MENTAL HEALTH PROGRAM

Colorado Population in Need – 2009

Western Interstate Commission for Higher Education
3035 Center Green Drive Suite 200
Boulder, CO 80301-2204
303.541.0200 PH 303.541.0230 FX

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Division of Behavioral Health
Office of Behavioral Health and Housing
Colorado Department of Human Services

Colorado Population in Need 2009

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Division of Behavioral Health,
Office of Behavioral Health and Housing,
Colorado Department of Human Services

Contact: David Menefee, PhD
David.Menefee@state.co.us

This report was produced by the WICHE Mental Health Program

Contacts:
Chuck McGee, MS, cmcgee@wiche.edu, or
Maurene Flory, PhD, mflory@wiche.edu

With contributions by:
David Menefee, PhD, Director of Data and Evaluation, Division of Behavioral Health
In collaboration with:
Charles Holzer, PhD, University of Texas Medical Branch

November 2009

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Executive Summary

The Colorado Population in Need (COPIN) 2009 generated indicators of unmet need and penetration rates for behavioral health services for low income Coloradans with a serious behavioral health condition. These indictors provide standardized data that may be used to inform policy planning decisions.
Data sources used to generate indicators:

A. Synthetic prevalence estimates of persons with serious behavioral health conditions.
B. Unduplicated counts of individuals receiving services from four State agencies:
   1) Division of Behavioral Health.
   2) Department of Health Care Policy and Financing (Medicaid mental health and substance abuse services).
   3) Division of Vocational Rehabilitation.
   4) Division of Child Welfare.

Performance indicators generated:

- Unmet need = prevalence estimate – number of unique individuals served.
- Penetration rate = service use count / prevalence estimate.

Adult Indicators:

- Unmet need = 108,496.
- Penetration rate = 36%.
- Mental health service areas with the largest unmet need:
  - Denver (12,813).
  - Pikes Peak (12,749).
- Substance abuse planning area with the largest unmet need:
  - Metropolitan Denver (43,597); more than twice the number as the next substance abuse planning area.
- Overall penetration rate was 36%:
  - Variations in penetration rates across mental health service areas ranged from 26% to 54% disregarding extremes; this is comparable to substance abuse planning area rates.
  - Rates were lower for males (34%) than females (39%).
  - Generally rose with age (24% ages 21-24 to 57% ages 45-54) until age 55.
  - Lower for White non-Hispanics than overall (17% v 36% respectively).

Child and Adolescent Indicators:

- Unmet need = 18,525.
- Penetration rate = 62%.
- Mental health service area with the largest unmet need:
  - Denver (3,554).
  - Pikes Peak (3,447).
- Substance abuse planning area with the largest unmet need:
  - Metropolitan Denver with 9,599; more than twice the number as the next substance abuse service area.
- Overall penetration rate was 62%, much higher than for adults:
  - Variations across mental health service areas ranged from 49% to 88% disregarding extremes; this is comparable to substance abuse planning area rates.
  - Rates were lower for females (55%) than males (69%).
  - Were highest for ages 6-11 (91%) and lowest for ages 0-5 (30%).
  - Rates for White non-Hispanics (63%) were similar to rates overall (62%).

2002 to 2009 PIN Comparison

This comparison was limited to youths with serious emotional disturbance (SED) and adults with serious mental illness (SMI). Statewide:

- The definition of population of interest did not change.
- The prevalence of individuals with SED/SMI was down 9% (due to more rigorous criteria for serious disorders).
- Service use funded by the Division of Behavioral Health and Medicaid decreased 1%.
- Penetration rates increased for youth and decreased for adults, with an overall population decrease of 5%.

Uses of the Data

Indicators developed by this project are part of the continuous quality improvement process of the State. The specific planning questions of interest include: How many people in the population **need** behavioral health services (need was defined as prevalence of serious behavioral health disorders)? How many actually **use services**? How many people who need and could benefit from services did not receive them (**unmet need**)? Are services distributed equitably geographically and demographically (**disparities in care**)?

In addition to unmet need and under-met need, policy and planning can be informed by other performance indicators. The broader scope of indicators can also include quality of care, and appropriateness of services, and outcomes.

Findings from this study may be used to:

- Inform planning for mental health and substance abuse service provision, i.e., targeting needed services by geographic area and demographic subgroup.
- Advocate for services for individuals who are not currently being served.
- Reflect on the impact of existing policy and to inform new policy development.
- Inform the discussion regarding appropriateness of current resource allocations to the various funding systems in order to ensure efficient and effective care.

A by-product of the project, an estimation of the number of clients in common across all possible pairs of the nine agencies contributing data, can be found in Appendix A.

Acknowledgements

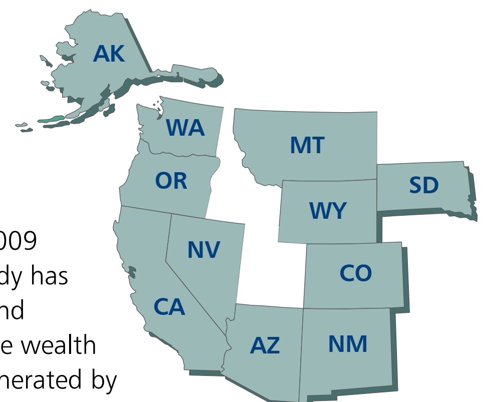
This second Statewide Population in Need (PIN) study (2009) was authorized and supported by the 2008 Colorado State Legislature. The study is an initiative of the **Division of Behavioral Health** (DBH) of the Colorado Department of Human Services (CDHS). DBH contracted with the **Western Interstate Commission for Higher Education** (WICHE) to conduct the study. Prevalence estimates are generated by the **University of Texas Medical Branch, Department of Psychiatry and Behavioral Sciences** using a proprietary epidemiological research methodology.[1] Initial service utilization estimates were performed by the **Bristol Observatory** using probabilistic population estimation[2] and final service utilization counts were obtained from client level databases shared by Colorado State agencies involved in the research.

Throughout this report we refer to the 2002 and 2009 PIN studies. The 2002 PIN study is based upon data from the U.S. Census (1990, updated to 1997), the National Co-Morbidity Study[3] (1990-1991), the Epidemiological Catchment Area survey (1980-1985), and the Probabilistic Population Estimation project (1999). All of these data were available in 1999 and were used to generate the estimates found in the original 2002 PIN study. The 2009 PIN study is based upon data from the U.S. Census (2000 updated to 2007), the National Co-Morbidity Study-Replication (2001-2003), the National Survey of American Life (2001-2003), and the National Latino and Asian American Study, (2002-2003). These data were available in 2007 and were used to generate the estimates found in the 2009 PIN study. The remainder of this report refers to the 2002 PIN study with its 1999 data and the 2009 PIN study with its 2007 data.

All phases of the study employed a collaborative decision making approach that engaged principal stakeholders in the Colorado public behavioral health system. Private non-profit stakeholders informing the study include the Colorado Behavioral Healthcare Council; OMNI, Inc.; the Colorado Providers Association; *and* the Mental Health Planning and Advisory Council. Through these organizations the project reached behavioral health organizations; managed service organizations; community mental health centers; substance abuse treatment facilities; and families and consumers. State governmental organizations informing the study include the Department of Health Care Policy and Financing, the Department of Corrections, the Department of Education, the Department of Public Safety, and within the Department of Human Services: the Division for Developmental Disabilities, the Division of Vocational Rehabilitation, the Division of Child Welfare, Supportive Housing and Homeless Programs, the Division of Youth Corrections, and the Division of Behavioral Health.

The 2009 PIN study enhances the research foundation created by the 2002 PIN study in several ways. First, there is an expansion of the population of interest beyond mental health disorders to include substance use disorders as well as co-occurring disorders. Second, the 2009 study includes *actual* unduplicated client level behavioral health service utilization data obtained from multiple state agencies instead of *estimates* of service utilization from these same agencies. Third, actual client level data from six other state agencies on all clients served were obtained instead of estimates. These additions have greatly enhanced the original study which focused exclusively on the population in need of mental health services, and thus have also added to the utility of the study for the State and Counties of Colorado. These enhancements are consistent with the direction of the State in integrating mental health and substance abuse into one Division of Behavioral Health.

Finally, the 2009 Colorado Population in Need study is one of 11 western state studies scientifically quantifying and describing the behavioral health needs of their populations. These states include Alaska, Arizona, California, Colorado, Montana, New Mexico, Nevada, Oregon, South Dakota, Washington, and Wyoming. The 2009 Colorado PIN study has benefited from and contributed to the wealth of knowledge generated by



[1] Prevalence estimates were provided by Dr. Charles Holzer, Ph.D., at the University of Texas Medical Center.

[2] Initial service utilization estimates were provided by Dr. John Pandiani, Ph.D., at the The Bristol Observatory.

[3] Developed and conducted by Dr. Ronald Kessler, Ph.D., Harvard Medical School, Department of Health Care Policy.

each of these states. Regarding the level of scientific sophistication, Colorado has contributed to the research technology by adding a level of detail not previously found in other state population in need studies, an account of service utilization at the client level.

The Role of DBH in this Study

The Colorado Department of Human Services Division of Behavioral Health is both the Mental Health Authority and Substance Abuse Authority for the State of Colorado and the lead agency in directing this study. The vision of the Division of Behavioral Health is to strengthen the health, resiliency, and recovery of Coloradans through quality and effective behavioral health prevention, intervention and treatment. The Division's five-year goals are (1) to continually improve the quality of services for prevention, intervention, and treatment, (2) to advance collaboration among internal and external stakeholders, (3) to enhance knowledge, understanding, and awareness of behavioral health disorders, (4) to secure, preserve, and maximize resources, (5) to strengthen the system infrastructure and workforce, and (6) to design, develop, and maintain a comprehensive evaluation and reporting system.

The 2009 PIN study serves as a foundation for achieving these goals by accurately identifying the populations needing public mental health, substance abuse, and co-occurring services; by including behavioral health stakeholders in the State that share the DBH vision in the process; by increasing public awareness and understanding of prevalence, service utilization, and unmet need; by effectively targeting resources based on unmet need and disparities in care; by informing the need for prevention and treatment expertise within the service delivery system; and by comprehensively assessing the needs of the population at the state, service area, and planning area. The data are available at the county level and the next report originating from this data will focus on prevalence, service utilization, unmet need, and penetration rates at the county level.

The DBH is primarily concerned with Coloradans who rely on the public sector for access to behavioral health (substance abuse disorder and mental health disorder) services. This includes anyone in need of services who is eligible for Medicaid funded behavioral health services including the Medicaid fee for service and the capitation programs and anyone who is uninsured, or has insurance coverage that does not include mental health or substance abuse benefits, and anyone who has Medicare and whose income is below 300% of the federal poverty level. The target population of the PIN study includes those who reside in households below 300% FPL (Federal Poverty Level,) in group homes or in institutions.

By knowing how many Coloradans presently need public behavioral health services and how many are currently accessing these services, the DBH can estimate how many persons need public services, would benefit from them, and have not yet accessed them. Furthermore, an understanding of this population based on age, race, gender, marital status, education, poverty, and residence, enables the State and its behavioral health stakeholders to effect positive change in public policy, develop targeted plans for service, better advocate for the needs of special populations, improve access to services by underserved groups, evaluate the outcomes of services, and contract and finance services based on need, capacity, and performance. Overall the study provides an excellent foundation for achieving the mission of addressing the behavioral health needs within Colorado.

Finally, by comparing the results of the 2002 and 2009 PIN studies, the DBH is better able to understand the rates at which prevalence, service utilization, and unmet needs vary over time by location, and various client demographics such as age, gender, ethnicity, etc. This information becomes critical in predicting and therefore preventing the occurrence and consequences of untreated mental illness and substance abuse in Colorado. Prevention and early intervention are therefore essential to improving the overall health of Coloradans while simultaneously reducing the social and economic impact of serious behavioral health disorders for the State. An important strategy to curb the escalating cost of behavioral health intervention and treatment services is to invest in preventing their occurrence in the first place. Prevention is a major goal for the Division of Behavioral Health.

Study Purpose

The 2009 Colorado "Population in Need" (PIN) study estimates unmet need and penetration rates among those citizens of Colorado with serious behavioral health disorders (SBHD) who cannot afford to pay for mental health and/or substance abuse services. SBHD includes children and adolescents with serious emotional disturbance (SED), and adults with serious mental illness (SMI), substance use disorders (SUD), and co-occurring disorders (COD includes SUD and SMI or SED). (Children and adolescents with co-occurring disorders substance used disorders are included with SED.) The study therefore reflects the behavioral health needs of the State from a public health perspective and is not limited to any particular provider organization(s). "Unmet need" is defined as the estimated number of individuals who have a SBHD minus the number of individuals who have accessed services during the 2007 State fiscal year. The difference represents those who "need" but have not accessed any type of behavioral health service. Penetration rates are calculated by dividing by the number of individuals utilizing behavioral health services by the number of individuals with a SBHD. This represents the percent of the population in need who have received services and conversely the percent who have not received services. By comparing rates across various population demographics, it is possible to determine if some groups are receiving more or fewer services than others; hence, the expression "disparities in care."

Study Method

The 2009 PIN study was conducted in three phases over a two-year period from June 2007 to May 2009 using 2007 data available from the U.S. Census and multiple databases in the Colorado public behavioral health system. The "Prevalence" phase used U.S. Census 2000 data to estimate the number of individuals in the 2007 Colorado population who have a SBHD. The "Service Utilization" phase counted the number of individuals in Colorado who actually accessed services during 2007. The final phase calculated "Unmet Need and Penetration Rates" based upon the findings of the first two phases. The remainder of this section presents the methodology used in each phase of the study.

Prevalence Phase

Prevalence refers to the total number of individuals with a SBHD in the population. Conducting an epidemiologic survey of the prevalence of SBHD in the Colorado population was too expensive to be practical, so a scientific estimate was needed. The estimate was generated by taking national prevalence rates from epidemiological studies and applying these rates to Colorado census data. Since this technique does not actually survey Coloradans, it is synthetic and the model produces what is termed 'synthetic' prevalence estimates.

The national epidemiologic data used for the project came from the Collaborative Psychiatric Epidemiology Surveys (CPES). CPES joined together three nationally representative datasets generated by three surveys: the National Co-morbidity Survey Replication (NCS-R), the National Survey of American Life (NSAL), and the National Latino and Asian American Study (NLAAS). The CPES permits analysts to approach analysis of the combined datasets as though it were a single, nationally representative dataset.

Rates from these national surveys were applied to census data from Colorado at a very detailed level producing synthetic prevalence estimates for each county by poverty level, age group, gender, race/ethnicity, marital status, education, and group quarters. A limitation of the synthetic prevalence estimates used in this report is the lack of prevalence data on youth with SUD. The CPES dataset does not include data for youth with substance use disorders only. Estimates of youth with co-occurring SED and SUD are included with the SED data. Thus the term SED refers to youth with SED only and to youth with co-occurring SED and SUD.

Prevalence estimates based on the CPES provide a relatively conservative estimate of persons in need of services. The CPES survey methodology produces conservative estimates because the methodology calls for a screening of a respondent prior to probing for specific disorders. Typically this method results in fewer positive responses than probing for every possible diagnosis from the beginning. The National Survey of Drug Use and Health focuses on substance use disorders, probes for every possible substance related

diagnosis, and generates prevalence rates about twice as high for substance use disorders as the CPES does. The largest methodological difference between the surveys is the screening conducted in the CPES surveys.

The more conservative prevalence estimates are preferable for reasons raised in an article by David Mechanic.[4] He argues that prevalence alone is a poor measure of need. For comparison he notes many people would qualify for some physical health diagnosis, however one would not argue all of those with a diagnosis need services. Thus, the conservative nature of the estimates makes them more realistic for use as an indicator of the need for services.

Dr. Mechanic goes on to note: “Clinicians and researchers have understood this for some time, and they have used a variety of ways to estimate need more realistically by considering diagnostic category, persistence and recurrence of symptoms, comorbidity, and various measures of impairment or poor functioning…” Synthetic prevalence estimates of serious mental disorders include measures of functioning in order to more realistically estimate need for services.

This project was restricted to a low-income household population (<300% Federal Poverty Level (FPL)) because publicly funded services are provided on a sliding fee scale and in Colorado some portion of a service may be paid for by the State for individuals in this group. While some individuals under 300% FPL have insurance, the insurance typically has limited coverage for behavioral health services.

The census separates data on individuals living in households from data about individuals living in group quarters (including institutions). Major institutions are nursing homes, prisons, and hospitals. Major group quarters are college dormitories, homeless shelters, and military quarters. Data on individuals living in group quarters are included in this report and reported separately from data on individuals living in households. The utility of including the population in group quarters with the low income household population is related to the likelihood that some persons within these settings will seek services within the public behavioral health sector. For example, military personnel are a large group in some geographic areas. They and their family members may or may not be served internally through military services; if they seek community services, they are likely to qualify for State subsidized services. College students living in dormitories are another large group whose members may choose to use community programs, and they are also likely to qualify for State subsidized services. In Colorado, some MH Service Areas and some SA Planning Areas have a significant portion of their population living in a group quarter situation.

The State is divided into seven (7) planning areas for substance abuse (SA Planning Area) and seventeen (17) service areas for mental health (MH Service Area). These traditional planning and service areas are used as a framework for displaying the results of the study. The substance abuse planning areas include one or more mental health service areas (see Figures 1 & 2 below). Mental health service area borders match county borders, with the exception of the Aurora MH Service Area, though there is almost always more than one county per service area. The municipality of Aurora is a separate mental health service area with parts in Adams County and in Arapahoe County. Prevalence estimates for Aurora MH Service Area were generated based on population figures showing the municipality of Aurora accounts for 12.55% of Adams County population and 48.80% of Arapahoe County’s population.

[1] Mechanic, David. “Is the Prevalence of Mental Disorders A Good Measure Of The Need For Services?,” In Health Affairs (22.5), September/October, 2003.

Figure 1. Mental Health Planning Areas (17)

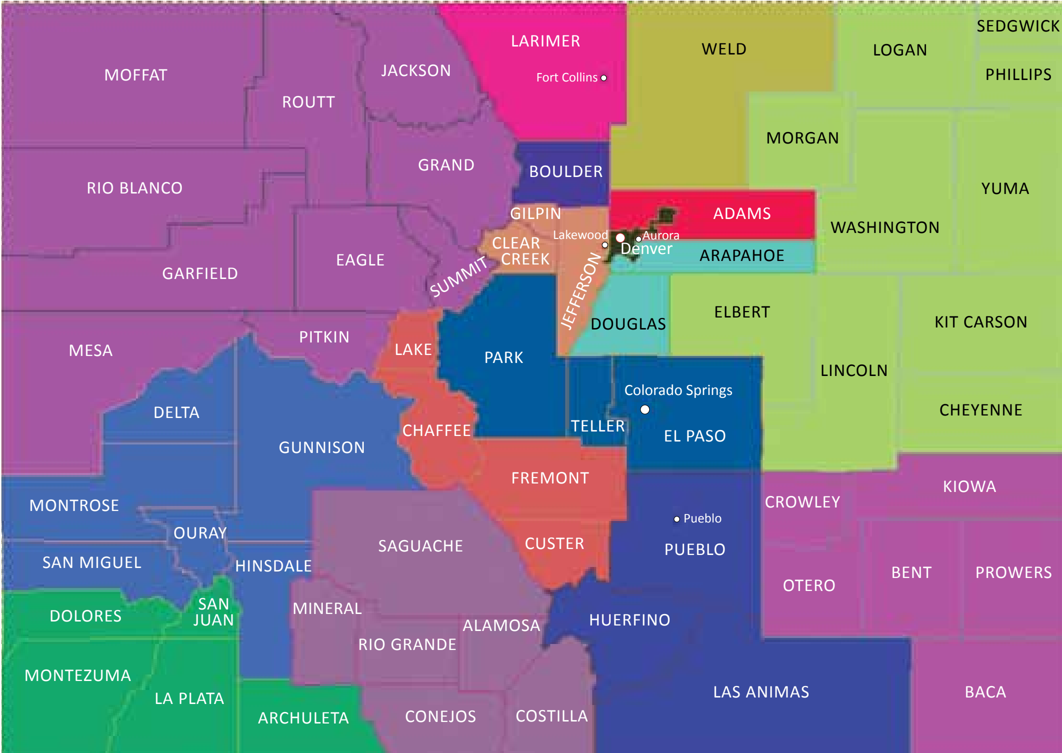
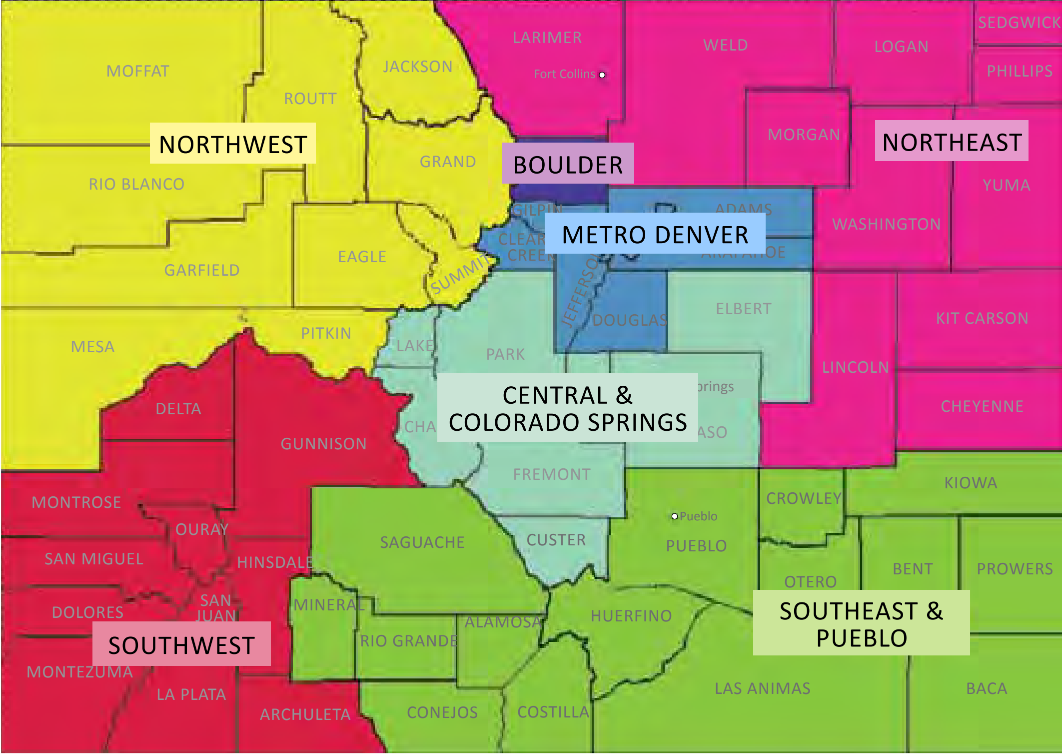


Figure 2. Substance Abuse Planning Areas (7)



Recall that this project is specifically focused on the population of persons in low income households (i.e., below 300% of the FPL), those living in group quarters, and, those living in institutions. The following table shows this population in each planning/service area for 2007.

Table 1. Low Income and Group Quartered Individuals in Colorado

SA Planning Area	MH Service Area	Youth	% State	Adult	% State	Total	% State
Northeast	Centennial	17,170	2.8%	44,465	3.0%	61,635	2.9%
	Larimer	26,876	4.4%	88,891	6.1%	115,767	5.5%
	North Range	39,729	6.6%	84,576	5.8%	124,305	6.1%
Northeast Total		**83,775**	**13.9%**	**217,932**	**14.9%**	**301,707**	**14.5%**
Metro Denver	Adams	58,085	9.6%	108,993	7.5%	167,078	8.4%
	Arapahoe/ Douglas	48,784	8.1%	97,487	6.7%	146,271	7.3%
	Aurora	38,780	6.4%	77,931	5.3%	116,711	5.8%
	Denver	92,276	15.3%	207,585	14.2%	299,861	14.8%
	Jefferson	46,838	7.7%	121,333	8.3%	168,171	8.2%
Metro Denver Total		**284,763**	**47.1%**	**613,329**	**42.0%**	**898,092**	**44.4%**
Central & Colorado Springs	Pikes Peak	84,173	13.9%	183,366	12.5%	267,539	12.8%
	West Central	8,204	1.4%	35,120	2.4%	43,324	1.7%
Central & Colorado Springs Total		**92,377**	**15.3%**	**218,486**	**15.0%**	**310,863**	**14.5%**
Southeast & Pueblo	San Luis Valley	8,991	1.5%	21,734	1.5%	30,725	1.5%
	Southeast	8,392	1.4%	24,890	1.7%	33,282	1.4%
	Spanish Peaks	29,379	4.9%	78,067	5.3%	107,446	5.2%
Southeast & Pueblo Total		**46,762**	**7.7%**	**124,691**	**8.5%**	**171,453**	**8.1%**
Southwest	Midwestern	12,253	2.0%	38,565	2.6%	50,818	2.5%
	Southwest	11,861	2.0%	36,856	2.5%	48,717	2.4%
Southwest Total		**24,114**	**4.0%**	**75,421**	**5.2%**	**99,535**	**4.8%**
Northwest	Colorado West	43,117	7.1%	117,510	8.0%	160,627	7.8%
Northwest Total		**43,117**	**7.1%**	**117,510**	**8.0%**	**160,627**	**7.8%**
Boulder	Boulder	29,603	4.9%	93,836	6.4%	123,439	5.8%
Boulder Total		**29,603**	**4.9%**	**93,836**	**6.4%**	**123,439**	**5.8%**
Grand Total		**604,511**	**100.0%**	**1,461,205**	**100.0%**	**2,065,716**	**100%**
% Grand Total		**29%**		**71%**		**100%**	

Based on 2007 data, 2,065,716 (42%) of the total State population met the definition of low income, living in households, group quarters, or an institution.

Service Utilization Phase

This section describes the second set of data used to generate indicators of unmet need and penetration rates: service utilization data. This section lists the sources of service utilization data, describes how they were compiled, and presents statewide counts for adults, and children and adolescents.

State Fiscal Year 2007 data on behavioral health service provision were obtained from four agencies: the Department of Health Care Policy and Financing (State Authority for Medicaid and Medicare); the Department of Human Services, Division of Behavioral Health; the Division of Vocational Rehabilitation; and the Division of Child Welfare. It is common to refer to services funded by the Department of Health Care Policy and Financing (i.e., Medicaid managed care and fee for service programs) and by the Division of Behavioral Health as the public behavioral health system. Therefore, in this report data provided by the Department of Health Care Policy and Financing (HCPF) and the Division of Behavioral Health (DBH) are referred to as the **base dataset**. Only services funded by public sources were included; specifically, privately funded services in the Division of Behavioral Health data set were excluded. Because DBH recognizes that other State agencies provide and/or fund behavioral health services, the **base** dataset was **extended** by adding the data from the Division of Vocational Rehabilitation (DVR) and the Division of Child Welfare (DCW). For the purpose of this project, Medicaid funded services for the Division for Developmental Disabilities were included in the expanded dataset, not the base. Data from each of these agencies were combined to provide unduplicated counts of adults and children/adolescents who received behavioral health services. The combined data set is referred to as the **extended dataset**. In the model, no figures of service utilization were estimated; all figures were actually calculated from the person-level data.

It is important to note that service utilization data were not limited to individuals with serious behavioral health disorders; all individuals receiving behavioral health services were included, even those with less serious conditions. Since the prevalence estimates had only persons with serious behavioral health disorders, including all individuals in the behavioral health service utilization data ensures that the estimate of unmet need will be conservative.

*Base **MH** means a consumer received at least one mental health treatment service funded by Medicaid or DBH in SFY 2007.*

The Division decided to count all individuals who received a behavioral health service using public funds, rather than only counting consumers with serious disorders. This approach would increase the number counted as served, thus producing a conservative estimate of the need for services.

The objective in analyzing service utilization data across agencies was to count the total number of individuals with serious behavioral health disorders who received publicly funded behavioral health services in State Fiscal Year (SFY) 2007 as accurately as possible. All four participating agencies maintained individual-level data on all persons served in SFY 2007; however, there was no person-specific common identification method across data sets. The ability to match clients across data sets varied, depending on the data the agency collected. Extensive effort was taken to develop an unduplicated database of individuals served by the participating agencies.

Identifying individuals who received behavioral health services was challenging. DVR clearly identified individuals receiving behavioral health services through their funding, and they were able to extract these data from their database. However, behavioral health services funded by DCW were not as apparent and some of the services may have been provided to family members rather than the child of record. Decisions about which services to include in the database counts and which to exclude were made in collaboration with DCW and DBH. Nonetheless, a database of unduplicated individuals and the behavioral health services they received was created. The service utilization data used for this project are more comprehensive than data used by most states to generate indicators of service utilization and more comprehensive than Colorado has used in the past.

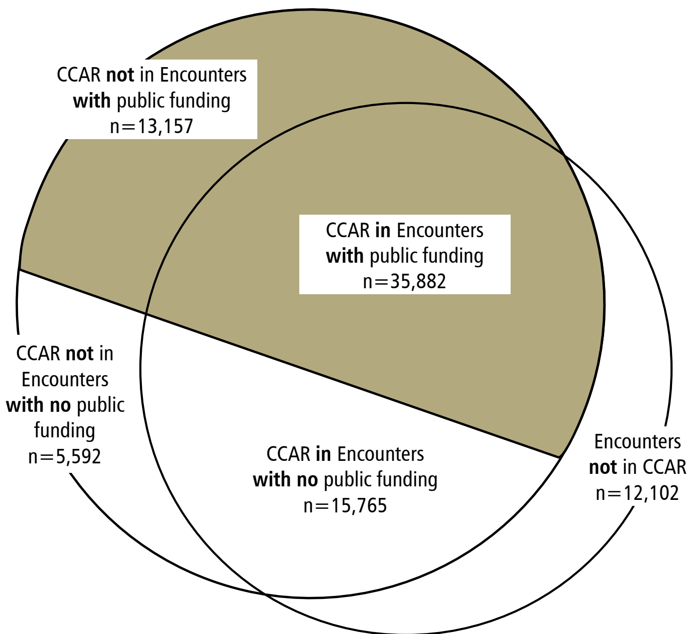
Base Mental Health (MH). The Medicaid program is a state and federal program that purchases healthcare for qualified Coloradans. HCPF provided Medicaid data on individuals who received services through the Medicaid managed care mental health capitated program or the Medicaid fee-for-service mental health program. Medicaid mental health numbers represent mental health services paid for by the Medicaid program, excluding pharmacy only and those billed to Medicaid by the

Division for Developmental Disabilities. (Medicaid Division for Developmental Disabilities data will be shown separately from the general Medicaid data.) Additionally, general Medicaid data do not include information about children enrolled in the Child Health Plan Plus program. The number of unique individuals who actually received a treatment service funded by Medicaid mental health in SFY 2007 was 45,957; individuals who received an assessment but did not receive a treatment service were excluded from the base dataset.

The Division of Behavioral Health provided data used to select individuals receiving mental health services funded by DBH. In order to be included in the DBH mental health dataset for this project, an individual had to be identified as using a public funding source and had to have received a mental health service in State Fiscal Year (SFY) 2007. Individuals using a public funding source were identified using the information submitted by providers on the Colorado Client Assessment Record (CCAR). The DBH Encounter file was used to validate that a treatment service was provided.

Figure 3 below demonstrates the relationship between CCARs and Encounters. The CCARs circle is divided to represent individuals with an identified source of public funding (in grey). There were a total of 70,496 CCAR records and 63,659 DBH Encounter records. The overlap between CCARS and DBH Encounters was 51,647: 35,882 with a source of public funding and

Figure 3. DBH Mental Health Dataset



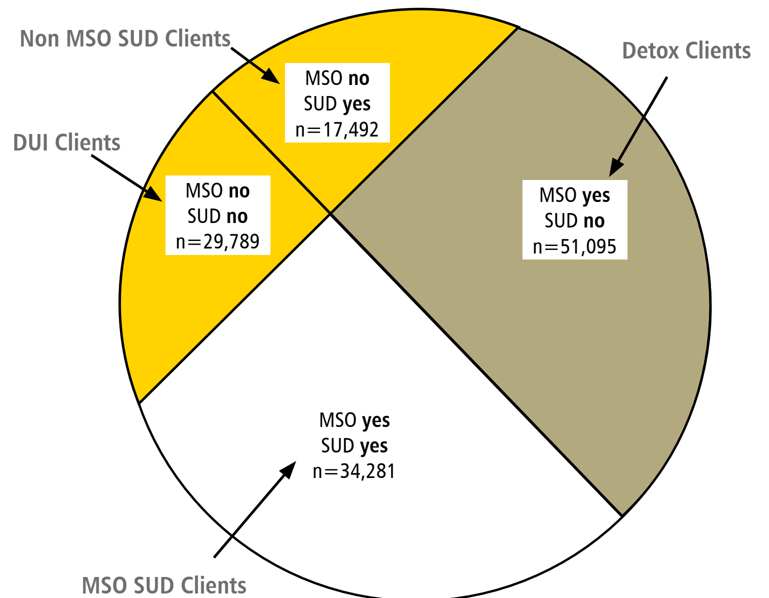
15,765 without (35,882+15,765 = 51,647.) Thus 35,882 unique individuals from the DBH file met the criteria for this project.

Once the Medicaid and DBH datasets were combined, there were 58,892 unique mental health consumers who received services in SFY 2007 and 54,557 unique mental health consumers who received a treatment service in the Base MH dataset.

Base Substance Abuse (SA). HCPF provided data on an unduplicated total of 1,275 individuals who received outpatient substance abuse services through the Medicaid fee-for-service program.

In order to be included in the DBH substance abuse dataset, an individual had to 1) have a record associated with a Managed Service Organization (MSO) indicating public funding, and 2) have participated in substance use disorder (SUD) treatment service in SFY07, not including a Driving Under the Influence (DUI) or detoxification program (DUI and detoxification programs were excluded because they are not equivalent to treatment programs). The figure below shows the 34,281 unique persons qualifying for both criteria.

Figure 4. DBH Substance Abuse Dataset



Once HCPF and DBH SA datasets were combined, there were 34,281 unique individuals with substance use disorder treatment needs served by HCPF and/or DBH in SFY07 and thus in the Base SA dataset.

Extended Mental Health (MH). The Division of Vocational Rehabilitation (DVR), the Division of Child Welfare (DCW), and Medicaid for the Division for Developmental Disabilities (DD) each funded mental health services in SFY 2007. These individuals were added to the base of Medicaid and DBH. Extended MH represents individuals of mental health services funded by Medicaid (including DD funds), DBH, DVR or DCW.

***Extended MH** means a consumer received at least one mental health treatment service funded by Medicaid, DBH, or Developmental Disability Medicaid, Vocational Rehabilitation, or Child Welfare in SFY 2007.*

The Division of Vocational Rehabilitation clearly identified individuals receiving mental health services that DVR funded, and provided a summary of each service received by each consumer. There were 3,013 DVR individuals; 68% of service payments were for evaluations, however. Removing those who received only evaluation services left 842 records representing individuals who received a mental health treatment service through DVR. These individuals were added to the Extended MH data set.

The Division of Child Welfare provided detailed program records. However, it was not always the identified child who received the services; another family member, such as a parent, may have consumed services in order to keep the child in the home. There were 11,575 unique IDs associated with a mental health program in the Division of Child Welfare data. These 11,575 records were added to the Extended MH data set.

HCPF also provided detailed service records for individuals served in the DD system. This dataset represented 1,296 records which were included in the Extended MH data set.

All of the records added to the Extended Mental Health data set were then unduplicated leaving 63,495 unique persons receiving funding for some form of mental health treatment service from one of the providers in the Extended MH dataset.

Extended Substance Abuse (SA). Extended SA represents individuals of substance use disorder treatment services funded by Medicaid, DBH or DCW. DVR did not fund substance use disorder treatment services.

DCW provided detailed program records. Programs were not always clearly identified as substance abuse; the title was used to categorize whether the program was providing substance use treatment services. In addition, it was not always the identified child who received the services; another family member, such as a parent, may have received services in order to keep the child in the home. To account for this as much as possible, substance use treatment services were ignored for children under age eleven (amounting to 4,278 IDs). There were 4,199 unique individuals ages eleven and above who were counted as SA service consumers. Individuals receiving substance use treatment services funded by DCW were added to the base of HCPF and DBH to form the Extended SA data set.

***Extended SA** means a consumer received at least one substance abuse disorder treatment funded by Medicaid, DBH, or Child Welfare in SFY 2007.*

When all the records in the Extended Substance Abuse data set were unduplicated, there were 38,613 unique individuals who received publicly funded substance use treatment services in SFY07.

Unduplicated Adults. Data were collected on a total of 32,656 unduplicated adult mental health consumers and 30,879 unduplicated adult substance abuse consumers across the extended dataset (see Table 2.) Table 2 shows consumers funded by the Division of Behavioral Health (DBH) and Medicaid (Med) for mental health (MH) or substance abuse (SA) services compared to others in the Base and Extended datasets. DBH had 20,392 mental health and 30,206 substance abuse adult consumers in SFY 2007; Medicaid had 25,009 mental health and 1,080 substance abuse consumers.

Table 2 also shows the number of mental health (MH) and substance abuse (SA) service consumers funded by each agency as well as the overlap with others. Medicaid, for example, had 25,009 adult mental health consumers. Following the Med MH row over shows 14,542 were in the DBH MH column indicating they were also DBH mental health consumers.

Tables 2 and 3 show the overlap between datasets; Table 2 shows the number of clients in common and Table 3 shows the percentage of each pay source that is in common with other pay sources in the extended dataset. Follow the row Med MH to the column titled Med MH to find the number of consumers of Medicaid mental health (**25,009**.) To find the number of Medicaid mental health consumers also served through DBH mental health (**14,542**), follow the Med MH row to the column DBH MH. Using the two tables together, there were **1,214** adults who appeared in both the DBH mental health and the DBH substance abuse data sets (Table 2) representing **4%** of DBH SA consumers (Table 3.)

Key to abbreviations used in tables:

DBH MH Division of Behavioral Health: Mental Health Services
DBH SA Division of Behavioral Health: Substance Abuse Services
Med MH Medicaid: Mental Health Services
Med SA Medicaid: Substance Abuse Services
MH Base Mental Health Base (DBH MH + Med MH)
SA Base Substance Abuse Base (DBH SA + Med SA)
DD Med MH Developmental Disabilities: Medicaid Mental Health Services
VR MH Vocational Rehabilitation: Mental Health Services
CW MH Child Welfare: Mental Health Services
CW SA Child Welfare: Substance Abuse Services
MH Ext Mental Health Extended: DBH MH + Med MH + DD Med MH+ VR M + CW MH
SA Ext Substance Abuse Extended: DBH SA + Med SA + CW SA

Table 2: Extended Data SFY 2007: Unduplicated Adults (Ages 18+)

Overlap	DBH MH	DBH SA	Med MH	Med SA	MH Base	SA Base	DD Med MH	VR MH	CW MH*	CW SA	MH Ext	SA Ext
DBH MH	**20,392**	1,214	14,542	400	20,392	1,343	289	53	97	56	20,392	1,393
DBH SA	**1,214**	**30,206**	1,639	610	1,862	30,206	7	40	19	15	1,908	30,206
Med MH	**14,542**	1,639	**25,009**	538	25,009	1,836	536	44	150	94	25,009	1,918
Med SA	400	610	538	**1,080**	565	1,080	0	1	4	5	566	1,080
MH Base	20,392	1,862	25,009	565	30,919	2,062	552	74	155	96	30,919	2,146
SA Base	1,343	30,206	1,836	1,080	2,062	30,676	7	41	20	15	2,108	30,676
DD Med MH	289	7	536	0	552	7	1,296	3	6	5	1,296	12
VR MH	53	40	44	1	74	41	3	837	1	0	837	41
CW MH*	97	19	150	4	155	20	6	1	388	191	388	204
CW SA	56	15	94	5	96	15	5	0	191	236	204	236
MH Ext	20,392	1,904	25,009	566	30,919	2,104	1,296	837	388	204	**32,656**	2,294
SA Ext	1,393	30,206	1,918	1,080	2,146	30,676	12	41	204	236	2,298	**30,897**

*The Division of Child Welfare provides services to persons up to age 21. Persons age 18+ are included in this table.

Table 3: Extended Data SFY 2007: Percent Overlap for Adult Clients												
Overlap	**DBH MH**	**DBH SA**	**Med MH**	**Med SA**	**MH Base**	**SA Base**	**DD Med MH**	**VR MH**	**CW MH***	**CW SA**	**MH Ext**	**SA Ext**
DBH MH	100%	6%	71%	2%	100%	7%	1%	0%	0%	0%	100%	7%
DBH SA	**4%**	100%	5%	2%	6%	100%	0%	0%	0%	0%	6%	100%
Med MH	58%	7%	100%	2%	100%	7%	2%	0%	1%	0%	100%	8%
Med SA	37%	56%	50%	100%	52%	100%	0%	0%	0%	0%	52%	100%
MH Base	66%	6%	81%	2%	100%	7%	2%	0%	1%	0%	100%	7%
SA Base	4%	98%	6%	4%	7%	100%	0%	0%	0%	0%	7%	100%
DD Med MH	22%	1%	41%	0%	43%	1%	100%	0%	0%	0%	100%	1%
VR MH	6%	5%	5%	0%	9%	5%	0%	100%	0%	0%	100%	5%
CW MH*	25%	5%	39%	1%	40%	5%	2%	0%	100%	49%	100%	53%
CW SA	24%	6%	40%	2%	41%	6%	2%	0%	81%	100%	86%	100%
MH Ext	62%	6%	77%	2%	95%	6%	4%	3%	1%	1%	100%	7%
SA Ext	5%	98%	6%	3%	7%	99%	0%	0%	1%	1%	7%	100%

*The Division of Child Welfare provides services to persons up to age 21. Persons age 18+ are included in this table.

Unduplicated Children and Adolescents. Data were collected on **30,839** unique consumers of mental health services and **7,716** unique consumers of substance abuse services under age 18 in the Extended data set (see Table 4). DBH and Medicaid data comprise the MH Base and SA Base data sets. DBH, Medicaid, Vocational Rehabilitation, and Child Welfare data comprise the MH Extend and SA Extend data sets in these tables.

Table 4 shows the number of child or adolescent consumers in the Base and the Extended datasets for mental health (MH) and substance abuse (SA) services. DBH had **13,795** mental health and **4,075** substance abuse child or adolescent consumers in SFY 2007; Medicaid had **20,948** mental health and **195** child or adolescent substance abuse consumers in SFY 2007.

Table 4: Extended Data SFY 2007: Unduplicated Children and Adolescents										
Overlap	**DBH MH**	**DBH SA**	**Med MH**	**Med SA**	**MH Base**	**SA Base**	**CW MH***	**CW SA**	**MH Ext**	**SA Ext**
DBH MH	**13,795**	471	11,122	100	13,795	498	2,535	1,322	13,795	1,322
DBH SA	**471**	**4,075**	682	134	732	4,075	384	4,075	773	4,075
Med MH	11,122	682	**20,948**	122	20,948	715	3,822	2,012	20,948	2,012
Med SA	100	134	122	**195**	128	195	60	195	139	195
MH Base	13,795	732	20,948	128	23,638	767	3,991	2,129	23,638	2,129
SA Base	498	4,075	715	195	767	4,136	398	4,136	810	4,136
CW MH*	2,535	384	3,822	60	3,991	398	11,187	3,376	11,187	3,376
CW SA	1,046	375	1,621	45	1,704	383	3,267	3,963	3,630	3,963
MH Ext	13,795	773	20,948	139	23,638	810	11,187	3,971	**30,839**	3,971
SA Ext	1,322	4,075	2,012	195	2,129	4,136	3,376	7,716	3,971	**7,716**

*The Division of Child Welfare provides services to persons up to age 21. Persons age <18.

Table 5: Extended Data SFY 2007: Percent Overlap for Children and Adolescents										
Overlap	DBH MH	DBH SA	Med MH	Med SA	MH Base	SA Base	CW MH*	CW SA	MH Ext	SA Ext
DBH MH	100%	3%	81%	1%	100%	4%	18%	8%	100%	10%
DBH SA	12%	100%	17%	3%	18%	100%	9%	9%	19%	100%
Med MH	53%	3%	100%	1%	100%	3%	18%	8%	100%	10%
Med SA	51%	69%	63%	100%	66%	100%	31%	23%	71%	100%
MH Base	58%	3%	89%	1%	100%	3%	17%	7%	100%	9%
SA Base	12%	99%	17%	5%	19%	100%	10%	9%	20%	100%
CW MH*	23%	3%	34%	1%	36%	4%	100%	29%	100%	30%
CW SA	26%	9%	41%	1%	43%	10%	82%	100%	92%	100%
MH Ext	45%	3%	68%	0%	77%	3%	36%	12%	100%	13%
SA Ext	17%	53%	26%	3%	28%	54%	44%	51%	51%	100%

*The Division of Child Welfare provides services to persons up to age 21. Persons age <18.

Tables 4 and 5 show the overlap between datasets. There were **471** children and adolescents present in both the DBH MH dataset and the DBH SA data set (Table 4) representing **12%** of DBH SA consumers (Table 5).

Unmet Need and Penetration Rate Phase

The unmet need phase of the project involved defining "unmet need" and counting the number of individuals with "unmet need" during SFY07. DBH convened a meeting of representatives from substance use disorder treatment services, mental health treatment services, and co-occurring treatment services to accomplish this task. One of the taskforce's major concerns was the use of the term "unmet need" to describe that part of the study population that qualified for but had not accessed services in SFY07. The taskforce took issue with "prevalence" being used as a proxy for "need for services." This methodological limitation is widely discussed in the literature, and as is true in the literature, no consensus was achieved by the taskforce on how to address this concern. The taskforce ultimately decided that since the other 10 states conducting the PIN study chose to use the term "unmet need" to describe those who needed but did not access services, Colorado would remain consistent with the other states and retain the same term and definition.

The formula for calculating unmet need was prevalence minus service utilization. Since the study had already produced the prevalence numbers (see 2007 Behavioral Health Prevalence Estimates for Colorado) and the service utilization numbers, the task of counting "unmet need" was relatively simple at the service area and State levels.

Penetration rates are calculated as the ratio of individuals served over the prevalence estimate.

Study Limitations

The purpose of this phase of the study was to estimate unmet need and penetration rates for citizens who could not afford to pay for services in SFY 2007. Two data sets were used: the prevalence of persons with serious disorders; and the number who received services. The extent to which the study achieves this depends on the soundness of each data source. The World Health Organization supports the use of prevalence estimates as a proxy for need.[5] Estimating service use is more challenging. This section focuses on how counts of persons using services were generated for this study.

The use of publicly funded services in the specialty sector for persons with serious behavioral health disorders is largely supported through Medicaid and

[5] World Health Organization, 2003. "Planning and Budgeting to Deliver Services for Mental Health."

the Division of Behavioral Health. This is particularly true, as in this study, when counting the number of persons served rather than the amount of money spent. However, in addition to these two payment sources, there are other sources of funding for behavioral health services. This study attempted to obtain client-level data on persons with serious behavioral health disorders for whom the agency funded behavioral health services from a number of other State and non-State agencies. The project approached a number of other State agencies beyond the four providing service use data including the Department of Corrections, the Judicial Department (Probation), the Department of Education, the Department of Public Safety, and within the Department of Human Services: the Division for Developmental Disabilities, Supportive Housing and Homeless Programs, the Division of Youth Corrections. The study also approached other funders of services including Veterans Affairs and the Hospital Association. The study was unsuccessful however in obtaining the desired data from many of these data sources for a variety of reasons. The main reasons given were a) privacy regulations, and b) the level of data requested were not available, were incomplete or the agency was unable to extract the data from their data collection system.

While the 2002 project could not obtain data on consumers of behavioral health services, it could and did obtain client-level data from several other organizations irrespective of behavioral health status. In 2002 client-level data were used to estimate a count of clients served by each agency that received behavioral health services from the Division of Mental Health and Medicaid. Using these counts the 2002 project *estimated* the number of additional persons served with behavioral health services from each agency. This was only done at the State level and 2002 stakeholders determined adding the agency estimates provided a more complete estimate of service use by persons with serious behavioral health disorders.

The situation had not improved significantly since the 2002 project was conducted. In fact, two agencies that had participated in the 2002 project (the Department of Education, and the Veterans Administration) were not able to participate with 2007 data. Several other State agencies were willing and able to provide client-level data on all persons served even though they could not provide behavioral health data. Additional agencies were willing to participate however were not able to provide the behavioral health service use data sought. The necessary business associate agreements were put into place and client-level data were provided by the Division of Youth Corrections, Supportive Housing and Homeless Programs, the Department of Corrections, and the Judicial Department (Probation). The decisions on whether to use these additional data and how to use them were left open until very late in the project. Stakeholders in the current project decided to only use the actual count of consumers of behavioral health services and not venture into estimates, as was done in 2002.

While the data on all clients served were not used for the purpose of this project they were explored by the project and are informative in their own right. A total of nine State agencies participated in this project. Four agencies each provided a data set representing consumers of behavioral health services, seven agencies provided a data set representing all clients active in the year, and two agencies provided data on both. These data were used to generate an unduplicated count of clients served. Appendix A provides these counts. There are tables for children and adolescents, for adults, and for the total population served. Appendix B describes the data sets and the process of generating unique counts.

The limited data on service use means the estimates of unmet need in the report are larger than actually exist. However, a majority of the behavioral health services for the low income population are paid for via Medicaid and DBH, and this data is included in the study. Penetration rates are subject to similar concerns. Even with the limitations, data on service use in this project is more complete than that collected in the past.

Findings

Adults with Serious Behavioral Health Disorders

This section presents four sets of findings. The first two tables provide the basis for generating the indicators of interest, prevalence estimates, and counts of adults utilizing services. The following tables provide indicators of unmet need and penetration rates.

Prevalence estimates are provided in Table 6. The first column of numbers provides estimates of adults with serious mental illness only (SMI Only); the second column provides estimates of adults with co-occurring substance use disorders (COD = SMI + SUD), and the third column provides estimates of adults with substance use disorders only (SUD Only). The total across all three columns provides estimates of adults with serious behavioral health disorders (SBHD).

Table 7 provides counts of adults utilizing behavioral health services. These counts represent unduplicated consumers of behavioral health services from the four agencies providing service utilization data: HCPF, DBH, DVR, and DCW.

Table 8 provides estimates of unmet need. It shows the difference between the first two tables (subtracting utilization figures from prevalence estimates).

Table 9 shows penetration rates; the ratio of individuals utilizing services to estimates of those with serious behavioral health disorders.

Prevalence Estimates. In 2007 there were an estimated 169,751 adults in Colorado with serious behavioral health disorders living at or below 300% of the federal poverty level. This included 89,803 adults with serious mental illness (SMI Only) excluding those with co-occurring disorders, 13,958 adults with co-occurring disorders (COD), and 65,990 adults with substance use disorders (SUD Only), excluding those with co-occurring disorders.

Table 6: Adults with Serious Behavioral Health Disorders Living At or Below 300% FPL

SA Planning Area	MH Service Area	Adults (ages 18+)			SBHD Total
		SMI Only	COD	SUD Only	
Northeast	Centennial	2,941	387	1,837	5,165
	Larimer	5,109	866	4,510	10,485
	North Range	5,023	836	4,164	10,023
Northeast Total		**13,073**	**2,089**	**10,511**	**25,673**
Metro Denver	Adams	6,597	1,153	5,272	13,022
	Arapahoe/ Douglas	5,414	824	4,008	10,246
	Aurora	4,540	725	3,355	8,620
	Denver	12,968	2,049	9,597	24,614
	Jefferson	7,221	1,137	5,179	13,537
Metro Denver Total		**36,744**	**5,888**	**27,408**	**70,040**
Central & Colorado Springs	Pikes Peak	11,284	1,705	7,725	20,714
	West Central	3,076	353	1,666	5,095
Central & Colorado Springs Total		**14,360**	**2,058**	**9,391**	**25,809**
Southeast & Pueblo	San Luis Valley	1,237	167	813	2,217
	Southeast	1,947	247	1,136	3,330
	Spanish Peaks	5,048	685	3,059	8,792
Southeast & Pueblo Total		**8,232**	**1,099**	**5,008**	**14,339**
Southwest	Midwest	2,363	349	1,610	4,322
	Southwest	2,318	356	1,629	4,303
Southwest Total		**4,681**	**705**	**3,239**	**8,625**
Northwest	Colorado West	7,233	1,195	5,568	13,996
Northwest Total		**7,233**	**1,195**	**5,568**	**13,996**
Boulder	Boulder	5,480	924	4,865	11,269
Boulder Total		**5,480**	**924**	**4,865**	**11,269**
Grand Total		**89,803**	**13,958**	**65,990**	**169,751**
Mental Health Total*		**103,761**			
Substance Abuse Total*				**79,948**	

Note: Combines individuals in low-income households and in group quarters.

*The few individuals with an unknown service area or who were from out of state were included in the mental health and substance abuse totals only. This practice is carried out throughout this report.

Service Utilization. In SFY 2007 there were approximately 61,255 unique adults who received behavioral health services funded through Medicaid, DBH, Vocational Rehabilitation, and Child Welfare.

The second column 'COD' represents persons who received both a mental health service (MH) and a substance abuse (SA) service in SFY 2007. Because it is possible for MH providers to address SA issues and SA abuse providers to address some MH issues, and also because this information was unavailable for this project, these numbers represent only a portion of the persons who received services for a co-occurring disorder. For this reason the unmet need for co-occurring disorders in Table 10 might be higher than it should be, thus leading to the penetration rates for co-occurring treatment being lower than they should be. The 'COD' category is included here to point out the level of detail that would be useful for planning purposes.

Table 7: Adults Service Utilization Excluding "Assessment Only"

SA Planning Area	MH Service Area	Adults (ages 18+)			Total
		SMI Only	COD	SUD Only	
Northeast	Centennial	784	60	478	1,322
	Larimer	1,706	167	922	2,795
	North Range	1,318	106	1,343	2,767
Northeast Total		**3,808**	**333**	**2,743**	**6,884**
Metro Denver	Adams	2,206	108	2,986	5,301
	Arapahoe/ Douglas	1,502	142	342	1,987
	Aurora	1,809	123	773	2,705
	Denver	5,879	359	5,563	11,801
	Jefferson	2,776	165	1,708	4,649
Metro Denver Total		**14,173**	**897**	**11,372**	**26,442**
Central & Colorado Springs	Pikes Peak	2,974	265	4,726	7,965
	West Central	686	93	787	1,566
Central & Colorado Springs Total		**3,660**	**358**	**5,513**	**9,531**
Southeast & Pueblo	San Luis Valley	807	89	1,281	2,177
	Southeast	664	44	584	1,292
	Spanish Peaks	2,285	196	2,281	4,762
Southeast & Pueblo Total		**3,756**	**329**	**4,146**	**8,231**
Southwest	Midwest	746	56	440	1,242
	Southwest	641	77	1,165	1,883
Southwest Total		**1,387**	**133**	**1,605**	**3,125**
Northwest	Colorado West	1,826	116	2,107	4,049
Northwest Total		**1,826**	**116**	**2,107**	**4,049**
Boulder	Boulder	1,695	130	1,112	2,937
Boulder Total		**1,695**	**130**	**1,112**	**2,937**
Grand Total		**30,358**	**2,298**	**28,599**	**61,255**
Mental Health Total		**32,656**			
Substance Abuse Total				**30,897**	

Estimates of Unmet Need. Table 8 subtracts the number of individuals served (figures in Table 7) from the prevalence estimate of individuals with serious behavioral health disorders in Colorado (figures in Table 6).

Table 8: Unmet Needs for Adults

SA Planning Area	MH Service Area	Adults (ages 18+) SMI Only	COD	SUD Only	Total
Northeast	Centennial	2,157	327	1,359	3,843
	Larimer	3,403	699	3,588	7,690
	North Range	3,705	730	2,821	7,256
Northeast Total		**9,265**	**1,756**	**7,768**	**18,789**
Metro Denver	Adams	4,391	1,044	2,286	7,721
	Arapahoe/ Douglas	3,912	682	3,665	8,259
	Aurora	2,731	602	2,583	5,916
	Denver	7,089	1,690	4,034	12,813
	Jefferson	4,445	972	3,471	8,888
Metro Denver Total		**22,571**	**4,991**	**16,036**	**43,597**
Central & Colorado Springs	Pikes Peak	8,310	1,440	2,999	12,749
	West Central	2,390	260	879	3,529
Central & Colorado Springs Total		**10,700**	**1,700**	**3,878**	**16,278**
Southeast & Pueblo	San Luis Valley	430	78	-468	40
	Southeast	1,283	203	552	2,038
	Spanish Peaks	2,763	489	778	4,030
Southeast & Pueblo Total		**4,476**	**770**	**862**	**6,108**
Southwest	Midwest	1,617	293	1,170	3,080
	Southwest	1,677	279	464	2,420
Southwest Total		**3,294**	**572**	**1,634**	**5,500**
Northwest	Colorado West	5,407	1,079	3,461	9,947
Northwest Total		**5,407**	**1,079**	**3,461**	**9,947**
Boulder	Boulder	3,785	794	3,753	8,332
Boulder Total		**3,785**	**794**	**3,753**	**8,332**
Grand Total		**59,445**	**11,660**	**37,391**	**108,496**
Mental Health Total		**71,105**			
Substance Abuse Total				**49,051**	

Remember that the project is dealing with **estimates** of prevalence along with **simple counts** on the service utilization side, thus the difference between the two is the prevalence estimate. A negative figure, such as the -468 SA Only for San Luis Valley, indicates the number of individuals served was greater than the prevalence estimate. This will result in a penetration rate greater than 100% (Table 9). Interpretation of all unmet need estimates and penetration rates need to involve 1) analysts looking further into types and amounts of treatment, and 2) knowledgeable stakeholders in affected areas discussing further the types and amounts of treatment.

Penetration Rates. Table 9 provides a penetration rate (i.e., the percent of people in need of services who were served in SFY 2007) by using the number of individuals served (figures in Table 7) as the numerator and the number of individuals with serious behavioral health disorders (from Table 6) as the denominator.

Table 9: Penetration Rates for Adults

SA Planning Area	MH Service Area	Adults (ages 18+)			Total
		SMI Only	COD	SUD Only	
Northeast	Centennial	27%	16%	26%	26%
	Larimer	33%	19%	20%	27%
	North Range	26%	13%	32%	28%
Northeast Total		**29%**	**16%**	**26%**	**27%**
Metro Denver	Adams	33%	9%	57%	41%
	Arapahoe/ Douglas	28%	17%	9%	19%
	Aurora	40%	17%	23%	31%
	Denver	45%	18%	58%	48%
	Jefferson	38%	15%	33%	34%
Metro Denver Total		**39%**	**15%**	**41%**	**38%**
Central & Colorado Springs	Pikes Peak	26%	16%	61%	38%
	West Central	22%	26%	47%	31%
Central & Colorado Springs Total		**25%**	**17%**	**59%**	**37%**
Southeast & Pueblo	San Luis Valley	65%	53%	158%	98%
	Southeast	34%	18%	51%	39%
	Spanish Peaks	45%	29%	75%	54%
Southeast & Pueblo Total		**46%**	**30%**	**83%**	**57%**
Southwest	Midwest	32%	16%	27%	29%
	Southwest	28%	22%	72%	44%
Southwest Total		**30%**	**19%**	**50%**	**36%**
Northwest	Colorado West	25%	10%	38%	29%
Northwest Total		**25%**	**10%**	**38%**	**29%**
Boulder	Boulder	31%	14%	23%	26%
Boulder Total		**31%**	**14%**	**23%**	**26%**
Grand Total		**34%**	**16%**	**43%**	**36%**
Mental Health Total		**31%**			
Substance Abuse Total				**39%**	

Children and Adolescents

This section presents four sets of findings (Tables 10-13). The findings in the first two tables provide the basis for generating indicators: prevalence estimates, and counts of children and adolescents utilizing services. The following two tables provide indicators of unmet need and penetration rates for children and adolescents in Colorado in SFY 2007.

Prevalence estimates are provided in Table 10. The first column provides estimates of the number of children and adolescents with serious emotional disturbances (SED.) Prevalence estimates of adolescents with substance use disorders only were not available for the project because the national surveys used to generate the prevalence estimates did not gather these data. However, estimates of youth with SED include those with co-occurring SED and SUD disorders as noted in the prevalence table. To recognize this limitation a placeholder was put in the tables for youth with substance use disorders only. Ideally, prevalence estimates would be available for youths with SED only, with SUD Only and with co-occurring SED and SUD.

Table 11 provides counts of children and adolescents utilizing behavioral health services paid for by the State in SFY 2007. These counts represent unduplicated child and adolescent consumers of behavioral health services from the four agencies providing service utilization data: Medicaid, Division of Behavioral Health, Division of Vocational Rehabilitation, and Division of Child Welfare.

Table 12 provides estimates of unmet need. It shows the difference between the estimated prevalence of children and adolescents with a serious behavioral health disorder in SFY 2007 and the number of children and adolescents receiving behavioral health services paid for by the State in SFY 2007 (subtracting utilization figures from prevalence estimates.)

Table 13 shows penetration rates: the ratio of children and adolescents utilizing services to estimates of children and adolescents with serious behavioral health disorders (number served/prevalence estimate.)

Prevalence Estimates. Statewide there were an estimated 49,364 children and adolescents living at or below 300% of the federal poverty level with serious emotional disturbances (SED) in Colorado in 2007. Table 10 distributes this count across planning areas for Substance Abuse (SA) and service areas for Mental Health (MH). Recall that the number of children and adolescents with substance use disorders only (SUD Only) and the number with co-occurring disorders were not available. The SED column includes children or adolescents who are estimated to have a co-occurring disorder.

Table 10: Children and Adolescents with Serious Behavioral Health Disorders

SA Planning Area	MH Service Area	SED (includes COD)	Children & Adolescents SED Only (Not Avail.)	COD (Not Avail.)	SUD (Not Avail.)	Total
Northeast	Centennial	1,401				1,403
	Larimer	2,143				2,143
	North Range	3,268				3,268
Northeast Total		**6,814**				**6,814**
Metro Denver	Adams	4,694				**4,694**
	Arapahoe/ Douglas	3,866				**3,866**
	Aurora	3,127				3,127
	Denver	7,775				7,775
	Jefferson	3,778				3,778
Metro Denver Total		**23,240**				**23,240**
Central & Colorado Springs	Pikes Peak	6,805				6,805
	West Central	675				675
Central & Colorado Springs Total		**7,480**				**7,480**
Southeast & Pueblo	San Luis Valley	760				760
	Southeast	720				720
	Spanish Peaks	2,474				2,474
Southeast & Pueblo Total		**3,954**				**3,954**
Southwest	Midwest	1,012				1,012
	Southwest	970				970
Southwest Total		**1,982**				**1,982**
Northwest	Colorado West	3,456				3,456
Northwest Total		**3,456**				**3,456**
Boulder	Boulder	2,438				2,438
Boulder Total		**2,438**				**2,438**
Grand Total		**49,364**				**49,364**

Service Utilization. Service utilization data were counts of children and adolescents receiving behavioral health services from one or more of the four agencies providing client level service data. These include the Department of Health Care Policy and Financing, the Division of Behavioral Health, the Division of Vocational Rehabilitation, and the Division of Child Welfare.

Identifying consumers of behavioral health services in the Division of Child Welfare presented challenges. Behavioral health services were not clearly identified as such, so service titles were used to identify mental health and substance abuse services. In addition, only the child or adolescent is represented in the database, the service may have been provided to an adult in the household in order to keep the child in the home, however. For the purposes of this project all mental health services were assigned to the child or adolescent while substance abuse services to children under age 11 were dropped and not assigned to anyone.

Table 11 includes information about both mental health and substance abuse service utilization. It shows the number of individuals served by mental health providers only in the column labeled 'MH Only', i.e., excluding those served by both mental health providers and substance abuse providers. The column 'COD' is an attempt to highlight individuals receiving co-occurring services: these youth received services from both mental health and substance abuse agencies. It should be recognized this is a limited count of youths receiving co-occurring service, as a more accurate count would include special co-occurring services provided by mental health or substance abuse agencies. The 'SA Only' column shows youth served only by substance abuse providers. The total is an unduplicated count (34,584) of all children and adolescents receiving behavioral health services identified by the four agencies by SA Planning Area and MH Service area in SFY 2007.

Table 11: Children and Adolescents Service Utilization						
			Children & Adolescents			
SA Planning Area	MH Service Area	SED (includes COD)	SED Only	COD	SUD Only	Total
Northeast	Centennial	998	893	105	51	1,049
	Larimer	1,855	1,697	158	239	2,094
	North Range	2,011	1,838	173	252	2,263
Northeast Total		**4,864**	**4,428**	**436**	**542**	**5,406**
Metro Denver	Adams	2,713	2,499	213	184	2,896
	Arapahoe/ Douglas	1,642	1,429	213	45	1,687
	Aurora	1,732	1,509	223	71	1,803
	Denver	4,221	3,365	856	1,118	5,339
	Jefferson	3,333	2,923	410	140	3,473
Metro Denver Total		**13,641**	**11,725**	**1,916**	**1,558**	**15,199**
Central & Colorado Springs	Pikes Peak	3,358	2,921	437	533	3,891
	West Central	691	560	131	163	854
Central & Colorado Springs Total		**4,049**	**3,481**	**568**	**696**	**4,745**
Southeast & Pueblo	San Luis Valley	809	706	103	84	893
	Southeast	721	675	46	67	788
	Spanish Peaks	2,036	1,785	251	149	2,185
Southeast & Pueblo Total		**3,566**	**3,166**	**400**	**300**	**3,866**
Southwest	Midwest	721	651	70	54	775
	Southwest	651	561	90	205	856
Southwest Total		**1,372**	**1,212**	**160**	**259**	**1,631**
Northwest	Colorado West	1,966	1,685	281	201	2,167
Northwest Total		**1,966**	**1,685**	**281**	**201**	**2,167**
Boulder	Boulder	1,355	1,147	208	189	1,544
Boulder Total		**1,355**	**1,147**	**208**	**189**	**1,544**
Grand Total		**30,839**	**26,868**	**3,971**	**3,745**	**34,584**

Estimates of Unmet Need. An indicator of unmet need was established by calculating the difference between the prevalence of SED (Table 10) and the corresponding child and adolescent service usage data from (sum of the 'MH Only' and 'COD' columns from Table 11). Because not all columns of data were available from the prevalence table, not all columns of data could be completed in Table 12. The empty columns show where additional data is needed; these are areas that could be improved upon in future studies.

The reader may note negative figures in the table. This indicates the prevalence estimate is smaller

than the number served, i.e., there is no "unmet need" in that cell using this formula. This finding is a warning to interpret all figures cautiously. Findings are indicators based on a standardized method for making calculations. They do not take into consideration potential unique characteristics affecting the indicator. On the one hand the prevalence estimate may underestimate need because of unique characteristics of the area or population. On the other hand service use may be over counted due to a special program or way of entering data.

Table 12: Unmet Need for Children and Adolescents

SA Planning Area	MH Service Area	SED (includes COD)	Children & Adolescents			Total
			SED Only	COD	SUD Only	
Northeast	Centennial	405				
	Larimer	288				
	North Range	1,257				
Northeast Total		**1,950**				
Metro Denver	Adams	1,979				
	Arapahoe/ Douglas	2,223				
	Aurora	1,396				
	Denver	3,554				
	Jefferson	445				
Metro Denver Total		**9,599**				
Central & Colorado Springs	Pikes Peak	3,447				
	West Central	-16				
Central & Colorado Springs Total		**3,431**				
Southeast & Pueblo	San Luis Valley	-49				
	Southeast	-1				
	Spanish Peaks	438				
Southeast & Pueblo Total		**388**				
Southwest	Midwest	291				
	Southwest	319				
Southwest Total		**610**				
Northwest	Colorado West	1,490				
Northwest Total		**1,490**				
Boulder	Boulder	1,083				
Boulder Total		**1,083**				
Grand Total		**18,525**				

Note: The negative figures in the table indicate the prevalence estimate is smaller than the number served, i.e., there is no "unmet need" in that cell. This calculation does not take into consideration potential unique characteristics affecting the indicator, e.g., the prevalence estimate may underestimate need because of unique characteristics of the area or population, or service use may be over-counted due to a special program implemented in that area or a particular way of entering data.

Penetration Rates. Penetration rates are the ratio of children and adolescents served to the estimates of children and adolescents living with SED. The numerator was the sum of the two columns receiving mental health services ('MH Only' and 'COD' columns from Table 11). The denominator was the prevalence of SED (source Table 10).

A penetration rate greater than 100% corresponds directly to a negative figure in the previous section on unmet need. Both indicators use the same data though in different formulas such that each negative figure in the unmet need section becomes a penetration rate greater than 100% in this section. For example, the first negative figure in the unmet need section was -16 for West Central in Table 12; the penetration rate for West Central is 102% in Table 13. This indicates the number served (the numerator) is larger than the prevalence estimate (the denominator). Findings are indicators based on a standardized method for making calculations and do not take into consideration potential unique characteristics affecting the indicator. Two potential explanations: the prevalence estimate may underestimate need because of unique characteristics of the area or population, or the service use may be over counted due to a special program or way of entering data.

Table 13: Penetration Rates for Children and Adolescents

SA Planning Area	MH Service Area	SED (includes COD)	Children & Adolescents			Total
			SED Only	COD	SUD Only	
Northeast	Centennial	71%				
	Larimer	87%				
	North Range	62%				
Northeast Total		**71%**				
Metro Denver	Adams	58%				
	Arapahoe/ Douglas	42%				
	Aurora	55%				
	Denver	54%				
	Jefferson	88%				
Metro Denver Total		**59%**				
Central & Colorado Springs	Pikes Peak	49%				
	West Central	102%				
Central & Colorado Springs Total		**54%**				
Southeast & Pueblo	San Luis Valley	106%				
	Southeast	100%				
	Spanish Peaks	82%				
Southeast & Pueblo Total		**90%**				
Southwest	Midwest	71%				
	Southwest	67%				
Southwest Total		**69%**				
Northwest	Colorado West	57%				
Northwest Total		**57%**				
Boulder	Boulder	56%				
Boulder Total		**56%**				
Grand Total		**62%**				

Demographic Data and Indicators

Previous sections addressed geographic characteristics (i.e., mental health service area, substance abuse planning area.) Another valuable way to look at unmet need and penetration rates is in terms of demographic characteristics (e.g., age groups, gender, and race/ ethnicity groups.) Stakeholders are concerned that people in various geographic and demographic groups have relatively equal access to services and that no one is selectively excluded, that there is equity in care.

The same approach in presenting data was taken as in previous sections. Tables are presented for prevalence estimates, service utilization, indicators of unmet need, and penetration rates. Tables for adults are presented before tables for children and adolescents. The text descriptions focus on differences between demographic groups.

Adult Statewide Demographics

Prevalence Estimates. Prevalence estimates are provided in Table 14. The first column of numbers provides estimates of adults with serious mental illness only (SMI Only); the second column provides estimates of adults with co-occurring substance use disorders (COD = SMI and SUD), and the third column provides estimates of adults with substance use disorders only (SUD Only). The total across all three columns provides estimates of adults with serious behavioral health disorders (SBHD).

Prevalence estimates for the Total SBHD are higher for males than females (54% v 46% respectively). This is driven by much higher numbers for male substance use only (48,934 male SUD Only v 17,056 female). The estimates of adults with serious mental illness are significantly higher for females however not high enough to counterbalance the male substance use only figure.

Statewide prevalence estimates for the Total SBHD are highest for White non-Hispanics with 107,384 adults representing 63% of adults with SBHD.

Table 14. Adult Prevalence Estimates by Demographic Group

	SMI Only	COD	SUD Only	Total SBHD	% Total
Age Group					
18-20	2,200	1,173	10,401	13,774	8%
21-24	8,858	2,669	16,976	28,503	17%
25-34	24,451	4,765	23,208	52,424	31%
35-44	24,005	3,216	10,675	37,896	22%
45-54	15,600	1,419	3,499	20,518	12%
55-64	7,760	453	898	9,111	5%
65+	6,929	263	333	7,525	4%
Adult Total	**89,803**	**13,958**	**65,990**	**169,751**	**100%**
Gender					
Female	54,285	6,289	17,056	77,630	46%
Male	35,518	7,669	48,934	92,121	54%
Adult Total	**89,803**	**13,958**	**65,990**	**169,751**	**100%**
Race/Ethnicity					
White-NH	59,390	8,871	39,123	107,384	63%
African American	5,377	498	1,843	7,718	5%
Other-NH	3,845	773	3,014	7,632	4%
Hispanic	21,191	3,816	22,010	47,017	28%
Unknown	n/a	n/a	n/a	n/a	
Adult Total	**89,803**	**13,958**	**65,990**	**169,751**	**100%**

Adult Service Use. Some caveats on service use data are in order before proceeding. Data for the persons with co-occurring conditions COD, meaning both SMI and SUD, are limited for reasons having to do with service utilization. The counts include only persons who received a service from both a mental health provider and a substance abuse provider; they do not include those who received a service from a single provider for a co-occurring condition. Also, a significant proportion of race/ethnicity data on service utilization was missing (over 9%), enough to affect analysis. Most missing race/ethnicity data were for SMI Only consumers.

Table 15 provides counts of adults utilizing behavioral health services. These counts represent unduplicated consumers of behavioral health services from the four agencies providing service utilization data: HCPF, DBH, DVR, and DCW.

Though it starts out low for the 18-20 age group, service use increases and is relatively stable across age groups for Total SBHD through age 54 then drops. It is also stable for gender. Service use is very high for Hispanics. This is driven by exceedingly high figures for Hispanics receiving substance use only services and warrants checking the assignment of ethnic categorization at admission to substance abuse programs.

Table 15. Adult Service Utilization by Demographic Group

	SMI Only	COD	SUD Only	Total SBHD	% Total
Age Group					
18-20	2,031	358	2,682	5,071	8%
21-24	2,379	273	4,094	6,746	11%
25-34	6,465	715	8,601	15,781	26%
35-44	6,708	561	7,350	14,619	24%
45-54	6,637	314	4,687	11,638	19%
55-64	3,767	69	1,029	4,865	8%
65+	2,371	8	156	2,535	4%
Adult Total	**30,358**	**2,298**	**28,599**	**61,255**	**100%**
Gender					
Female	19,672	1,567	8,882	30,121	49%
Male	10,686	731	19,717	31,134	51%
Adult Total	**30,358**	**2,298**	**28,599**	**61,255**	**100%**
Race/Ethnicity					
White-NH	14,351	1,216	2,718	18,285	30%
African American	2,021	129	308	2,458	4%
Other-NH	6,530	301	831	7,662	13%
Hispanic	3,184	212	24,053	27,449	45%
Unknown	4,272	440	689	5,401	9%
Adult Total	**30,358**	**2,298**	**28,599**	**61,255**	**100%**

Adult Unmet Need. Table 16 provides estimates of unmet need. It shows the difference between the first two tables (subtracting utilization figures from prevalence estimates).

The age group with the largest unmet need is 25-34 followed by ages 35-44 and 21-24 (with unmet needs of 36,643; 23,277 and 21,757 respectively). The age group with the largest unmet need relative to the number of years in the group is 21-24. (While the age group 35-44 has a higher number of individuals with unmet need, the age group spans ten years. The age group 21-24 includes only four years.) Males have a higher unmet need than females (60,987 vs. 47,509). White non-Hispanics have a higher unmet need than minorities and account for 82% of the unmet need by race/ethnicity.

Table 16. Adult Unmet Need by Demographic Group

	SMI Only	COD	SUD Only	Total SBHD	% Total
Age Group					
18-20	169	815	7,719	8,703	8%
21-24	6,479	2,396	12,882	21,757	20%
25-34	17,986	4,050	14,607	36,643	34%
35-44	17,297	2,655	3,325	23,277	21%
45-54	8,963	1,105	-1,188	8,880	8%
55-64	3,993	384	-131	4,246	4%
65+	4,558	255	177	4,990	5%
Adult Total	**59,445**	**11,660**	**37,391**	**108,496**	**100%**
Gender					
Female	34,613	4,722	8,174	47,509	44%
Male	24,832	6,938	29,217	60,987	56%
Adult Total	**59,445**	**11,660**	**37,391**	**108,496**	**100%**
Race/Ethnicity					
White-NH	45,039	7,655	36,405	89,099	82%
African American	3,356	369	1,535	5,260	5%
Other-NH	-2,685	472	2,183	-30	0%
Hispanic	18,007	3,604	-2,043	19,568	18%
Unknown	n/a	n/a	n/a	n/a	
Adult Total	**59,445**	**11,660**	**37,391**	**108,496**	**100%**

Adult Penetration Rates. Table 17 shows penetration rates; the ratio of individuals utilizing services to estimates of those with serious behavioral health disorders.

Penetration rates provide indicators of disparities in care. There was considerable variation in adult penetration rates for demographic groups; less by age group in the total than in the three individual behavioral health conditions (SMI Only, COD, SUD Only). The overall adult penetration rate was 36%.

The percentages for age groups ranged from a high of 57% for ages 45-54 to a low of 24% for ages 21-24. The pattern was similar for all three conditions with the exception of ages 18-20. The rate for young adults ages 18-20 was slightly higher than the overall. Young adults had very high penetration rates for 'SMI Only' (92%) and very low penetration rates for 'SUD Only' (26%).

Gender did not show as wide a variation in penetration rates. Females were higher than males for each condition.

The overall variation was greatest for race/ethnic groups. These groups ranged from a low of 17% for White non-Hispanics to a high of 100% for Other non-Hispanics. Thus there is no concern raised in these indicators that minorities were underserved.

Table 17. Adult Penetration Rates by Demographic Group

	SMI Only	COD	SUD Only	% Total
Age Group				
18-20	92%	31%	26%	37%
21-24	27%	10%	24%	24%
25-34	26%	15%	37%	30%
35-44	28%	17%	69%	39%
45-54	43%	22%	134%	57%
55-64	49%	15%	115%	53%
65+	34%	3%	47%	34%
Adult Total	34%	16%	43%	36%
Gender				
Female	36%	25%	52%	39%
Male	30%	10%	40%	34%
Adult Total	**34%**	**16%**	**43%**	**36%**
Race/Ethnicity				
White-NH	24%	14%	7%	17%
African American	38%	26%	17%	32%
Other-NH	170%	39%	28%	100%
Hispanic	15%	6%	109%	58%
Unknown	n/a	n/a	n/a	n/a
Adult Total	**34%**	**16%**	**43%**	**36%**

Children and Adolescent Statewide Demographic Indicators

Prevalence Estimates. Prevalence estimates are provided in Table 18. The first column of numbers is an estimate of children and adolescents with serious emotional disturbance (SED), including youths with co-occurring disorders. Estimates were not available for youths with substance use disorders only. The remaining columns were included as place holders to remind readers of the need for additional data on children and adolescents. Limited data were available for service use.

Table 18. Children and Adolescent Prevalence Estimates by Demographic Group

	SED (incl. COD)	SED Only	COD	SUD Only	Total
Age Group					
00-05	18,476				18,476
06-11	16,318				16,318
12-17	14,570				14,570
Total	**49,364**				**49,364**
Gender					
Female	24,263				24,263
Male	25,101				25,101
Total	**49,364**				**49,364**
Race/Ethnicity					
White-NH	22,800				22,800
African American	2,939				2,939
Other-NH	3,167				3,167
Hispanic	20,458				20,458
Unknown	n/a				n/a
Total	**49,364**				**49,364**

Prevalence estimates are similar for gender with a few more males than females (25,101 and 24,263 respectively). Estimates for Hispanics are slightly lower than estimates for White non-Hispanics (20,458 and 22,800 respectively).

Service Use. Table 19 provides counts of children and adolescents utilizing behavioral health services. These counts represent unduplicated consumers of behavioral health services from the four agencies providing service utilization data: HCPF, DBH, DVR, and DCW.

Table 19. Children and Adolescent Service Utilization by Demographic Group

	SED (incl. COD)	SED Only	COD	SUD Only	Total
Age Group					
00-05	5,501	5,501			5,501
06-11	14,925	11,220	3,705	3,689	18,614
12-17	10,413	10,147	266	57	10,470
Total	**30,839**	**26,868**	**3,971**	**3,746**	**34,585**
Gender					
Female	13,436	11,818	1,618	1,177	14,613
Male	17,403	15,050	2,353	2,568	19,971
Total	**30,839**	**26,868**	**3,971**	**3,745**	**34,584**
Race/Ethnicity					
White-NH	14,260	12,354	1,906	355	14,615
African American	2,666	2,181	485	63	2,729
Other-NH	3,873	3,565	308	570	4,443
Hispanic	917	860	57	2,264	3,181
Unknown	9,123	7,908	1,215	493	9,616
Total	**30,839**	**26,868**	**3,971**	**3,745**	**34,584**

Significantly more males were served than females in all categories. White non-Hispanics represent the largest race/ethnicity with 14,615 served. This is difficult to interpret given the large number in the Unknown category of 9,616.

Unmet Need. Unmet need is highest in the 0-05 age group. Females have a higher unmet need than males (10,827 and 7,698 respectively). The indicator shows Hispanics have the largest unmet need by far among race/ethnicities even taking into consideration the high number of unknown race/ethnicity.

Table 20. Children and Adolescent Unmet Need by Demographic Group

	SED (incl. COD)	SED Only	COD	SUD Only	Total
Age Group					
00-05	12,975				12,975
06-11	1,393				1,393
12-17	4,157				4,157
Total	**18,525**				**18,525**
Gender					
Female	10,827				10,827
Male	7,698				7,698
Total	**18,525**				**18,525**
Race/Ethnicity					
White-NH	8,540				8,540
African American	273				273
Other-NH	-706				-706
Hispanic	19,541				19,541
Unknown	-9,123				
Total	**18,525**				**18,525**

Children and Adolescent Penetration Rates. The penetration rate for children and adolescents varied considerably for all demographic groups. The rate for children ages 06-11 was high at 91%. The rate for children ages 00-05 was only 30%, thus lowering the overall percentage. The rate for adolescents was 71%.

The penetration rate for females was substantially lower than the rate for males. Females had a penetration rate of 55% compared with a rate of 69% for males.

The largest variation in penetration rates for demographic groups was for race/ethnicity. The penetration rate of 63% for White non-Hispanics is virtually the same as the overall rate of 62%. African Americans (91%) and Other non-Hispanic (122%) had much higher penetration rates than White non-Hispanics while Hispanics had an extremely low penetration rate (4%).

Cautions were provided earlier in this report about penetration rates over 100% and the relationship to negative figures for unmet need (see discussions on Tables 12 and 13). The same caution applies here. Additionally, alternative explanations for the large variation for race/ethnicity should be explored. It is likely the reason for the extremely low penetration rate for Hispanics and the relatively high penetration rate for Other non-Hispanics is due to data collection errors, particularly given 1) the rates for White non-Hispanics is the same as the overall rate, and 2) the large number of Unknown race/ethnicity.

The reader may note negative figures in the table. This indicates the prevalence estimate is smaller than the number served, i.e., there is no "unmet need" in that cell using this formula. This finding is a warning to interpret all figures cautiously. Findings are indicators based on a standardized method for making calculations. They do not take into consideration potential unique characteristics affecting the indicator. On the one hand the prevalence estimate may underestimate need because of unique characteristics of the area or population. On the other hand service use may be over counted due to a special program or way of entering data.

Table 21. Children and Adolescent Penetration Rates by Demographic Group

	SED (incl. COD)
Age Group	
00-05	30%
06-11	91%
12-17	71%
Total	**62%**
Gender	
Female	55%
Male	69%
Total	**62%**
Race/Ethnicity	
White-NH	63%
African American	91%
Other-NH	122%
Hispanic	4%
Unknown	n/a
Total	**62%**

PIN 2002 to 2009 Comparison

As stated in the beginning of this report, a comparison of prevalence, service utilization, and unmet need at different points in time provides valuable information on how, when, where, and for whom service demand changes. With data from just two points in time (1999 & 2007) it is difficult to draw conclusions about trends in prevalence, service utilization, and unmet need. Continuing these assessments over time will ultimately provide a clearer picture of these trends in Colorado. As data accumulate, it will become possible not only to describe the differences but to begin to explore and explain what factors may account for them and to predict likely rates in the immediate future. With such information DBH will be able to more strategically target its resources toward preventing behavioral health disorders and reducing their social and economic impact.

Before comparing the two PIN studies it is appropriate to note any differences in methodology used in calculating the prevalence and service utilization rates (unmet need and penetration rates are calculated using the same formula in both studies) for 2002 and 2009. It is also important to identify the impact these differences may have on the estimates from one year to the next. A word of caution: whenever two studies are done at different points in time using similar but slightly different methods of data collection the reader must take into consideration the increased chance for error in estimating population parameters. Still, it is worthwhile to compare the two studies after the following caveats are presented.

Differences in the methodology for estimating prevalence were driven by changes in the instrument or set of instruments used to generate the numbers. The 2002 prevalence estimates were generated using the National Co-morbidity Survey (NCS) results obtained from a nationally representative sample of U.S. citizens. The NCS is a version of the World Health Organization's Composite International Diagnostic Interview (CIDI). This survey was based upon the DSM-III or DSM-III-R. The 2007 prevalence estimates were generated using the NCS-R, a replication study that used many of the original questions contained in the NCS but updated the diagnostic criteria based upon the DSM-IV. Another important addition to the NCS-R is the use of impairment criteria; and, the implementation of the definition called SMI is intrinsically different. The impairment criteria or days off usual role and the definition used for "persistent" are more conservative than those used in the NCS. In addition, the 2009 prevalence study utilized two additional surveys: the National Survey of American Life (NSAL), and the National Latino and Asian American Study (NLAAS). These additions enhanced the study's capacity to accurately estimate prevalence based on racial and ethnic affiliation. In general, the two methods of estimating prevalence are closely related, with the 2009 approach representing an enhancement of the 2002 approach.

In comparing the youth, adult, and total prevalence data from the two studies (2002 & 2009) we find almost perfect correlations among the seventeen mental health areas (r=0.985, 0.986, 0.990, respectively) for each. Relative orderings across areas are extremely similar, i.e., ratings that were low in the initial analysis remained low and ratings that were high in the initial analysis remained high.

In obtaining service utilization numbers, the 2002 method used "Probabilistic Population Estimation" a statistical technique that estimates the number of unduplicated individuals who access services based on multiple population demographics; these estimates have extremely small margins of error. By contrast, the 2009 COPIN service utilization numbers are counts of unduplicated individuals who actually received services during the year. Service use figures for 2002 were calculated to be comparable to the 2002 report and differ from 2009 COPIN service use figures found in previous sections of this report in two ways: 1) figures used in the 2002 report include only Medicaid and DMH mental health data, and 2) figures used in the 2002 report are for all individuals receiving any mental health service; not just a treatment service, i.e., persons receiving only an evaluation service were included in this comparison. Thus the 2002 PIN estimates, even with their small margins of error, are still estimates, while the 2009 COPIN numbers are counts of actual people receiving services. Nonetheless, the two methods are designed to produce valid and reliable data on service utilization each year. In fact, an examination of the relationship between the two data sets for youths, adults, and totals shows extremely high correlations (r=0.92, 0.97, & 0.96, respectively) between 2002 PIN and 2009 PIN reports, indicating that the two methods produce similar patterns of results.

Given the above findings, it is reasonable to assume that the 1999 and 2007 data sets can be compared to one another. In interpreting the findings, however, it is important to keep the different methodologies in mind. It is possible that some unknown factor may have influenced the data in either the 2002 or 2009 studies. We now turn to the comparison.

Population of Interest Comparison

It is important to compare the results of the two "Population in Need" studies if only to note the differences over the five year period. Because the 2002 Population in Need" study focused only on Mental Health this comparison will be limited to that population. Table 22 shows that there has been a fairly wide variation among the mental health service areas with respect to the percent of change in youth, adult, and total population of those at or below 300% of the federal poverty level.

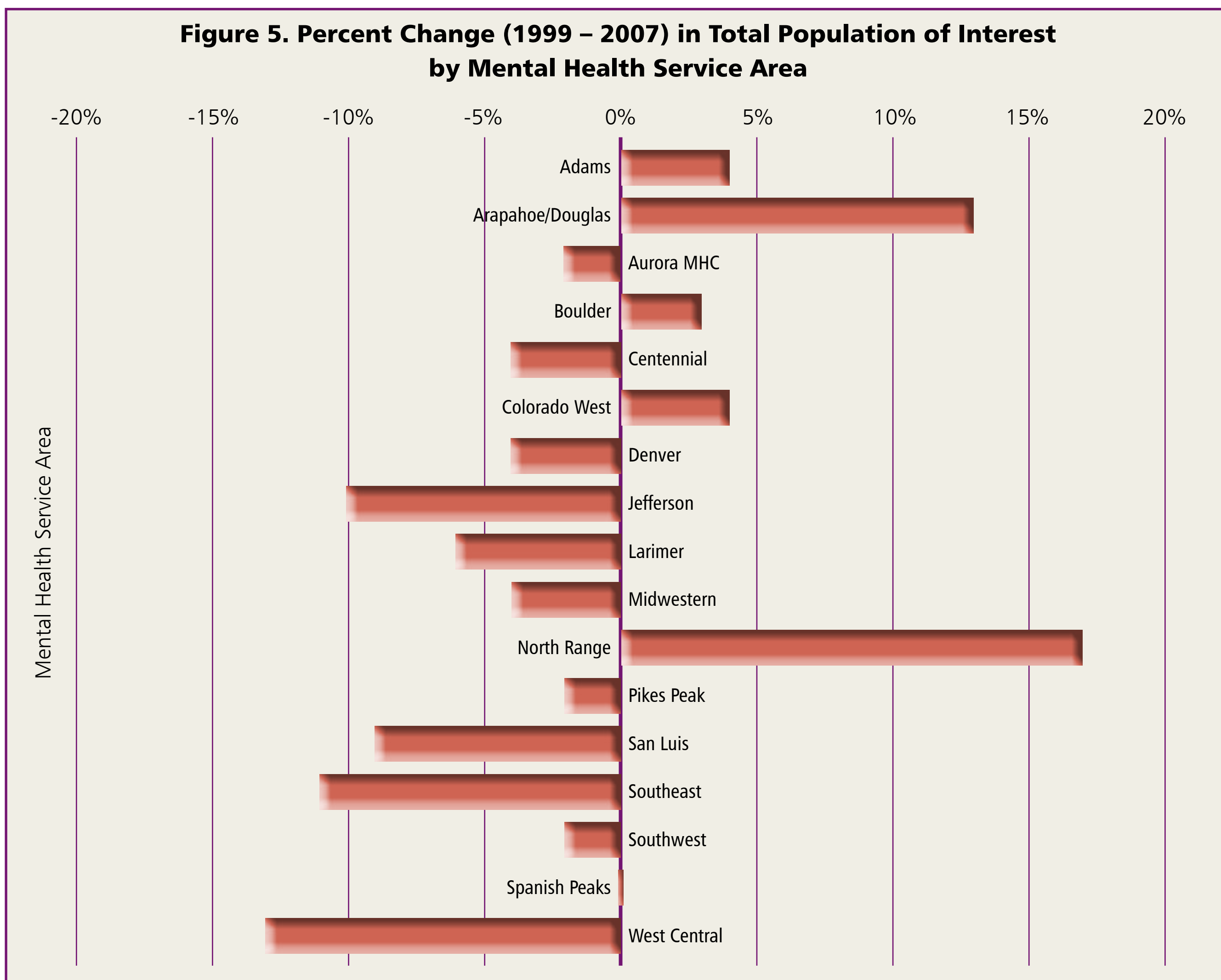
The percent change in the youth population of interest ranges from +13% to -31%. Of course these changes must be understood in relation to the actual raw number of consumers they represent (see table 22). For example, from 1999 to 2007, the West Central service area shows a 31% decrease in youth living at or below 300% of the federal poverty level and this represents an actual decrease of 3,618 youth over the five year period. So the actual decrease in raw numbers is relatively small when compared to decreases observed in other service areas. Similarly, in the West Central service area, the percent change from 1999 to 2007 in the adult population of interest is -8%. Overall, the percent change among service areas for the total

Table 22: Population of Interest by Service Area and Age Group (Youth <18, Adults 18+)

Mental Health Service Area	1999			2007			Percent Change		
	Youth	Adult	Total	Youth	Adult	Total	Youth	Adult	Total
Adams	55,767	105,389	161,156	58,085	108,993	167,078	4%	3%	4%
Arapahoe/Douglas	44,712	84,344	129,056	48,784	97,487	146,271	9%	16%	13%
Aurora MHC	42,222	77,047	119,269	38,780	77,931	116,711	-8%	1%	-2%
Boulder	30,738	88,901	119,639	29,603	93,836	123,439	-4%	6%	3%
Centennial	20,923	42,963	63,886	17,170	44,465	61,635	-18%	3%	-4%
Colorado West	44,056	109,813	153,869	43,117	117,510	160,627	-2%	7%	4%
Denver	88,951	224,812	313,763	92,276	207,585	299,861	4%	-8%	-4%
Jefferson	59,694	126,788	186,482	46,838	121,333	168,171	-22%	-4%	-10%
Larimer	32,424	90,700	123,124	26,876	88,891	115,767	-17%	-2%	-6%
Midwestern	14,519	38,215	52,734	12,253	38,565	50,818	-16%	1%	-4%
North Range	35,192	71,221	106,413	39,729	84,576	124,305	13%	19%	17%
Pikes Peak	91,625	181,392	273,017	84,173	183,366	267,539	-8%	1%	-2%
San Luis	10,870	22,859	33,729	8,991	21,734	30,725	-17%	-5%	-9%
Southeast	11,303	25,886	37,189	8,392	24,890	33,282	-26%	-4%	-11%
Southwest	14,306	35,422	49,728	11,861	36,856	48,717	-17%	4%	-2%
Spanish Peaks	32,456	75,248	107,704	29,379	78,067	107,446	-9%	4%	0%
West Central	11,822	38,143	49,965	8,204	35,120	43,324	-31%	-8%	-13%
Grand Total	**641,580**	**1,439,143**	**2,080,723**	**604,511**	**1,461,205**	**2,065,716**	**-6%**	**2%**	**-1%**

population of interest ranges from +17% to -13%. In addition, those mental health service areas with the greatest growth (5% or more) in the target population are North Range (17%) and Arapahoe/Douglas (13%). Those with a large decrease (-5% or more) in the target population include West Central (-13%), Southeast (-11%), Jefferson (-10%), San Luis Valley (19%), and Larimer (-6%).

The remaining service areas show little if any increase or decrease in the target population. These same variations can be observed for Youth and Adults separately using Figure 6. For example, North Range shows an increase in the population of interest for both adults (17%) and youth (13%). Conversely, Jefferson shows a slight decrease in the adult target population (-4%) and a rather substantial decrease in its youth target population (-22%). Other service areas indicate opposite changes in target population rates among adults and youth. Centennial, for example, shows a slight increase in its adult target population (3%) and a large decrease in its youth target population (-18%). All other changes in target populations can be observed using the same approach. There is a slight overall decrease (-1%) in the population of interest Statewide.



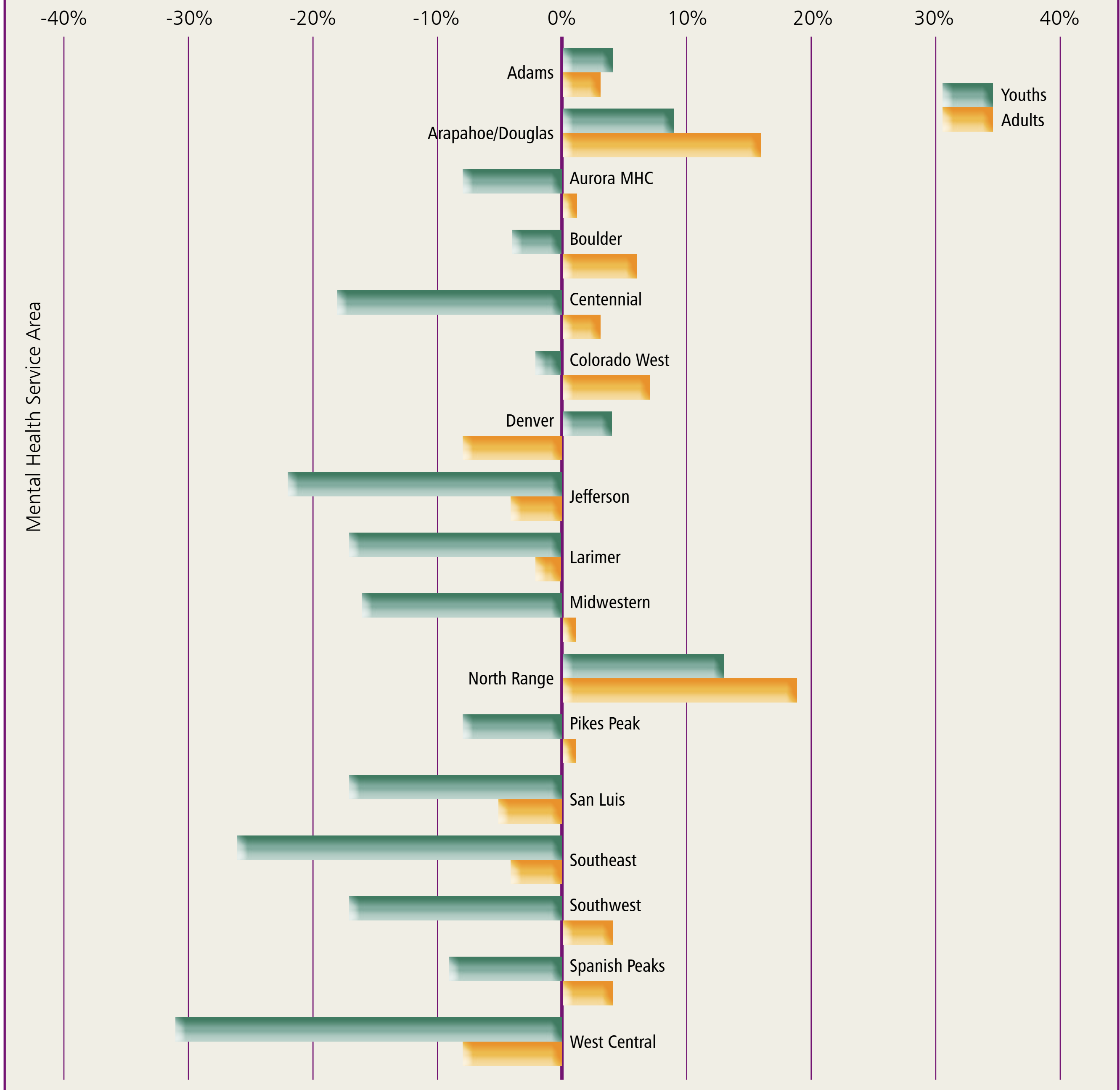


Figure 6. Percent Change (1999 – 2007) in Youth and Adult Population of Interest by Mental Health Service Area
-40%
-30%
-20%
-10%
0%
10%
20%
30%
40%
Youths
Adults
Mental Health Service Area
Adams
Arapahoe/Douglas
Aurora MHC
Boulder
Centennial
Colorado West
Denver
Jefferson
Larimer
Midwestern
North Range
Pikes Peak
San Luis
Southeast
Southwest
Spanish Peaks
West Central

Prevalence Comparison

Table 23 compares the 1999 and 2007 prevalence counts for youth, adults, and total individuals with serious behavioral health disorders (SBHD) in the Colorado Population of Interest by mental health service area. This table also provides a picture of the change that has occurred in these counts over the last five years. For example, an examination of the percent change in youth with SBHD between 1999 and 2007 for Adams County indicates a slight increase in the prevalence from 4,518 to 4,694 or a change of 4%.

While the child counts have slightly increased, the adult counts have decreased by 7%, declining from 8,340 to 7,750. The remainder of the prevalence numbers in the table can be interpreted using this same example. Looking at the entire percent change column reveals that the SBHD prevalence has decreased for most of the population of interest. Statewide prevalence has decreased by 9%, from 168,878 to 153,121 between 1999 and 2007, respectively.

Table 23: Prevalence of SED/SMI in the Colorado Population of Interest by Mental Health Service Area, including Youth, Adult, Total, and Percent Change

Mental Health Service Area	1999			2007			Percent Change		
	Youth	Adult	Total	Youth	Adult	Total	Youth	Adult	Total
Adams	4,518	8,340	12,858	4,694	7,750	12,444	4%	-7%	-3%
Arapahoe/Douglas	3,571	6,436	10,007	3,866	6,238	10,104	8%	-3%	1%
Aurora MHC	3,407	5,936	9,343	3,127	5,265	8,392	-8%	-11%	-10%
Boulder	2,476	7,094	9,570	2,438	6,404	8,842	-2%	-10%	-8%
Centennial	1,723	3,244	4,967	1,403	3,328	4,731	-19%	3%	-5%
Colorado West	3,601	8,451	12,052	3,456	8,428	11,884	-4%	0%	-1%
Denver	7,791	18,777	26,568	7,775	15,017	22,792	0%	-20%	-14%
Jefferson	4,948	10,043	14,991	3,778	8,358	12,136	-24%	-17%	-19%
Larimer	2,593	6,970	9,563	2,143	5,975	8,118	-17%	-14%	-15%
Midwestern	1,194	2,907	4,101	1,012	2,712	3,724	-15%	-7%	-9%
North Range	2,940	5,794	8,734	3,268	5,859	9,127	11%	1%	4%
Pikes Peak	7,530	13,843	21,373	6,805	12,989	19,794	-10%	-6%	-7%
San Luis	944	1,717	2,661	760	1,404	2,164	-19%	-18%	-19%
Southeast	958	2,378	3,336	720	2,194	2,914	-25%	-8%	-13%
Southwest	1,175	2,625	3,800	970	2,674	3,644	-17%	2%	-4%
Spanish Peaks	2,840	6,049	8,889	2,474	5,733	8,207	-13%	-5%	-8%
West Central	988	5,077	6,065	675	3,429	4,104	-32%	-32%	-32%
Grand Total	**53,197**	**115,681**	**168,878**	**49,364**	**103,761**	**153,121**	**-7%**	**-10%**	**-9%**

The following graph (Figure 7) shows the extent to which the prevalence of SBHD has increased or decreased for the total population of interest in each service area. North Range exhibits the greatest increase (4%) in the prevalence of SBHD and West Central has the largest decrease (-32%) over the five year period.

Figure 8 provides a picture of the percent change in prevalence of SBHD for adults and children in Colorado by mental health service area. For nearly all service areas the prevalence of SBHD has decreased for children and adults. Those few areas where the prevalence of SBHD has increased for youth include Adams, Arapahoe/Douglas, and North Range. Slight increases in prevalence are observed for adults with SBHD in Centennial, North Range, and Southwest. Again, to fully appreciate these increases and decreases, the reader should examine the raw numbers in table 21.

Figure 7. Percent Change (1999 – 2007) in Total Prevalence of SBHD in Colorado by Mental Health Service Area

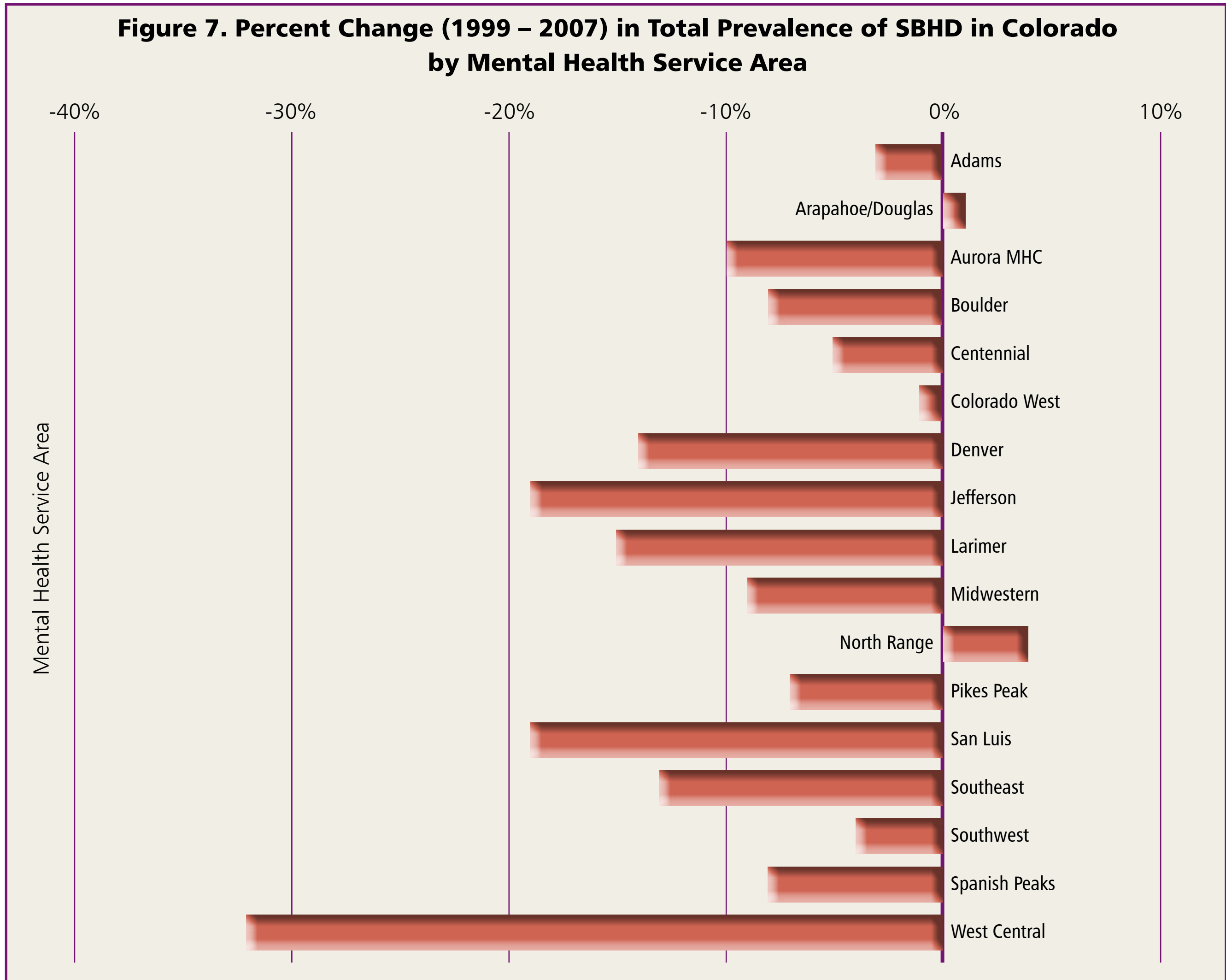


Figure 8. Percent Change (1999 – 2007) in Prevalence of Adult and Child SBHD in Colorado by Mental Health Service Area
-35%
-30%
-25%
-20%
-15%
-10%
-5%
0%
5%
10%
15%
Youths
Adults
Mental Health Service Area
Adams
Arapahoe/Douglas
Aurora MHC
Boulder
Centennial
Colorado West
Denver
Jefferson
Larimer
Midwestern
North Range
Pikes Peak
San Luis
Southeast
Southwest
Spanish Peaks
West Central

Service Utilization Comparison

Table 24 contains counts of individuals with serious behavioral health disorders in Colorado who accessed services during 1999 and 2007. These counts are sorted by mental health service area. There is an important methodological difference between the 1999 and 2007 service utilization counts. The 1999 counts are estimates obtained from Bristol Observatories through a process called probabilistic population estimation (PPE); the 2007 counts are actual clients who accessed services in that year rather than estimates. The probabilistic population estimates have confidence intervals associated with them that tell us how accurate the estimates are (not shown in table 22). The 95% confidence interval for all estimates is extremely small (CI ≤ ±30), indicating that the PPE estimates should be very accurate. This provides statistical support for comparing the 1999 and 2007 estimates. This support is essential because, in some service areas, the numbers vary considerably from 1999 to 2007. For example, in 1999 North Range had 828 youths access services and in 2007 this number more than doubled to 1,790, a 116% increase. Denver had a decrease in youths served, from 3,722 to 3,543 for 1999 and 2007, respectively, a 5% decrease. Boulder had a 10% increase in youth service utilization and a 22% decrease in adult service utilization. With the exception of North Range and San Luis Valley, all service areas show an overall decrease in total service utilization from 1999 to 2007.

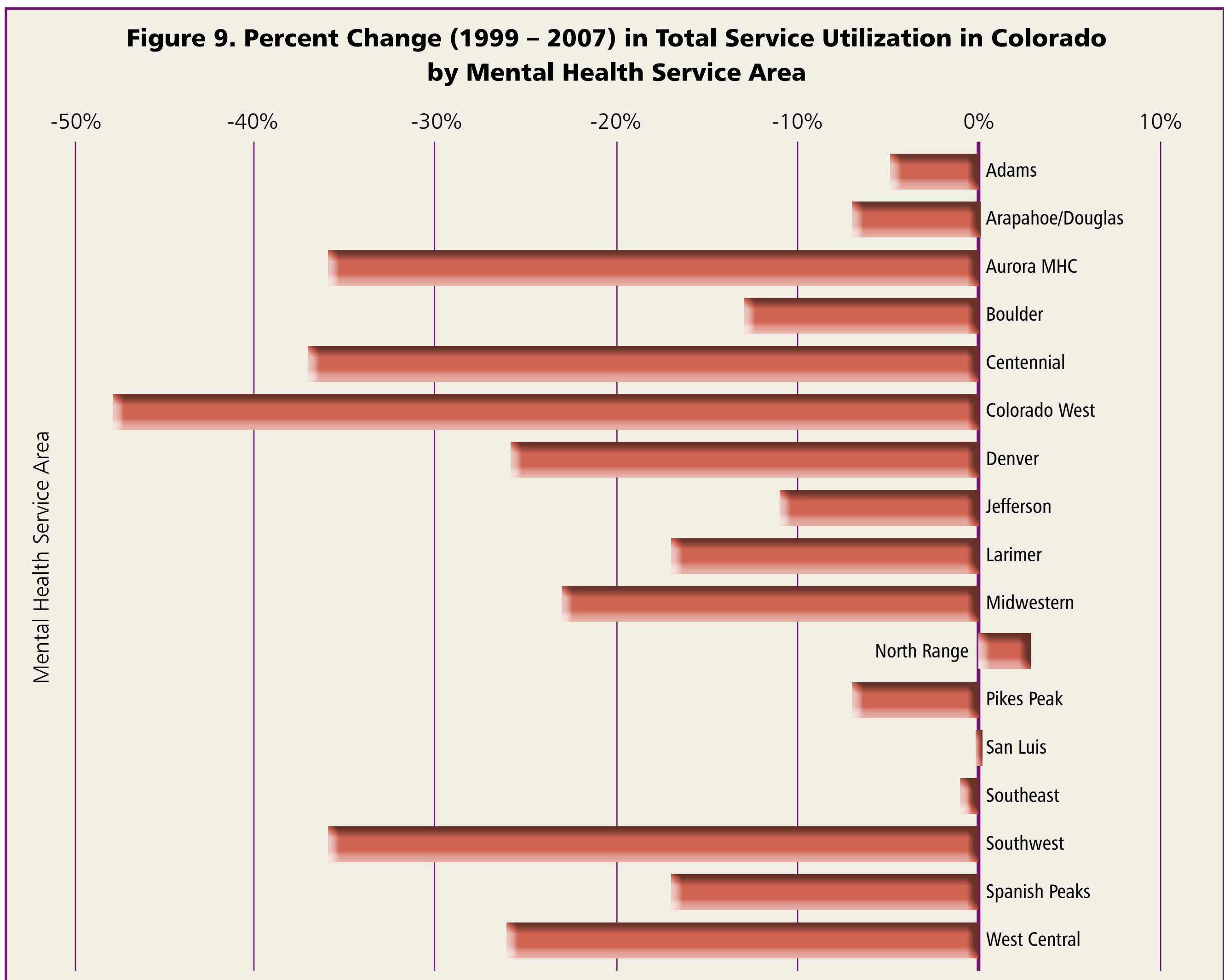
Table 24: Service Utilization Among Those with SED/SMI in the Colorado Population of Interest by Mental Health Service Area, including Youth, Adult, Total, and Percent Change

Mental Health Service Area	1999			2007			Percent Change		
	Youth	Adult	Total	Youth	Adult	Total	Youth	Adult	Total
Adams	1,951	2,897	4,848	2,261	2,353	4,614	16%	-19%	-5%
Arapahoe/Douglas	1,316	1,917	3,233	1,345	1,672	3,017	2%	-13%	-7%
Aurora MHC	2,015	3,304	5,319	1,425	1,958	3,383	-29%	-41%	-36%
Boulder	956	2,445	3,401	1,056	1,903	2,959	10%	-22%	-13%
Centennial	775	1,778	2,553	750	847	1,597	-3%	-52%	-37%
Colorado West	2,043	4,316	6,359	1,416	1,887	3,303	-31%	-56%	-48%
Denver	3,722	9,581	13,303	3,543	6,342	9,885	-5%	-34%	-26%
Jefferson	1,945	4,437	6,382	2,515	3,173	5,688	29%	-28%	-11%
Larimer	1,262	2,819	4,081	1,504	1,872	3,376	19%	-34%	-17%
Midwestern	544	1,177	1,721	507	821	1,328	-7%	-30%	-23%
North Range	828	2,299	3,127	1,790	1,430	3,220	116%	-38%	3%
Pikes Peak	2,931	4,928	7,859	3,298	4,007	7,305	13%	-19%	-7%
San Luis	560	1,140	1,700	710	989	1,699	27%	-13%	0%
Southeast	555	934	1,489	699	776	1,475	26%	-17%	-1%
Southwest	557	1,244	1,801	436	711	1,147	-22%	-43%	-36%
Spanish Peaks	1,581	3,507	5,088	1,662	2,574	4,236	5%	-27%	-17%
West Central	573	1,363	1,936	601	822	1,423	5%	-40%	-26%
Grand Total	**24,114**	**50,086**	**74,200**	**25,518**	**34,137**	**59,655**	**6%**	**-32%**	**-20%**

The graph below (Figure 9) shows change in the percent of people using services in 1999 and 2007. North Range shows an overall increase in the percent of individuals served by the mental health system, while the remaining service areas show a decrease in the percent served or no change. Statewide there has been a 20% reduction in people using mental health services, a decrease from 74,000 in 2002 to 59,655 in 2007.

For service utilization, Figure 10 breaks out children and adults by mental health service area. Note that North Range has the highest percentage increase (116%) in youth accessing services. At the same time, this area served fewer adults in 2007 than in 1999. Other mental health service areas showing slight to moderate growth in youth served are Adams, Arapahoe/Douglas, Boulder, Pikes Peak, San Luis, Southeast, Spanish Peaks, and West Central. All mental health service areas decreased the number of services provided to adults from 1999 to 2007. Overall, there was an increase of 6% and a decrease of 32% in the number of children and adults, respectively, served throughout in the Colorado mental health system. The total served across the State decreased by 20%.

Figure 9. Percent Change (1999 – 2007) in Total Service Utilization in Colorado by Mental Health Service Area



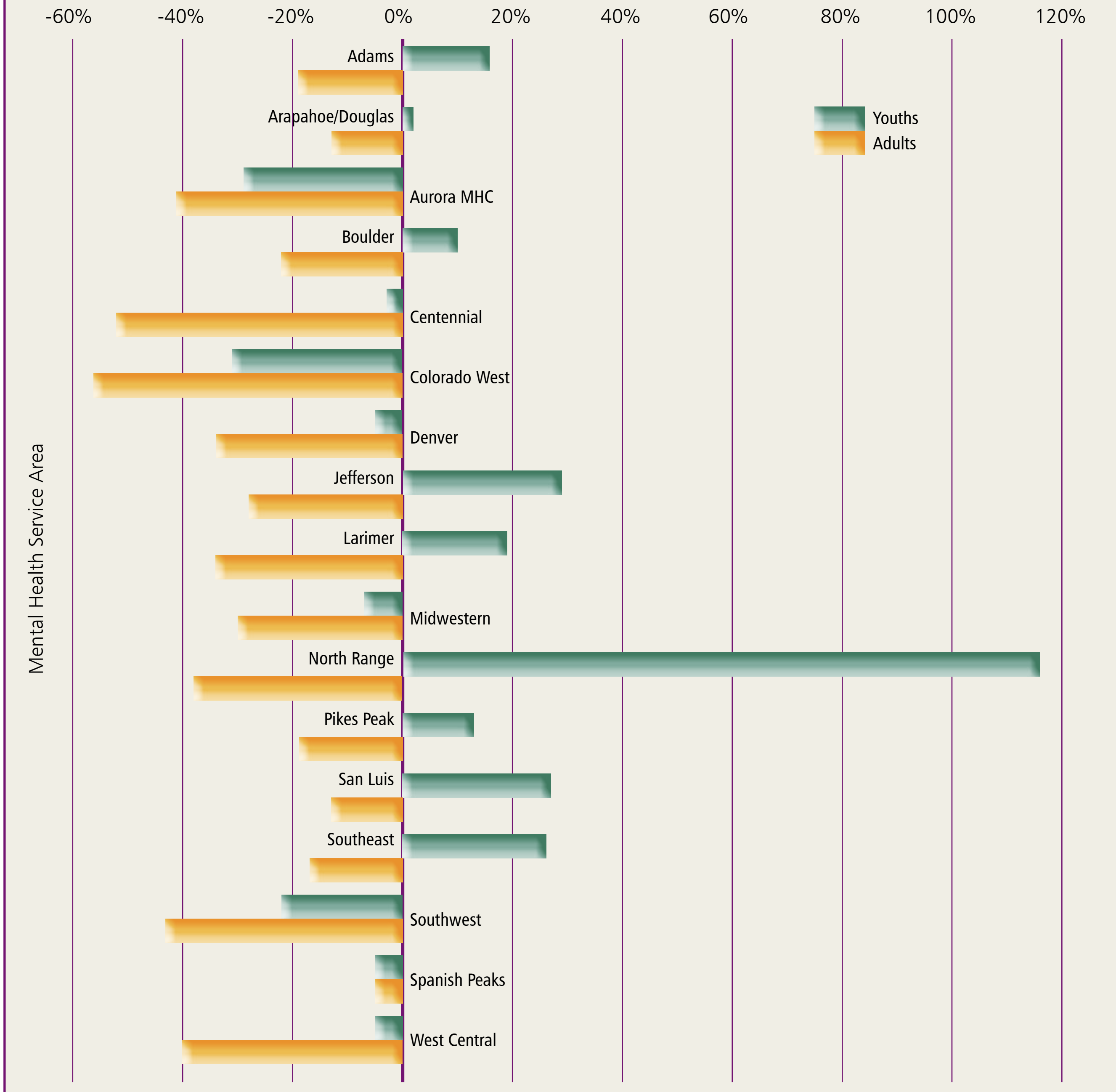


Figure 10. Percent Change (1999 – 2007) in Service Utilization Among Youth and Adult Population of Interest in Colorado by Mental Health Service Area
-60%
-40%
-20%
0%
20%
40%
60%
80%
100%
120%
Mental Health Service Area
Adams
Arapahoe/Douglas
Aurora MHC
Boulder
Centennial
Colorado West
Denver
Jefferson
Larimer
Midwestern
North Range
Pikes Peak
San Luis
Southeast
Southwest
Spanish Peaks
West Central
Youths
Adults

Unmet Need Comparison

Unmet need is calculated by subtracting the number in the population of interest utilizing mental health services from the prevalence of individuals needing mental health services. What remains is unmet need. The table below provides a comparison between 1999 and 2007 with respect to unmet need for youth, adults, and the total population of interest. Negative numbers represent the number of persons who need mental health services but did not access them. Negative percentages represent a reduction in unmet need for youth, adults, and total population by service area and for the State as a whole. Positive percentages mean an increase in the percent of unmet need. Pikes Peak service area shows a total percent change of -8% in unmet need, indicating a reduction of unmet need from 1999 to 2007. Looking at the Arapahoe Douglas service area, we find that there is a 5% increase in the amount of unmet need when comparing 1999 and 2007. This is apparent from the increase in the raw number of individuals not receiving services in 1999 (-6,774) and those not receiving services in 2007 (-7,087). Unmet need in the remaining service areas can be interpreted using the same approach. From the State perspective, there has been a reduction in unmet need of 1%, which is mostly explained by a reduction in unmet need among Colorado's youth (-18%).

Table 25: 1999 to 2007 Comparison of Unmet Need for Mental Health Services: Adult, Children, and Total

Mental Health Service Area	1999			2007			Percent Change		
	Youth	Adult	Total	Youth	Adult	Total	Youth	Adult	Total
Adams	-2,567	-5,443	-8,010	-2,433	-5,397	-7,830	-5%	-1%	-2%
Arapahoe/Douglas	-2,255	-4,519	-6,774	-2,521	-4,566	-7,087	12%	1%	5%
Aurora MHC	-1,392	-2,632	-4,024	-1,702	-3,307	-5,009	22%	26%	24%
Boulder	-1,520	-4,649	-6,169	-1,382	-4,501	-5,883	-9%	-3%	-5%
Centennial	-948	-1,466	-2,414	-653	-2,481	-3,134	-31%	69%	30%
Colorado West	-1,558	-4,135	-5,693	-2,040	-6,541	-8,581	31%	58%	51%
Denver	-4,069	-9,196	-13,265	-4,232	-8,675	-12,907	4%	-6%	-3%
Jefferson	-3,003	-5,606	-8,609	-1,263	-5,185	-6,448	-58%	-8%	-25%
Larimer	-1,331	-4,151	-5,482	-639	-4,103	-4,742	-52%	-1%	-13%
Midwestern	-650	-1,730	-2,380	-505	-1,891	-2,396	-22%	9%	1%
North Range	-2,112	-3,495	-5,607	-1,478	-4,429	-5,907	-30%	27%	5%
Pikes Peak	-4,599	-8,915	-13,514	-3,507	-8,982	-12,489	-24%	1%	-8%
San Luis	-384	-577	-961	-50	-415	-465	-87%	-28%	-52%
Southeast	-403	-1,444	-1,847	-21	-1,418	-1,439	-95%	-2%	-22%
Southwest	-618	-1,381	-1,999	-534	-1,963	-2,497	-14%	42%	25%
Spanish Peaks	-1,259	-2,542	-3,801	-812	-3,159	-3,971	-36%	24%	4%
West Central	-415	-3,714	-4,129	-74	-2,607	-2,681	-82%	-30%	-35%
Grand Total	**-29,083**	**-65,595**	**-94,678**	**-23,846**	**-69,620**	**-93,466**	**-18%**	**6%**	**-1%**

Figure 11 below depicts a wide variation in unmet need across the State from service area to service area. San Luis service area shows the greatest reduction in unmet need overall with a -52%, comprised of a reduction in youth unmet need of -87% and in adult unmet need of -28%. Adams, Boulder, Denver, Jefferson, Larimer, Pikes Peak, San Luis, Southeast and West Central service areas all show slight to moderate decreases in unmet need. Conversely, those service areas with an increase in unmet need include Arapahoe/Douglas, Aurora, Centennial, Colorado West, North Range, Southwest, and Spanish Peaks. Again, the raw numbers in table 23 help in the interpretation of these percent change scores.

Figure 11. Percent Change (1999 – 2007) in Total Unmet Need in Colorado by Mental Health Service Area

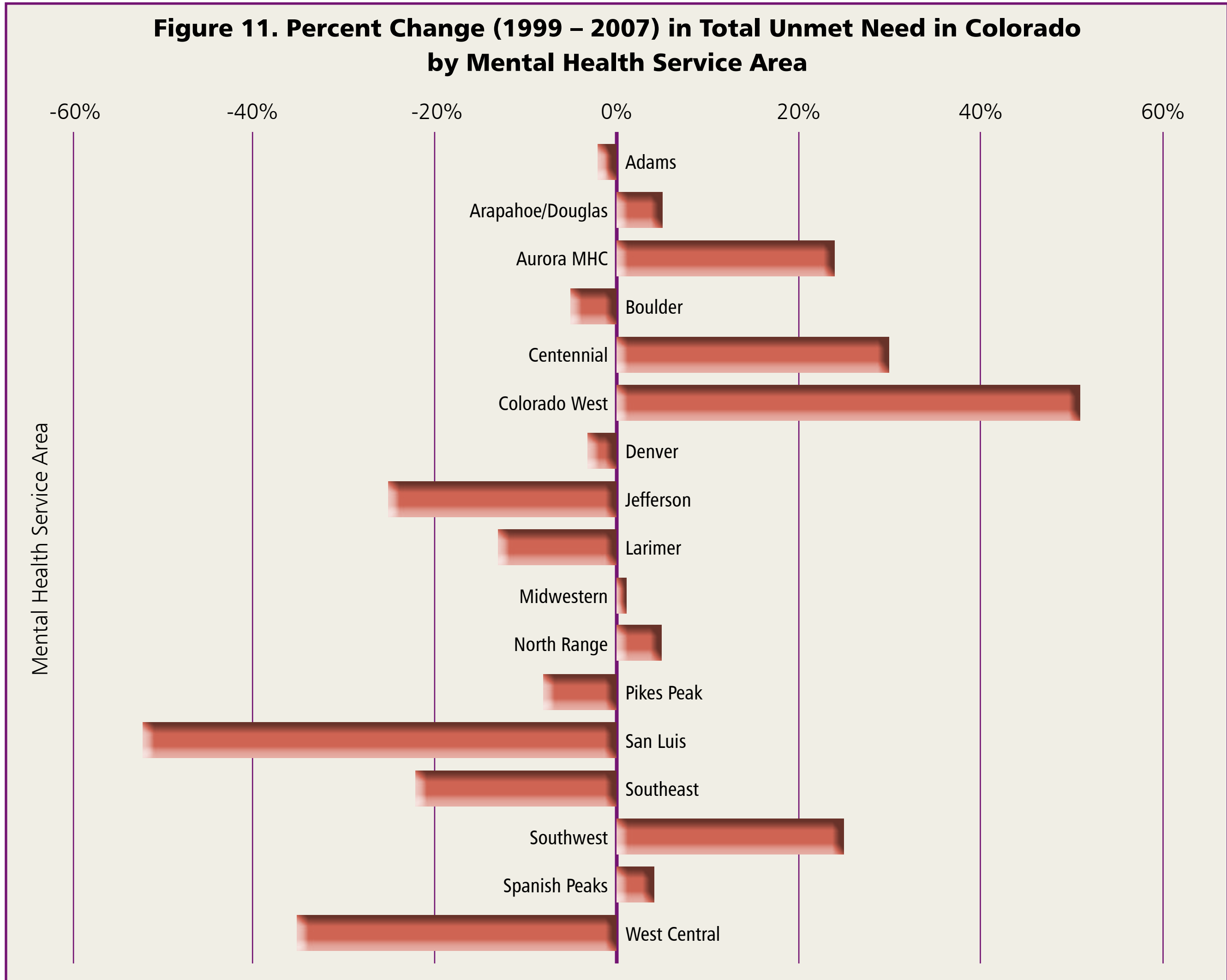
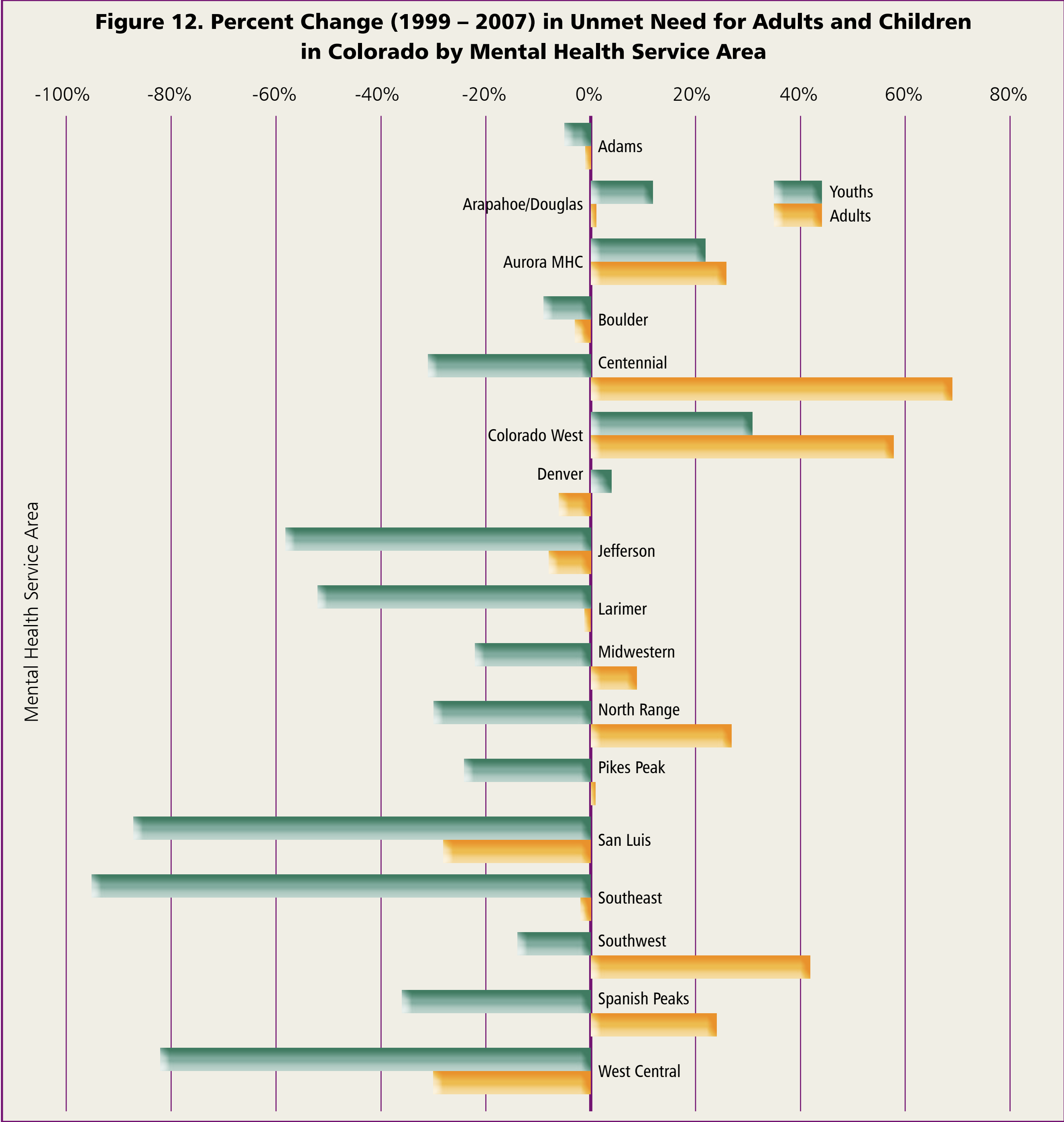


Figure 12 displays unmet need for both adult and youth groups separately. The number of San Luis youth with unmet need has decreased by 87% from a high of 384 to a low of 50, representing a positive direction for change, but not accounting for a great number of youth. Denver shows a 4% increase from 1999 to 2007 in youth who have not met their need for treatment. Other service area data can be interpreted using the same approach. Overall, there has been a reduction in unmet need among youth of 18%. From an adult perspective, there has been an overall increase of 6% in those with unmet need Statewide.

Figure 12. Percent Change (1999 – 2007) in Unmet Need for Adults and Children in Colorado by Mental Health Service Area



Penetration Rate Comparison

Table 26 provides information about the rate at which the State and each service area satisfies the need of those in the population of interest who have SBHD. This is called the penetration rate. For example, in 1999 the Adams service area was able to serve 43% of its youth population in need; and in 2007 they served 48% of this population. This represents an increase of 5% in the penetration rate for youths in need of services. For adults, the Denver service area's 1999 penetration rate was 51% and in 2007 it was 42%, representing a decrease of 9%. Overall, there has been an increase in the penetration rate for youths (6%) and a decrease in the penetration rate for adults (-10%). Statewide totals show an overall decrease of 5% in the penetration rate for the population in need over the five year period.

Table 26: 1999 to 2007 Penetration Rate: Adult, Children, and Total SED/SMI

Mental Health Service Area	2002			2007			Percent Change		
	Youth	Adult	Total	Youth	Adult	Total	Youth	Adult	Total
Adams	43%	35%	38%	48%	30%	37%	5%	-4%	-1%
Arapahoe/Douglas	37%	30%	32%	35%	27%	30%	-2%	-3%	-2%
Aurora MHC	59%	56%	57%	46%	37%	40%	-14%	-18%	-17%
Boulder	39%	34%	36%	43%	30%	33%	5%	-5%	-2%
Centennial	45%	55%	51%	53%	25%	34%	8%	-29%	-18%
Colorado West	57%	51%	53%	41%	22%	28%	-16%	-29%	-25%
Denver	48%	51%	50%	46%	42%	43%	-2%	-9%	-7%
Jefferson	39%	44%	43%	67%	38%	47%	27%	-6%	4%
Larimer	49%	40%	43%	70%	31%	42%	22%	-9%	-1%
Midwestern	46%	40%	42%	50%	30%	36%	5%	-10%	-6%
North Range	28%	40%	36%	55%	24%	35%	27%	-15%	-1%
Pikes Peak	39%	36%	37%	48%	31%	37%	10%	-5%	0%
San Luis	59%	66%	64%	93%	70%	79%	34%	4%	15%
Southeast	58%	39%	45%	97%	35%	51%	39%	-4%	6%
Southwest	47%	47%	47%	45%	27%	31%	-2%	-21%	-16%
Spanish Peaks	56%	58%	57%	67%	45%	52%	12%	-13%	-6%
West Central	58%	27%	32%	89%	24%	35%	31%	-3%	3%
Statewide Average	**45%**	**43%**	**44%**	**52%**	**33%**	**39%**	**6%**	**-10%**	**-5%**

Figure 13 depicts the percent change in penetration rates from 1999 to 2007 for the total population of interest with SBHD by mental health service area. West Central, Southeast, San Luis, Pikes Peak, and Jefferson service areas show increases in penetration rates while the remaining service areas show a decrease. The largest increase in penetration rates is in San Luis and the largest decrease in penetration rate is in Colorado West.

Figure 13. Percent Change (1999 – 2007) in Penetration Rates for the Total Population of Interest with SBHD by Mental Health Service Area

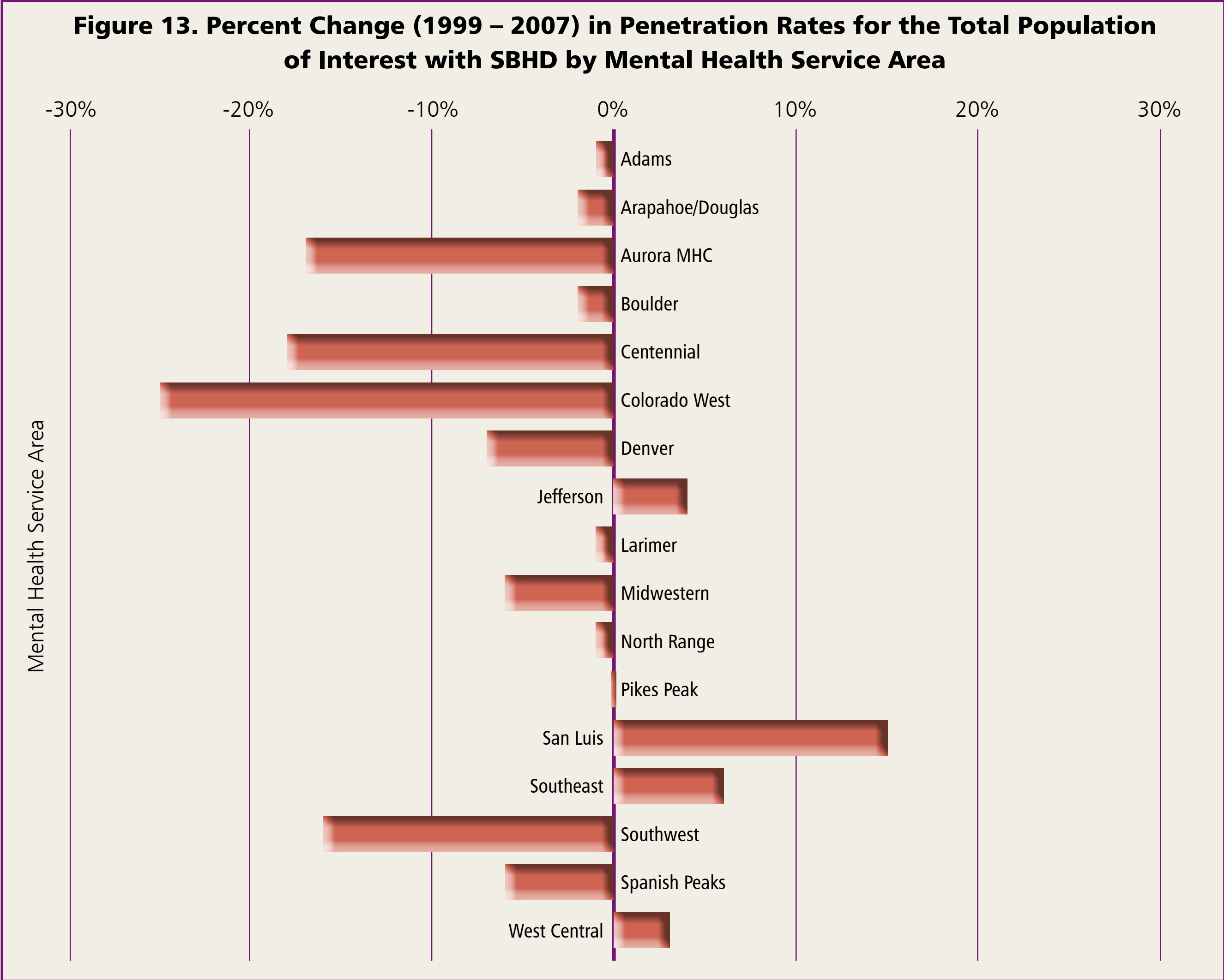
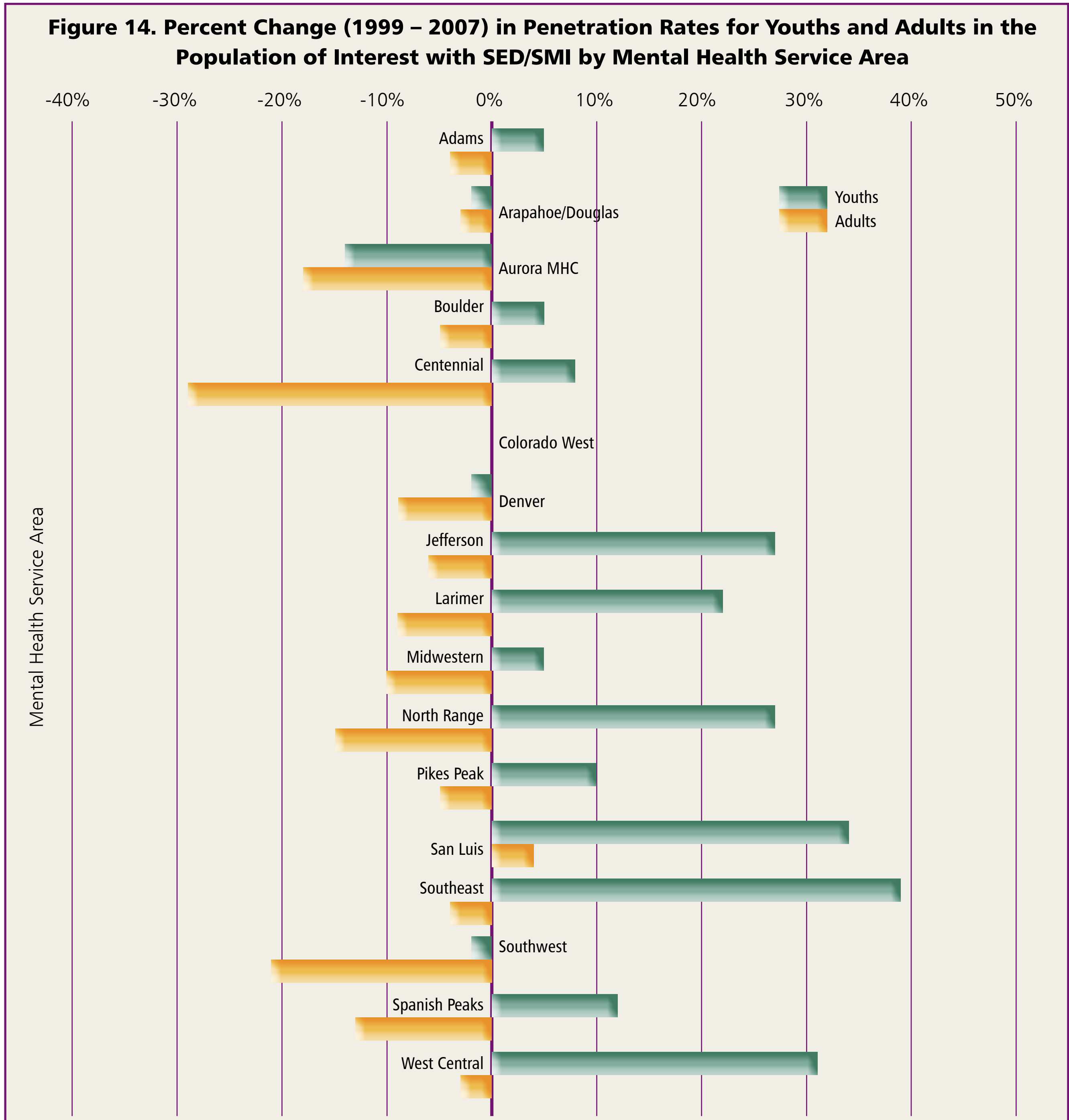


Figure 14 shows an interesting pattern with respect to changes in penetration rates among youths and adults in the population of interest with SED/SMI. It appears that the majority of service areas show an increase in the penetration rates for youths and a decrease in those rates for adults.



Discussion

The focus of this project is the low-income population in Colorado with a serious behavioral health condition (SED/SMI/SUD/COD). Indicators of the unmet need for behavioral health services in Colorado, and penetration rates were generated. These indictors provide standardized data that may be used to inform policy and planning decisions.

Two data sources were used to generate indicators, synthetic prevalence estimates, and unduplicated counts of individuals receiving services from four State agencies. Synthetic prevalence estimates are conservative estimates of persons with serious behavioral health disorders; they were generated for the low income population and persons in group quarters and institutions collectively representing persons in need of publicly supported services. Individuals receiving services were unduplicated across the Division of Behavioral Health, Medicaid mental health and substance abuse services, the Division of Vocational Rehabilitation, and the Division of Child Welfare. The formula for unmet need subtracts service use from the prevalence estimate. The formula to generate a penetration rate takes the service use count and divides it by the prevalence estimate.

This section summarizes the report starting with an overview of strengths and limitations. Findings are then described for adults, for children and adolescents, and for demographic groups. A comparison is made with an earlier population in need study conducted in 2002, and the report ends outlining potential uses of the data.

Strengths and Limitations

The strengths of this project are 1) generating estimates of the need for behavioral health services in the low-income population in Colorado, and 2) expanding service use data beyond the data sets of the Division of Behavioral Health and Medicaid to include other funding sources. Including additional sources of data allowed the project to improve indicators of unmet need and penetration rates.

The formulae used in this report to generate indicators of 'unmet need' and 'penetration rates' are accepted in the behavioral health field nationally, however the two sources of data used to generate these indicators vary. The method used to generate these indicators in this report is more comprehensive than that used by most States and more comprehensive than Colorado has used in the past. While efforts were taken in this report to point out the limitations of the data, the data are a considerable improvement over the current standard used in the field.

The main limitation of the project is the number of agencies contributing behavioral health service data. Data were obtained from the funders of behavioral health services: Division of Behavioral Health, Department of Health Care Policy and Financing (Medicaid), Division of Vocational Rehabilitation, and Division of Child Welfare. This is the first time this has been accomplished. Nonetheless, there are other sources of funding for behavioral health services, and this study was unsuccessful in obtaining the desired data from these other agencies. The 2002 project faced similar limitations. However, 2007 client-level data from several other organizations, irrespective of behavioral health status, was gathered and stakeholders used this data to estimate the number of persons who received behavioral health services from each agency.

While additional agencies were willing to participate in the 2009 study, they were not able to provide the behavioral health service use data sought. The project initially expected to approximate what was done in the 2002 project, however, stakeholders in the 2009 study decided not to venture into estimates. It is left to the reader to take into consideration estimates of consumers funded through other sources when using these data.

Findings

Findings include indicators of unmet need and penetration rates. The indicator of unmet need is the difference between the prevalence of serious behavioral health disorders and the count of persons using services. The penetration rate is the count of persons using services divided by the prevalence of serious behavioral health disorders. The data used to generate the indicators may be found in the report body.

Indicators for adults are provided for adults with serious mental illness only (SMI Only), adults with substance use disorders (SUD Only), and adults with co-occurring disorders (COD=SMI and SUD). Indicators for children and adolescents include those with serious emotional

disturbances (SED, including COD.) (Prevalence data for youths with substance use disorders only were not available.) Indicators for adults and for children and adolescents were generated at the State and MH service and SA planning area levels. Indicators for demographic groups, including age, gender, and race/ethnicity, were generated at the State level.

Adult Indicators. The difference between the prevalence of persons with a serious behavioral health disorder and the number served through four State agencies was 108,496. This is the estimated unmet need for services in the public sector when other funding sources are not taken into consideration. The mental health service area with the largest unmet need was Denver followed closely by Pikes Peak (12,813 and 12,749 respectively). The substance abuse planning area with the largest unmet need was Metropolitan Denver with 43,597, more than twice the number as the next substance abuse service area.

The overall penetration rate for low income adults with a SBHD was 36%. That means over one-third of adults in the state with a serious behavioral health disorder received at least one treatment service in SFY 2007 from one of the four agencies that provided data on services.

Geographic variation in penetration rates was larger for mental health service areas (19% in Arapahoe/Douglas to 98% in San Luis Valley) than for substance abuse planning areas (26% in Boulder to 57% in Southeast & Pueblo). In general, the State population is more evenly distributed across SA planning areas than MH service areas. Thus, disregarding the two extremes, the overall geographic variation across MH service areas for adults was more modest, ranging from 26% to 54%.

Demographic variation for adult penetration rates by gender was small (39% for females and 34% for males). The range for age groups was wider with a high of 57% for ages 45-54 dropping to a low of 24% for ages 21-24. The rate for young adults ages 18-20 (37%) was slightly higher than the overall (36%) driven by a very high penetration rate for mental health conditions (92%) and a low penetration rate for substance abuse (26%).

The overall variation for adults was greatest for race/ethnic groups. The penetration rate for White non-Hispanics was very low at 17%. Penetration rates for minorities were higher: 32% for African Americans, 58% for Hispanics, and 100% for Other non-Hispanics (prevalence figures for Other non-Hispanics are small and call into question accuracy of race/ethnic categorization at the point of service).

The body of the report provides figures for adults with serious mental illness only (SMI excluding co-occurring disorders), substance use only (SUD excluding co-occurring disorders), and co-occurring SMI and SUD disorders separately. (Note: SUD includes both substance abuse and dependence.)

Child and Adolescent Indicators. The difference between the prevalence of children and adolescents with serious emotional disturbance (SED) and the number served through the four State agencies was 18,525. This is the estimated unmet need for services in the public sector when other funding sources are not taken into consideration. The mental health service area with the largest unmet need was Denver followed closely by Pikes Peak (3,554 and 3,447 respectively). The substance abuse planning area with the largest unmet need was Metropolitan Denver with 9,599; more than twice the number as the next substance abuse service area.

The penetration rate for children and adolescents with SED (including COD) was 62%. This was considerably higher than the penetration rate for adults (43% combining figures for 'SMI Only' and 'COD').

Geographic variation of penetration rates across mental health service areas ranged from a low of 42% (Arapahoe/Douglas) to a high of 106% (San Luis Valley). Without the outliers, the range across MH service areas becomes 49% (Pikes Peak) to 88% (Jefferson) which is comparable to the range of penetration rates for SA planning areas (54% for Central & Colorado Springs to 90% for Southeast & Pueblo.)

The penetration rate for children and adolescents varied considerably for all demographic groups. The penetration rate for children ages 06-11 was highest at 91%. The penetration rate for children ages 00-05 was lowest at 30% and the rate for adolescents (12-17) was 71%. The overall rate for females (55%) was lower than for males (69%). The overall rate for minorities was comparable with White non-Hispanics, although there was substantial variation among the three minority groups.

PIN 2002 to 2009 Comparison

Comparing the 2002 and 2009 PIN studies was limited to the SED and SMI Only population. The 2007 numbers were adjusted to include co-occurring disorders; substance use disorder data was not used because it was not a focus of the 2002 PIN study. Slight methodological differences between the 2002 and 2009 studies may have affected these findings, but since the estimates of prevalence and service utilization in both studies were so strongly correlated, it is unlikely that these small differences had significant influence. From 2002 to 2009 the statewide population of interest did not change much, about -1% from 2,080,723 to 2,065,716. A more substantial change was observed in the statewide prevalence of individuals with SED/SMI, decreasing from 168,878 to 153,121 or 9%; this decrease is largely due to more rigorous criteria for serious behavioral health disorder. Actual mental health service utilization for the Division of Behavioral Health and the Division of Health Care Policy and Financing (Medicaid) throughout Colorado decreased approximately 20% from 74,200 in 1999 to 59,655 in 2007, and unmet need decreased slightly from 94,678 to 93,466 or -1%. Finally, penetration rates increased for youths and decreased for adults, with an overall total decrease statewide of 5%.

Uses of the Data

The larger intent behind the project was to use quantifiable data and cutting edge methodology to generate indicators to inform decision making. This is part of the continuous quality improvement process of the State. The more specific planning questions of interest to service planners, managers and service providers include: How many people in the population need mental health, substance abuse, or co-occurring services? How many actually receive services? Are people who need and could benefit from services receiving services? Are services distributed in a manner that is equitable both geographically and demographically?

The project developed indicators for use in planning and policy making. An indicator does not stand on its own but must be used with other sources of information to steer policy and practice. The reason underlying an identified unmet need for services for instance *may* be stigma around receiving services, lack of accessibility, and/or lack of culturally compatible responsiveness in the service system. Underlying reasons affect interventions.

An indicator of particular relevance to this project that was not developed is under-met need. Consider an area or group in this project that indicated little or no unmet need, i.e., they had a high penetration rate. The indicator of unmet need begs the question of the amount of services provided; it may be most consumers received only one service the entire year.

In addition to unmet need and under-met need, policy and planning would be informed by other performance indicators. The broader scope of indicators would also include quality and appropriateness of services, and perhaps most important of all, the outcome of service provision. The Division of Behavioral Health has a framework that includes all these areas of concern and have generated indicators in each domain.

Findings from this study may be used to:

- Inform planning for mental health and substance abuse service provision, i.e., targeting needed services by geographic area and demographic subgroup (age, gender, and race/ethnicity).
- Advocate for services for individuals with SBHD who are not currently being served.
- Reflect on the impact of existing policy and to inform new policy development.
- Inform the discussion regarding appropriateness of current resource allocations to the various systems that serve individuals with SBHD in order to ensure more efficient care.

NOTE:

The current report is the second of several documents in the study. The first document was a report on prevalence estimates. The next report originating from this data will focus on prevalence, service utilization, unmet need, and penetration rates at the county level. More detailed data and ad hoc reports can be obtained from the Division of Behavioral Health's on-line data request system located at the following website:

http://www.surveymonkey.com/s.aspx?sm=_2fCLjdlLqxNSDUk9KjjeCYg_3d_3d

Appendices

Appendix A. Consumer Overlap

Four agencies provided data on consumers of behavioral health services, seven agencies provided data on all clients active in the year, and two agencies provided data on both. A total of nine State agencies participated in this project, providing person-level demographic data for all clients receiving any type of service through their agency. The ability to match clients across data sets varied, depending on the type of data the agency collected. This person-level data was used to generate an unduplicated count of clients served within each agency and across any pair of agencies.

Appendix A provides counts of consumers of mental health services and substances abuse services from all nine agencies, the Base data set, the Extended dataset and any caseload overlap (the number of persons served by any pair of agencies in SFY 2007.) There are tables for the total population served, the children and adolescents, and the adults. [Note: The review by agency representatives participating in this project indicated the easiest way to follow these tables is to start with the total population, and follow with children and adolescents, and adults.] Each table of counts is followed by a table of percents of the row, so that an agency can look at their row and find the overlap in number of clients served with each other agency or group.

The following abbreviations will be helpful in interpreting the data in the tables that follow.

Abbreviation	Meaning
DBH MH	Division of Behavioral Health: Mental Health Services
DBH SA	Division of Behavioral Health: Substance Abuse Services
Med MH	Medicaid: Mental Health Services (less Developmental Disabilities)
Med SA	Medicaid: Substance Abuse Services
MH Base	Mental Health Base (DBH MH + Med MH)
SA Base	Substance Abuse Base (DBH SA + Med SA)
DD MH	Division for Developmental Disabilities: Medicaid Mental Health Services
VR MH	Division of Vocational Rehabilitation: Mental Health Services
CW MH	Division of Child Welfare: Mental Health Services
CW SA	Division of Child Welfare: Substance Abuse Services
MH Ext	Mental Health Extended (MH Base + DD MED MH+ VR MH + CW MH)
SA Ext	Substance Abuse Extended (SA Base + CW SA)
VR	Vocational Rehabilitation total client population*
CW	Child Welfare total client population*
DYC	Division of Youth Corrections total client population*
DD	Developmental Disabilities total client population*
Jud	Judicial (Probation) total client population*
DOC	Department of Corrections total client population*
SHHP	Supportive Housing and Homeless Programs total client population*

*Total client population refers to every individual who received any service from or service paid for by the State funded program regardless of whether or not the service was a behavioral health service.

Total All Ages

Interpretation: The total number of clients served in SFY 2007 by the Division of Vocational Rehabilitation (VR) was **17,661** (the number in the cell where the VR column intersects with the VR row.) The number of VR clients who also received services from the Division for Developmental Disabilities (DD) was **1,547** (the number in the cell where VR column intersects with DD row or where DD column intersects with VR row.)

Table 1. Overlap Across Agencies and Behavioral Health Provider Categories: Total of All Ages

Overlap	DBH MH	DBH SA	Med MH	Med SA	MH Base	SA Base	DD MH	VR MH	CW MH	CW SA	MH Ext	SA Ext	VR*	CW*	DYC*	DD*	Jud*	DOC*	SHHP*
DBH MH	34,187	1,685	25,664	500	34,187	1,841	289	53	2,632	1,102	34,187	2,715	1,642	4,761	1,158	1,883	1,162	242	1,614
DBH SA	1,685	34,281	2,321	744	2,594	34,281	7	40	403	390	2,681	34,281	539	571	1,397	56	3,909	4,176	143
Med MH	25,664	2,321	45,957	660	45,957	2,551	536	44	3,972	1,715	45,957	3,930	2,039	7,725	1,669	2,928	1,381	316	1,785
Med SA	500	744	660	1,275	693	1,275	0	1	64	50	705	1,275	52	99	70	20	186	41	38
MH Base	34,187	2,594	45,957	693	54,557	2,829	552	74	4,146	1,800	54,557	4,275	2,392	7,987	1,408	3,025	1,737	381	2,044
SA Base	1,841	34,281	2,551	1,275	2,829	34,812	7	41	418	398	2,918	34,812	568	593	1,408	69	3,957	4,187	164
DD MH	289	7	536	0	552	7	1,296	3	6	5	1,296	12	145	17	0	1,266	8	9	202
VR MH	53	40	44	1	74	41	3	842	1	0	842	41	842	1	0	19	24	56	4
CW MH	2,632	403	3,972	64	4,146	418	6	1	11,575	3,458	11,575	3,580	65	11,575	934	353	360	0	43
CW SA	1,102	390	1,715	50	1,800	398	5	0	3,458	4,199	3,834	4,199	30	4,199	601	114	233	0	20
MH Ext	34,187	2,677	45,957	705	54,557	2,914	1,296	842	11,575	3,834	63,495	6,265	3,250	15,417	1,939	3,928	1,791	438	2,155
SA Ext	2,715	34,281	3,930	1,275	4,275	34,812	12	41	3,580	4,199	6,269	38,613	594	4,394	1,794	181	4,101	4,187	181
VR*	1,642	539	2,039	52	2,392	568	145	842	65	30	3,250	594	17,661	160	72	1,547	332	531	343
CW*	4,761	571	7,725	99	7,987	593	17	1	11,575	4,199	15,417	4,394	160	30,209	1,209	984	446	1	72
DYC*	1,158	1,397	1,669	70	1,854	1,408	0	0	934	601	1,939	1,794	72	1,209	8,623	44	774	92	21
DD*	1,883	56	2,928	20	3,025	69	1,266	19	353	114	3,928	181	1,547	984	44	26,763	44	53	759
Jud*	1,162	3,909	1,381	186	1,737	3,957	8	24	360	233	1,791	4,101	332	446	774	44	38,781	2,009	69
DOC*	242	4,176	316	41	381	4,187	9	56	0	0	438	4,187	531	1	92	53	2,009	39,828	30
SHHP*	1,614	143	1,785	38	2,044	164	202	4	43	20	2,155	181	343	72	21	759	69	30	4,895

*Total client population refers to every individual who received any service from or service paid for by the State funded program regardless of whether or not the service was a behavioral health service.

Table 2 provides percentages from the previous table. Each row shows the percent of consumers for the agency in that row that is also a consumer for the agency in the column heading.

Interpretation Example: For example, **9%** of Vocational Rehabilitation (VR) clients received services from the Division for Developmental Disabilities in SFY 2007 (DD column.) Using the client counts from Table 1, 1,547 is 9% of all VR clients (1,547 / 17,661 = 9%)

Table 2. Percent Overlap Across Agencies and Behavioral Health Provider Categories: Total of All Ages

Overlap	DBH MH	DBH SA	Med MH	Med SA	MH Base	SA Base	DD MH	VR MH	CW MH	CW SA	MH Ext	SA Ext	VR*	CW*	DYC*	DD*	Jud*	DOC*	SHHP*
DBH MH	100%	5%	75%	1%	100%	5%	1%	0%	8%	3%	100%	8%	5%	14%	3%	6%	3%	1%	5%
DBH SA	5%	100%	7%	2%	8%	100%	0%	0%	1%	1%	8%	100%	2%	2%	4%	0%	11%	12%	0%
Med MH	56%	5%	100%	1%	100%	6%	1%	0%	9%	4%	100%	9%	4%	17%	4%	6%	3%	1%	4%
Med SA	39%	58%	52%	100%	54%	100%	0%	0%	5%	4%	55%	100%	4%	8%	5%	2%	15%	3%	3%
MH Base	63%	5%	84%	1%	100%	5%	1%	0%	8%	3%	100%	8%	4%	15%	3%	6%	3%	1%	4%
SA Base	5%	98%	7%	4%	8%	100%	0%	0%	1%	1%	8%	100%	2%	2%	4%	0%	11%	12%	0%
DD MH	22%	1%	41%	0%	43%	1%	100%	0%	0%	0%	100%	1%	11%	1%	0%	98%	1%	1%	16%
VR MH	6%	5%	5%	0%	9%	5%	0%	100%	0%	0%	100%	5%	100%	0%	0%	2%	3%	7%	0%
CW MH	23%	3%	34%	1%	36%	4%	0%	0%	100%	30%	100%	31%	1%	100%	8%	3%	3%	0%	0%
CW SA	26%	9%	41%	1%	43%	9%	0%	0%	82%	100%	91%	100%	1%	100%	14%	3%	6%	0%	0%
MH Ext	54%	4%	72%	1%	86%	5%	2%	1%	18%	6%	100%	10%	5%	24%	3%	6%	3%	1%	3%
SA Ext	7%	89%	10%	3%	11%	90%	0%	0%	9%	11%	16%	100%	2%	11%	5%	0%	11%	11%	0%
VR*	9%	3%	12%	0%	14%	3%	1%	5%	0%	0%	18%	3%	100%	1%	0%	**9%**	2%	3%	2%
CW*	16%	2%	26%	0%	26%	2%	0%	0%	38%	14%	51%	15%	1%	100%	4%	3%	1%	0%	0%
DYC*	13%	16%	19%	1%	22%	16%	0%	0%	11%	7%	22%	21%	1%	14%	100%	1%	9%	1%	0%
DD*	7%	0%	11%	0%	11%	0%	5%	0%	1%	0%	15%	1%	6%	4%	0%	100%	0%	0%	3%
Jud*	3%	10%	4%	0%	4%	10%	0%	0%	1%	1%	5%	11%	1%	1%	2%	0%	100%	5%	0%
DOC*	1%	10%	1%	0%	1%	11%	0%	0%	0%	0%	1%	11%	1%	0%	0%	0%	5%	100%	0%
SHHP*	33%	3%	36%	1%	42%	3%	4%	0%	1%	0%	44%	4%	7%	1%	0%	16%	1%	1%	100%

*Total client population refers to every individual who received *any* service from or service paid for by the State funded program regardless of whether or not the service was a behavioral health service.

Children and Adolescents

Interpretation Example: The total number of children and adolescents served in SFY 2007 by the Division of Youth Corrections (DYC) was **7,071** (refer to row DYC and DYC column). The number of DYC clients who received substance abuse services through at least one of the SA Ext agencies was **1,647** (on the DYC row in the SA Ext column in bold).

Table 3. Overlap Across Agencies and Behavioral Health Provider Categories: Children and Adolescents (under age 18)

Overlap	DBH MH	DBH SA	Med MH	Med SA	MH Base	SA Base	DD MH	VR MH	CW MH	CW SA	MH Ext	SA Ext	VR*	CW*	DYC*	DD*	Jud*	DOC*	SHHP*
DBH MH	13,795	471	11,122	100	13,795	498	0	0	2,535	1,046	13,795	1,322	55	4,532	1,085	391	463	1	133
DBH SA	471	4,075	682	134	732	4,075	0	0	384	375	773	4,075	22	535	1,264	7	400	0	14
Med MH	11,122	682	20,948	122	20,948	715	0	0	3,822	1,621	20,948	2,012	72	7,366	1,555	683	564	1	192
Med SA	100	134	122	195	128	195	0	0	60	45	139	195	1	91	63	2	32	0	4
MH Base	13,795	732	20,948	128	23,638	767	0	0	3,991	1,704	23,638	2,129	84	7,616	1,272	701	679	2	200
SA Base	498	4,075	715	195	767	4,136	0	0	398	383	810	4,136	23	555	1,272	9	406	0	16
DD MH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VR MH	0	0	0	0	0	0	0	5	0	0	5	0	5	0	0	0	0	0	0
CW MH	2,535	384	3,822	60	3,991	398	0	0	11,187	3,267	11,187	3,376	33	11,187	907	302	338	0	40
CW SA	1,046	375	1,621	45	1,704	383	0	0	3,267	3,963	3,630	3,963	15	3,963	589	76	219	0	17
MH Ext	13,795	773	20,948	139	23,638	810	0	5	11,187	3,630	30,839	3,971	106	14,812	1,800	850	707	2	204
SA Ext	1,322	4,075	2,012	195	2,129	4,136	0	0	3,376	3,963	3,971	7,716	35	4,135	1,647	83	539	0	31
VR*	55	22	72	1	84	23	0	5	33	15	106	35	617	63	39	22	17	1	2
CW*	4,532	535	7,366	91	7,616	555	0	0	11,187	3,963	14,812	4,135	63	29,055	1,175	822	415	0	62
DYC*	1,085	1,264	1,555	63	1,720	1,272	0	0	907	589	1,800	**1,647**	39	1,175	**7,071**	38	696	27	19
DD*	391	7	683	2	701	9	0	0	302	76	850	83	22	822	38	16,326	14	1	9
Jud*	463	400	564	32	679	406	0	0	338	219	707	539	17	415	696	14	5,503	2	6
DOC*	1	0	1	0	2	0	0	0	0	0	2	0	1	0	27	1	2	66	0
SHHP*	133	14	192	4	200	16	0	0	40	17	204	31	2	62	19	9	6	0	1,115

*Total client population refers to every individual who received any service from or service paid for by the State funded program regardless of whether or not the service was a behavioral health service.

Table 4 provides percentages based on the previous table's numbers. Each row shows the percent of consumers for the agency in that row that is also a consumer for the agency in the column heading.

Interpretation Example: For example, **23%** of DYC clients under age 18 received substance abuse services from one of the SA Ext agencies (DYC row and SA Ext column (1,647 / 7,071 = 23%)) in SFY 2007.

Table 4. Percent Overlap Across Agencies and Behavioral Health Provider Categories: Children and Adolescents

Overlap	DBH MH	DBH SA	Med MH	Med SA	MH Base	SA Base	DD MH	VR MH	CW MH	CW SA	MH Ext	SA Ext	VR*	CW*	DYC*	DD*	Jud*	DOC*	SHHP*
DBH MH	100%	3%	81%	1%	100%	4%	0%	0%	18%	8%	100%	10%	0%	33%	8%	3%	3%	0%	1%
DBH SA	12%	100%	17%	3%	18%	100%	0%	0%	9%	9%	19%	100%	1%	13%	31%	0%	10%	0%	0%
Med MH	53%	3%	100%	1%	100%	3%	0%	0%	18%	8%	100%	10%	0%	35%	7%	3%	3%	0%	1%
Med SA	51%	69%	63%	100%	66%	100%	0%	0%	31%	23%	71%	100%	1%	47%	32%	1%	16%	0%	2%
MH Base	58%	3%	89%	1%	100%	3%	0%	0%	17%	7%	100%	9%	0%	32%	5%	3%	3%	0%	1%
SA Base	12%	99%	17%	5%	19%	100%	0%	0%	10%	9%	20%	100%	1%	13%	31%	0%	10%	0%	0%
DD MH	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VR MH	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	100%	0%	0%	0%	0%	0%	0%
CW MH	23%	3%	34%	1%	36%	4%	0%	0%	100%	29%	100%	30%	0%	100%	8%	3%	3%	0%	0%
CW SA	26%	9%	41%	1%	43%	10%	0%	0%	82%	100%	92%	100%	0%	100%	15%	2%	6%	0%	0%
MH Ext	45%	3%	68%	0%	77%	3%	0%	0%	36%	12%	100%	13%	0%	48%	6%	3%	2%	0%	1%
SA Ext	17%	53%	26%	3%	28%	54%	0%	0%	44%	51%	51%	100%	0%	54%	21%	1%	7%	0%	0%
VR*	9%	4%	12%	0%	14%	4%	0%	0%	5%	2%	17%	6%	100%	10%	6%	4%	3%	0%	0%
CW*	16%	2%	25%	0%	26%	2%	0%	0%	39%	14%	51%	14%	0%	100%	4%	3%	1%	0%	0%
DYC*	15%	18%	22%	1%	24%	18%	0%	0%	13%	8%	25%	**23%**	1%	17%	100%	1%	10%	0%	0%
DD*	2%	0%	4%	0%	4%	0%	0%	0%	2%	0%	5%	1%	0%	5%	0%	100%	0%	0%	0%
Jud*	8%	7%	10%	1%	12%	7%	0%	0%	6%	4%	13%	10%	0%	8%	13%	0%	100%	0%	0%
DOC*	2%	0%	2%	0%	3%	0%	0%	0%	0%	0%	3%	0%	2%	0%	41%	2%	3%	100%	0%
SHHP*	12%	1%	17%	0%	18%	1%	0%	0%	4%	2%	18%	3%	0%	6%	2%	1%	1%	0%	100%

*Total client population refers to every individual who received any service from or service paid for by the State funded program regardless of whether or not the service was a behavioral health service.

Adults

The total number of adults served in SFY 2007 by Supportive Housing and Homeless Programs (SHHP) was **3,780** (refer to the intersection of the SHHP row and SHHP column.) The number of SHHP consumers who received mental health services from at least one of the MH Extended agencies in SFY was **1,951**.

Table 5. Overlap Across Agencies and Behavioral Health Provider Categories: Adults (ages 18+)

Overlap	DBH MH	DBH SA	Med MH	Med SA	MH Base	SA Base	DD MH	VR MH	CW** MH	CW** SA	MH Ext	SA Ext	VR*	CW**	DYC*	DD*	Jud*	DOC*	SHHP*
DBH MH	20,392	1,214	14,542	400	20,392	1,343	289	53	97	56	20,392	1,393	1,587	229	73	1,492	699	241	1,481
DBH SA	1,214	30,206	1,639	610	1,862	30,206	7	40	19	15	1,908	30,206	517	36	133	49	3,509	4,176	12
Med MH	14,542	1,639	25,009	538	25,009	1,836	536	44	150	94	25,009	1,918	1,967	359	114	2,245	817	315	1,593
Med SA	400	610	538	1,080	565	1,080	0	1	4	5	566	1,080	51	8	7	18	154	41	34
MH Base	20,392	1,862	25,009	565	30,919	2,062	552	74	155	96	30,919	2,146	2,308	371	136	2,324	1,058	379	1,844
SA Base	1,343	30,206	1,836	1,080	2,062	30,676	7	41	20	15	2,108	30,676	545	38	136	60	3,551	4,187	148
DD MH	289	7	536	0	552	7	1,296	3	6	5	1,296	12	145	17	0	1,266	8	9	202
VR MH	53	40	44	1	74	41	3	837	1	0	837	41	837	1	0	19	24	56	4
CW MH**	97	19	150	4	155	20	6	1	388	191	388	204	32	388	27	51	22	0	3
CW SA**	56	15	94	5	96	15	5	0	191	236	204	236	15	236	12	38	14	0	3
MH Ext	20,392	1,904	25,009	566	30,919	2,104	1,296	837	388	204	32,656	2,294	3,144	605	139	3,078	1,084	436	1,951
SA Ext	1,393	30,206	1,918	1,080	2,146	30,676	12	41	204	236	2,298	30,897	559	259	147	98	3,562	4,187	150
VR*	1,587	517	1,967	51	2,308	545	145	837	32	15	3,144	559	17,044	97	33	1,525	315	530	341
CW**	229	36	359	8	371	38	17	1	388	236	605	259	97	1,154	34	162	31	1	10
DYC*	73	133	114	7	134	136	0	0	27	12	139	147	33	34	1,552	6	78	65	2
DD*	1,492	49	2,245	18	2,324	60	1,266	19	51	38	3,078	98	1,525	162	6	10,437	30	52	750
Jud*	699	3,509	817	154	1,058	3,551	8	24	22	14	1,084	3,562	315	31	78	30	33,278	2,007	63
DOC*	241	4,176	315	41	379	4,187	9	56	0	0	436	4,187	530	1	65	52	2,007	39,762	30
SHHP*	1,481	129	1,593	34	1,844	148	202	4	3	3	**1,951**	150	341	10	2	750	63	30	**3,780**

*Total client population refers to every individual who received any service from or service paid for by the State funded program regardless of whether or not the service was a behavioral health service.

** The Division of Child Welfare and the Division of Youth Corrections provide services to persons up to age 21.

Table 6 provides percentages based on the previous table's numbers. Each row shows the percent of consumers for the agency or group in that row who are also consumers for the agency or group in the column heading.

Interpretation Example: For example, **52%** of Supportive Housing adult clients received mental health services from at least one of the MH Extend agencies in SFY 2007.

Table 6. Percent Overlap Across Agencies and Behavioral Health Provider Categories: Adults

Overlap	DBH MH	DBH SA	Med MH	Med SA	MH Base	SA Base	DD MH	VR MH	CW MH**	CW SA**	MH Ext	SA Ext	VR*	CW**	DYC*	DD*	Jud*	DOC*	SHHP*
DBH MH	100%	6%	71%	2%	100%	7%	1%	0%	0%	0%	100%	7%	8%	1%	0%	7%	3%	1%	7%
DBH SA	4%	100%	5%	2%	6%	100%	0%	0%	0%	0%	6%	100%	2%	0%	0%	0%	12%	14%	0%
Med MH	58%	7%	100%	2%	100%	7%	2%	0%	1%	0%	100%	8%	8%	1%	0%	9%	3%	1%	6%
Med SA	37%	56%	50%	100%	52%	100%	0%	0%	0%	0%	52%	100%	5%	1%	1%	2%	14%	4%	3%
MH Base	66%	6%	81%	2%	100%	7%	2%	0%	1%	0%	100%	7%	7%	1%	0%	8%	3%	1%	6%
SA Base	4%	98%	6%	4%	7%	100%	0%	0%	0%	0%	7%	100%	2%	0%	0%	0%	12%	14%	0%
DD MH	22%	1%	41%	0%	43%	1%	100%	0%	0%	0%	100%	1%	11%	1%	0%	98%	1%	1%	16%
VR MH	6%	5%	5%	0%	9%	5%	0%	100%	0%	0%	100%	5%	100%	0%	0%	2%	3%	7%	0%
CW MH**	25%	5%	39%	1%	40%	5%	2%	0%	100%	49%	100%	53%	8%	100%	7%	13%	6%	0%	1%
CW SA**	24%	6%	40%	2%	41%	6%	2%	0%	81%	100%	86%	100%	6%	100%	5%	16%	6%	0%	1%
MH Ext	62%	6%	77%	2%	95%	6%	4%	3%	1%	1%	100%	7%	10%	2%	0%	9%	3%	1%	6%
SA Ext	5%	98%	6%	3%	7%	99%	0%	0%	1%	1%	7%	100%	2%	1%	0%	0%	12%	14%	0%
VR*	9%	3%	12%	0%	14%	3%	1%	5%	0%	0%	18%	3%	100%	1%	0%	9%	2%	3%	2%
CW**	20%	3%	31%	1%	32%	3%	1%	0%	34%	20%	52%	22%	8%	100%	3%	14%	3%	0%	1%
DYC*	5%	9%	7%	0%	9%	9%	0%	0%	2%	1%	9%	9%	2%	2%	100%	0%	5%	4%	0%
DD*	14%	0%	22%	0%	22%	1%	12%	0%	0%	0%	29%	1%	15%	2%	0%	100%	0%	0%	7%
Jud*	2%	11%	2%	0%	3%	11%	0%	0%	0%	0%	3%	11%	1%	0%	0%	0%	100%	6%	0%
DOC*	1%	11%	1%	0%	1%	11%	0%	0%	0%	0%	1%	11%	1%	0%	0%	0%	5%	100%	0%
SHHP*	39%	3%	42%	1%	49%	4%	5%	0%	0%	0%	**52%**	4%	9%	0%	0%	20%	2%	1%	100%

*Total client population refers to every individual who received any service from or service paid for by the State funded program regardless of whether or not the service was a behavioral health service.

** The Division of Child Welfare and the Division of Youth Corrections provide services to persons up to age 21.

Appendix B.

Data Obtained for the Population In Need Project

Client data for the project were provided by nine state agencies during for State Fiscal Year 2007. The agencies included the Department of Health Care Policy and Financing (Medicaid), the Division of Behavioral Health, the Division of Vocational Rehabilitation, the Division of Child Welfare, the Division for Developmental Disabilities, the Division of Youth Corrections, the Supportive Housing and Homeless Programs, the Department of Corrections, and the Judicial Department (Probation).

Four agencies provided data on consumers of behavioral health services SFY07:

- **Department of Health Care Policy and Financing**. The Medicaid program is a state and federal program that purchases healthcare for qualified Coloradans. Medicaid mental health data represent behavioral health consumers, excluding pharmacy only, paid for by the Medicaid program including Behavioral Health Organizations and Fee-For-Service payments. A small number of substance use disorder clients are also served through the Medicaid program. These data do not include information about children enrolled in the Child Health Plan Plus program.
- **Division of Behavioral Health (DBH)**. DBH provided data on services they funded (identified by a public source of funding on the CCAR and DACODS) to consumers not eligible for Medicaid.
- **Division of Vocational Rehabilitation**. VR provided data on mental health services they funded. Mental health services were clearly identified. This Division did not fund specific substance abuse services.
- **Division of Child Welfare**. CW provided data on services they funded. Behavioral health services were identified by title. In their database, CW associates services necessary to support the child with the child even if the service was to another person. Services identified as substance abuse were ignored for children under age 11.

Seven agencies provided data on all clients of the agency served in SFY 2007:

- **Division of Vocational Rehabilitation**. The Division of Vocational Rehabilitation numbers include all active cases with the services they received during SFY 2007, including the applicants who were given mental health evaluation services during the application process whether or not they became eligible for services during SFY 2007.
- **Division of Child Welfare**. Data were provided on all out of home placement services, Core services to children in homes, and adoption services for SFY 2007.
- **Division of Youth Corrections**. Data were provided on all active cases for SFY 2007.
- **Division for Developmental Disabilities (DD)**. DD supplied client specific information for all clients known to the Division during the period of July 1, 2006 through June 30, 2007, including those that were active, case management, status pending, and on a waiting list. Information regarding behavioral health services provided to these consumers was provided by the Colorado Department of Health Care Policy and Financing based on Medicaid claims.
- **State Judicial, Division of Probation Services**. The file includes all adult and juvenile offenders sentenced, statewide, to probation in FY2007. These data include offenders sentenced to regular probation, an intensive supervision program, community corrections, and those offenders supervised by a private provider. Also included are those offenders who have a mental health diagnosis that the officer has entered in the database.
- **Department of Corrections**. Data were provided on all offenders who had been under DOC's jurisdiction at some point during FY07, either as an inmate or parolee.
- **Supportive Housing and Homeless Program**. Data were provided on all active cases in the year including head of household and all household members.

Generating Unique IDs Across 11 State Data Files

Base Data Files for Behavioral Health Services

The Department of Health Care Policy and Financing, and the Division of Behavioral Health provided data on consumers of behavioral health services. Medicaid provided a demographic file that included all consumers of behavioral health services from Behavioral Health Organizations and Fee-For-Service payments, excluding pharmacy and the Child Health Plan Plus program.

Data from the Division of Behavioral Health (DBH) came from two sources: mental health encounters (DBH MH Encounters), and Drug and Alcohol Coordinated Data System (DBH SA DACODS). DBH MH Encounters were selected if they had a Colorado Client Assessment Record (CCAR) indicating a public source of funding. DBH SA DACODS were included if they were associated with a Managed Care Organization, excluding DUI and Detoxification.

Table 1. Base Data Files for Behavioral Health Services

State Files	Agency Consumers in Agency File	Unique Consumers in Agency File
Medicaid Demographics	53,138	53,138
DBH MH Encounters	106,247	68,427
DBH MH CCARs	77,189	70,657
DBH SA DACODs	166,563	132,794

Table 1 shows two different counts of consumers in each file. The first column is a cumulative count of the number of clients each agency providing services for the associated division or department reports serving in SFY 2007. The second column counts a client only once statewide; the second column is an unduplicated number of clients served by Medicaid or DBH.

Data Files for All Clients Served

Data on all clients served were reported from seven agencies: Divisions of Vocational Rehabilitation, Child Welfare, Developmental Disabilities, Youth Corrections, Supportive Housing and Homeless Programs, the Department of Corrections and the Judicial Department Division of Probation Services. Vocational Rehabilitation and Child Welfare are also included here because in addition to providing data on behavioral health services, they also provided data on all the clients served in SFY 2007.

The first column is a cumulative count of the number of clients each agency providing services for the associated division or department reports serving in SFY 2007. The second column counts a client only once statewide; the second column is an unduplicated number of clients served by the division or department.

Table 2. Data Files for All Clients Served

State Files	Agency Consumers in Agency File	Unique Consumers in Agency File
Vocational Rehabilitation	23,226	17,678
Child Welfare	30,220	30,220
Developmental Disabilities	27,876	26,761
Division of Youth Corrections	14,685	8,623
Supportive Housing and Homeless Programs	4,999	4,999
Department of Corrections	40,046	40,046
Judicial (Probation)	43,304	38,837

Note: Small numbers of clients in some agency files appeared to be represented more than once in that agency's file.

The Population In Need Common File

The first step of creating a common file for the Population in Need project (PIN Common File) was to create a unique set of client records. Some agencies, like Medicaid with their Medicaid Demographic File, supplied a file where each record was a unique client. Others used different criteria such as including all service records.

The PIN Common File was created by combining the 11 State data files identified above: four files relevant for consumers of behavioral health services, and seven files with all clients served. Five pieces of information from the individual files were used to match clients across State Files. Each agency sending files was asked to provide at a minimum for each client the first character of their first name, the first 3 characters of their last name, their DOB, and at least the last 4 digits of their Social Security Number and/or Medicaid (State) ID to the extent that was possible. When there was missing or incomplete information in one file and a match was made, information provided by other State File(s) was used to fill gaps, if possible.

Medicaid (State) ID and Social Security Number (SSN) are, in theory and frequently in practice, unique, and are thus the best information to use for matching. However, many people are not eligible for Medicaid and so do not have Medicaid IDs and not every agency collected Social Security Numbers. Additionally, matches can be compromised by data entry mistakes, multiple IDs provided to the same person, and clients giving incomplete or inaccurate information. Thus, names and dates of birth became valuable, even though entry mistakes, multiple spellings of names, and name changes (especially for women) limit their utility. Full name information was not requested but was provided by some agencies; complete information on a data field was much more useful in matching duplicate people served within the same file as well as across files. Gender was also used for matching, though it was the least useful matching criterion used. The ability to match clients across State data files and thus create a unique set of client records was directly related to how complete and accurate the information provided in each file was.

Table 3 presents, for each of the 11 files received, the number of records in the file supplied (column 2) and the number of unique clients represented in that State File's record set (column 3). Column 4 contains the number of unique clients that file contributed to the PIN Common File. Three additional columns are shown: the number of unique clients in the file unmatched with any other agency file, the number matched with another agency file, and the percent of clients matched with another agency file.

Table 3: Data Files Combined into a PIN Common File

State Files	Agency Clients in Agency File	Unique Clients in Agency File	Unique Clients in Common File	Unique Clients Unmatched with any other Agency File	Unique Clients Matched with any other Agency File	*% of Clients Matched with another Agency File*
Medicaid Demographics	53,138	53,138	53,107	10,463	42,644	80%
DBH MH Encounters	106,247	68,427	63,822	10,194	53,628	84%
DBH MH CCARs	77,189	70,657	70,496	9,575	60,921	86%
DBH SA DACODs	166,563	132,794	132,657	107,880	24,854	19%
Vocational Rehabilitation	23,226	17,678	17,678	12,924	4,754	27%
Child Welfare	30,220	30,220	30,209	20,832	9,377	31%
Developmental Disabilities	27,876	26,761	26,761	21,032	5,729	21%
Youth Corrections	14,685	8,623	8,623	4,688	3,935	46%
Supportive Housing and Homeless	4,999	4,999	4,895	2,158	2,737	56%
Department of Corrections	40,046	40,046	39,828	28,980	10,848	27%
Judicial (Probation)	43,304	38,837	38,781	26,843	11,938	31%

The following analysis will focus on the extent to which the estimate of each paired overlap is likely to be accurate.

Accuracy of the estimated overlap is very closely related to how accurate and complete data in each data file was for each client. A file that contained all the data elements used for matching and where all the data for each data element were complete was rated excellent, a '5.' If two files had all the data elements and were complete the match was also considered excellent, a '5.' On the other hand, the Child Welfare file included only Medicaid ID and Date of Birth, while Supportive Housing and Homeless Programs did not provide a Medicaid ID; these two files matched on Date of Birth only. This was not sufficient information in itself to generate any matches. The only way clients in these two files could be matched would be if a client was also recorded in one of the other State Files. Because the Child Welfare and Supportive Housing and Homeless Programs had only one data matching element in common, the pair was given a rating of '1' in the following table. Table 4 provides ratings of the accuracy of estimating overlap for these 11 State Files. The following scale was used for this assessment:

5 = Excellent, 4 = Very Good, 3 = Good, 2 = Fair, and 1= Poor.

Overall Medicaid had the highest average among these 11 State Files. The Division for Developmental Disabilities and the Division of Youth Corrections were the two files with the lowest average ratings, followed closely by Judicial and the Division of Child Welfare.

This analysis shows the limitations matching data sets this way and provides a caution interpreting findings in the report. It also suggests that in contrast to this study future studies encourage agencies to provide complete data on any identifying fields that are available.

Table 4: Accuracy of the Estimate of the Overlap Across Files

Population	Pop. #	1	2	3	4	5	6	7	8	9	10	11
Medicaid Demographics	**1**		**4**	**3**	**4**	**4**	**4**	**3**	**4**	**3**	**3**	**4**
DBH CCAR	**2**	4		3	3	3	3	2	2	2	2	3
DBH Encounters	**3**	3	3		3	3	2	2	2	2	2	1
DBH SA DACODs	**4**	4	3	3		3	1	2	3	2	2	2.5
Vocational Rehabilitation	**5**	4	3	3	3		3	2	3	2	2	3
Child Welfare	**6**	4	3	2	1	3		1	2	1	1	1
Developmental Disabilities	**7**	3	2	2	2	2	1		2	1	1	1
Department of Corrections	**8**	**4**	**3**	**3**	**3**	**3**	**2**	**2**		**1**	**2**	**3**
Divison of Youth Corrections	**9**	**3**	**2**	**2**	**2**	**2**	**1**	**1**	**1**		**1**	**1**
Judicial	**10**	3	2	2	2	2	1	1	2	1		2
Supportive Housing	**11**	**4**	**3**	**1**	**2.5**	**3**	**1**	**1**	**3**	**1**	**2**	
Average Ratings		**3.6**	**2.7**	**2.3**	**2.55**	**2.8**	**1.9**	**1.7**	**2.6**	**1.6**	**1.8**	**2.15**