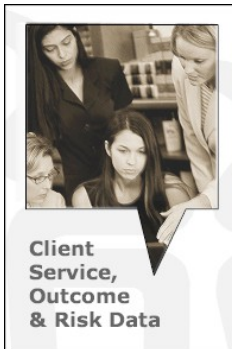




DSHS | Client Services, Outcomes and Risk Databases

Data that improves DSHS decision making and services



THE CLIENT SERVICES DATABASE (CSDB) is DSHS' central research database on client services and costs, and contains nearly a decade of individual client records. It is created by extracting and processing DSHS client records from administrative data collected by DSHS and other state agencies in their ongoing work with Washington residents.

DSHS serves over 2.1 million clients annually with an annual expenditure of \$8 billion dollars a year. This is one-third of Washington's residents and one-third of the state's operating budget. And CSDB is the only place where all of the client information comes together.

As the central client database, CSDB currently includes, for each DSHS client, almost all DSHS services used since 1999, with service spans and costs. Birth and death records are attached and a client residential history is maintained, along with sex, race/ethnicity and citizenship. More service need indicators and service outcome tables are being added over the next three years, through project funding, forming the **Client Outcomes Database (CODB)**.

These databases are not used in face-to-face work with clients. Instead, they support operational decision-making across and within DSHS programs, program evaluation, and in-depth research.

Strict confidentiality standards are in place to ensure protection of personal client information and strict adherence to human subjects review applies to all research conducted from this central client database. Data management is HIPAA compliant.

With more than seven years of expenditure information, CSDB and Client Outcome and Risk analyses are used to develop a current and historical look into the life experience of our clients. These allow evaluation of the social services used by DSHS clients, from birth to death. Services, risks, and outcomes include:

- Prenatal care and birth records
- Length and type of social services received and their costs
- Health status, medical encounters and prescriptions
- Mental health status and services
- Alcohol and drug problems and treatment
- Economic services and child support enforcement
- Family problems, household members, child abuse and neglect case progression
- Out-of-home placement episodes and events
- Adult and juvenile criminal justice events (arrests, convictions, and incarcerations)
- Juvenile rehabilitation services
- Employment information (wages, hours and industry type)
- Disabling health conditions and long-term care services
- Death and its causes

CSDB draws from nearly 20 data systems across and external to DSHS. Over 2,000 different types of human services are extracted, stored and grouped for analysis into 60 to 80 service groupings. The information stream into CSDB is monitored for consistency and the outputs are checked prior to reporting and collaboration with the DSHS program areas.

Questions CSDB can answer

The **Client Services Data Base (CSDB)** alone can answer many questions. For example, the following can be answered using only CSDB information, for all clients or subsets of clients:

- *How many clients is DSHS serving a year?*
- *What is the average cost of those services?*
- *What is the history of service, for a particular client or group of clients?*
- *How are those clients distributed across the state, in counties and communities?*
- *What financial impact do DSHS services have on local areas?*
- *How many clients are being served by more than one program; how do those clients differ from those being served by one program?*
- *What are the characteristics and services used by the most costly clients?*
- *What is the impact of a particular treatment on costs across the agency after treatment is complete?*
- *After a policy change, what happened to services and costs across the agency?*

Questions answered by adding outcome and risk information

The **Client Outcome Database** generates longitudinal client-level outcome information for all DSHS clients. The outcomes analyzed are based on significant life events (such as arrest, conviction, employment, wages, health status, disability, dropping out of school, low grades) or on human service use patterns which are not desirable (such as using emergency rooms for primary care, high medical costs, out-of-home placement). These tables facilitate in-depth program monitoring, performance measurement, actuarial, research and evaluation analyses related to DSHS clients.

Life event outcomes currently in the data tables

- **Criminal justice**—arrests, convictions, or incarcerations.
- **Employment**—status, earnings, wages, reduction in grant support, wage progression.
- **Health**—infant mortality, functional progression of disability, accidents and injuries, death
- **Health services**—emergency room use, preventable inpatient hospitalizations, and health care quality measures

Outcomes planned for next year

- **School outcomes**—dropout rates, low grades, WASL tests.
- **Homelessness**—status and spells.

Service need or client risk tables include measures of *severity* or *prior use* which help researchers to create appropriate treatment and comparison groups for evaluating program impacts in quasi-experimental treatment designs. These may be derived from medical diagnoses, case management assessments, service use, and arrests.

Need and risk constructs currently available

- *Problem alcohol or drug use*
- *Mental health difficulties*
- *Family health and long-term care needs*
- *Activities of daily living needs*
- *Chronic and acute medical conditions*
- *Medical and long-term care costs*
- *Pregnancy*
- *Medical coverage*

CSDB data and processes

Extracting and Combining Data

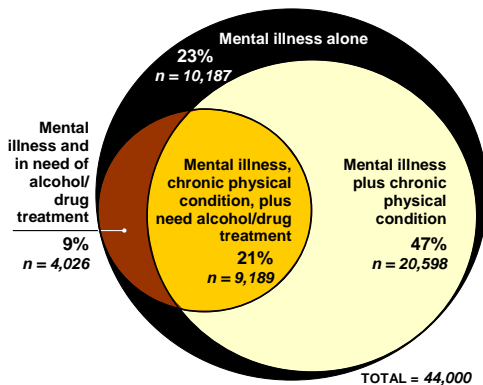
The Client Services Database (CSDB) obtains client, service, expenditure, and residence information from virtually all—over 20—DSHS client and fiscal data systems. These include:

- AFRS
- ACES
- CAMIS
- CARE
- CLIP
- DDD Client DB
- eJAS
- JRA-CTS, Juv. County
- MHD-HIS
- MHD-RSN/CIS
- MMIS REC
- OFM Eligibility
- ORIA PR
- SEMS
- SSPS-Authorization
- SSPS Payhistory
- STARS
- Target

These data are obtained in a consistent format from each source on a weekly or monthly basis. External sources include birth and death data, map boundaries, population data, and state fiscal data.

Unique Client Identifiers Allow Sophisticated Analysis

Many consumers with mental illness have other problems



A common identifier is created for each client that unites information from many systems. The systems were not designed to share client identities. The common identifier overcomes this problem. (See attachment, "Matching and Linking Procedures for the Client-Services Database" describing this process.)

Place and time – This allows RDA to create analytical extracts from single or multiple sources to support descriptive research, detailed analysis, and geographic mapping. One example is shown to the left. Many more are shown later in this document.

Distinct client counts – The unique client identifier takes analyses beyond averages and allows RDA to identify specific type of service for each client and frequency of use so we can see relationships and trends – a more accurate view than averages over periods of time. We refer to the resulting client counts as 'unduplicated' meaning each client is counted once at each level of aggregation.

Race – The standard for recording race varies from system to system. Some use a single race; others allow clients to select multiple races. Additionally, a client may be inconsistent in how they identify their race in different systems over time. CSDB processes analyze and weight indicators of race to maintain integrity of the data with the goal of accurately representing minorities.

Defining Services

DSHS has history for clients, services, and costs:

- Client history since July 1998
- Service data since 1999
- Mapping and boundaries since 1999
- Direct service costs since 2001
- Death records since 1987

DSHS provides a very broad array of social services to its clients. These services are defined by various state and federal laws and defined in the authorizing legislation.

CSDB works with DSHS programs to develop short and long standardized service descriptions—over 2,000 of these—and common-language definitions of service groupings—generally around 75—that are consistent with professional usage and the enabling legislation.

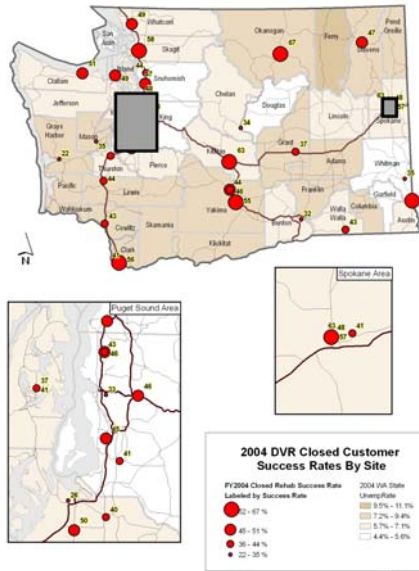
Start and end dates of services are stored so span(s) of service can be identified.

Client service records (service instances) are stored as covering date ranges or specific days as appropriate. Fine levels of service detail can be retrieved and reported at various summary levels. (See attachment.)

Expenditures

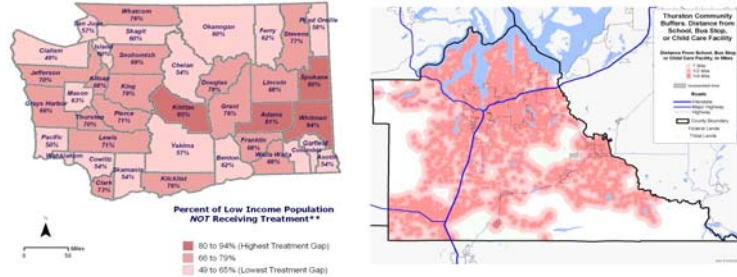
Over 87 percent of DSHS expenditures are included in CSDB and attributed to individual clients and service instances. Of this amount, 84 percent comes from payment systems. The remaining expenditures are derived and attributed to specific client services using available information. For example, number of bed-days in a state institution times an average daily bed rate derived from total expenditures. Expenditure information is reconciled to the state accounting system. CSDB does not include capital, program management, or administration expenditures.

Geography for Mapping and Analysis



CSDB uses geographical information systems to standardize client resident addresses, adding latitude and longitude. It also stores state and local population data and many boundary files so the data can be mapped.

For geographic analyses, maps are created using ArcInfo and ArcGIS. Detail can include use rates, client locations, and proximity of clients to schools, community centers, Community Service Offices, and other facilities. One example of how the data is used is to place facilities and support programs to best serve communities.



Robustness

Policies, costs, and issues change. CSDB is robust in that it contains data with rich detail on client lives and maintains a documented record of the changing service definitions as they evolve over time in response to changes in policy, budget, and law. This allows longitudinal analyses and comparisons over time. The longitudinal comparisons have been invaluable in recent years in comparing client outcomes, identifying approaches that are the most cost effective, and as a result have saved the state millions in service dollars. (See attachment.)

CSDB technology

CSDB obtains interface files from source systems and processes these files on a weekly or monthly basis. Each month CSDB receives an average of 90 files. Every quarter, CSDB creates special files for reporting. The process involves resolution and unduplication of client and residential address information, which includes adding new clients, and assigning unique client identifiers where appropriate.

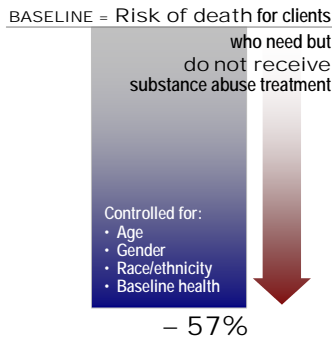
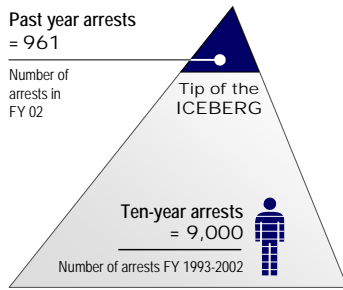
Internal to the system are about 80 pl/sql packages containing some 80 thousand lines of pl/sql code. The SAS processes consist of 50 main program files and 303 supporting code files containing about 42,000 lines of code. These have produced over 204 gigabytes of data files including 487 SAS data sets and 325 Excel spreadsheets, which are available on request.

The RDBMS is Oracle (version 10.2), with partitioning and spatial options. The system includes a design repository, a testing environment, an enterprise management repository, a backup catalog, and the production database.

Oracle forms provide interface for running batch jobs and metadata administration. The current size of the production database, measured by the amount of allocated space, is about 350 Giga Bytes. It grows in size by about 50 GB per year.

***The system has almost three hundred tables.
The largest table, containing client services, is about 24 GB.***

Client outcome and risk data and processes

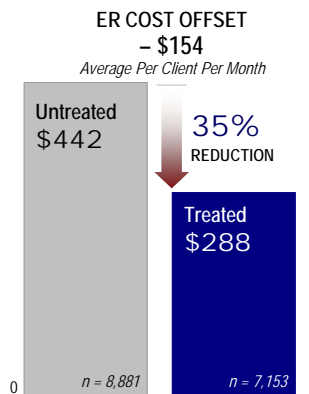
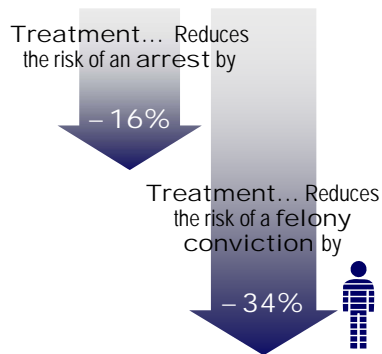


These tables contain a history of person- and event-level outcome, service use, service need, risk, demographic, and geographic data for DSHS clients. The matching process between CODB person record and external source data is generally similar to that used in CSDB, although some sources have particular matching problems that generate matching solutions unique to the source. For example, criminal justice sources often have multiple person-identifiers attached to a single person.

The initial development of these tables and processes is funded primarily through specific research and evaluation projects. Project researchers work with program staff to obtain files from source systems, match those files with CSDB clients, define and analyze outcomes from those source files, and record those outcomes in tables keyed to the CSDB client sources.

Considerable analytic and research work is needed to define the most relevant outcomes and risks from the source files. Once those are defined, they are updated quarterly. (See Attachment for a list of the current outcome and risk tables and variables.)

Client outcome and risk technology



The largest component of the CODB is a Medicaid Management Information System (MMIS) claims warehouse that includes all claims for all clients paid since July 1, 2001. The CODB also currently includes: detailed service, demographic, and geographic data from the RDA CSDB, arrest data from the Washington State Patrol; adjudication data from the Administrative Office of the Courts; and death certificate data from the Department of Health.

The system includes Oracle and SAS components. An Oracle database is used to maintain the medical claims warehouse containing more than 200 million paid claims. SAS processes are used to link external data to DSHS client identifiers and to build longitudinal client-level data tables that facilitate quick-turnaround analysis. The CODB and associated SAS data tables are updated quarterly.

CODB employs Oracle database technology to manage the large volume of cumulative data and regular updates. Three environments are maintained with similar configurations:

- Production
- Test
- Development

All of them are supported by a Storage Area Network with about 4.5 Terabytes of storage capacity. Oracle SQL programs, stored procedures and SAS programs are used together to update the system quarterly with about 25 Gigabytes of new claim data. The current size of the production database, measured by the amount of allocated space, is about 900 Gigabytes. The three largest tables are about 90 Gigabytes each.

The benefit of CSDB to decision makers is far reaching

Besides supporting operational decision-making, CSDB and the Client Outcome and Risk Tables provide client counts and direct service expenditures for internal researchers, the legislature, the governor, local agencies, students, and also enable DSHS to respond to public inquiries.

For all of these reasons, CSDB and its allied tables can be characterized the core tool for decision-making within DSHS. It is a living data enterprise that over a decade of evolution has evolved into a vital problem-solving tool for policy makers throughout and external to DSHS.

Without CSDB, DSHS and the state would be unable to benefit from the cost savings researchers have been able to identify in past years, as well as learn from the program outcomes that researchers continue to monitor on an ongoing basis. It is because of the highly sophisticated technology behind CSDB and the richness of detail that the analytical backbone for DSHS is in place. Because of this, DSHS is positioned to help clients more productive and healthier lives.

Recent publications based on Service and Outcome Data

Studies that rely on service, risk, and outcome data over the years are numerous. A partial list is provided below. For more, please visit RDA at:

www1.dshs.wa.gov/rda/

EMPLOYMENT AND WAGES



Vocational Rehabilitation Rates Since 2000: A Study of Two Cohorts

FEBRUARY 2007

Longhi, Wang and Felver

www1.dshs.wa.gov/pdf/ms/rda/research/10/00.pdf

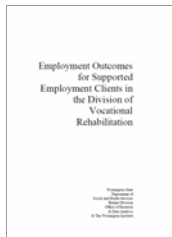


Employment Outcomes of Chemical Dependency and Treatment: Analysis from Washington State

AUGUST 2002

Luchansky and He

www1.dshs.wa.gov/pdf/ms/rda/research/4/45.pdf



Employment Outcomes for Supported Employment Clients in the Division of Vocational Rehabilitation

JUNE 1996

Hempleman and Longhi

www1.dshs.wa.gov/pdf/ms/rda/research/10/09.pdf



Net Impact Analysis of Substance Abuse Treatment

1998

Wang and Liu

www1.dshs.wa.gov/pdf/ms/rda/research/4/34.pdf

MEDICAL COSTS AND SERVICES



Chemical Dependency Treatment for Disabled, Blind and Aged Clients: Alternative Health and Nursing Home Cost Offset Models

FEBRUARY 2005

Kohlenberg, Mancuso and Nordlund

www1.dshs.wa.gov/rda/research/11/125.shtm



Washington State Mental Health Services: Cost Offsets and Client Outcomes Fact Sheet

DECEMBER 2003

Estee and Mancuso

www1.dshs.wa.gov/pdf/ms/rda/research/3/29fs.pdf



Cost Savings in Medicaid Medical Expenses: An Outcome of Publicly Funded Chemical Dependency Treatment in Washington

JUNE 1997

Luchansky and Longhi

www1.dshs.wa.gov/rda/research/4/30.shtm



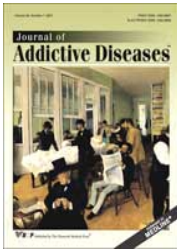
Children's Medical Caseload: Why the Decline?

AUGUST 2005

Mancuso, Beall, Felver, Wilson, and Hamilton

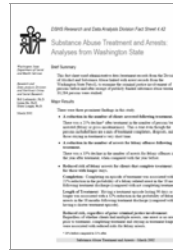
www1.dshs.wa.gov/pdf/ms/rda/research/9/74.pdf

ARRESTS AND CONVICTIONS



Treatment Readmissions and Criminal Recidivism in Youth Following Participation in Chemical Dependency Treatment

2006
Luchansky, He, Longhi, Krupski, Stark
Published in *Journal of Addictive Diseases* 25(1)



Substance Abuse Treatment and Arrests: Analyses from Washington State

MARCH 2002
Luchansky, He and Longhi
www1.dshs.wa.gov/rda/research/4/42.shtm

SCHOOL FAILURE AND INCOMPLETION



School Youth Outcomes of Alcohol and Other Drug Treatment

DECEMBER 2005
Longhi and Felver
www1.dshs.wa.gov/rda/research/4/54.shtm



Risk and Protection Profile for Substance Abuse Prevention in Washington Counties

Published for each school district
DECEMBER 2006
Barga, Ferguson and Kohlenberg
www1.dshs.wa.gov/rda/research/risk.shtm

EMERGENCY ROOM USAGE



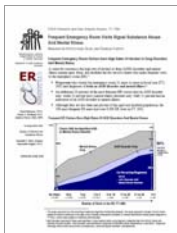
Chemical Dependency Treatment Reduces Emergency Room Costs and Visits

JULY 2004
Nordlund, Mancuso and Felver
www1.dshs.wa.gov/rda/research/11/120.shtm



Reducing Emergency Room Visits through Chemical Dependency Treatment: Focus on Frequent Emergency Room Visitors

JULY 2004
Mancuso, Nordlund and Felver
www1.dshs.wa.gov/rda/research/11/121.shtm



Frequent Emergency Room Visits Signal Substance Abuse and Mental Illness: Washington State's Aged, Blind and Disabled Clients

JANUARY 2004
Mancuso, Nordlund and Felver
www1.dshs.wa.gov/rda/research/11/119.shtm



Patterns of Prescription Opiate Use by Aged, Blind or Disabled Clients in Washington State

APRIL 2005
Mancuso, Nordlund and Felver
www1.dshs.wa.gov/pdf/ms/rda/research/8/27.pdf

COMPLEX CLIENTS WITH DISABILITIES



Medicaid Integration: Coordinating Care, Improving Outcomes, Saving Dollars

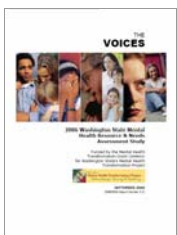
JANUARY 2005
Hidano, Mancuso and Felver
www1.dshs.wa.gov/pdf/ms/rda/research/policy/MIPSept04v6.pdf



GA-U Clients: Challenges and Opportunities

AUGUST 2006
Mancuso, Nordlund and Felver
www1.dshs.wa.gov/rda/research/6/54.shtm

MENTAL HEALTH



The Voices: 2006 Washington State Mental Health Resources and Needs Assessment Study

SEPTEMBER 2006
Kohlenberg, et al
www1.dshs.wa.gov/rda/research/3/31.shtm



Washington State Mental Health Services: Cost Offsets and Client Outcomes

DECEMBER 2003
Mancuso and Estee
www1.dshs.wa.gov/pdf/ms/rda/research/3/29.pdf

DSHS SERVICE DATA



County Summary Data on DSHS Services
 DECEMBER 2006, *preliminary*
 Fiedler, et al
www1.dshs.wa.gov/pdf/ms/rda/clientdata/05State.pdf
 Also available by age, race, counties, cities, and legislative districts and for years prior to 2005

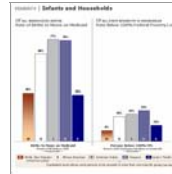


Use of DSHS Services Fiscal Year 2005
 DECEMBER 2006, *preliminary*
 Fiedler, et al
www1.dshs.wa.gov/pdf/ms/rda/clientata/05county.pdf
 Also available for years prior to 2005

SERVICE EQUITY



Serving TANF Families with Limited English Proficiency: An Analysis of Services and Funding for Adult LEP TANF Clients
 MAY 2006
 Fiedler and Felver
www1.dshs.wa.gov/pdf/ms/rda/research/6/53.pdf



Diversity Service Patterns and Outcomes
 ONGOING
 RDA Staff
 Special analyses and data comparisons available by request

SERVICE INTEGRATION



Early Achievements in Service Integration: What We Can Learn from No Wrong Door Startups
 AUGUST 2003
 Longhi and Kohlenberg
www1.dshs.wa.gov/pdf/ms/rda/research/11/111.pdf



No Wrong Door: Designs of Integrated, Client Centered Service Plans for Persons and Families with Multiple Needs
 AUGUST 2001
 Webster, Longhi and Kohlenberg
www1.dshs.wa.gov/pdf/ms/rda/research/11/99.pdf

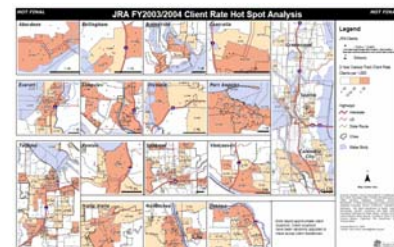
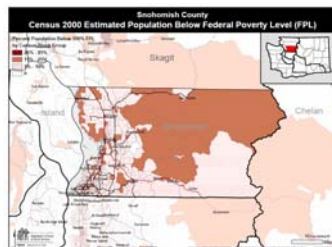
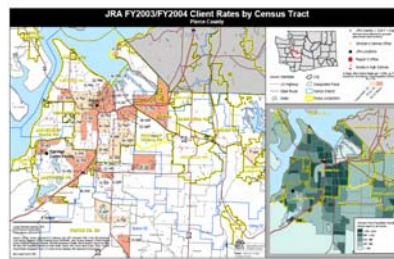
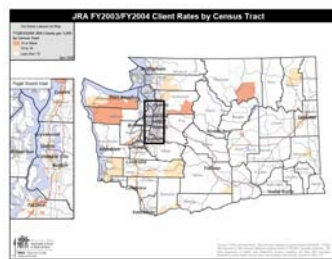


What do we want to change? The White Center and Boulevard Park November 17, 2001 Community Decision Group Report
 APRIL 2002
 Kohlenberg
www1.dshs.wa.gov/pdf/ms/rda/research/11/105.pdf



How do people in need use DSHS Services?
 APRIL 1999
 Fiedler, Axelsson and Kohlenberg
www1.dshs.wa.gov/pdf/ms/rda/clientdata/99slidepresentation.pdf

GEOGRAPHIC ANALYSES



Special **GEOGRAPHIC** analyses, **MAPS** and **DATA** available by request
 Kohlenberg and Zerbe