 1.6 |
| Clark | 5.5 | 6.5 | 4.9 | 5.8 | 7.0 | 7.0 |
| Grays Harbor | 1.7 | 1.6 | 1.6 | 1.5 | 2.0 | 2.0 |
| *Greater Columbia* | *12.8* | *10.7* | *12.4* | *10.2* | *13.7* | *12.5* |
| *King* | *24.3* | *33.1* | *25.4* | *34.3* | *21.6* | *29.4* |
| North Central | 2.2 | 2.2 | 2.0 | 2.3 | 2.4 | 2.0 |
| North East | 1.4 | 0.8 | 1.4 | 0.9 | 1.4 | 0.8 |
| *North Sound* | *14.5* | *13.7* | *13.9* | *13.3* | *16.0* | *15.0* |
| Peninsula | 5.3 | 6.0 | 5.6 | 6.5 | 4.5 | 4.4 |
| *Pierce* | *12.4* | *7.9* | *12.4* | *7.8* | *12.4* | *8.1* |
| Southwest | 3.5 | 3.9 | 3.7 | 3.9 | 3.3 | 3.8 |
| Spokane | 7.9 | 7.8 | 8.0 | 7.5 | 7.9 | 8.8 |
| Thurston-Mason | 3.9 | 3.9 | 3.8 | 3.8 | 4.1 | 4.2 |
| Timberlands | 3.2 | 2.7 | 3.4 | 2.7 | 2.8 | 2.6 |

*WSIPP, 2006*
Note 1: RSN for the two-year sample is based on designation in baseline year.
Note 2: Italicized rows contain at least one cell greater than 10 percent.

## Mental Health Conditions

Two mental health measures are presented in this section: (1) primary diagnoses of mental disorders and (2) global assessment of functioning (GAF). The most prevalent diagnosis among adult Clients at the Two-year Follow-up was schizophrenia, while the diagnosis with the largest share of Baseline Cohort adults was major depression. Clients at the Two-year Follow-up of all age groups had slightly lower GAF scores.

[10] For a list of counties served by each RSN, see Appendix A.

**Primary diagnoses**. Exhibit 6 shows prevalence rates of select mental disorders among the Baseline Cohort and Clients at the Two-year Follow-up, broken down by adults, children, and clients overall. In the Baseline Cohort, the most prevalent diagnosis was other mental health disorders (20.7 percent). For Clients at the Two-year Follow-up, schizophrenia (16.8 percent) and major depression (16.7 percent) were the two most prevalent diagnoses. For adults, the most prevalent disorder among the Baseline Cohort was major depression (21.4 percent), while among Clients at the Two-year Follow-up, the most prevalent disorder was schizophrenia (21.8 percent). For children, the most prevalent disorder among the Baseline Cohort was other mental health disorders (41.7 percent), while among Clients at the Two-year Follow-up the most prevalent mental disorder was ADD (21.7 percent).

***Exhibit 6***
**Percentage of Clients With Select Primary Diagnoses of Mental Disorders**

| | Total Clients | | Adults | | Children | |
|---|---|---|---|---|---|---|
| **Primary Diagnosis** | **Baseline Cohort (2002)** | **Clients at the Two-year Follow-up (2004)** | **Baseline Cohort (2002)** | **Clients at the Two-year Follow-up (2004)** | **Baseline Cohort (2002)** | **Clients at the Two-year Follow-up (2004)** |
| ADD | 5.6 | 5.7 | 0.8 | 0.8 | 16.1 | 21.7 |
| Anxiety | 11.9 | 12.4 | 11.9 | 11.4 | 12.1 | 15.5 |
| Autism/Development | 2.1 | 2.0 | 1.6 | 1.5 | 3.1 | 3.5 |
| Bipolar | 9.8 | 12.4 | 13.4 | 15.0 | 1.9 | 3.7 |
| Conduct Disorder | 7.3 | 5.1 | 0.9 | 0.8 | 21.4 | 19.2 |
| Dementia | 3.3 | 2.6 | 4.6 | 3.3 | 0.3 | 0.3 |
| Major Depression | 16.6 | 16.7 | 21.4 | 19.9 | 6.1 | 6.3 |
| Personality Disorder | 5.8 | 4.7 | 8.2 | 6.1 | 0.5 | 0.3 |
| Schizophrenia | 11.1 | 16.8 | 15.9 | 21.8 | 0.4 | 0.5 |
| Substance Dependence | 4.8 | 3.2 | 6.5 | 4.0 | 1.0 | 0.8 |
| Other Childhood Disorders | 0.9 | 0.6 | 0.1 | 0.1 | 2.6 | 2.2 |
| Other Mood Disorders | 13.1 | 12.3 | 13.7 | 9.6 | 11.7 | 12.4 |
| Other Psychotic Disorders | 3.4 | 3.4 | 4.7 | 4.3 | 0.7 | 0.4 |
| Other Mental Health Disorders | 20.7 | 7.4 | 11.1 | 3.6 | 41.7 | 19.6 |

*WSIPP, 2006*
Note: Column total may exceed 100 percent because of cross-listing of primary diagnoses.

**Global Assessment of Functioning**.[11] The GAF scores of the Baseline Cohort and Clients at the Two-year Follow-up follow a similar pattern for clients overall, adults, and children: Clients at the Two-year Follow-up had slightly worse (lower) scores than the Baseline Cohort. Adults, as well as clients overall, had average GAF scores that were slightly below 50, the mid-point of the assessment scale. Children's average functioning assessment scores were slightly higher than 50.

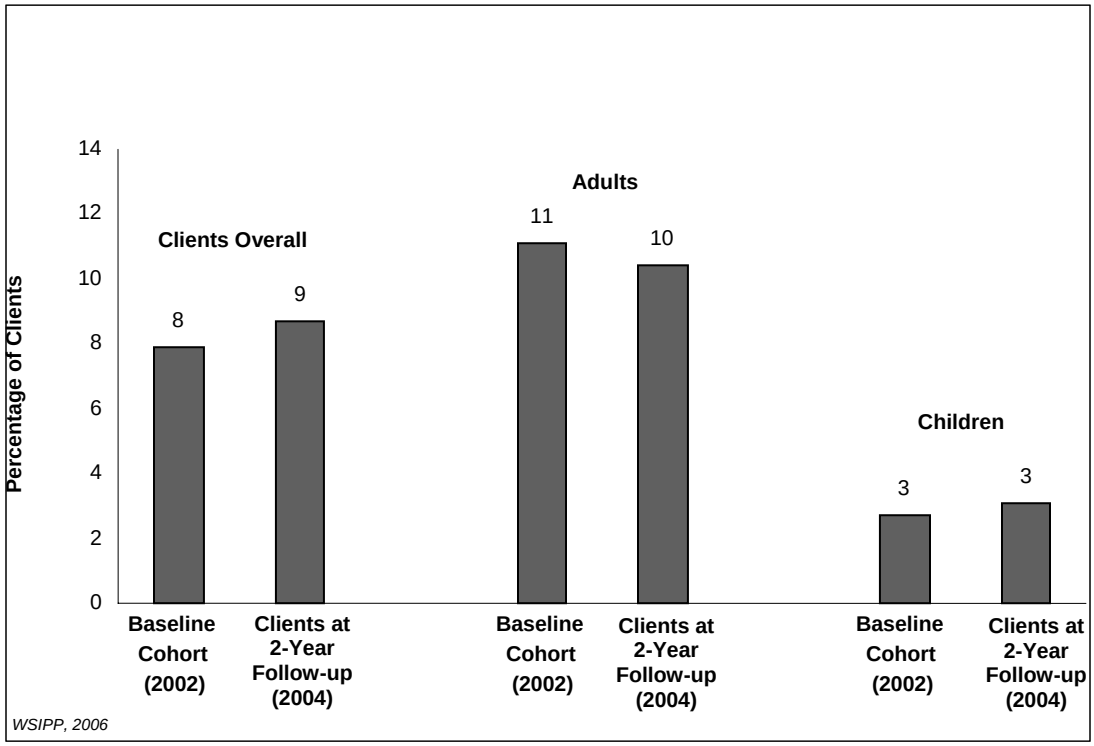
[11] MHD periodically assesses clients' overall functioning. The assessment differs for adults 18 and older, children 6 through 17, and children under 6. However, for all age groups, the assessment is measured on a scale from 1 to 100, where the lowest scores mean persistent problems with functioning (or even danger to self or others), and the highest scores mean superior functioning. Although the assessment is named differently for each age group, the term "global assessment of functioning," originally used for the adult assessment, is used here to refer to the assessment of all age groups.

## Utilization of Public Mental Health Services

Measures of public mental health service utilization examined include: (1) use of inpatient services, (2) days in hospital, and (3) hours of outpatient services. Clients at the Two-year Follow-up had longer hospital stays and more hours of outpatient services than the Baseline Cohort. There were only slight differences in proportions of clients using inpatient services.

**Use of inpatient services**. Exhibit 7 shows percentages of clients using inpatient services. Overall, 7.9 percent of Baseline Cohort clients and 8.7 percent of Clients at the Two-year Follow-up used inpatient services. For adults, Clients at the Two-year Follow-up used a slightly smaller proportion of inpatient services than the Baseline Cohort (10.4 percent vs. 11.1 percent). For children, the proportion among Clients at the Two-year Follow-up was slightly greater than the Baseline Cohort (3.1 percent vs. 2.7 percent). Compared with adults, fewer children used inpatient services.

***Exhibit 7***
**Percentage of Clients Using Inpatient Services**




**Days in hospital**. Clients at the Two-year Follow-up had longer hospital stays than the Baseline Cohort. Overall, Clients at the Two-year Follow-up had an average hospital stay that was 22 days longer than the Baseline Cohort (69 vs. 47 days). For adults, the average hospital stay among Clients at the Two-year Follow-up was also 22 days longer than the Baseline Cohort (70 vs. 48 days). For children, the average hospital stay among Clients at the Two-year Follow-up was 14 days longer than the Baseline Cohort (50 vs. 36 days). Children's hospital days were fewer than adult days.

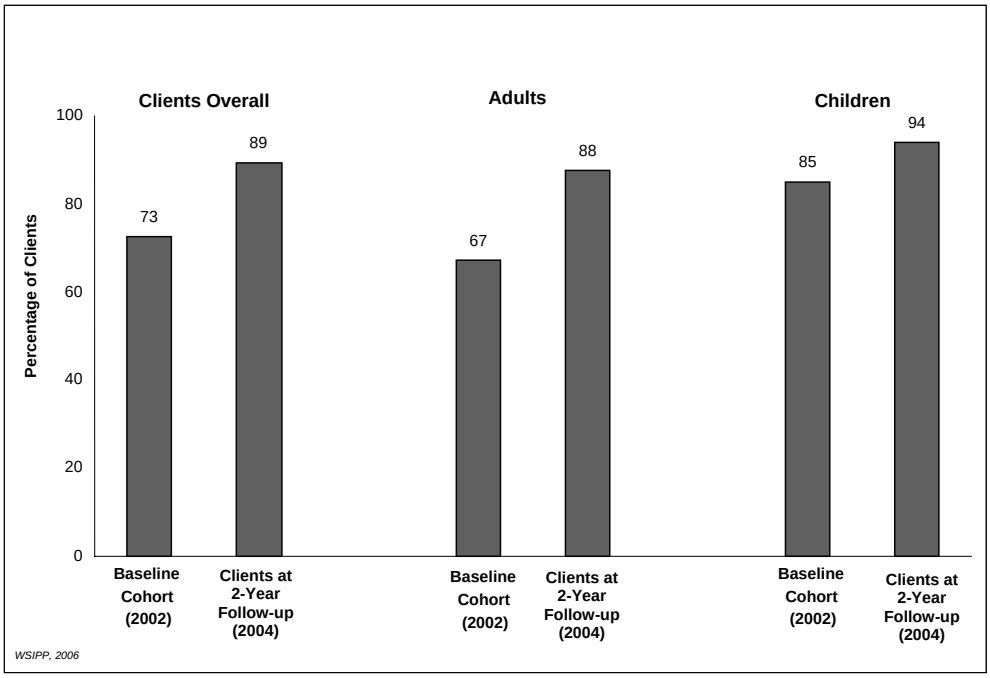
**Hours of outpatient services.** Across all age groups, Clients at the Two-year Follow-up used more hours of outpatient services than the Baseline Cohort. Overall, Clients at the Two-year Follow-up used 11 more hours than the Baseline Cohort clients (35 vs. 24 hours). Adult Clients at the Two-year Follow-up used 12 more hours on average than adults in the Baseline Cohort (37 vs. 25 hours). Among Clients at the Two-year Follow-up, children used 7 more hours than children in the Baseline Cohort (29 vs. 22 hours).

## Utilization of Other Public Medical Care Services

In addition to public mental health services, MHD clients who qualify for Medicaid also have access to other publicly funded medical care provided by DSHS Medical Assistance Administration (MAA). Three MAA service measures are presented here: (1) Medicaid enrollment, (2) number of MAA service encounters, and (3) MAA service encounters involving mental health conditions. For all three measures, usage by Clients at the Two-year Follow-up was higher than by the Baseline Cohort.

**Medicaid enrollment.** Exhibit 8 shows that the majority of both Clients at the Two-year Follow-up and the Baseline Cohort were enrolled in Medicaid; however, the percentage enrolled in Medicaid was greater for Clients at the Two-year Follow-up than for the Baseline Cohort among all age groups. Overall, 89 percent of Clients at the Two-year Follow-up were enrolled in Medicaid compared with 73 percent of the Baseline Cohort. Similarly, 88 percent of adult Clients at the Two-year Follow-up were in Medicaid compared with 67 percent of adults in the Baseline Cohort. Finally, 94 percent of children from Clients at the Two-year Follow-up were in Medicaid compared with 85 percent of children in the Baseline Cohort. Compared with adults, more children served by MHD were enrolled in Medicaid.

***Exhibit 8***
**Percentage of Clients Enrolled in Medicaid**



**MAA service encounters.**[12] The data suggest that Clients at the Two-year Follow-up had more MAA service encounters than the Baseline Cohort. This is true for adults, children, and clients overall. Among clients overall, the average MAA service encounters among Clients at the Two-year Follow-up exceeded those of the Baseline Cohort by eight encounters (39 vs. 31 encounters). Among adults, Clients at the Two-year Follow-up had six more encounters than the Baseline Cohort (45 vs. 39 encounters). Finally, children of Clients at the Two-year Follow-up had four more encounters than children of the Baseline Cohort (22 vs. 18 encounters). Compared with adults, children had far fewer MAA service encounters.

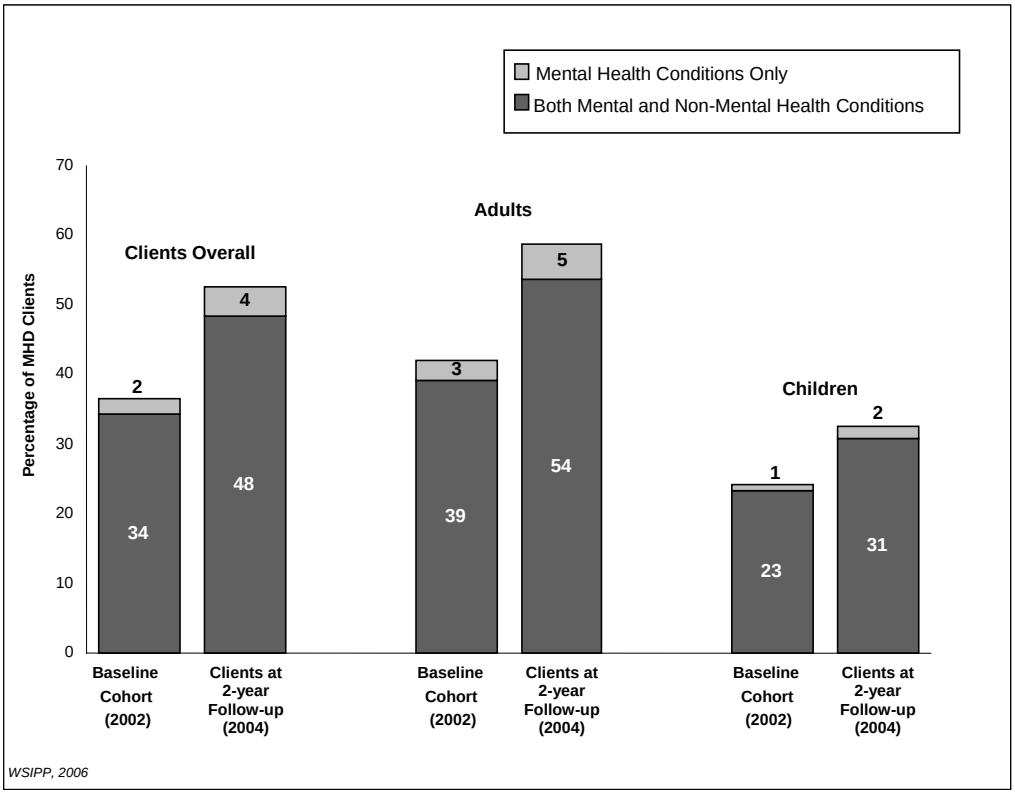
**MAA service encounters involving mental health conditions**. Although MHD is the main source for public mental health services, it is common for MHD clients enrolled in Medicaid to receive treatment for their mental health conditions through MAA as well. However, when they are treated for mental health conditions through MAA, they are usually treated for some non-mental conditions at the same time.

Exhibit 9 shows the percentage of MHD clients who received MAA services for mental health conditions. The percentages shown include two situations: receipt of MAA services for mental health conditions only and receipt of MAA services for both mental health and non-mental health conditions.

The data show that, across age groups, Clients at the Two-year Follow-up had a larger proportion receiving MAA services for mental health conditions. Overall, approximately 36 percent of the Baseline Cohort received MAA services for mental health conditions, with 2 percent for mental health conditions only. In comparison, about 52 percent of Clients at the Two-year Follow-up received MAA services for mental health conditions, with 4 percent for mental health conditions only. For adults, 42 percent of the Baseline Cohort received MAA services for mental health conditions, compared with 59 percent of Clients at the Two-year Follow-up. For children, 24 percent of the Baseline Cohort received MAA services for mental health conditions compared with 33 percent of Clients at the Two-year Follow-up. Compared with adults, fewer children had MAA encounters that involved mental health conditions.

[12] An MAA service encounter in this report refers to either a single day with multiple services or a single service across multiple days. Where a single day with multiple services and a single service across multiple days overlap, it is counted in one or the other category, but not both.

***Exhibit 9***
**Percentage of MHD Clients Receiving MAA Services for Mental Health Conditions**




## Primary Living Situations

The prevailing living situation for MHD clients was private residence (with or without support) among all client groups examined. Exhibit 10 shows that between 77 and 85 percent of these client groups reported living in a private residence. The exhibit also shows that while the second most common living situation for adults was homeless/shelter, for children it was foster home.

***Exhibit 10***
**Percentage of Living Situations**

| | Total | | Adults | | Children | |
|---|---|---|---|---|---|---|
| | **Baseline Cohort (2002)** | **Clients at the Two-year Follow-up (2004)** | **Baseline Cohort (2002)** | **Clients at the Two-year Follow-up (2004)** | **Baseline Cohort (2002)** | **Clients at the Two-year Follow-up (2004)** |
| Private Residence | 79.2 | 81.1 | 76.6 | 79.9 | 84.5 | 84.7 |
| Foster Home | 2.8 | 3.4 | 0.7 | 1.5 | 7.3 | 9.3 |
| 24-hour Residential Care | 3.1 | 3.6 | 4.3 | 4.6 | 0.5 | 0.6 |
| Institutional Setting | 3.1 | 2.9 | 4.5 | 3.8 | 0.1 | 0.2 |
| Jail/Juvenile Corrections | 3.6 | 1.4 | 3.6 | 1.2 | 3.8 | 1.9 |
| Homeless/Shelter | 4.3 | 3.8 | 5.8 | 4.8 | 1.2 | 0.7 |
| Other/Multiple Situations | 3.9 | 3.8 | 4.6 | 4.2 | 2.5 | 2.7 |

*WSIPP, 2006*

## Employment and Wage Earnings

For this report, the latest period ESD employment and earnings data was available was the third quarter of 2004. To compare 2002 and 2004, a summary "annual" measure was created for both employment status and earnings based on the first three quarters of each year. The analysis was limited to adults of working ages between 19 and 64. Employment status refers to whether a client was employed in any of the first three quarters of the year; wage earnings include all such earnings in the first three quarters.

Fewer adult Clients at the Two-year Follow-up were employed compared with the Baseline Cohort. Among Clients at the Two-year Follow-up, the employment rate in the first three quarters of the year was 17.9 percent, compared with the corresponding rate of 27.9 percent among the Baseline Cohort. When employed, Clients at the Two-year Follow-up also earned less than the Baseline Cohort. Clients at the Two-year Follow-up earned $5,145 on average, about three-fourths of the Baseline Cohort ($6,885).[13]

An Institute report on employment characteristics of the Baseline Cohort shows that there was a considerable disparity in the employment rates between MHD clients and the state's general population. This report shows that the annual employment rate in 2002 among MHD adult clients (ages 19 and older) was 27 percent compared with 70 percent of the state's general population.[14]

## Criminal Justice Involvement

For criminal justice involvement, we measured whether a client was convicted of felony crimes during 2001–2002 for the Baseline Cohort, and during 2003–2004 for Clients at the Two-year Follow-up. A felony conviction is rare among children. Therefore, the analysis of this measure is limited to adults only. The analysis shows that proportionately fewer Clients at the Two-year Follow-up had felony convictions in 2003–2004 than the Baseline Cohort in 2001–2002 (4.8 percent vs. 6.5 percent).

An Institute report that examined baseline characteristics in detail noted that proportionately more MHD adult clients had felony convictions than the state's general adult population.[15] The study found that 16 percent of the MHD adult client population in 2002 had at least one felony conviction in their lifetime compared with 7 percent of adults in the general population.

---

[13] The dollar values between the two years are held constant to values in 2002.

[14] J. Mayfield (2005). *Employment Characteristics of Clients Receiving Public Mental Health Services* (Document No. 05-10-3902). Olympia: Washington State Institute for Public Policy.

[15] W. Yen (2005). *Criminal Justice Involvement Among Clients Receiving Public Mental Health Services* (Document No. 05-10-3901). Olympia: Washington State Institute for Public Policy.

## Summary

Clients at the Two-year Follow-up differed from the Baseline Cohort in a number of client characteristics. In general, Clients at the Two-year Follow-up tended to be more frequent users of both MHD and MAA services, more likely to be in King RSN, and more likely to be enrolled in Medicaid. Compared with the Baseline Cohort, clients at the Two-year Follow-up also had higher rates of schizophrenia and bipolar among adults, and higher rates of ADD and anxiety among children. Adult Clients at the Two-year Follow-up had a lower employment rate, earned less when employed, but had a lower rate of felony convictions when compared with the Baseline Cohort. Clients at the Two-year Follow-up appeared to be similar to the Baseline Cohort in gender distribution, racial/ethnic makeup, proportion living in private residences, and GAF scores.

The next section tracks outcomes of baseline adult clients from 2002 to 2004 and examines client characteristics that are associated with variations in those outcomes.

# SECTION IV: OUTCOMES AND ASSOCIATED CHARACTERISTICS OF ADULT CLIENTS

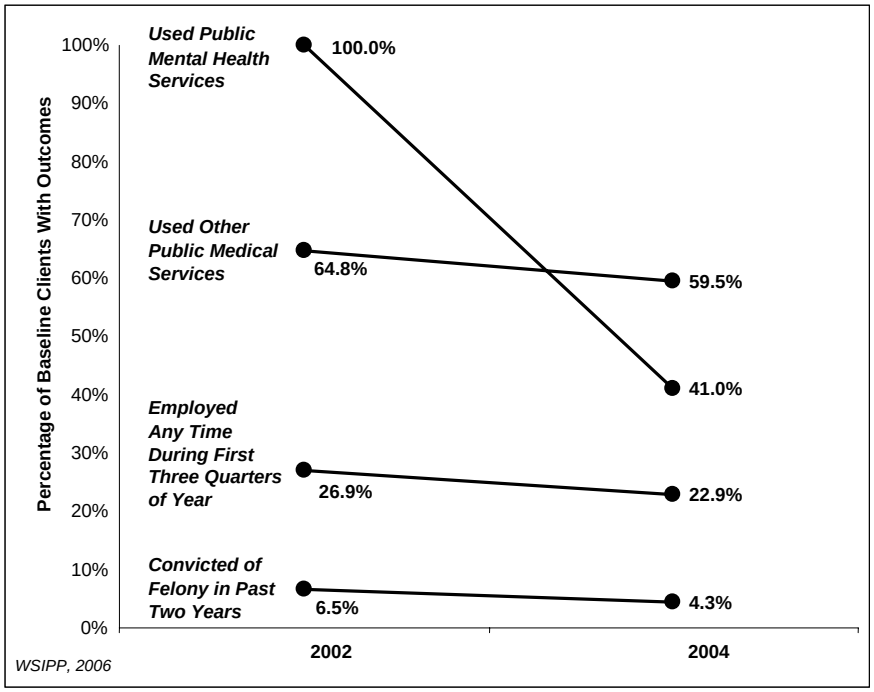
The previous section examined and compared characteristics of the Baseline Cohort and Clients at the Two-year Follow-up. This section tracks four outcomes of all adult clients from the 2002 baseline year to 2004 and identifies client characteristics associated with variations in these outcomes. Again, the following are the four outcome measures:

1) Utilization of public mental health services (MHD)
2) Utilization of other public medical services (MAA)
3) Employment
4) Conviction of felony in past two years

## Outcome Changes Between 2002 and 2004

Exhibit 11 shows changes in the four outcomes from 2002 to 2004 among all adults from the baseline.[16] While these clients were selected because they used MHD services in 2002, the data show that only 41 percent continued to use MHD services in 2004. Their use of MAA services also decreased from 65 percent in 2002 to 60 percent in 2004. Fewer were employed in 2004 (23 percent) than in 2002 (27 percent). Finally, the felony conviction rate declined from 6.5 percent in 2001–2002 to 4.3 in 2003–2004.

***Exhibit 11***
**Outcome Changes for Adults: 2002 to 2004**




[16] Clients who died in 2002 and 2003 were excluded in the calculation of rates for 2004 in this section.

## Selection of Client Characteristics for Outcome Analyses

Exhibit 12 lists client characteristic measures used in each outcome analysis. These characteristics were selected based on review of available data sources and their relevance to the outcomes. The majority of these characteristics are measures for 2002 and are included in all four outcome analyses. In addition, each outcome measure for 2004 is treated as a client characteristic in the analyses of the other three outcomes. Also, except for MHD service utilization, each outcome analysis includes the outcome measure for 2002 as a predictor of the outcome in 2004. For example, the analysis of the utilization of MAA services in 2004 includes prior use of MAA services in 2002 as a predictor.

***Exhibit 12***
**Outcomes and Client Characteristics**

| | **Outcomes** | | | |
|---|---|---|---|---|
| **Characteristics** | **Use of MHD Services in 2004** | **Use of MAA Services in 2004** | **Employment in 2004** | **Felony Convictions since 2002** |
| Age | ✓ | ✓ | ✓ | ✓ |
| Gender | ✓ | ✓ | ✓ | ✓ |
| Race/Ethnicity | ✓ | ✓ | ✓ | ✓ |
| RSN of Service in 2002 | ✓ | ✓ | ✓ | ✓ |
| Living Situation in 2002 | ✓ | ✓ | ✓ | ✓ |
| Primary Diagnoses in 2002 | ✓ | ✓ | ✓ | ✓ |
| Global Assessment of Functioning Scores in 2002 | ✓ | ✓ | ✓ | ✓ |
| Use of Inpatient Services in 2002 | ✓ | ✓ | ✓ | ✓ |
| Amount of Outpatient Services in 2002 | ✓ | ✓ | ✓ | ✓ |
| Use of MAA Services in 2002 | | ✓ | | |
| Employment in 2002 | | | ✓ | |
| Felony Convictions as of 2002 | | | | ✓ |
| Use of MHD Services in 2004 | | ✓ | ✓ | ✓ |
| Use of MAA Services in 2004 | ✓ | | ✓ | ✓ |
| Employment in 2004 | ✓ | ✓ | | ✓ |
| Felony Convictions since 2002 | ✓ | ✓ | ✓ | |

The four sections below show how these client characteristics are related to the outcomes in question. See Appendix B for more information on the research methods used for the outcome analyses as well as the statistical results.

## Client Characteristics Associated With Utilization of MHD Services in 2004

Exhibit 13 shows how client characteristics are associated with utilization of MHD services in 2004. The strongest association is clients' utilization of MAA services in 2004.

- *Clients who used MAA services in 2004 were over 5 times more likely to receive MHD services in 2004 than those who did not.*

Other significant associations between client characteristics and use of MHD services in 2004 include the following:

- Presence of schizophrenia in 2002 diagnoses increased a client's probability of using MHD services in 2004 by 123 percent. The probabilities for clients with bipolar and other psychotic disorders were also higher by 61 and 57 percent, respectively.
- For every 1 percent increase in MHD outpatient service hours in 2002, the probability of using MHD services in 2004 increased by 36 percent.
- When compared with clients in King RSN, clients in Pierce RSN and Northeast RSN were 71 percent and 66 percent, respectively, less likely to use MHD services in 2004.
- Clients in a 24-hour-care setting were less likely to use MHD services in 2004 by 37 percent when compared with clients in private residences.

***Exhibit 13***

**Probabilities of Using MHD Services in 2004**

| Client Characteristics | Probability of Using MHD Services in 2004 (relative to comparison group) | Percent of Probability Higher or Lower Than Comparison Group |
|---|---|---|
| Race/Ethnicity (comparison group: White) | | |
| Black | No Difference | |
| Hispanic | Lower | 13 |
| Asian | No Difference | |
| American Indian/Alaska Native | No Difference | |
| Race/Ethnicity Unknown | Lower | 52 |
| Gender (comparison group: male) | | |
| Female | Lower | 12 |
| Age (comparison group: next younger group) | | |
| Age in increments of 10 years | Higher | 5 |
| RSN (comparison group: King RSN) | | |
| Chelan-Douglas | Lower | 47 |
| Clark | No Difference | |
| Grays Harbor | Lower | 47 |
| Greater Columbia | Lower | 42 |
| North Central | Lower | 28 |
| Northeast | Lower | 66 |
| North Sound | Lower | 17 |
| Peninsula | Lower | 9 |
| Pierce | Lower | 71 |
| Southwest | No Difference | |
| Spokane | Lower | 36 |
| Thurston-Mason | Lower | 40 |
| Timberlands | No Difference | |
| Living Situation (comparison group: private residence) | | |
| Homeless/Shelter | No Difference | |
| 24-hour Setting | Lower | 37 |
| Jail/Corrections Facilities | No Difference | |
| Other Situations | Lower | 15 |
| Living Situation Unknown | No Difference | |
| Primary Diagnosis (comparison group: clients without the mentioned diagnosis) | | |
| Bipolar | Higher | 61 |
| Dementia | No Difference | |
| Major Depression | Higher | 13 |
| Other Mental Disorders | Lower | 15 |
| Other Mood Disorders | Lower | 6 |
| Other Psychotic Disorders | Higher | 57 |
| Personality Disorders | No Difference | |
| Schizophrenia | Higher | 123 |
| Substance Dependence | Higher | 13 |
| Anxiety | Higher | 13 |
| Childhood Disorders | Higher | 14 |
| GAF Score (comparison group: clients with scores of 50 plus) | | |
| Score Unknown | Lower | 25 |
| Less than 50 | Lower | 3 |
| Use of MAA Services in 2004 (comparison group: "No") | | |
| Yes | Higher | 547 |
| Use of Inpatient Services in 2002 (comparison group: "No") | | |
| Yes | Higher | 11 |
| Hours of Outpatient Services in 2002 (comparison group: next lower percentage group) | | |
| Hours (in percent of increase) | Higher | 36 |
| Employment in 2004 (comparison group: not employed) | | |
| Employed | Lower | 16 |
| Felony Convictions 2003-2004 (comparison group: no convictions) | | |
| Convicted | Higher | 20 |

### Client Characteristics Associated With Utilization of MAA Services in 2004

Exhibit 14 shows how client characteristics are associated with utilization of MAA services in 2004. Two client characteristics stand out in their association with clients' utilization of MAA services in 2004.

- *Clients who used MAA services in 2002, compared with those who did not, were nearly 20 times more likely to use MAA services again in 2004.*
- *Clients who used MHD services in 2004, compared with clients who did not, were nearly 7 times more likely to use MAA services in 2004.*

Among other significant associations between client characteristics and use MAA services in 2004 are the following:

- Female clients had a 58 percent greater probability than male clients of using MAA services in 2004.
- Presence of childhood disorders in 2002 diagnoses increased the probability of using MAA services by 52 percent.
- Compared with clients in King RSN, clients in Northeast, Grays Harbor, and Pierce RSNs were more likely to use MAA services in 2004 by 30 percent, 31 percent, and 32 percent, respectively.
- The probability of MAA service utilization in 2004 for clients who used MHD inpatient services in 2002 was 40 percent less than that of clients who did not use inpatient services in 2002.

***Exhibit 14***

**Probabilities of Using MAA Services in 2004**

| Client Characteristics | Probability of Using MAA Services in 2004 (relative to comparison group) | Percent of Probability Higher or Lower Than Comparison Group |
|---|---|---|
| Race/Ethnicity (comparison group: White) | | |
| Black | Higher | 12 |
| Hispanic | Lower | 21 |
| Asian | No Difference | |
| American Indian/Alaska Native | No Difference | |
| Race/Ethnicity Unknown | Lower | 23 |
| Gender (comparison group: male) | | |
| Female | Higher | 58 |
| Age (comparison group: next younger group) | | |
| Age in increments of 10 years | Lower | 8 |
| RSN (comparison group: King RSN) | | |
| Chelan-Douglas | Higher | 18 |
| Clark | Lower | 17 |
| Grays Harbor | Higher | 31 |
| Greater Columbia | Higher | 14 |
| North Central | Higher | 15 |
| Northeast | Higher | 30 |
| North Sound | Higher | 9 |
| Peninsula | No Difference | |
| Pierce | Higher | 32 |
| Southwest | Lower | 11 |
| Spokane | Higher | 21 |
| Thurston-Mason | Higher | 13 |
| Timberlands | Lower | 12 |
| Living Situation (comparison group: private residence) | | |
| Homeless-Shelters | Lower | 22 |
| 24-hour Setting | Lower | 9 |
| Jail-Corrections Facilities | No Difference | |
| Other Situations | No Difference | |
| Living Situation Unknown | Lower | 8 |
| Primary Diagnosis (comparison group: clients without the mentioned diagnosis) | | |
| Bipolar | Lower | 13 |
| Dementia | Lower | 18 |
| Major Depression | No Difference | |
| Other Mental Disorders | No Difference | |
| Other Mood Disorders | No Difference | |
| Other Psychotic Disorders | Lower | 14 |
| Personality Disorders | No Difference | |
| Schizophrenia | Higher | 26 |
| Substance Dependence | Lower | 18 |
| Anxiety | No Difference | |
| Childhood Disorders | Higher | 52 |
| GAF Score (comparison group: clients with scores of 50 plus) | | |
| Score Unknown | No Difference | |
| Less than 50 | No Difference | |
| Use of MAA Services in 2004 (comparison group: "No") | | |
| Yes | Higher | 1964 |
| Use of Inpatient Services in 2002 (comparison group: "No") | | |
| Yes | Lower | 40 |
| Hours of Outpatient Services in 2002 (comparison group: next lower increment) | | |
| Hours in increment of 50 hours | Higher | 3 |
| Employment in 2004 (comparison group: not employed) | | |
| Employed | Lower | 9 |
| Felony Convictions 2003-2004 (comparison group: no convictions) | | |
| New Convictions | No Difference | |
| Use of MHD Services in 2004 (comparison group: "No") | | |
| Yes | Higher | 661 |

## Client Characteristics Associated with Employment in 2004

Exhibit 15 contains results of the outcome analysis of employment in 2004. Employment in 2002 is by far the strongest predictor of clients' employment in 2004.

- *Clients who worked in 2002, compared with those who did not, were nearly 11 times more likely to be employed in 2004.*

Other significant associations between client characteristics and clients' probability of employment in 2004 include the following:

- For every increase of 10 years in age, the probability of being employed in 2004 decreased by 31 percent.
- Compared with clients living in private residences in 2002, clients in all other known living situations were significantly less likely to be employed in 2004, by 19 to 45 percent.
- Probability of being employed in 2004 was 50 percent lower for clients with dementia diagnoses in 2002.

***Exhibit 15***

**Probabilities of Being Employed in 2004**

| Client Characteristics | Probability of Being Employed in 2004 (relative to comparison group) | Percent of Probability Higher or Lower Than Comparison Group |
|---|---|---|
| Race/Ethnicity (comparison group: White) | | |
| Black | No Difference | |
| Hispanic | Lower | 11 |
| Asian | No Difference | |
| Native American | No Difference | |
| Race/Ethnicity Unknown | No Difference | |
| Gender (comparison group: male) | | |
| Female | No Difference | |
| Age (comparison group: next younger group) | | |
| Age in increments of 10 years | Lower | 31 |
| RSN (comparison group: King RSN) | | |
| Chelan-Douglas | No Difference | |
| Clark | No Difference | |
| Grays Harbor | No Difference | |
| Greater Columbia | Higher | 11 |
| North Central | No Difference | |
| Northeast | No Difference | |
| North Sound | No Difference | |
| Peninsula | Higher | 12 |
| Pierce | No Difference | |
| Southwest | No Difference | |
| Spokane | No Difference | |
| Thurston-Mason | Lower | 17 |
| Timberlands | No Difference | |
| Living Situation (comparison group: private residence) | | |
| Homeless-Shelters | Lower | 19 |
| 24-hour Setting | Lower | 45 |
| Jail-Corrections Facilities | Lower | 19 |
| Other Situations | Lower | 19 |
| Living Situation Unknown | Lower | 8 |
| Primary Diagnosis (comparison group: clients without the mentioned diagnosis) | | |
| Bipolar | Lower | 8 |
| Dementia | Lower | 50 |
| Major Depression | Higher | 8 |
| Other Mental Disorders | Higher | 19 |
| Other Mood Disorders | No Difference | |
| Other Psychotic Disorders | Lower | 18 |
| Personality Disorders | Lower | 14 |
| Schizophrenia | Lower | 19 |
| Substance Dependence | No Difference | |
| Anxiety | No Difference | |
| Childhood Disorders | No Difference | |
| GAF Score (comparison group: clients with scores of 50 plus) | | |
| Score Unknown | No Difference | |
| Less than 50 | Lower | 23 |
| Use of MAA Services in 2004 (comparison group: "No") | | |
| Yes | Lower | 9 |
| Use of Inpatient Services in 2002 (comparison group: "No") | | |
| Yes | Lower | 13 |
| Hours of Outpatient Services in 2002 (comparison group: less than 5.75 hours) | | |
| 5.75 or More Hours | No Difference | |
| Employment in 2002 (comparison group: not employed) | | |
| Employed | Higher | 1096 |
| Felony Convictions 2003-2004 (comparison group: no convictions) | | |
| New Convictions | Lower | 9 |
| Use of MHD Services in 2004 (comparison group: "No") | | |
| Yes | Lower | 14 |

## Client Characteristics Associated With Felony Convictions in 2003–2004

Exhibit 16 shows the results of outcome analysis of felony convictions in the two-year follow-up period (2003–2004). The most significant factor for this outcome is a client's history of felony convictions as of 2002.

- *Clients with a history of felony convictions were over 6 times more likely than clients without a history to have felony convictions during 2003–2004.*

Other significant associations between client characteristics and felony convictions in 2003–2004 include the following:

- When compared with clients no longer in the MHD system in 2004, those who remained in the system were 91 percent more likely to have convictions during 2003–2004.
- When compared with non-Hispanic White clients, non-Hispanic Black clients were 48 percent more likely, and non-Hispanic Asian clients were 31 percent less likely to have felony convictions during 2003–2004.
- Female clients were 30 percent less likely than male clients to have felony convictions during 2003–2004.
- Every 10-year age increment reduced the probability of having felony convictions during 2003–2004 by 40 percent.
- When compared with King RSN, clients in Northeast were 42 percent less likely, while clients in Chelan-Douglas, Clark, Southwest, Greater Columbia, Peninsula, Pierce, and Thurston-Mason were 24 to 90 percent more likely to have felony convictions in 2002–2004.
- Compared with living in private residences, clients in 24-hour-care settings were 51 percent less likely, while clients in the remaining living situations were 31 to 79 percent more likely to have felony convictions during 2003–2004.
- Clients with substance dependence disorders in 2002 were 57 percent more likely, while clients with schizophrenia were 42 percent less likely to have felony convictions during 2003–2004, than clients without these disorders.

***Exhibit 16***

**Probabilities of Felony Convictions in 2003–2004**

| Client Characteristics | Probability of Felony Convictions for 2002-2004 (relative to comparison group) | Percent of Probability Higher or Lower Than Comparison Group |
|---|---|---|
| Race/Ethnicity (comparison group: White) | | |
| Black | Higher | 48 |
| Hispanic | No Difference | |
| Asian | Lower | 31 |
| American Indian/Alaska Native | No Difference | |
| Race/Ethnicity Unknown | No Difference | |
| Gender (comparison group: male) | | |
| Female | Lower | 30 |
| Age (comparison group: next younger group) | | |
| Age in increments of 10 years | Lower | 41 |
| RSN (comparison group: King RSN) | | |
| Chelan-Douglas | Higher | 90 |
| Clark | Higher | 24 |
| Grays Harbor | No Difference | |
| Greater Columbia | Higher | 38 |
| North Central | No Difference | |
| Northeast | Lower | 42 |
| North Sound | No Difference | |
| Peninsula | Higher | 40 |
| Pierce | Higher | 82 |
| Southwest | Higher | 57 |
| Spokane | No Difference | |
| Thurston-Mason | Higher | 27 |
| Timberlands | No Difference | |
| Living Situation (comparison group: private residence) | | |
| Homeless-Shelters | Higher | 54 |
| 24-hour Setting | Lower | 51 |
| Jail-Corrections Facilities | Higher | 79 |
| Other Situations | Higher | 31 |
| Living Situation Unknown | Higher | 37 |
| Primary Diagnosis (comparison group: clients without the mentioned diagnosis) | | |
| Bipolar | No Difference | |
| Dementia | No Difference | |
| Major Depression | No Difference | |
| Other Mental Disorders | No Difference | |
| Other Mood Disorders | No Difference | |
| Other Psychotic Disorders | No Difference | |
| Personality Disorders | No Difference | |
| Schizophrenia | Lower | 42 |
| Substance Dependence | Higher | 57 |
| Anxiety | No Difference | |
| Childhood Disorders | No Difference | |
| GAF Score (comparison group: clients with scores of 50 plus) | | |
| Score Unknown | No Difference | |
| Less than 50 | No Difference | |
| Use of MAA Services in 2004 (comparison group: "No") | | |
| Yes | Lower | 13 |
| Use of Inpatient Services in 2002 (comparison group: "No") | | |
| Yes | Higher | 26 |
| Hours of Outpatient Services in 2002 (comparison group: less than 5.75 hours) | | |
| 5.75 or More Hours | Lower | 17 |
| Employment in 2004 (comparison group: not employed) | | |
| Employed | Lower | 22 |
| Felony Convictions as of 2002 (comparison group: no convictions) | | |
| Yes | Higher | 649 |
| Use of MHD Services in 2004 (comparison group: "No") | | |
| Yes | Higher | 91 |

# SECTION V: SUMMARY AND NEXT STEPS

The 2001 Legislature directed the Institute to examine long-term outcomes of clients receiving public mental health services. The longitudinal study will comprise three outcome follow-up reports at two-year, five-year, and ten-year periods. This report is the first of the three.

The current report addresses two questions:

1) *What are the profiles of the MHD Baseline Cohort and Clients at the Two-year Follow-up?*
2) *What are the adult Baseline Cohort client outcomes in 2004 and client characteristics associated with variations in the outcomes?*

## Profiles of the Baseline Cohort and Clients at the Two-year Follow-up

The Baseline Cohort consists of all clients who used MHD services in 2002. Clients at the Two-year Follow-up include clients from the Baseline Cohort who used MHD services again in 2004. Of the total Baseline Cohort (127,784), just over one-third (37 percent) continued to use MHD services in 2004. The profile of Clients at the Two-year Follow-up appears to be different from the Baseline Cohort. The differences between the two also existed when adults were examined separately from children. When compared with the Baseline Cohort, the profile of Clients at the Two-year Follow-up showed the following:[17]

- Longer hospital stays;
- More outpatient hours;
- More likely to enroll in Medicaid;
- More MAA service encounters;
- More likely to have bipolar and schizophrenia diagnoses among adults and ADD among children;
- Larger share of clients in King RSN, but smaller share in Pierce RSN;
- Less likely to be employed and earned less when employed (among adults);
- Slightly less likely to be convicted of a felony in a previous two-year period (among adults);
- Slightly older (overall); and
- Similar in gender mix, race/ethnicity makeup, and GAF scores.

[17] Unless otherwise noted, the statements that follow apply to adults, children, and clients overall.

## Outcomes and Associated Client Characteristics

Four client outcomes in 2004 are examined for all Baseline Cohort adults. The analyses first examined changes in these outcomes from 2002 to 2004, and then identified client characteristics that are significantly associated with these outcomes.

An analysis of changes in the outcomes shows the following:

- Forty-one percent of the total Baseline Cohort adult clients used MHD services again in 2004;
- Utilization of MAA services declined from 65 percent in 2002 to 60 percent in 2004;
- Employment rate declined from 27 percent in 2002 to 23 percent in 2004; and
- The rate of felony convictions declined from 6.5 percent in 2001–2002 to 4.3 percent in 2003–2004.

The analyses of client characteristics associated with the 2004 outcomes suggest that each outcome is associated to a varying degree with a number of client characteristics.

**Characteristics associated with MHD service utilization in 2004**. The client characteristic most significantly associated with MHD service utilization in 2004 was utilization of MAA services in 2004. Clients who used MAA services in 2004 were over five times more likely than clients who did not use MAA services in 2004 to use MHD services in 2004.

Other characteristics associated with higher probabilities of using MHD services in 2004 include the following:

- Diagnoses of bipolar, major depression, schizophrenia, substance dependence, anxiety, childhood, and other-psychotic disorders in 2002; and
- More hours of outpatient services in 2002.

Characteristics associated with lower probabilities of MHD service utilization in 2004 include the following:

- Pierce and Northeast RSNs (compared with King RSN), and
- Living in 24-hour-care settings (compared with private residences).

**Characteristics associated with MAA service utilization in 2004**. Two client characteristics were most strongly associated with increased probabilities in MAA service utilization in 2004: (1) clients using MAA services in 2002 were almost 20 times more likely to use MAA services in 2004, and (2) use of MHD services in 2004 increased the probability of using MAA services in 2004 nearly seven-fold.

Other characteristics that significantly increased a client's probability for MAA service utilization in 2004 include the following:

- Female;
- Diagnoses of childhood disorders in 2002; and
- Northeast, Grays Harbor, and Pierce RSNs (compared with King RSN).

Characteristics associated with lower probabilities for this outcome include the following:

- Use of MHD inpatient services in 2002.

**Characteristics associated with employment in 2004**. The characteristic that most significantly predicted a client's probability of being employed in 2004 was his or her employment situation in 2002. Clients employed in 2002 were nearly 11 times more likely to be employed in 2004 than clients not employed in 2002.

Characteristics associated with lower probabilities of employment in 2004 include the following:

- Older age,
- All other living situations in 2002 when compared with private residences, and
- Diagnoses of dementia.

**Characteristics associated with felony convictions in 2003–2004**. Prior history of felony convictions had the strongest association of all characteristics examined with a client's probability of having felony convictions in 2003–2004. Clients who had a prior history of felony convictions were six times more likely to have felony convictions during this period than clients with no such prior history. Other client characteristics that also increased this outcome's probability include the following:

- Use of MHD services in 2004;
- Black (compared with White);
- Chelan-Douglas, Clark, Southwest, Greater Columbia, Peninsula, Pierce, and Thurston-Mason RSNs (compared with King RSN);
- Living situations of homeless/shelters, jail/corrections facilities, and other situations (compared with private residences); and
- Diagnosis of substance dependence disorder.

Characteristics associated with lower probabilities of this outcome include the following:

- Asian (compared with White)
- Employed in 2004,
- Female,
- Older age,
- Northeast RSN (compared with King RSN),

- Living situation of 24-hour setting (compared with private residences), and
- Diagnoses of schizophrenia.

## Limitations

This report used data from administrative sources. For a number of reasons, administrative data have great appeal for public policy and program studies:

- The low cost of data collection from these sources;
- A non-invasive approach to the individuals studied (information is not collected directly from the study subjects by the research team); and
- The data provide information about the entire population of interest.

However, administrative data also have limitations that can affect the scope of analysis and interpretation of results:

- Administrative data do not allow random assignment. Random assignment is a methodological feature necessary to draw causal conclusions in outcome analyses. This design randomly assigns subjects into an experimental group and a control group. It allows establishment of a causal relationship between the controlled factor(s) and an outcome. Without a random assignment design, the relationship between a factor(s) and an outcome can only be described as one of association, not of causality.
- Available administrative data may not contain desired data items and the quality of existing data items may not be certain. These limitations occur because administrative data systems are not designed to meet a particular research objective, and attention paid to data quality varies from one data item to another depending on the importance of that item to the administration of the program. Institute staff encountered the following such limitations in the administrative data made available for this project:
    - ✓ Several outcomes could not be tracked after clients left the MHD system (e.g., mental health status and living situations);
    - ✓ Some potentially meaningful items did not exist in the administrative MHD system (e.g., family income, educational attainment, marital status, and reasons for exiting the MHD system).
    - ✓ Several data items used in this report's analyses contained relatively large portions of records with missing data (e.g., living situation, GAF scores, and race/ethnicity).

Two potential changes to the MHD administrative data could result in information beneficial to program administration and increased value in research:

- Closer oversight of data reports provided by RSNs to MHD, and
- Collecting client exit data.

A closer oversight of RSN data reports could improve data quality, which in turn could result in better information for program administrators' use in monitoring and evaluating services.[18] Client exit data (e.g. reasons why clients stop receiving services) would help fill the current knowledge void in this area.

In addition, a longitudinal survey with a sample of MHD clients could be used to track client outcomes that cannot be tracked with existing administrative data sources. This approach could yield data not only on the outcomes of interest to the legislature, but also relevant to other client changes. These longitudinal survey data could provide cross-validation of observations made using administrative data.

## Next Steps

This report is preceded by four Institute reports on MHD client characteristics at the baseline.[19] The next scheduled report is the five-year follow-up in 2008 and the ten-year follow-up in 2013. The Institute also plans to produce interim reports that more closely examine certain client characteristics and/or outcomes. Topics for these interim reports will be selected after consultation with legislative and executive agency staff.

In addition, the Institute will convene an advisory group to explore possible design changes and/or to identify new data sources that will enable tracking of all long-term outcomes of interest to the legislature. The advisory group will include academic experts as well as legislative and executive agency research staff.

[18] Recent communications with MHD suggest that MHD has improved the quality of some of the items in the RSN data reports mentioned here.
[19] For a complete list of the reports published by the Institute in response to ESSB 5583 of 2001, see Appendix C or visit the Institute's website at www.wsipp.wa.gov.

# APPENDIX A: REGIONAL SUPPORT NETWORKS

***Exhibit A.1***
**Regional Support Networks (RSNs) and Counties**

| RSN | County |
|---|---|
| Chelan-Douglas | Chelan and Douglas |
| Clark | Clark |
| Greater Columbia | Asotin, Benton, Columbia, Franklin, Garfield, Kittitas, Klickitat, Skamania, Walla Walla, Whitman, and Yakima |
| Grays Harbor | Grays Harbor |
| King | King |
| North Central | Adams, Grant, and Okanogan |
| Northeast | Ferry, Lincoln, Pend Oreille, and Stevens |
| North Sound | Island, San Juan, Skagit, Snohomish, and Whatcom |
| Peninsula | Clallam, Jefferson, and Kitsap |
| Pierce | Pierce |
| Southwest | Cowlitz |
| Spokane | Spokane |
| Thurston-Mason | Mason and Thurston |
| Timberlands | Lewis, Pacific, and Wahkiakum |

*Source: DSHS MHD*

# APPENDIX B: LOGISTIC ANALYSES AND RESULTS

Based on legislative interest and data availability, the Institute selected four outcomes for multivariate analyses. The outcome measures are each a dichotomous variable with one level meaning "yes" and the other level meaning "no." These four outcomes are as follows:

- Used public mental health services (MHD) in 2004,
- Used other public medical services (MAA) in 2004,
- Employed in 2004, and
- Convicted of felony during two-year follow-up period.

## Modeling Process

Each outcome was analyzed with a logistic regression model that included covariates selected from the above data sources. The covariates were selected using a process that consisted of the following steps:

1) Initial review of the source data set for potential relevant covariates and selection of initial set of covariates;
2) Simple logistic regression to determine significance of each covariate from the initial set to the outcome variable;
3) Selection of set of covariates significant to most outcomes;
4) For each model (when meaningful) inclusion of, as covariate, the outcome measure from 2002;
5) Identifying proper scales for continuous variables; and
6) Finalizing each model.

## Interpreting the Results

The observed relationship between a covariate and an outcome in this report's logistic regressions is that of an association, not of causality, due to lack of random assignment in the source data. Also, the logistic regression for each outcome is a multivariate model that includes all selected covariates. As such, the odds-ratio estimated for a covariate's level is the level's effect on the outcome, in comparison with the reference level of the covariate, while controlling for all other covariates.

## Statistical Results

Exhibits B.1 through B.4 display results of the logistic analyses. The following covariate effect statistics are shown:

- Estimate
- Standard error (se)
- Probability > chi-square (prob)
- Odds ratio (or)
- Lower 95% confidence limit of the odds ratio (or ll)
- Upper 95% confidence limit of the odds ratio (or ul)

The following model statistics are shown:

- Chi-square of likelihood ratio
- Probability > chi-square
- Tau-a statistic

## *Exhibit B.1*

**Logistic Results**
**Outcome = Utilization of MHD Services in 2004**

| Parameter | Estimate | SE | Prob | OR | OR LL | OR UL |
|---|---|---|---|---|---|---|
| Intercept | -2.090 | 0.046 | <.0001 | | | |
| Race/Ethnicity (reference group: White) | | | | | | |
| Black | -0.006 | 0.038 | 0.8793 | 0.994 | 0.924 | 1.070 |
| Hispanic | -0.141 | 0.041 | 0.0006 | 0.868 | 0.801 | 0.941 |
| Asian | 0.073 | 0.056 | 0.196 | 1.075 | 0.963 | 1.200 |
| Native American | -0.095 | 0.055 | 0.0829 | 0.909 | 0.816 | 1.012 |
| Race/Ethnicity Unknown | -0.724 | 0.024 | <.0001 | 0.485 | 0.462 | 0.508 |
| White | | | | | | |
| Gender | | | | | | |
| Female | -0.128 | 0.019 | <.0001 | 0.880 | 0.849 | 0.913 |
| Age | | | | | | |
| Age | 0.005 | 0.001 | <.0001 | 1.005 | 1.004 | 1.007 |
| Age Adjusted (age unit = 10) | | | | 1.055 | | |
| RSN (reference group: King) | | | | | | |
| Chelan-Douglas | -0.636 | 0.067 | <.0001 | 0.529 | 0.464 | 0.604 |
| Clark | -0.079 | 0.043 | 0.0627 | 0.924 | 0.850 | 1.004 |
| Grays Harbor | -0.637 | 0.071 | <.0001 | 0.529 | 0.460 | 0.608 |
| Greater Columbia | -0.545 | 0.031 | <.0001 | 0.580 | 0.546 | 0.616 |
| King | | | | | | |
| North Central | -0.330 | 0.059 | <.0001 | 0.719 | 0.641 | 0.807 |
| Northeast | -1.082 | 0.078 | <.0001 | 0.339 | 0.291 | 0.395 |
| North Sound | -0.183 | 0.030 | <.0001 | 0.833 | 0.786 | 0.883 |
| Peninsula | -0.090 | 0.041 | 0.0257 | 0.914 | 0.844 | 0.989 |
| Pierce | -1.235 | 0.032 | <.0001 | 0.291 | 0.273 | 0.309 |
| Southwest | 0.046 | 0.048 | 0.3372 | 1.047 | 0.953 | 1.151 |
| Spokane | -0.446 | 0.037 | <.0001 | 0.640 | 0.595 | 0.688 |
| Thurston-Mason | -0.515 | 0.049 | <.0001 | 0.597 | 0.543 | 0.657 |
| Timberlands | -0.056 | 0.054 | 0.2962 | 0.945 | 0.850 | 1.051 |
| Living Situation (reference group: private residence) | | | | | | |
| Homeless-Shelters | -0.012 | 0.036 | 0.7388 | 0.988 | 0.921 | 1.060 |
| 24-hour Setting | -0.465 | 0.037 | <.0001 | 0.628 | 0.584 | 0.676 |
| Jail-Corrections Facilities | -0.032 | 0.064 | 0.6137 | 0.968 | 0.855 | 1.097 |
| Other Situations | -0.164 | 0.030 | <.0001 | 0.849 | 0.800 | 0.900 |
| Living Situation Unknown | 0.008 | 0.033 | 0.8 | 1.008 | 0.945 | 1.075 |
| Private Residence | | | | | | |
| Primary Diagnosis | | | | | | |
| Bipolar | 0.475 | 0.032 | <.0001 | 1.608 | 1.512 | 1.711 |
| Dementia | -0.083 | 0.049 | 0.0921 | 0.921 | 0.836 | 1.014 |
| Major Depression | 0.118 | 0.027 | <.0001 | 1.125 | 1.066 | 1.187 |
| Other Mental Disorders | -0.167 | 0.032 | <.0001 | 0.846 | 0.794 | 0.901 |
| Other Mood Disorders | -0.062 | 0.030 | 0.0383 | 0.940 | 0.887 | 0.997 |
| Other Psychotic Disorders | 0.449 | 0.045 | <.0001 | 1.567 | 1.435 | 1.710 |
| Personality Disorders | 0.047 | 0.033 | 0.1555 | 1.048 | 0.982 | 1.117 |
| Schizophrenia | 0.802 | 0.033 | <.0001 | 2.231 | 2.091 | 2.380 |
| Substance Dependence | 0.123 | 0.040 | 0.0021 | 1.131 | 1.046 | 1.223 |
| Anxiety | 0.123 | 0.031 | <.0001 | 1.131 | 1.065 | 1.201 |
| Childhood Disorders | 0.129 | 0.050 | 0.0095 | 1.137 | 1.032 | 1.253 |
| GAF Score (reference group: scores of 50 or higher) | | | | | | |
| Score Unknown | -0.184 | 0.022 | <.0001 | 0.747 | 0.700 | 0.797 |
| Less than 50 | 0.077 | 0.016 | <.0001 | 0.970 | 0.930 | 1.011 |
| 50 or Higher | | | | | | |
| Use of MAA Services in 2004 | | | | | | |
| Yes | 1.867 | 0.020 | <.0001 | 6.467 | 6.223 | 6.721 |
| Use of Inpatient Services in 2002 | | | | | | |
| Yes | 0.104 | 0.030 | 0.0006 | 1.110 | 1.046 | 1.178 |
| Outpatient Services in 2002 | | | | | | |
| Hours of Services | 0.304 | 0.007 | <.0001 | 1.355 | 1.337 | 1.372 |
| Employment in 2004 | | | | | | |
| Employed | -0.170 | 0.022 | <.0001 | 0.843 | 0.808 | 0.881 |
| New Felony Convictions since 2002 | | | | | | |
| Yes | 0.183 | 0.024 | <.0001 | 1.201 | 1.146 | 1.258 |

| Select model statistics: | |
|---|---|
| Likelihood Ratio Chi-Square: | 32441 |
| Pr. > Chi-Square: | <.0001 |
| Tau-a | 0.324 |

## *Exhibit B.2*

**Logistic Results**
**Outcome = Utilization of MAA Services in 2004**

| Parameter | Estimate | SE | Prob | OR | OR LL | OR UL |
|---|---|---|---|---|---|---|
| Intercept | -2.216 | 0.052 | <.0001 | | | |
| Race/Ethnicity (reference group: White) | | | | | | |
| Black | 0.112 | 0.045 | 0.0133 | 1.118 | 1.024 | 1.222 |
| Hispanic | -0.237 | 0.047 | <.0001 | 0.789 | 0.720 | 0.864 |
| Asian | 0.034 | 0.068 | 0.6186 | 1.035 | 0.905 | 1.183 |
| Native American | -0.083 | 0.062 | 0.179 | 0.920 | 0.815 | 1.039 |
| Race/Ethnicity Unknown | -0.262 | 0.025 | <.0001 | 0.77 | 0.733 | 0.808 |
| White | | | | | | |
| Gender | | | | | | |
| Female | 0.456 | 0.021 | <.0001 | 1.577 | 1.515 | 1.642 |
| Age | | | | | | |
| Age | -0.008 | 0.001 | <.0001 | 0.992 | 0.991 | 0.994 |
| Age Adjusted (age unit=10) | | | | 0.925 | | |
| RSN (reference group: King) | | | | | | |
| Chelan-Douglas | 0.163 | 0.070 | 0.0196 | 1.177 | 1.026 | 1.350 |
| Clark | -0.190 | 0.051 | 0.0002 | 0.827 | 0.749 | 0.914 |
| Grays Harbor | 0.272 | 0.080 | 0.0007 | 1.313 | 1.121 | 1.537 |
| Greater Columbia | 0.134 | 0.035 | 0.0001 | 1.143 | 1.067 | 1.224 |
| King | | | | | | |
| North Central | 0.144 | 0.070 | 0.0394 | 1.154 | 1.007 | 1.323 |
| Northeast | 0.260 | 0.082 | 0.0016 | 1.297 | 1.104 | 1.523 |
| North Sound | 0.087 | 0.034 | 0.0113 | 1.091 | 1.020 | 1.166 |
| Peninsula | -0.013 | 0.047 | 0.7811 | 0.987 | 0.900 | 1.083 |
| Pierce | 0.279 | 0.034 | <.0001 | 1.322 | 1.235 | 1.414 |
| Southwest | -0.111 | 0.055 | 0.0453 | 0.895 | 0.804 | 0.998 |
| Spokane | 0.192 | 0.044 | <.0001 | 1.211 | 1.112 | 1.319 |
| Thurston-Mason | 0.124 | 0.057 | 0.0295 | 1.132 | 1.012 | 1.265 |
| Timberlands | -0.125 | 0.059 | 0.0324 | 0.882 | 0.787 | 0.990 |
| Living Situation (reference group: private residence) | | | | | | |
| Homeless-Shelters | -0.253 | 0.039 | <.0001 | 0.777 | 0.719 | 0.839 |
| 24-hour Setting | -0.098 | 0.043 | 0.0217 | 0.906 | 0.834 | 0.986 |
| Jail-Corrections Facilities | -0.055 | 0.064 | 0.3901 | 0.947 | 0.835 | 1.073 |
| Other Situations | -0.003 | 0.037 | 0.9402 | 0.997 | 0.928 | 1.071 |
| Living Situation Unknown | -0.081 | 0.033 | 0.0152 | 0.922 | 0.864 | 0.984 |
| Private Residence | | | | | | |
| Primary Diagnosis | | | | | | |
| Bipolar | -0.134 | 0.037 | 0.0004 | 0.875 | 0.813 | 0.941 |
| Dementia | -0.204 | 0.055 | 0.0002 | 0.816 | 0.733 | 0.908 |
| Major Depression | -0.060 | 0.032 | 0.0593 | 0.941 | 0.884 | 1.002 |
| Other Mental Disorders | -0.001 | 0.036 | 0.9784 | 0.999 | 0.932 | 1.071 |
| Other Mood Disorders | 0.022 | 0.034 | 0.5184 | 1.022 | 0.956 | 1.094 |
| Other Psychotic Disorders | -0.151 | 0.052 | 0.004 | 0.860 | 0.776 | 0.953 |
| Personality Disorders | 0.072 | 0.040 | 0.0746 | 1.074 | 0.993 | 1.162 |
| Schizophrenia | 0.227 | 0.040 | <.0001 | 1.255 | 1.161 | 1.357 |
| Substance Dependence | -0.197 | 0.044 | <.0001 | 0.822 | 0.753 | 0.896 |
| Anxiety | 0.060 | 0.037 | 0.1075 | 1.062 | 0.987 | 1.142 |
| Childhood Disorders | 0.420 | 0.065 | <.0001 | 1.522 | 1.34 | 1.729 |
| GAF Score (reference group: scores of 50 or higher) | | | | | | |
| Score Unknown | -0.018 | 0.023 | 0.4327 | 0.990 | 0.923 | 1.061 |
| Less than 50 | 0.025 | 0.018 | 0.1549 | 1.033 | 0.983 | 1.086 |
| 50 or Higher | | | | | | |
| Use of MAA Services in 2004 | | | | | | |
| Yes | 3.027 | 0.023 | <.0001 | 20.635 | 19.719 | 21.593 |
| Use of Inpatient Services in 2002 | | | | | | |
| Yes | -0.515 | 0.034 | <.0001 | 0.597 | 0.559 | 0.639 |
| Outpatient Services in 2002 | | | | | | |
| Hours of Services (as hours increase) | 0.001 | 0.000 | <.0001 | 1.001 | 1.000 | 1.001 |
| Hours of Services (unit = 50 hours) | | | | 1.034 | | |
| Employment in 2004 | | | | | | |
| Employed | -0.097 | 0.024 | <.0001 | 0.908 | 0.866 | 0.952 |
| New Felony Convictions since 2002 | | | | | | |
| Yes | 0.043 | 0.027 | 0.1063 | 1.044 | 0.991 | 1.100 |
| Use of MHD Services in 2004 | | | | | | |
| Yes | 2.030 | 0.023 | <.0001 | 7.612 | 7.271 | 7.969 |

| Select model statistics: | |
|---|---|
| Likelihood Ratio Chi-Square: | 50414 |
| Pr. > Chi-Square: | <.0001 |
| Tau-a | 0.390 |

## *Exhibit B.3*

**Logistic Results**
**Outcome = Employment in 2004**

| Parameter | Estimate | SE | Prob | OR | OR LL | OR UL |
|---|---|---|---|---|---|---|
| Intercept | -0.600 | 0.054 | <.0001 | | | |
| Race/Ethnicity (reference group: White) | | | | | | |
| Black | 0.038 | 0.046 | 0.4161 | 1.038 | 0.948 | 1.137 |
| Hispanic | -0.121 | 0.048 | 0.012 | 0.886 | 0.807 | 0.974 |
| Asian | -0.005 | 0.076 | 0.9475 | 0.995 | 0.858 | 1.154 |
| Native American | -0.034 | 0.064 | 0.5957 | 0.966 | 0.852 | 1.096 |
| Race/Ethnicity Unknown | -0.047 | 0.026 | 0.0695 | 0.954 | 0.907 | 1.004 |
| White | | | | | | |
| Gender | | | | | | |
| Female | 0.013 | 0.022 | 0.5487 | 1.013 | 0.971 | 1.057 |
| Age | | | | | | |
| Age | -0.037 | 0.001 | <.0001 | 0.964 | 0.962 | 0.966 |
| Age Adjusted (age unit = 10) | | | | 0.692 | | |
| RSN (reference group: King) | | | | | | |
| Chelan-Douglas | 0.108 | 0.071 | 0.1288 | 1.114 | 0.969 | 1.280 |
| Clark | -0.022 | 0.052 | 0.6802 | 0.979 | 0.884 | 1.084 |
| Grays Harbor | 0.056 | 0.086 | 0.5135 | 1.057 | 0.894 | 1.250 |
| Greater Columbia | 0.106 | 0.037 | 0.0038 | 1.112 | 1.035 | 1.195 |
| King | | | | | | |
| North Central | 0.110 | 0.072 | 0.1229 | 1.117 | 0.971 | 1.285 |
| Northeast | -0.132 | 0.088 | 0.1345 | 0.877 | 0.738 | 1.042 |
| North Sound | 0.039 | 0.035 | 0.2728 | 1.040 | 0.970 | 1.114 |
| Peninsula | 0.115 | 0.050 | 0.0206 | 1.121 | 1.018 | 1.236 |
| Pierce | -0.009 | 0.037 | 0.81 | 0.991 | 0.922 | 1.065 |
| Southwest | -0.104 | 0.055 | 0.0574 | 0.901 | 0.809 | 1.003 |
| Spokane | -0.063 | 0.047 | 0.178 | 0.939 | 0.857 | 1.029 |
| Timberlands | -0.119 | 0.066 | 0.0707 | 0.888 | 0.781 | 1.010 |
| Thurston-Mason | -0.189 | 0.061 | 0.002 | 0.827 | 0.734 | 0.933 |
| Living Situation (reference group: private residence) | | | | | | |
| Homeless-Shelters | -0.208 | 0.042 | <.0001 | 0.812 | 0.748 | 0.882 |
| 24-hour Setting | -0.600 | 0.077 | <.0001 | 0.549 | 0.472 | 0.638 |
| Jail-Corrections Facilities | -0.211 | 0.063 | 0.0008 | 0.810 | 0.716 | 0.917 |
| Other Situations | -0.213 | 0.041 | <.0001 | 0.808 | 0.746 | 0.876 |
| Living Situation Unknown | -0.088 | 0.034 | 0.0086 | 0.916 | 0.857 | 0.978 |
| Private Residence | | | | | | |
| Primary Diagnosis | | | | | | |
| Bipolar | -0.083 | 0.039 | 0.0327 | 0.921 | 0.854 | 0.993 |
| Dementia | -0.695 | 0.107 | <.0001 | 0.499 | 0.405 | 0.615 |
| Major Depression | 0.078 | 0.034 | 0.0192 | 1.082 | 1.013 | 1.155 |
| Other Mental Disorders | 0.171 | 0.035 | <.0001 | 1.186 | 1.108 | 1.270 |
| Other Mood Disorders | 0.000 | 0.035 | 0.9961 | 1.000 | 0.933 | 1.071 |
| Other Psychotic Disorders | -0.196 | 0.058 | 0.0007 | 0.822 | 0.734 | 0.920 |
| Personality Disorders | -0.149 | 0.043 | 0.0005 | 0.862 | 0.793 | 0.937 |
| Schizophrenia | -0.207 | 0.043 | <.0001 | 0.813 | 0.747 | 0.886 |
| Substance Dependence | 0.062 | 0.045 | 0.1658 | 1.064 | 0.975 | 1.162 |
| Anxiety | -0.051 | 0.038 | 0.179 | 0.950 | 0.881 | 1.024 |
| Childhood Disorders | -0.045 | 0.062 | 0.4707 | 0.956 | 0.847 | 1.079 |
| GAF Score (reference group: scores of 50 or higher) | | | | | | |
| Score Unknown | -0.044 | 0.024 | 0.0636 | 0.823 | 0.766 | 0.884 |
| Less than 50 | -0.106 | 0.019 | <.0001 | 0.774 | 0.734 | 0.815 |
| 50 or Higher | | | | | | |
| Use of MAA Services in 2004 | | | | | | |
| Yes | -0.089 | 0.023 | 0.0001 | 0.915 | 0.873 | 0.957 |
| Use of Inpatient Services in 2002 | | | | | | |
| Yes | -0.137 | 0.038 | 0.0003 | 0.872 | 0.809 | 0.940 |
| Outpatient Services in 2002 | | | | | | |
| 5.75 or More Hours | -0.039 | 0.024 | 0.1048 | 0.962 | 0.917 | 1.008 |
| Employment in 2002 | | | | | | |
| Employed | 2.482 | 0.021 | <.0001 | 11.961 | 11.490 | 12.451 |
| New Felony Convictions since 2002 | | | | | | |
| Yes | -0.093 | 0.027 | 0.0006 | 0.911 | 0.864 | 0.961 |
| Use of MHD Services in 2004 | | | | | | |
| Yes | -0.146 | 0.025 | <.0001 | 0.864 | 0.823 | 0.908 |

| Select model statistics: | |
|---|---|
| Likelihood Ratio Chi-Square: | 27971 |
| Pr. > Chi-Square: | <.0001 |
| Tau-a | 0.245 |

## *Exhibit B.4*

**Logistic Results**
**Outcome = Felony Convictions Since 2002**

| Parameter | Estimate | SE | Prob | OR | OR LL | OR UL |
|---|---|---|---|---|---|---|
| Intercept | -2.235 | 0.103 | <.0001 | | | |
| Race/Ethnicity (reference group: White) | | | | | | |
| Black | 0.391 | 0.066 | <.0001 | 1.479 | 1.300 | 1.682 |
| Hispanic | -0.113 | 0.099 | 0.2538 | 0.894 | 0.736 | 1.084 |
| Asian | -0.368 | 0.186 | 0.0471 | 0.692 | 0.481 | 0.995 |
| Native American | 0.162 | 0.105 | 0.1229 | 1.176 | 0.957 | 1.446 |
| Race/Ethnicity Unknown | -0.048 | 0.048 | 0.3213 | 0.953 | 0.867 | 1.048 |
| White | | | | | | |
| Gender | | | | | | |
| Female | -0.352 | 0.041 | <.0001 | 0.703 | 0.649 | 0.762 |
| Age | | | | | | |
| Age | -0.052 | 0.002 | <.0001 | 0.949 | 0.946 | 0.953 |
| Age Adjusted (age unit = 10) | | | | 0.594 | | |
| RSN (reference group: King) | | | | | | |
| Chelan-Douglas | 0.640 | 0.122 | <.0001 | 1.896 | 1.492 | 2.410 |
| Clark | 0.216 | 0.102 | 0.0341 | 1.241 | 1.016 | 1.516 |
| Grays Harbor | 0.051 | 0.170 | 0.7635 | 1.053 | 0.754 | 1.469 |
| Greater Columbia | 0.325 | 0.073 | <.0001 | 1.383 | 1.200 | 1.595 |
| King | | | | | | |
| North Central | 0.098 | 0.148 | 0.5049 | 1.103 | 0.826 | 1.474 |
| Northeast | -0.543 | 0.261 | 0.0378 | 0.581 | 0.348 | 0.970 |
| North Sound | -0.113 | 0.077 | 0.1429 | 0.893 | 0.768 | 1.039 |
| Peninsula | 0.336 | 0.090 | 0.0002 | 1.400 | 1.173 | 1.670 |
| Pierce | 0.597 | 0.062 | <.0001 | 1.817 | 1.609 | 2.053 |
| Southwest | 0.454 | 0.092 | <.0001 | 1.574 | 1.314 | 1.886 |
| Spokane | -0.100 | 0.093 | 0.2817 | 0.905 | 0.754 | 1.086 |
| Thurston-Mason | 0.236 | 0.097 | 0.015 | 1.266 | 1.047 | 1.532 |
| Timberlands | 0.039 | 0.129 | 0.7621 | 1.040 | 0.808 | 1.338 |
| Living Situation (reference group: private residence) | | | | | | |
| Homeless-Shelters | 0.430 | 0.062 | <.0001 | 1.538 | 1.362 | 1.736 |
| 24-hour Setting | -0.720 | 0.191 | 0.0002 | 0.487 | 0.335 | 0.708 |
| Jail-Corrections Facilities | 0.585 | 0.075 | <.0001 | 1.794 | 1.549 | 2.078 |
| Other Situations | 0.271 | 0.064 | <.0001 | 1.311 | 1.156 | 1.487 |
| Living Situation Unknown | 0.312 | 0.062 | <.0001 | 1.367 | 1.211 | 1.542 |
| Private Residence | | | | | | |
| Primary Diagnosis | | | | | | |
| Bipolar | -0.095 | 0.070 | 0.1706 | 0.909 | 0.793 | 1.042 |
| Dementia | -0.287 | 0.184 | 0.1193 | 0.750 | 0.523 | 1.077 |
| Major Depression | -0.063 | 0.065 | 0.332 | 0.939 | 0.828 | 1.066 |
| Other Mental Disorders | 0.100 | 0.067 | 0.1363 | 1.105 | 0.969 | 1.259 |
| Other Mood Disorders | -0.015 | 0.064 | 0.8134 | 0.985 | 0.869 | 1.117 |
| Other Psychotic Disorders | 0.002 | 0.089 | 0.9794 | 1.002 | 0.841 | 1.194 |
| Personality Disorders | 0.037 | 0.069 | 0.589 | 1.038 | 0.907 | 1.189 |
| Schizophrenia | -0.543 | 0.080 | <.0001 | 0.581 | 0.496 | 0.680 |
| Substance Dependence | 0.450 | 0.062 | <.0001 | 1.567 | 1.389 | 1.768 |
| Anxiety | -0.014 | 0.075 | 0.8512 | 0.986 | 0.852 | 1.142 |
| Childhood Disorders | 0.036 | 0.105 | 0.731 | 1.037 | 0.844 | 1.273 |
| GAF Score (reference group: scores of 50 or higher) | | | | | | |
| Score Unknown | 0.024 | 0.042 | 0.5602 | 1.078 | 0.949 | 1.224 |
| Less than 50 | 0.026 | 0.035 | 0.4505 | 1.079 | 0.978 | 1.191 |
| 50 or Higher | | | | | | |
| Use of MAA Services in 2004 | | | | | | |
| Yes | -0.140 | 0.044 | 0.0014 | 0.869 | 0.798 | 0.947 |
| Use of Inpatient Services in 2002 | | | | | | |
| Yes | 0.233 | 0.063 | 0.0002 | 1.262 | 1.115 | 1.428 |
| Outpatient Services in 2002 | | | | | | |
| 5.75 or More Hours | -0.191 | 0.046 | <.0001 | 0.826 | 0.754 | 0.904 |
| Employment in 2004 | | | | | | |
| Employed | -0.251 | 0.044 | <.0001 | 0.778 | 0.713 | 0.849 |
| Ever Convicted for Felony as of 2002 | | | | | | |
| Yes | 2.013 | 0.041 | <.0001 | 7.487 | 6.913 | 8.108 |
| Use of MHD Services in 2004 | | | | | | |
| Yes | 0.647 | 0.044 | <.0001 | 1.909 | 1.750 | 2.082 |

| Select model statistics: | |
|---|---|
| Likelihood Ratio Chi-Square: | 6855 |
| Pr. > Chi-Square: | <.0001 |
| Tau-a | 0.056 |

# APPENDIX C: Long-Term Outcomes of Public Mental Health Clients: Institute Publications

Lerch, Steve (2004). *Long-term outcomes of public mental health clients: Preliminary report* (Document No. 04-02-3401). Olympia: Washington State Institute for Public Policy.

Mayfield, Jim (2005). *Employment characteristics of clients receiving public mental health services* (Document No. 05-10-3902). Olympia: Washington State Institute for Public Policy.

Yen, Wei (2005). *Criminal justice involvement among clients receiving public mental health services* (Document No. 05-10-3901). Olympia: Washington State Institute for Public Policy.

Yen, Wei (2006). *Long-term outcomes of public mental health clients: Two-year follow-up* (Document No. 06-02-3401). Olympia: Washington State Institute for Public Policy.

Yen, Wei, and Mayfield, Jim (2005). *Long-term outcomes of public mental health clients: Additional baseline characteristics* (Document No. 05-03-3401). Olympia: Washington State Institute for Public Policy.

These reports are available on the Institute's website at www.wsipp.wa.gov.