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Twelve-Month Diagnosed Prevalence of Mental Illness, Substance Use Disorders, and Medical Comorbidity in Massachusetts Medicare and Medicaid Members Aged 55 and Over, 2005

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Improving Community Based Mental Health Services for Elders in Massachusetts

Twelve-Month Diagnosed Prevalence of Mental Illness, Substance Use Disorders, and Medical Comorbidity in Massachusetts Medicare and Medicaid Members Aged 55 and Over, 2005

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EXECUTIVE SUMMARY

This report describes the 12-month diagnosed prevalence of behavioral health disorders (BHDs) among Massachusetts Medicare and Medicaid (MassHealth) members 55 years of age and older during calendar year 2005. Although population-based estimates of prevalence of BHDs among the elderly are available in only a few selected studies, none of them describe Massachusetts. With an expected rise in the number of elderly people with psychiatric disorders, a better understanding of the prevalence of mental illness and addictions in this population is needed to plan for services and supports.

This study used merged Medicare and MassHealth claims data to examine 12-month diagnosed prevalence of BHDs. BHDs were organized into three groups: severe mental illness (schizophrenia/other paranoid disorders, bipolar disorder, and major depression), other mental illness (other depression, anxiety, and others), and substance use disorders (alcohol/drug abuse or dependence). Furthermore, fifteen chronic medical conditions with high prevalence among elders were selected as measures of medical comorbidity. BHDs and chronic conditions were identified primarily by diagnoses recorded on health insurance claims.

This study also examined the relationships between BHD prevalence, primary health care payment source, and age. Primary payment sources included Medicare Only, MassHealth Only, and Dual Eligibles (dually eligible for both Medicare and MassHealth). Age was broken into four groups: 55 to 64, 65 to 74, 75 to 84, and 85 and over. The under 65 study group (55 to 64) represented 25% of all Massachusetts residents between the ages of 55 and 64; the 65 and over groups (when combined) captured 80% of residents in those age groups. A distinguishing feature of the study population was that most of those in the under 65 group qualified for Medicare or Medicaid due to a disability, while most of those 65 and older qualified for Medicare due to old age. In addition, those who were Dual Eligibles were more likely to have lower income, to be older, and to have disabilities than those in the Medicare Only or MassHealth Only groups.

Significant findings included the following:

- **The 12-month diagnosed prevalence of BHDs was 20.8%** (N=168,960) for Massachusetts Medicare and Medicaid (MassHealth) beneficiaries aged 55 and over during calendar year 2005 (N=813,098).

- **Dual Eligibles had a higher diagnosed prevalence of BHDs than the Medicare Only and MassHealth Only groups.** In the 55 to 64 age group, the diagnosed prevalence of any BHD among Dual Eligibles (51.7%) was 4 times higher than in the Medicare Only group (12.9%) and more than 1.5 times higher than in the MassHealth Only group (31.2%). Although the differences between Dual Eligibles and the other groups are smaller among those aged 65 and over, the diagnosed prevalence among Dual Eligibles (38.8%) was almost 2.5 times higher than the Medicare Only group (16.1%).

- **Dual Eligibles had a higher proportion of people with multiple BHDs than the Medicare Only and MassHealth Only groups.** Among Dual Eligibles aged 55 to 64, 64.0% of people with severe mental illness also had at least one other psychiatric

diagnosis and 16.3% of people with severe mental illness had a co-occurring alcohol or drug use disorder. In addition, 50% of those with a substance use disorder had co-occurring severe mental illness. For people 65 and over, 70.3% of people with severe mental illness had a co-occurring psychiatric disorder and 7.7% had a co-occurring substance use disorder. In addition, 35.5% of those with a substance use disorder had co-occurring severe mental illness.

- **Regardless of age group or primary payment source, a much higher proportion of people with BHDs had 5 or more selected chronic medical conditions than those who had no BHD.** In addition, the proportion of people with 5 or more chronic medical conditions was highest among Dual Eligibles with BHDs. Among Dual Eligibles aged 55 to 64, 20.8% of people with BHDs had 5 or more chronic medical conditions compared to 13.0% of those who had no BHD; 49.2% of members aged 65 and over with BHDs and 23.3% without BHDs had 5 or more chronic conditions.

In conclusion, almost 170,000 Massachusetts Medicare and Medicaid enrollees aged 55 and over had BHD diagnoses recorded on health insurance claims and their overall disease burden was higher than those without a BHD. Innovative programs and better coordination with other medical care services need to be developed to address challenges posed by the increasing number of elderly people with BHDs and their high disease burden. Further analyses underway at UMMS will provide information on mental health services currently being used by this population in order to identify opportunities for systematic changes to better serve elders with BHDs.

1. INTRODUCTION

As the baby boom generation ages, it is estimated that the elderly population will increase from 34 million individuals in 2000 to 69 million in the year 2030 (Day, 1996). In addition, it is estimated that the number of elderly people with psychiatric disorders will disproportionally increase from 7 million in 2000 to 15 million in 2030 (Jeste et al., 1999). Reasons for the substantial increase in elderly people with psychiatric disorders include the anticipated increase in the number of elderly people; a higher likelihood of depressive, anxiety, and substance use disorders in this population (Klerman & Weissman, 1989; White, Aidals, & Zablocki, 1988); and longer life expectancy of those who had psychiatric disorders earlier in life (Jeste et al., 1999).

This increase in the number of older adults with psychiatric disorders poses serious challenges to the current mental health care delivery system in terms of health care financing, workforce training in geriatric mental health, and coordination with other medical care services. Nevertheless, existing population-based prevalence estimates for the elderly population are available in only a few selected studies. Therefore, a better understanding of the prevalence of psychiatric disorders in the elderly population is needed to plan for services and supports.

This report presents findings on the 12-month diagnosed prevalence of behavioral health disorders (BHDs) in Massachusetts Medicare beneficiaries and Medicaid (MassHealth) members aged 55 and over during the calendar year 2005. This is a population-based study and the BHDs were grouped into three categories: severe mental illness (schizophrenia/other paranoid disorders, bipolar disorder, and major depression), other mental illness (other depression, anxiety, and others), and substance use disorders (alcohol/drug abuse or dependence). Furthermore, fifteen chronic medical conditions with high prevalence among elders were selected as measures of medical comorbidity. BHDs and chronic conditions were identified primarily by diagnoses recorded on health insurance claims. In this study, Alzheimer's disease and other dementias were not treated as BHDs, but instead were addressed in the discussion of medical comorbidities.

This report is one deliverable from a comprehensive study of elder mental health that is currently underway as part of a collaboration between the Executive Office of Elder Affairs and the University of Massachusetts Medical School/Commonwealth Medicine. The diagnosed prevalence of BHDs reported here is the first part of a larger Medicare and Medicaid claims data analysis. Further analyses will provide information on use of mental health services in order to identify opportunities for systematic changes to better serve elders with BHDs.

2. BACKGROUND

2.1 Prevalence of Mental Disorders Based on Epidemiologic Studies

Efforts to study the prevalence of mental disorders in the U.S. population in a comprehensive manner began in the 1980s using data from large epidemiologic studies. The most often cited prevalence of mental disorders either in the adult population as a whole, or in older adults, relies on estimates from three large surveys supported by the National Institute of Mental Health (NIMH): the Epidemiologic Catchment Area (ECA) survey, the National Comorbidity Survey (NCS), and the National Comorbidity Survey-Replication (NCS-R) studies. The ECA Survey (1980-85) has been a major source of prevalence data on the adult U.S. population for over two decades. This study used the NIMH Diagnostic Interview Schedule (DIS) to estimate prevalence of mental and addictive disorders, including severe cognitive impairment, that were listed in the Diagnostic and Statistical Manual of Mental Disorders, Third Edition (DSM-III) (D. A. Regier et al., 1984). The ECA study also examined treatments received for these disorders. The ECA study population included adults aged 18 and over in 5 sites. Based on study findings, one-year prevalence of any mental disorder was reported to be 28.1% (Darrel A Regier et al., 1993). Regarding specific mental illness diagnoses, one-year prevalence was reported for major depression at 5.0%, schizophrenia at 1.1%, and bipolar disorder at 1.2% (Darrel A Regier et al., 1993).

Although the ECA study was the first survey to use fully structured research diagnostic interviews to examine the prevalence of mental disorders, it was implemented in only 5 sites and questions remained as to whether results held at the national level. In order to address the issue of representativeness, NIMH sponsored the NCS (in 1990 and 1992) to examine prevalence and correlates of mental disorders in a nationally representative sample of adults aged 18 to 54. The NCS used the World Health Organization's Composite International Diagnostic Interview (CIDI) to identify the presence of mental health diagnoses based on the DSM-III-R. In contrast to the ECA study, severe cognitive impairment was not included in the mental disorders examined by the NCS study. One-year overall prevalence of DSM-III-R mental disorders in the NCS study was reported to be 30.2% for persons aged 18 to 54 (Ronald C. Kessler et al., 1994).

The NCS study was replicated in 2001-2003 (NCS-R). The NCS-R study employed a different sampling scheme that included individuals 55 and older and used a substantially expanded interview form that assessed disorder severity in addition to prevalence (Ronald C Kessler, Chiu, Demler, & Walters, 2005). In the NCS-R, 12-month prevalence of any DSM-IV disorder for all ages (including 55 and over) was reported to be 26.2%. Twelve-month prevalence of major depression in this sample, which included older adults, was 6.7% and bipolar disorder was 2.6% (Ronald C Kessler et al., 2005). The NCS-R also categorized mental disorders by severity, but used much more comprehensive criteria, including functional status, risk of suicide and duration of symptoms, than the original NCS survey. Among those with any mental disorder, 22.3% of respondents were classified as having a "serious" mental disorder (Ronald C Kessler et al., 2005).

Any study of the prevalence of mental disorders depends greatly on the measurement tools and criteria used. Attempts have been made to reconcile the discrepant prevalence estimates of the

ECA and NCS studies, chiefly by accounting for changes in diagnostic criteria between the DMS-III and DSM-III-R and by looking more closely at clinical significance of symptoms (Narrow, Rae, Robins, & Regier, 2002; D. A. Regier et al., 1998). Applying more stringent and consistent criteria to both sets of data, the disparities between the two surveys decreased, and the one-year prevalence rates dropped significantly in both surveys. In the NCS, for example, the prevalence of major depression was 10.1% before the criteria were applied and 6.4% after the new criteria were applied (Narrow et al., 2002). For any mental disorder (not including severe cognitive impairment), the one-year prevalence dropped from 30.2% to 20.6% (Narrow et al., 2002). However, it is important to remember that data for the original NCS were collected only for adults aged 18 – 54 and findings may not be applicable to older adults.

For the ECA study (where the sample did include people 55 and older, as well as people with severe cognitive impairment) the prevalence estimates changed less dramatically for mental disorders, but still decreased when the clinical significance criterion was applied. For all ages (18 and older) the one-year prevalence of any disorder went from 28.0% to 22.5% (Narrow et al., 2002). Narrow and colleagues (2002) also reported 12-month prevalence of mental disorders in the ECA study by two age groups: 18 to 54 and 55 and over. After applying the clinical significance criterion, the estimates dropped from 29.6% to 24.7% for people aged 18 to 54 and from 24.0% to 17.3% for people aged 55 and over. Regarding specific mental disorders, one-year revised prevalence with the clinical significance criterion was 5.2% for major depression, 1.3% for schizophrenia, and 0.9% for bipolar disorder in people aged 18 to 54, while the prevalence was 2.7%, 0.4%, and 0.2%, respectively, in people aged 55 and over (Narrow et al., 2002).

In addition to the ECA, NCS, and NCS-R surveys noted above, there are several studies of prevalence that are more narrowly focused on specific populations or disorders. The 2002 National Survey on Drug Use and Health (a survey of the non-institutionalized population of the U.S. aged 12 and older) reported that approximately 8.3% of the adult population aged 18 and older was estimated to have serious mental illness (Epstein, Barker, Vorburger, & Murtha, 2004). However, neither prevalence rates for the older population nor specific diagnoses were studied.

The National Survey of American Life (NSAL) is one of the few national studies that specifically examined prevalence of DSM-IV mental disorders in a sample of non-white people. The NSAL is a national household probability sample of non-institutionalized African Americans, Caribbean blacks, and non-Hispanic whites aged 18 and older in the U.S. (Jackson et al., 2004). A recent study used the NSAL to study prevalence of major depressive disorders and found that the 12-month prevalence was highest for Caribbean blacks (7.2%) followed by whites at 6.9% and African Americans at 5.9% (Williams et al., 2007).   The study did not focus specifically on older adults, however.

Another study recently used a large national data set to examine prevalence of mental illness in older Hispanics. Data from the third wave of the Health and Retirement Study (HRS) and the second wave of the Health Dynamics of the Oldest Old (AHEAD) study were used to examine prevalence of depression in Hispanic adults aged 59 and older, and results were reported for Puerto Rican, Mexican American, Cuban and "Other" Hispanics on both severity and prevalence of depression based on criteria set forth in the DSM-III (Yang, Cazorla-Lancaster, & Jones,

2008). The study found that the unadjusted one-year prevalence of major depression was 16.9% for Puerto Rican, 9.7% for Cuban, 4.8% for Other Hispanic groups, and 4.1% for Mexican American (Yang et al., 2008).

Studies have also shown that the "Mental Component Score" derived from the SF-36, a general health status assessment instrument (Ware, Snow, Kosinski, & Gandek, 1993), is a valid screening tool for depression (Berwick et al., 1991; Beusterien, Steinwald, & Ware, 1996; Wells et al., 1989). When comparing to results obtained using the NIMH Diagnostic Interview Schedule, a "Mental Component Score" of 42 or below yielded the highest sensitivity (74%) and specificity (81%) in identifying people with DSM III diagnoses of major depression or dysthymia (Wells et al., 1989). Using the "Mental Component Score" from the Health Outcome Survey for Medicare fee-for-service beneficiaries, a study found one-month prevalence of major depression or dysthymia to be 29.9% across all Medicare beneficiaries and 25.0% for elderly Medicare beneficiaries (McCall, Parks, Smith, Pope, & Griggs, 2002).

The large national studies discussed above, including the ECA, the NCS and NCS-R, the NSAL, the HRS and the AHEAD, have all estimated the prevalence of mental disorders in the U.S. population. However, not all of these have specifically focused on older adults. In addition, diagnostic criteria for mental illnesses have differed across surveys.

2.2 Prevalence of Mental Disorders Based on Claims Data

In contrast to the epidemiologic studies described above, studies that use claims data to estimate prevalence of mental disorders draw diagnostic information from insurance claims for services delivered. Prevalence estimates derived from claims data account only for individuals with mental health diagnoses that were recorded in insurance claims.

Crystal and colleagues (2003) studied the prevalence of depression in the elderly Medicare population using merged claims and interview data from the 1992 – 1998 Medicare Current Beneficiary Survey, a nationally representative sample of Medicare recipients (Crystal, Sambamoorthi, Walkup, & Akincigil, 2003). The authors examined diagnosed depression data based on the ICD-9-CM codes in the claims data. The study examined major depressive disorder and other depression and found that the prevalence of any diagnosed depression in the elderly population increased from 2.8% in 1992 to 5.8% in 1998 (Crystal et al., 2003).

Another study based on insurance claims estimated the 12-month diagnosed prevalence of schizophrenia, weighted by insurance coverage type in a merged data set (private insurance, Medicare, California-Medicaid, and uninsured) (Wu, Shi, Birnbaum, Hudson, & Kessler, 2006). This study found that the12-month prevalence of schizophrenia was 1.66% among Medicaid only members (under 65 years old) and 0.83% among Medicare beneficiaries; 0.55% for males and 0.84% for females aged 65 and older in the entire study population.

2.3 Prevalence of Mental Disorders in Nursing Home Residents

The reported prevalence of mental disorders in nursing home residents has changed over time. In the 1997 National Nursing Home Survey, the category "mental disorders, including dementia", was the second most frequent diagnostic category (15.6%) at the time of nursing home admission (Gabrel, 2000). Mechanic and McAlpine (2000) compared data in the 1985 and 1995 National Nursing Home Survey and found that the prevalence of depression increased from 4.1% to 12.1% and the prevalence of dementia-related conditions increased from 27.8% to 41.0%, while the prevalence of schizophrenia decreased from 9.8% to 7.1% (Mechanic & McAlpine, 2000). A further examination of the 1987 and 1996 nursing home component of the Medical Expenditure Panel Survey found a consistent pattern of changes (Mechanic & McAlpine, 2000). However, the increase in the prevalence of depression mostly appeared as a secondary diagnosis. The authors concluded that, except for elderly people with dementia, nursing homes play a minor role in providing mental health services (Mechanic & McAlpine, 2000).

2.4 Summary

In summary, estimates of the overall prevalence of mental disorders have ranged from 22.5% to 28.1% for the population aged 18 and over. For the population aged 18 to 54, the estimates were higher, at 20.6% to 30.26%. For those aged 55 and over, estimates ranged from 17.3% to 24.0%.

Regarding the prevalence of specific mental disorders, estimates have ranged from 5% to 10.1% for major depression in adults aged 18 and over and from 2.7% to 3.7% for those who aged 55 and over. The prevalence of schizophrenia was around 1% and the prevalence of bipolar disorder ranged from 1.2% to 2.6%.

The following sections in this report describe methods and present findings on 12-month diagnosed prevalence of behavioral health disorders (BHDs) in Medicare beneficiaries and Medicaid (MassHealth) members aged 55 and over in Massachusetts during calendar year 2005.

3. METHODS
3.1 Data Sources

The main data sources used in this analysis included Medicare data, MassHealth data, and a Medicare and MassHealth linkage file; all data were from the Calendar year 2005. Unique identifiers within the first two data sets allowed linkage between denominator/eligibility data and various claims data. Individuals dually eligible for Medicare and Massachusetts Medicaid (MassHealth) were identified from the linkage file. The contents of these main data sources are described below.

- Medicare Data (Centers for Medicare and Medicaid Services), Calendar Year 2005 included:
  - The Denominator file
  - Institutional and non-institutional claims data

- MassHealth Data (Massachusetts Executive Office of Health and Human Service Data Warehouse), Calendar Year 2005 included:
  - Eligibility data
  - Medicaid Management Information System (MMIS) claims data
  - Managed Care Organizations (MCO) encounter data
  - Massachusetts Behavioral Health Partnership (MBHP) encounter data

- Medicare and MassHealth linkage file (Centers for Medicare and Medicaid Services) included:
  - A linkage variable that allowed the data to be linked with unique identifiers in Medicare and MassHealth data for individuals who were dually eligible for Medicare and MassHealth in calendar year 2005

3.2 Study Population

The study population included Medicare beneficiaries and MassHealth members aged 55 years or older as of January 1, 2005, excluding people who were enrolled in Medicare managed care for the entire Medicare coverage period in CY 2005, for whom claims data were incomplete. In other words, an individual was included in the study population if he/she stayed in the fee-for-service sector for a month or more, in CY 2005, regardless of managed care enrollment. This approach was consistent with our intention to include the full population to the extent possible in reporting the prevalence.

The study population (N=813,908) was further classified into three groups based on primary payment sources for health services claims. The three groups were:
- Dual Eligibles (N=138,379): enrolled in Medicare Part A or Part B for at least one day and enrolled in MassHealth for at least one day during CY05.
- Medicare Only (N=613,193): enrolled in Medicare Part A or Part B for at least one day and did not enroll in MassHealth at all during CY05
- MassHealth Only (N=62,336): enrolled in MassHealth for at least one day during CY05 and did not enroll in Medicare at all during CY05

Figure 3.1 shows how the study population (N=813,908) was derived.

Figure 3.1 Derivation of the Study Population

```
┌─────────────────────────┐        ┌─────────────────────────┐
│  Enrolled in Medicare   │        │ Enrolled in MassHealth  │
│     (CY05), all ages    │        │  (CY05), age>=55 as of  │
│       N=1,016,690       │        │         1/1/05          │
│                         │        │       N=217,116         │
└─────────────────────────┘        └─────────────────────────┘
```

```
┌──────────────────┐   ┌─────────────────────┐
│  Medicare Only,  │   │  Dual Eligible (from│
│ age < 55 as of   │   │ Medicare linking    │
│    1/1/05        │   │   file)             │
│   N=27,600       │   │   N=236,020         │
└──────────────────┘   └─────────────────────┘
```

```
┌──────────────────┐  ┌──────────────────┐  ┌──────────────────┐
│ Medicare Only,   │  │  Dual Eligible   │  │ MassHealth Only  │
│ age >=55 as of   │  │ age >=55 as of   │  │ age >=55 as of   │
│    1/1/05        │  │    1/1/05        │  │    1/1/05        │
│   N=753,070      │  │   N=154,780      │  │   N=62,336       │
└──────────────────┘  └──────────────────┘  └──────────────────┘
```

```
┌──────────────────┐  ┌──────────────────┐
│ Age<55 as of     │  │ Not in MassHealth[1]│
│    1/1/05        │  │   N=3,754        │
│   N=77,486       │  │                  │
└──────────────────┘  └──────────────────┘
```

```
┌──────────────────┐  ┌──────────────────┐
│  Enrolled in     │  │  Enrolled in     │
│   Medicare       │  │   Medicare       │
│ managed care[2]  │  │ managed care[2]  │
│   N=139,877      │  │   N=16,401       │
└──────────────────┘  └──────────────────┘
```

```
┌──────────────────┐  ┌──────────────────┐  ┌──────────────────┐
│  Medicare Only   │  │  Dual Eligible   │  │ MassHealth Only  │
│   N=613,193      │  │   N=138,379      │  │   N=62,336       │
└──────────────────┘  └──────────────────┘  └──────────────────┘
```

Note: 1. Dual eligibility was not consistent between data sources for these individuals.

2. Individuals enrolled in Medicare managed care for their entire Medicare coverage period in CY 2005. Those who were enrolled in Medicare fee-for-service sector for any portion of time were included in the study population regardless their managed care enrollment during the remainder of CY 2005.

3.3. Disease Identification

Twelve-month diagnosed prevalence was reported in the study. Behavioral health disorders and medical comorbidity were primarily classified based on the ICD-9-CM codes used in Medicare and MassHealth claims. Individuals were identified for inclusion in the study by having at least one claim with the specified diagnosis or procedure codes, either principal or others. These disease categories were not mutually exclusive. A list of these diagnosis and procedure codes is included in Appendix A1 and A2.

3.3a Behavioral health disorders

We grouped behavioral health disorders (BHDs) into three groups: severe mental illness, other mental illness, and substance use disorders. Below is a list of diseases included in each of the three groups of BHDs.

- Severe mental illness (SMI): schizophrenia/paranoid, bipolar disorder, and major depression.
- Other mental illness (OMI): other depression, anxiety, and others.
- Substance use disorders (SUD): alcohol abuse or dependence and drug abuse or dependence.

3.3b Comorbidity of chronic conditions

Fifteen conditions were selected as measures of medical comorbidity. These included major chronic conditions and diseases that studies have shown to be prevalent among in elderly people. Conditions (arranged by major diagnostic classifications) included diabetes, chronic kidney disease, atrial fibrillation, ischemic heart disease, congestive heart disease, hypertension, stroke, asthma/chronic obstructive pulmonary diseases, rheumatoid arthritis/osteoarthritis, osteoporosis, hip/pelvic fracture, Parkinson's disease, dementia/Alzheimer's disease, eye diseases (cataract, glaucoma, and macular degeneration), and cancer.

4. RESULTS

Demographic characteristics, Medicare enrollment status, and MassHealth (Massachusetts Medicaid) enrollment status of the study population are described in Sections 4.1 to 4.3. Results are shown by primary payment source, which includes Medicare Only, MassHealth Only, and Dual Eligibles (dually eligible for both Medicare and MassHealth).

Sections 4.4 to 4.6 present 12-month diagnosed prevalence of behavioral health disorders (BHDs), multiple BHDs, and selected chronic physical comorbidities by primary payment source and by age group. Section 4.7 presents geographic variation in diagnosed prevalence of BHDs among counties.

In these sections, age data is reported for four age groups: 55 to 64, 65 to 74, 75 to 84, and 85 and over. The under 65 study group (55 to 64, N=134,276) represented 25% of all Massachusetts residents between the ages of 55 and 64, while the over 65 groups (when combined N=679,182) captured 80% of residents in those age groups. In Figures 4.4b to 4.6c, an asterisk (*) and a double asterisk (**) are used to indicate that these age groups represent different percentages of the population. (The * is used for the under 65 group and the ** is used for the over 65 age groups.)

In discussing results, we often combine the 65 and over age groups when they show similar patterns. In addition, we often do not include the MassHealth Only group in the discussion because it has a small sample size and results may not be reliable. However, results for all three primary payment sources and all four age groups are shown in the following figures. In addition, exact numbers and percentages are shown in the Appendices.

Significant findings include the following:
- The 12-month diagnosed prevalence of BHDs was 20.8% (N=168,960) for Massachusetts Medicare and Medicaid (MassHealth) beneficiaries aged 55 and over during calendar year 2005 (N=813,098).
- Dual Eligibles had a higher diagnosed prevalence of BHDs than the Medicare Only and MassHealth Only groups.
- Dual Eligibles had a higher proportion of people with multiple BHDs than the Medicare Only and MassHealth Only groups.
- Regardless of age group or primary payment source, a much higher proportion of people with BHDs had 5 or more selected chronic medical conditions than those who had no BHD.

4.1 Demographic Characteristics by Primary Payment Source
   (Refer to Table 4.1)

- In our study population of Massachusetts residents aged 55 or older enrolled in Medicare and/or MassHealth during calendar year 2005 (N=813,908), 75% were Medicare Only (N=613,193), 17% were dually eligible for Medicare and MassHealth (N=138,379), and 8% were MassHealth Only (N=62,336).
- Although the average age was similar for the Dual Eligibles and Medicare Only group, the former had a higher proportion of people aged 55 to 64 (22%) and 85 and over (18%) compared to the latter group, which had 10% and 13%, respectively.
- MassHealth Only members were much younger than the Dual Eligibles and Medicare Only group and 70% of MassHealth Only group were between 55 and 64 years of age.
- Dual Eligibles had the highest proportion of female members (68%), followed by MassHealth Only (61%) and Medicare Only (56%)
- The majority of Medicare Only members were white (95%), followed by Dual Eligibles (78%); around 30% of MassHealth Only members did not report race in their eligibility records.

Table 4.1 Demographic Characteristics by Primary Payment Source, CY 2005

CY 2005 (Total N=813,908)	Dual Eligibles (N=138,379)	Medicare Only (N=613,193)	MassHealth Only (N=62,336)
Demographic Characteristics, N (%)			
Age (Mean)	74 (SD=10.8)	74 (SD=8.7)	64 (SD=9.0)
55 to 64	30,677 (22%)	60,967 (10%)	43,082 (70%)
65 to 74	44,602 (33%)	267,251 (44%)	10,795 (17%)
75 to 84	37,791 (27%)	207,670 (34%)	5,689 (9%)
>=85	25,309 (18%)	77,305 (13%)	2,770 (4%)
Male	44,351 (32%)	325,901 (44%)	24,304 (39%)
Race	(based on Medicare data)	(based on Medicare data)	(based on MassHealth data)
White	107,367 (78%)	584,873 (95%)	32,858 (53%)
Others	30,426 (21%)	26,889 (5%)	11,663 (18%)
Unknown	586 (<1%)	1,431 (<1%)	17,815 (29%)

4.2 Medicare Enrollment by Primary Payment Source
(Refer to Table 4.2)

- The majority of Dual Eligibles and Medicare Only had full 12-month of Part A coverage in CY 2005; more than 80% of them had full 12-month of Part B coverage.
- About one-third of Dual Eligibles were originally eligible for Medicare because of disability; in contrast, the majority (91%) of Medicare Only members was originally eligible for Medicare because of old age.

Table 4.2 Medicare Enrollment by Primary Payment Source, CY 2005

CY 2005 (N=751,572)	Dual Eligibles (N=138,379)	Medicare Only (N=613,193)
Medicare Enrollment, N (%)		
Part A 12 months	120,241 (87%)	558,126 (91%)
Part B 12 months	119,840 (87%)	494,322 (81%)
Not a member in HMO[1]	132,916 (96%)	605,255 (99%)
Original reason for entitlement		
Old age	*92,526 (67%)*	*556,157 (91%)*
Disabled	*45,311 (33%)*	*56,146 (9%)*
End stage renal disease (ESRD)	*244 (02%)*	*522 (<0.1%)*
Both disabled and ESRD	*298 (0.2%)*	*368 (<0.1%)*
Current reason for entitlement		
Old age	*112,053 (81%)*	*585,908 (96%)*
Disabled	*25,812 (19%)*	*26,424 (4%)*
ESRD	*308 (0.2%)*	*663 (0.1%)*
Both disabled and ESRD	*206 (0.2%)*	*198 (<0.1%)*

Note: 1. Including Medicare managed care enrollees who spent some portion of time in the Medicare fee-for-service sector in CY 2005.

4.3 MassHealth Enrollment by Primary Payment Source
(Refer to Table 4.3)

- 81% of Dual Eligibles enrolled in MassHealth for 12 months in CY 2005; their average MassHealth enrollment period was 329 days. Slightly more than two-thirds of MassHealth Only members had 12 months of MassHealth enrollment; the average MassHealth enrollment period was 307 days.
- Over one third of Dual Eligibles and almost half of MassHealth Only members became eligible because of a disability.
- Only a small percentage of people in the study population received services from Department of Mental Health.

Table 4.3 MassHealth Enrollment by Primary Payment Source, CY 2005

CY 2005 (N=200,715)	Dual Eligibles (N=138,379)	MassHealth Only (N=62,336)
MassHealth Enrollment, N (%)		
Full 12-month enrollment	111,803 (81%)	42,184 (68%)
Average enrollment days (s.d.)	329 (SD=86)	307 (SD=103)
Third party liability, except Medicare	234 (<1%)	4,145 (5%)
Disability[1]	53,967 (39%)	30,408 (49%)
Receiving DMH services	2,237 (2%)	1,803 (3%)

Note: 1. Disability determined by Social Security Administration or Massachusetts Disability Evaluation Services.

4.4 Twelve-Month Diagnosed Prevalence of Behavioral Health Disorders

4.4a Overall 12-Month Diagnosed Prevalence of Behavioral Health Disorders (BHDs) by Primary Payment Source
(Refer to Figures 4.4a and Appendix B1)

- The 12-month diagnosed prevalence of BHDs was 20.8% (N=168,960) for Massachusetts Medicare and MassHealth beneficiaries aged 55 and over during calendar year 2005 (N=813,098).
- Dual Eligibles had the highest prevalence of BHDs (41.6%), SMI (17.7%), and OMI (34.7%)
- Dual Eligibles and MassHealth Only members had similar diagnosed prevalence of SUD (4.5%).

Figure 4.4a Diagnosed Prevalence of Behavioral Health Disorders by Primary Payment Source, CY 2005
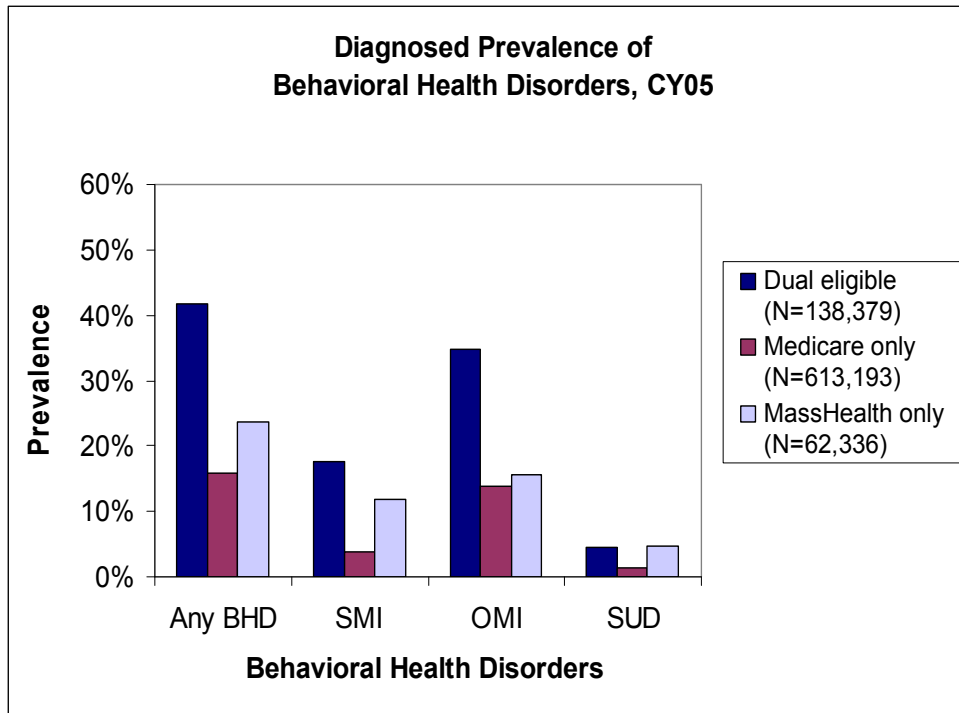
4.4b Twelve-Month Diagnosed Prevalence of BHDs by Age Group and Primary Payment Source, CY 05
(Refer to Figures 4.4b to 4.4e and Appendix B2 to B5)

Ages 55 to 64 *(N=134,726, representing 25% of the Massachusetts population in this age range)*
- Twelve-month diagnosed prevalence of BHDs:
  - For Dual Eligibles (N=30,677):
    - Any BHD (51.7%), SMI (28.8%), OMI (38.9%), and SUD (9.3%)
  - For Medicare Only (N=60,967)
    - Any BHD (12.9%), SMI (5.3%), OMI (9.9%), and SUD (1.7%)
  - For MassHealth Only (N=43,082):
    - Any BHD (31.2%), SMI (15.9%), OMI (20.6%), and SUD (6.5%)
- The diagnosed prevalence of BHDs among Dual Eligibles was 4 to 6 times higher than the Medicare Only group; almost 2 times higher than the MassHealth Only group for all BHD groups, except for SUD.

Ages 65 and over *(N=679,182, representing 80% of the Massachusetts population aged 65 and over.)*
- Twelve-month diagnosed prevalence of BHDs:
  - For Dual Eligibles (N=107,702):
    - Any BHD (38.8%), SMI (14.5%), OMI (33.5%), and SUD (3.2%)
  - For Medicare Only (N=552,226):
    - Any BHD (16.1%), SMI (3.7%), OMI (14.2%), and SUD (1.3%)
- The diagnosed prevalence of BHDs for the Dual Eligibles was 2.5 to 4 times higher than Medicare Only group.
- Within each primary payment source, the diagnosed prevalence of SMI remained similar for the three age groups over 65.
- The diagnosed prevalence of OMI increased as people aged; this was also reflected in the diagnosed prevalence of any BHD.

Figure 4.4b Diagnosed Prevalence of Any BHD by Age Group and Primary Payment Source, CY 05

**Diagnosed Prevalence of
Any Behavioral Health Disorders, CY05**
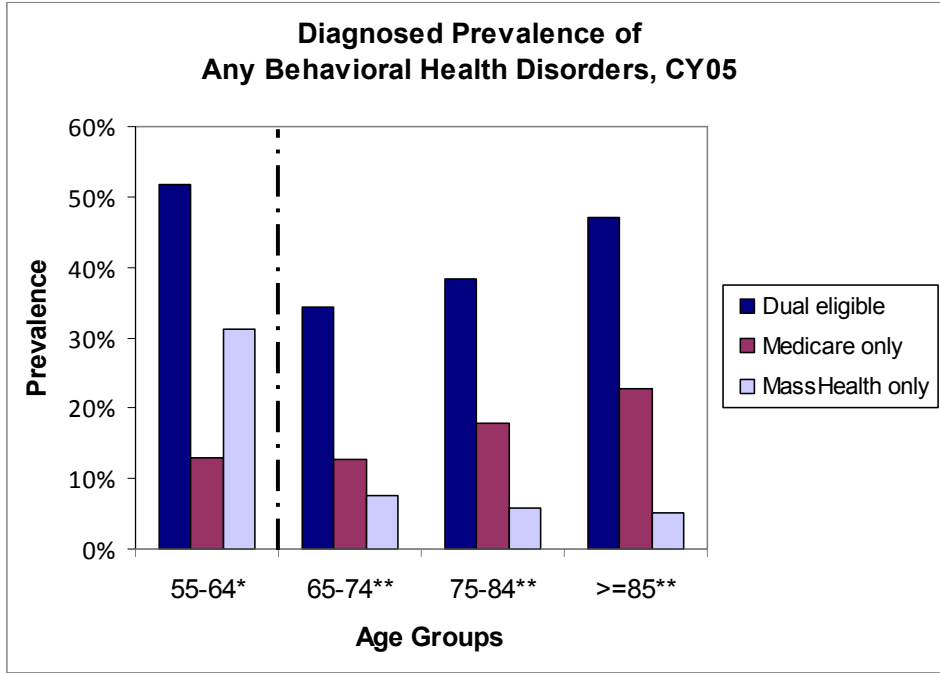
Figure 4.4c Diagnosed Prevalence of Severe Mental Illness by Age Group and Primary Payment Source, CY 05

Diagnosed Prevalence of Severe Mental Illness, CY05
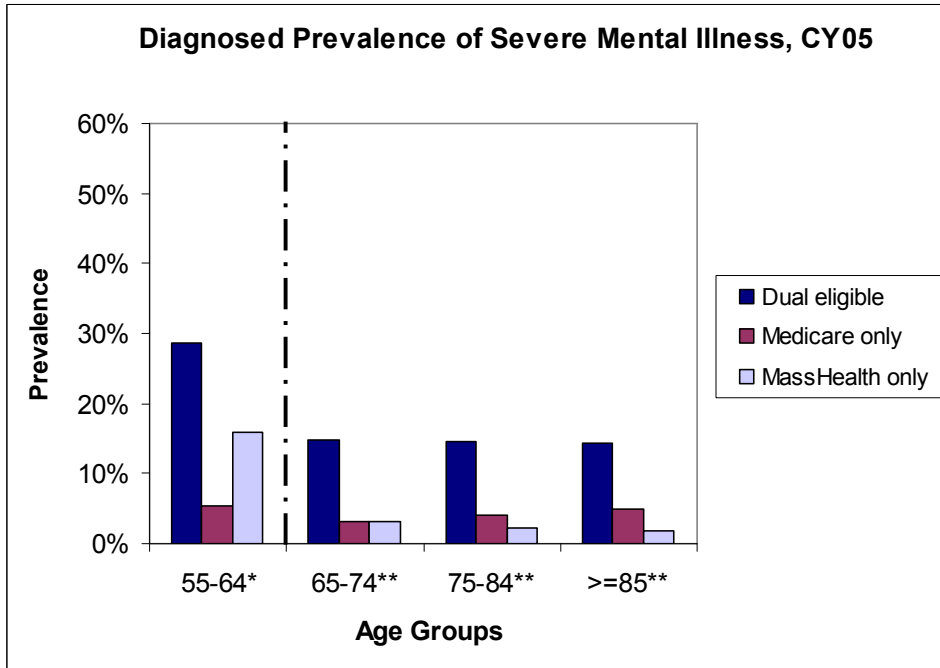
Figure 4.4d Diagnosed Prevalence of Other Mental Illness by Age Group and Primary Payment Source, CY 05
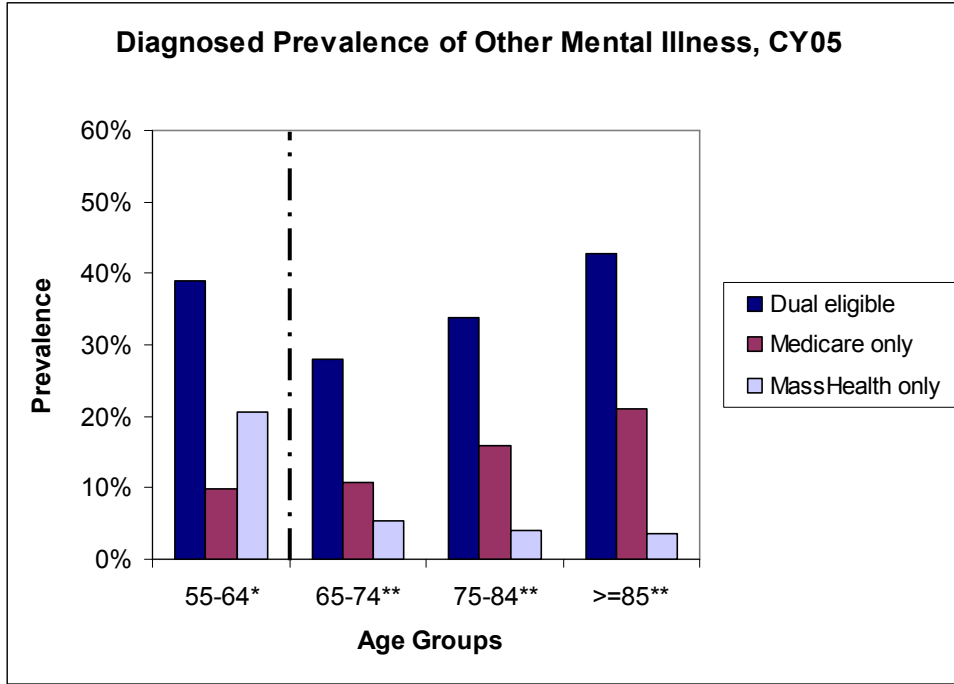
Figure 4.4e Diagnosed Prevalence of Substance Use Disorders by Age Group and Primary Payment Source, CY 05
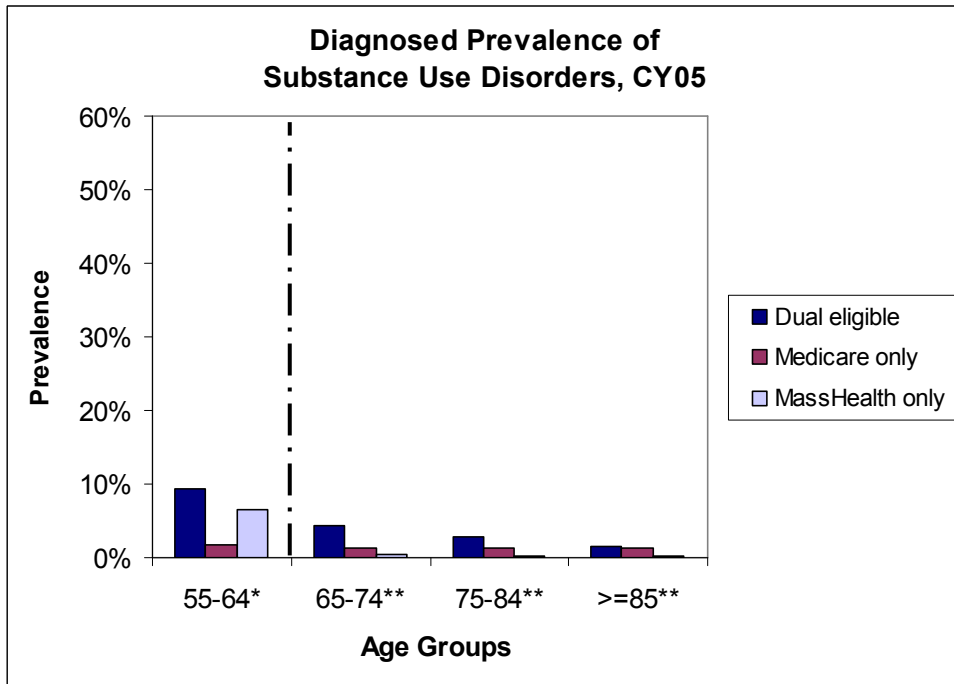
4.5 Diagnosed Co-occurring Behavioral Health Disorders by Age Group and Primary Payment Source
(Refer to Figures 4.5a to 4.5c and Appendix B6 to B8)

Co-occurring Other Mental Illness in People with Severe Mental Illness

Ages 55 to 64 (N=18,878 with SMI)
- A large proportion of people with SMI had co-occurring OMI: 64.0% among Dual Eligibles, 58.4% in Medicare Only groups, and slightly over 50% in MassHealth Only group.

Ages 65 and over (N=36,686 with SMI)
- The proportion of people with SMI having co-occurring OMI was close to 70% in Dual Eligibles and the Medicare Only group.

Figure 4.5a Proportion of People with Severe Mental Illness Having Co-occurring Other Mental Illness by Age Group and Primary Payment Source, CY 05
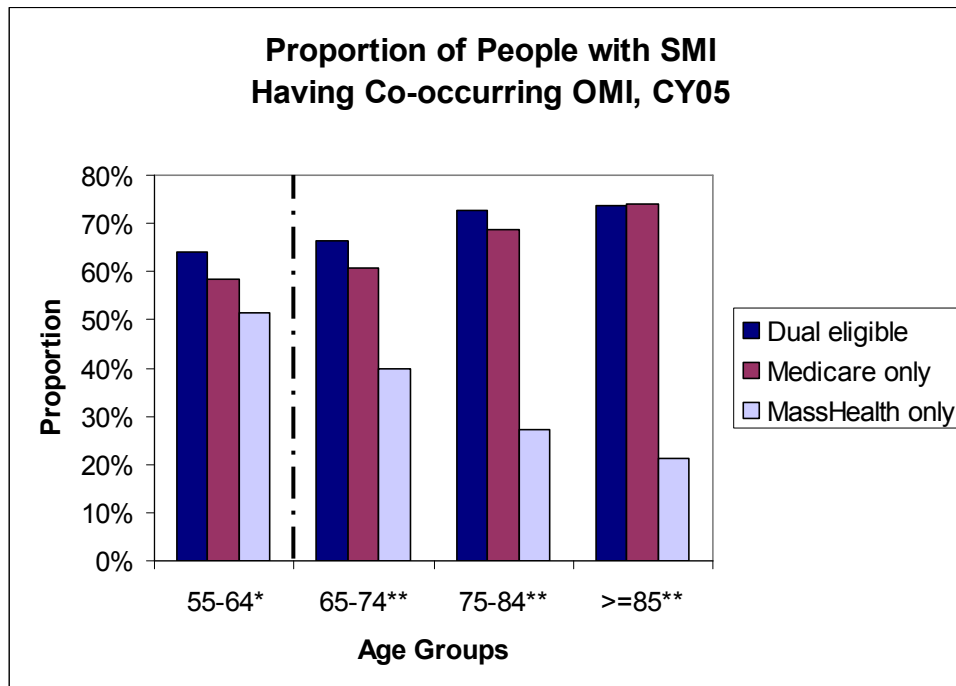
4.5 Diagnosed Co-occurring Behavioral Health Disorders by Age Group and Primary Payment Source, contd.

Co-occurring Substance Use Disorders in People with Severe Mental Illness

Ages 55 to 64 (N=18,878 with SMI)
- The proportion of people with SMI having co-occurring SUD was 16.3% in Dual Eligibles, followed by 13.5% in the MassHealth Only group and 10.2% in the Medicare Only group.

Ages 65 and over (N=36,686 with SMI)
- The proportion of people with SMI having co-occurring SUD was similar in the Dual Eligibles and the Medicare Only group (7.7% and 6.8%, respectively).
- For Dual Eligibles with SMI, the proportion of people having co-occurring SUD decreased as people aged (changed from 10.7% in ages 65 to 74 to 3.5% in ages 85 and over).

Figure 4.5b Proportion of People with Severe Mental Illness Having Co-occurring Substance Use Disorders by Age Group and Primary Payment Source, CY 05
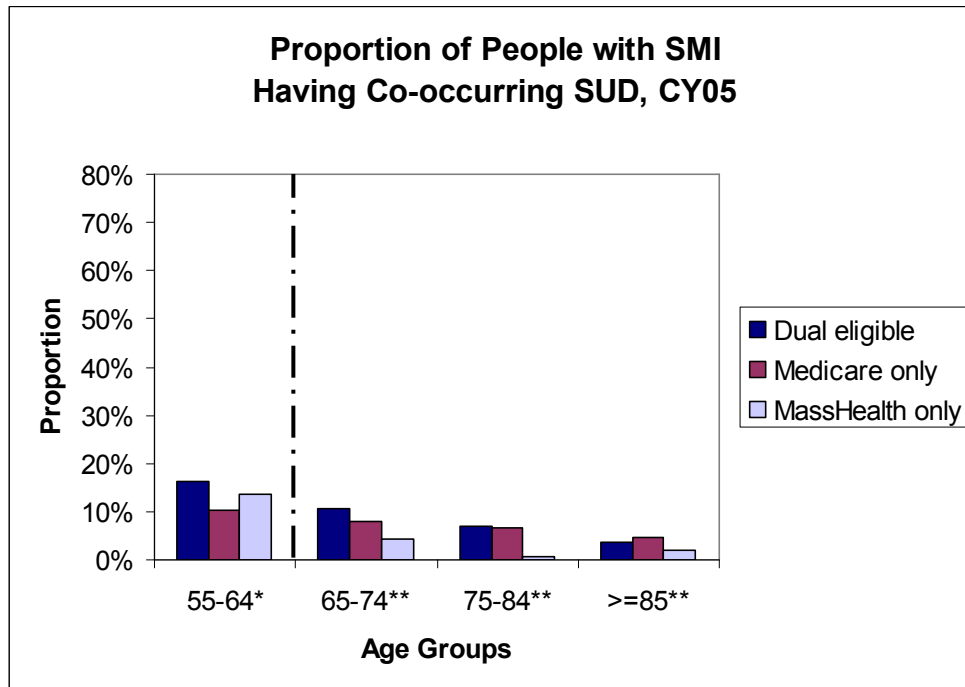
4.5 Diagnosed Co-occurring Behavioral health Disorders by Age Group and Primary Payment Source, contd.

Co-occurring Severe Mental Illness in People with a Substance Use Disorder

Ages 55 to 64 (N=6,710 with SUD)
- For people with SUD, half of Dual Eligibles and almost one third of the Medicare Only group and MassHealth Only group had co-occurring SMI.

Ages 65 and over (N=10,857 with SUD)
- More than 30% of Dual Eligibles and close to 20% of Medicare Only members with SUD had co-occurring SMI.

Figure 4.5c Proportion of People with Substance Use Disorders Having Co-occurring Severe Mental Illness by Age Group and Primary Payment Source, CY 05
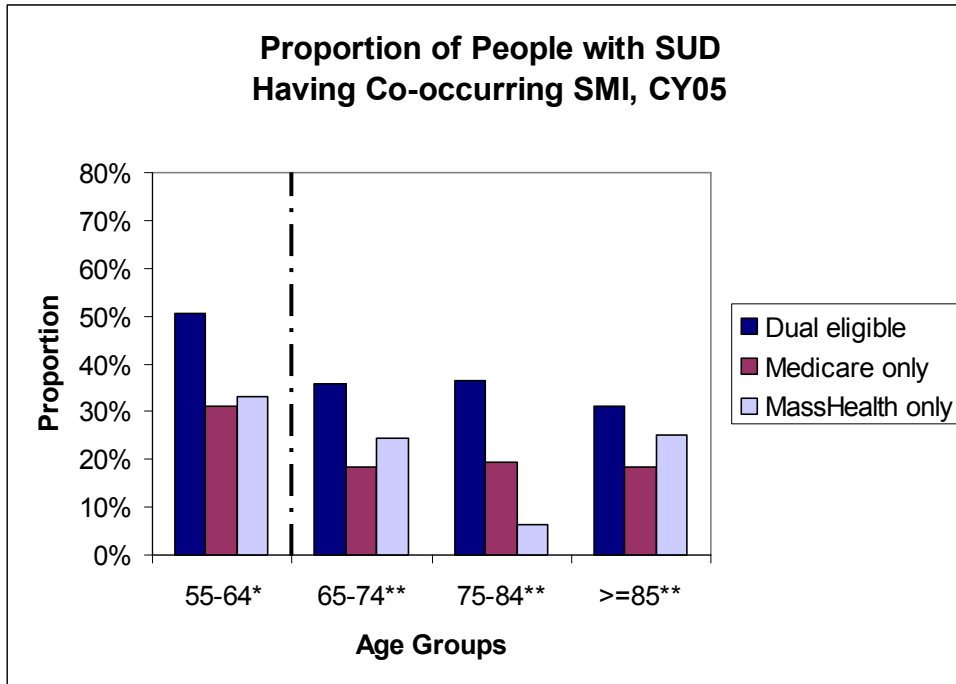
4.6 Medical Comorbidity by Age Group and Primary Payment Source
(Refer to Figures 4.6a to 4.6c and Appendix B9 to B14)

Ages 55 to 64
- A much higher proportion of people with BHDs had 5 or more selected medical conditions than those who had no BHD.
  - Dual Eligibles: 20.8% vs. 13.0%
  - Medicare Only: 14.8% vs. 2.9%
  - MassHealth Only: 8.5% vs. 3.3%
- Compared to others, Dual Eligibles had a higher proportion of people with 5 or more selected medical conditions.
- Among Dual Eligibles with BHDs, the most prevalent of the selected medical conditions studied were hypertension (61.9%), diabetes (36.0%), asthma/chronic obstructive pulmonary disease (34.2%), eye diseases (29.4%), and rheumatoid arthritis/osteoarthritis (24.5%); percentages in those who had no BHD were 58.1%, 35.7%, 23.4%, 25.1%, and 18.7%.

Ages 65 and over
- A much higher proportion of people with BHDs had 5 or more selected medical conditions than those who had no BHD.
  - Dual Eligibles: 49.2% vs. 23.3%
  - Medicare Only: 39.1% vs. 15.0%
- Dual Eligibles had a higher proportion of people with 5 or more selected medical conditions than the Medicare Only group.
- Among Dual Eligibles with BHDs, the most prevalent of the selected medical conditions studied were hypertension (76.3%), dementia/Alzheimer's disease (51.7%), eye diseases (44.2%), ischemic heart disease (40.1%), and diabetes (39.1%); percentages in those who had no BHD were 68.3%, 16.4%, 38.6%, 26.7%, and 34.1%.

Figure 4.6a Proportion of Dual Eligibles with 5 or More Selected Chronic Conditions by Age Group and Primary Payment Source, CY 05

Proportion of Dual Eligibles with
5 or More Selected Chronic Conditions, CY05
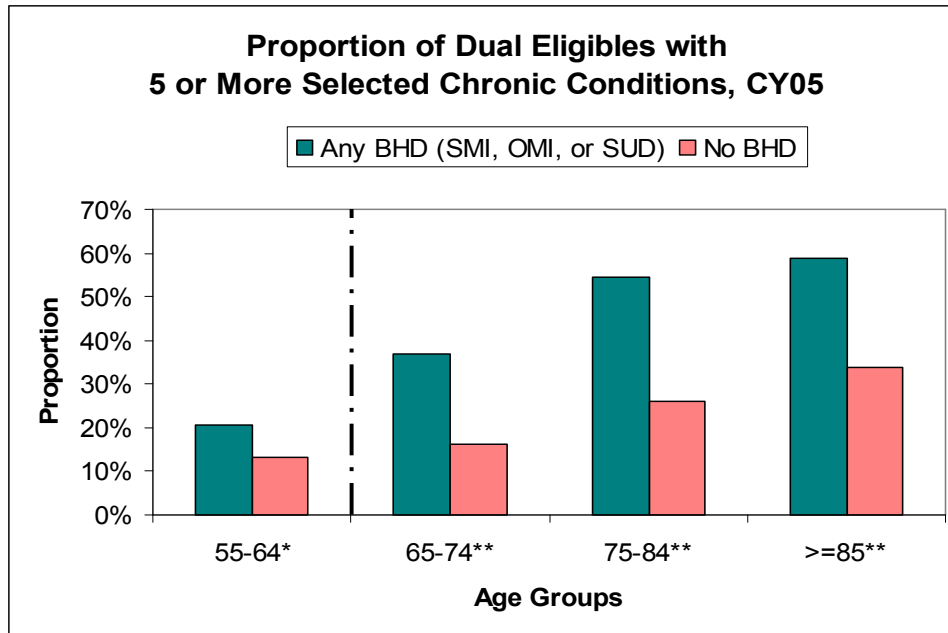
Figure 4.6b Proportion of Medicare Only with 5 or More Selected Chronic Conditions by Age Group and Primary Payment Source, CY 05

Proportion of Medicare Only People with
5 or More Selected Chronic Conditions, CY05
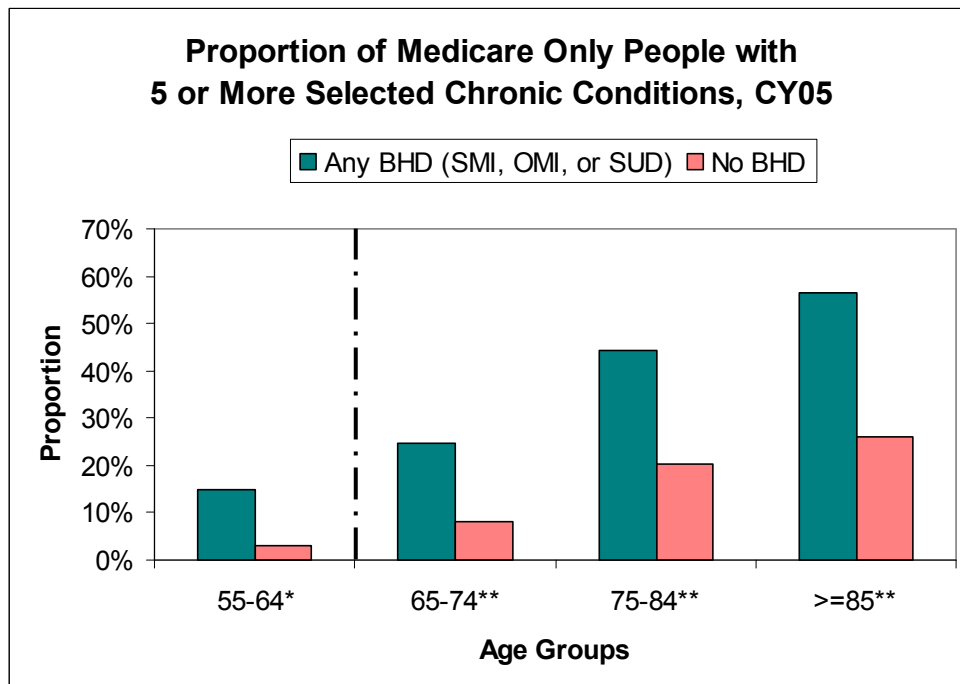
Figure 4.6c Proportion of MassHealth Only with 5 or More Selected Chronic Conditions by Age Group and Primary Payment Source, CY 05

Proportion of MassHealth Only People with
5 or More Selected Chronic Conditions, CY05

■ Any BHD (SMI, OMI, or SUD)   ■ No BHD
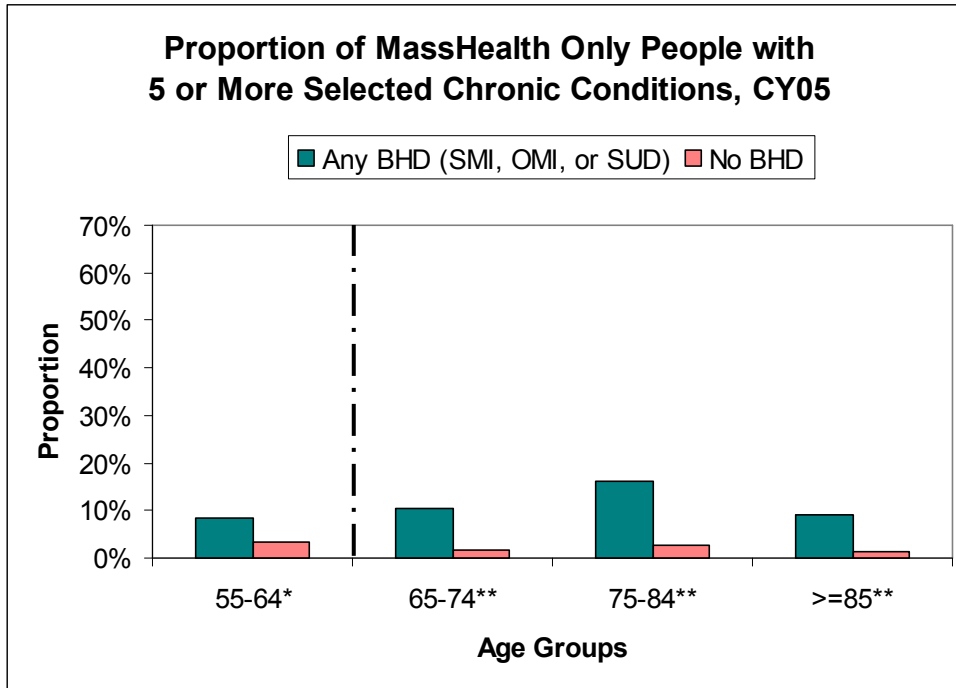
4.7 Geographic Variation in Diagnosed Prevalence of BHDs
(Refer to Figures 4.7 and Appendix B15 and B16; Nantucket County was excluded because of a small sample size)

- The diagnosed prevalence of BHDs in all Medicare and MassHealth members aged 65 and over was similar among counties, for example, prevalence for Any BHDs ranged from 18% to 21%.
- The diagnosed prevalence of Any BHDs in Dual Eligibles aged 65 and over varied among counties and ranged from 34% (Suffolk County) to 47% (Barnstable County); the prevalence of OMI shows similar variation while it was similar for SMI and SUD.

Figure 4.7 Diagnosed Prevalence of Any Behavioral Health Disorders by County, Dual Eligibles, Ages 65 and Over
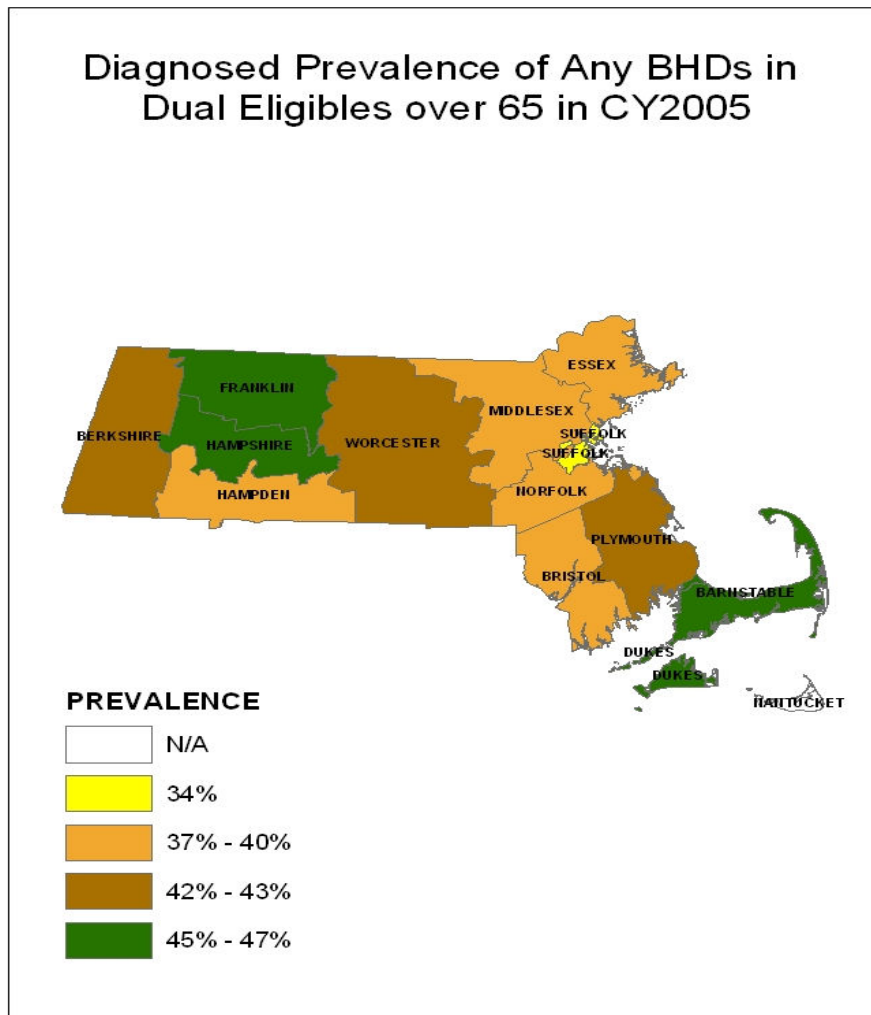
5. SUMMARY AND DISCUSSION

Almost 170,000 Massachusetts Medicare and Medicaid members aged 55 and over had BHD diagnoses recorded on their health insurance claims. Our findings indicate that BHD is a major contributor to the overall illness burden of the older population. In addition to mental health needs, people with BHDs had higher medical comorbidity than those without a BHD, as measured by the proportion of people with 5 or more selected chronic medical conditions. This is consistent across age groups and primary payment sources. The level of complexity in treatment and care coordination needed is expected to be higher among elderly people with BHDs due to the increased overall illness burden than those who without a BHD.

Individuals with dual Medicare and MassHealth enrollment had the highest proportion of BHDs. In the 55 to 64 age group, the diagnosed prevalence of BHDs among Dual Eligibles (51.7%) was 4 times higher than the Medicare Only group (12.9%) and more than 1.5 times higher than the MassHealth Only group (31.2%). In age groups over 65, the diagnosed prevalence among Dual Eligibles (38.8%) was almost 2.5 times higher than the Medicare Only group (16.1%). Dual Eligibles also had a higher proportion of people with multiple BHDs and with 5 or more selected chronic medical conditions than did the Medicare Only and MassHealth Only groups. Dual Eligibles tended to have lower income, to be older, and to have more disabilities than those in the Medicare Only and MassHealth Only groups. These differences contribute to the higher disease burden in the Dual Eligibles.

According to existing studies, the prevalence of substance use disorders in the elderly population is low. For example, the ECA estimated this prevalence to be 2.8% for people aged 55 and over. Our findings show higher rates, with 7% of Dual Eligibles and 9% of MassHealth Only members aged 55 to 64 having BHDs. For people aged 65 and over, 3% of Dual Eligibles, but less than 2% of Medicare Only members, have BHDs.

However, as the baby boom generation ages, the prevalence of substance use disorders is expected to increase. Patterson and colleagues (1999) estimated that 1.1 million more individuals in the baby boom generation were using drugs than in the older non-baby-boom generation (Patterson & Jeste, 1999). The 2007 National Survey on Drug Use and Health (NSDUH) shows an increase in drug use among people aged 55 to 59, the oldest cohort of the baby boom generation in this survey. So, despite the low rates of diagnosed substance use disorders observed in our analysis, other evidence suggests there may be a need for additional resources in this area. Drug and alcohol misuse increases Medicaid and Medicare expenditures for medical as well as behavioral healthcare. A recent study of six state Medicaid programs showed a particularly large impact of substance use disorders on medical treatment for members over age 50 (Clark, Samnaliev, & McGovern, in press).

While the use of merged Medicare and MassHealth claims data provides a population-based perspective on the diagnosed prevalence of BHDs, our findings may still underestimate the true prevalence of BHDs. This is mainly due to the under-reporting of BHDs by providers and treatment seeking behavior of people with BHDs. To minimize the underestimation from under-reporting, our disease identification included all diagnosis fields (primary and others) and used one claim in an inpatient or ambulatory setting, as the minimum requirement for inclusion. Our

findings on the overall prevalence of BHDs and the prevalence of SMI are similar to national estimates reported in the ECA study.

The increasing number of elderly people with BHDs, along with their high disease burden, poses serious challenges to the current mental health care delivery system for treating the elderly population in Massachusetts. Innovative programs for mental health services delivery and better coordination with other medical care need to be developed to address these challenges. The diagnosed prevalence of BHDs reported in this report is the first part of a larger Medicare and Medicaid claims data analysis. Further analyses will focus on mental health treatment received among people with BHDs to examine where mental health services are delivered and what proportion are provided by mental health specialists. We will also analyze health care expenditures. Results will provide a more comprehensive picture of how mental health services are delivered, who provides treatment, what types of treatment are provided, variation in treatment across geographic locations, and associated expenditures by primary payment sources and settings. The information will allow us to identify opportunities for systematic changes to better serve elders with BHDs.

Appendix

A1. Behavioral Health Disorders

Group	Broad classification	Includes:	ICD9-CM-Codes
Severe Mental Illness	Bipolar disorder	Bipolar disorder	2960, 2961, 2964-2969
	Major depression	Major depression	2963, 2962
	Paranoid States	Paranoid States	297
	Schizophrenia	Schizophrenia	295
Other Mental Illness	Other depression	Other depression	2980, 3004, 3090, 3091, 311
	Anxiety	Anxiety	3000
	Other mental illness		2981-2989, 3001-3003, 3005-3009, 301, 302, 306-308, 3092-3099, 312-316
Substance Use Disorders	Alcohol related		291, 303, 3050, 5353, 5710-5713
	Drug-related		292, 304, 3052-3059, 6483

Additional ICD-9-CM surgical codes, CPT codes for identifying substance use disorders

Diagnosis	ICD-9-CM Surgical procedure codes	CPT/HCPCs codes
Substance Use Disorders – Alcohol Related	'9446', '9453', '9461', '9462','9463', '9467','9468','9469'	'H0005', 'H0006', 'H0007', 'H0008', 'H0009', 'H0010', 'H0011','H0012','H0013','H0014','H0015','H0016','H0017','H0020','H0021','H0021', 'H0022', 'H0023', 'H0030', 'H0047','H2034','H2035','H2036', , 'T1006', 'T1007', 'T1008', 'T1009', 'T1010', 'T1011', 'T1012', ,'X2216','X2217','X2218','X2219', 'X2223', 'X2224','X2225', 'X2226', 'X2227', 'X2228', 'X2229', ,'X5605', 'X5607','ZZ116', 'ZZ126', 'ZZ136', 'ZZ146','ZZ156', 'ZZ945'
Substance Use Disorders – Drug Related	'9445', '9454', '9464', '9465', '9466', '9467', '9468', '9469'	'S9475', 'X2197', 'X2198', 'X2199', 'X2200', 'X2202', 'X2203', 'X2205', 'X2214','X2215', 'X2222', 'X5604', 'X5606','ZZ116', 'ZZ126', 'ZZ944',

Note: Drug and alcohol related disorder share some HCPCS codes.

A2. Selected Chronic Conditions (arranged by major diagnostic classifications)

Diagnosis	ICD9-Diagnosis Codes begin with:	ICD9-Surgical procedure codes begin with:	DRG codes	CPT/HCPCs codes begin with:
Diabetes Mellitus	250, 3572 ,3620, 36201, 36202, 36641, 6480		'294', '205'	
Chronic Kidney Disease	0160, 0954, 1890, 1899, 2230, 23691, 25040, 25041, 25042, 25043, 2714, 27141, 28311, 40301, 40311, 40391, 40402, 40403, 40412, 40413, 40492, 40493, 4401, 4421, 5724, 58, 591, 7531, 7532 , 7944			
Atrial Fibrillation	42731			
Ischemic Heart Disease	410-414	360, 361, 362, 3631, 3632	'121', '122', '156', '526'	3351, 33521-33523, 33533-33536, 33542, 33545, 92975, 92977, 92980, 92982, 92995, 33140, 33141
Congestive Heart Failure	428, 40211, 40291, 39891, 40201, 40401, 40411, 40491, 40403 40413, 40493			
Hypertension	401-405			
Stroke	430, 431, 434.00, 434.01, 434.10, 434.11, 434.90, 434.91, 435.0, 435.1, 435.3, 435.8, 435.9, 436, 997.02			
Chronic Obstructive Pulmonary Disease (COPD) [1]	491-492,494, 496, 2932, 5064, 5181, 5182, 4932, 493			
Osteoarthritis	715			
Osteoporosis	733			
Hip/Pelvic	808, 820.			

Fracture				
Parkinsonism	332			
Alzheimer and Other Dementia	331, 293, 294, 310, 290			
Eye disease[2]	36455, 36510, 36511, 36512, 36515, 36589, 3659, 36285, 36500-36504, 37714, 36520-36524, 36541, 36561, 36631, v801, 366, 37926, 37931, 37939, 74331, 74332, 74333, 99653, v431, v802, 3625			
Cancer[3]	185, 2334 162, 2312 174, 2330 182, 2332 154.0, 154.1, 153.0, 153.1-153.9, 230.3, 230.4			

Notes: 1. COPD includes chronic bronchitis, emphysema, asthma and other chronic respiratory disease.
2. Eye disease includes glaucoma, cataract and macular degeneration.
3. Cancer includes prostate cancer, lung cancer, breast cancer, endometrial cancer, and colorectal cancer.

B1. Diagnosed Prevalence of Behavioral Health Disorders by Primary Payment Source, CY 2005

CY 2005 (Total N=813,098)		Dual Eligibles (N=138,379)		Medicare Only (N=613,193)		MassHealth Only (N=62,336)	
Diagnosed Prevalence, N (%)							
Any BHD[1]		57,611 (41.6)		96,624 (15.8)		14,725 (23.6)	
Severe mental illness	Schizophrenia/ paranoid	24,468 (17.7)	7,593 (5.5)	23,743 (3.9)	2,756 (0.5)	7,353 (11.8)	1,750 (2.8)
	Bipolar		7,144 (5.2)		6,120 (1.0)		1,633 (2.6)
	Major depression		15,057 (10.9)		17,915 (2.9)		5,039 (8.1)
Other mental illness	Other depression	47,989 (34.7)	29,398 (21.2)	84,385 (13.8)	44,403 (7.2)	9,789 (15.7)	5,373 (8.6)
	Anxiety		16,713 (12.1)		32,490 (5.3)		3,160 (5.1)
	Others[2]		25,695 (18.6)		38,796 (6.3)		5,290 (8.5)
Substance use disorders	Alcohol abuse or dependence	6,276 (4.5)	4,720 (3.4)	8,422 (1.4)	6,353 (1.0)	2,869 (4.6)	2,013 (3.2)
	Drug abuse or dependence		2,204 (1.6)		2,444 (0.4)		1,226 (2.0)

Note: 1. Including severe mental illness, other mental illness, and substance use disorders.
2. For example, unspecified psychosis, adjustment reaction with mixed emotional features, and prolonged posttraumatic stress disorder

B2. Diagnosed Prevalence of Any Behavioral Health Disorder by Age Group and Primary Payment Source, CY 05

BHD	Dual Eligibles	Medicare Only	MassHealth Only
55-64	51.7%	12.9%	31.2%
65-74	34.4%	12.8%	7.6%
75-84	38.5%	17.9%	5.9%
>=85	47.0%	22.7%	5.1%
All ages	*41.6%*	*15.8%*	*23.6%*
55-64	*51.7%*	*12.9%*	*31.2%*
>=65	*38.8%*	*16.1%*	*6.7%*

Number of people w/ any BHD

Numerator	Dual Eligibles	Medicare Only	MassHealth Only
55-64	15853	7840	13432
65-74	15326	34078	817
75-84	14539	37152	335
>=85	11893	17554	141
All ages	*57611*	*96624*	*14725*
55-64	*15853*	*7840*	*13432*
>=65	*41758*	*88784*	*1293*

Number of people in the study population

Denominator	Dual Eligibles	Medicare Only	MassHealth Only
55-64	30677	60967	43082
65-74	44602	267251	10795
75-84	37791	207670	5689
>=85	25309	77305	2770
All ages	*138379*	*613193*	*62336*
55-64	*30677*	*60967*	*43082*
>=65	*107702*	*552226*	*19254*

B3. Diagnosed Prevalence of Severe Mental Illness by Age Group and Primary Payment Source, CY 05

SMI	Dual Eligibles	Medicare Only	MassHealth Only
55-64	28.8%	5.3%	15.9%
65-74	14.7%	3.1%	3.1%
75-84	14.6%	4.1%	2.2%
>=85	14.2%	4.9%	1.7%
All ages	*17.7%*	*3.9%*	*11.8%*
55-64	*28.8%*	*5.3%*	*15.9%*
>=65	*14.5%*	*3.7%*	*2.6%*

Number of people w/ SMI

Numerator	Dual Eligibles	Medicare Only	MassHealth Only
55-64	8822	3211	6845
65-74	6546	8279	336
75-84	5499	8502	125
>=85	3601	3751	47
All ages	*24468*	*23743*	*7353*
55-64	*8822*	*3211*	*6845*
>=65	*15646*	*20532*	*508*

Number of people in the study population

Denominator	Dual Eligibles	Medicare Only	MassHealth Only
55-64	30677	60967	43082
65-74	44602	267251	10795
75-84	37791	207670	5689
>=85	25309	77305	2770
All ages	*138379*	*613193*	*62336*
55-64	*30677*	*60967*	*43082*
>=65	*107702*	*552226*	*19254*

B4. Diagnosed Prevalence of Other Mental Illness by Age Group and Primary Payment Source, CY 05

OMI	Dual Eligibles	Medicare Only	MassHealth Only
55-64	38.9%	9.9%	20.6%
65-74	27.9%	10.8%	5.4%
75-84	33.7%	16.0%	4.1%
>=85	42.9%	21.0%	3.7%
All ages	*34.7%*	*13.8%*	*15.7%*
55-64	*38.9%*	*9.9%*	*20.6%*
>=65	*33.5%*	*14.2%*	*4.8%*

Number of people w/ OMI

Numerator	Dual Eligibles	Medicare Only	MassHealth Only
55-64	11944	6039	8873
65-74	12449	28972	581
75-84	12747	33137	233
>=85	10849	16237	102
All ages	*47989*	*84385*	*9789*
55-64	*11944*	*6039*	*8873*
>=65	*36045*	*78346*	*916*

Number of people in the study population

Denominator	Dual Eligibles	Medicare Only	MassHealth Only
55-64	30677	60967	43082
65-74	44602	267251	10795
75-84	37791	207670	5689
>=85	25309	77305	2770
All ages	*138379*	*613193*	*62336*
55-64	*30677*	*60967*	*43082*
>=65	*107702*	*552226*	*19254*

B5. Diagnosed Prevalence of Substance Use Disorders by Age Group and Primary Payment Source, CY 05

SUD	Dual Eligibles	Medicare Only	MassHealth Only
55-64	9.3%	1.7%	6.5%
65-74	4.4%	1.3%	NA
75-84	2.8%	1.4%	NA
>=85	1.6%	1.2%	NA
All ages	*4.5%*	*1.4%*	*4.6%*
55-64	*9.3%*	*1.7%*	*6.5%*
>=65	*3.2%*	*1.3%*	*0.4%*

Number of people w/ SUD

Numerator	Dual Eligibles	Medicare Only	MassHealth Only
55-64	2860	1058	2792
65-74	1952	3518	NA
75-84	1056	2920	NA
>=85	408	926	NA
All ages	*6276*	*8422*	*2869*
55-64	*2860*	*1058*	*2792*
>=65	*3416*	*7364*	*77*

Number of people in the study population

Denominator	Dual Eligibles	Medicare Only	MassHealth Only
55-64	30677	60967	43082
65-74	44602	267251	10795
75-84	37791	207670	5689
>=85	25309	77305	2770
All ages	*138379*	*613193*	*62336*
55-64	*30677*	*60967*	*43082*
>=65	*107702*	*552226*	*19254*

B6. Proportion of People with Severe Mental Illness Having Co-occurring Other Mental Illness by Age Group and Primary Payment Source, CY 05

Co-occurring OMI in people with SMI

	Dual Eligibles	Medicare Only	MassHealth Only
55-64	64.0%	58.4%	51.3%
65-74	66.4%	60.8%	39.9%
75-84	72.8%	68.8%	NA
>=85	73.6%	74.1%	NA
All ages	*68.1%*	*65.4%*	*50.2%*
55-64	*64.0%*	*58.4%*	*51.3%*
>=65	*70.3%*	*66.5%*	*35.0%*

Number of SMI people w/ OMI

Numerator	Dual Eligibles	Medicare Only	MassHealth Only
55-64	5648	1874	3511
65-74	4349	5035	134
75-84	4004	5847	NA
>=85	2651	2781	NA
All ages	*16652*	*15537*	*3689*
55-64	*5648*	*1874*	*3511*
>=65	*11004*	*13663*	*178*

Number of people with SMI

Denominator	Dual Eligibles	Medicare Only	MassHealth Only
55-64	8822	3211	6845
65-74	6546	8279	336
75-84	5499	8502	125
>=85	3601	3751	47
All ages	*24468*	*23743*	*7353*
55-64	*8822*	*3211*	*6845*
>=65	*15646*	*20532*	*508*

B7. Proportion of People with Severe Mental Illness Having Co-occurring Substance Use Disorders by Age Group and Primary Payment Source, CY 05

Co-occurring SUD in people with SMI

	Dual Eligibles	Medicare Only	MassHealth Only
55-64	16.3%	10.2%	13.5%
65-74	10.7%	7.9%	NA
75-84	7.0%	6.7%	NA
>=85	3.5%	4.5%	NA
All ages	*10.8%*	*7.2%*	*12.8%*
55-64	*16.3%*	*10.2%*	*13.5%*
>=65	*7.7%*	*6.8%*	*NA*

Number of SMI people w/ SUD

Numerator	Dual Eligibles	Medicare Only	MassHealth Only
55-64	1442	329	925
65-74	699	651	NA
75-84	385	568	NA
>=85	127	170	NA
All ages	*2653*	*1718*	*941*
55-64	*1442*	*329*	*925*
>=65	*1211*	*1389*	*NA*

Number of people with SMI

Denominator	Dual Eligibles	Medicare Only	MassHealth Only
55-64	8822	3211	6845
65-74	6546	8279	336
75-84	5499	8502	125
>=85	3601	3751	47
All ages	*24468*	*23743*	*7353*
55-64	*8822*	*3211*	*6845*
>=65	*15646*	*20532*	*508*

B8. Proportion of People with Substance Use Disorders Having Co-occurring Severe Mental Illness by Age Group and Primary Payment Source, CY 05

Co-occurring SMI in people with SUD

	Dual Eligibles	Medicare Only	MassHealth Only
55-64	50.4%	31.1%	33.1%
65-74	35.8%	18.5%	NA
75-84	36.5%	19.5%	NA
>=85	31.1%	18.4%	NA
All ages	*42.3%*	*20.4%*	*32.8%*
55-64	*50.4%*	*31.1%*	*33.1%*
>=65	*35.5%*	*18.9%*	*NA*

Number of SUD people w/ SMI

Numerator	Dual Eligibles	Medicare Only	MassHealth Only
55-64	1442	329	925
65-74	699	651	NA
75-84	385	568	NA
>=85	127	170	NA
All ages	*2653*	*1718*	*941*
55-64	*1442*	*329*	*925*
>=65	*1211*	*1389*	*NA*

Number of people with SUD

Denominator	Dual Eligibles	Medicare Only	MassHealth Only
55-64	2860	1058	2792
65-74	1952	3518	NA
75-84	1056	2920	NA
>=85	408	926	NA
All ages	*6276*	*8422*	*2869*
55-64	*2860*	*1058*	*2792*
>=65	*3416*	*7364*	*77*

B9. Proportion of Dual Eligibles with 5 or More Selected Chronic Conditions by Age Group, CY 05

Dual Eligibles

	Any BHD (SMI, OMI, or SUD)	No BHD
55-64	20.8%	13.0%
65-74	36.8%	16.2%
75-84	54.4%	26.2%
>=85	58.8%	33.9%
All ages	*41.4%*	*21.4%*
55-64	*20.8%*	*13.0%*
>=65	*49.2%*	*23.3%*

Number of Dual Eligibles w/ >=5 chronic conditions

Numerator	Any BHD	No BHD
55-64	3290	1932
65-74	5644	4749
75-84	7911	6086
>=85	6994	4549
All ages	*23839*	*17316*
55-64	*3290*	*1932*
>=65	*20549*	*15384*

Number of Dual Eligibles

Denominator	Any BHD	No BHD
55-64	15853	14824
65-74	15326	29276
75-84	14539	23252
>=85	11893	13416
All ages	*57611*	*80768*
55-64	*15853*	*14824*
>=65	*41758*	*65944*

B10. Proportion of Medicare Only with 5 or More Selected Chronic Conditions by Age Group, CY 05

Medicare Only

	Any BHD (SMI, OMI, or SUD)	No BHD
55-64	14.8%	2.9%
65-74	24.6%	8.3%
75-84	44.1%	20.4%
>=85	56.6%	26.1%
All ages	*37.1%*	*13.8%*
55-64	*14.8%*	*2.9%*
>=65	*39.1%*	*15.0%*

Number of Medicare Only members w/ >=5 chronic conditions

Numerator	Any BHD	No BHD
55-64	1157	1548
65-74	8371	19241
75-84	16400	34732
>=85	9934	15595
All ages	*35862*	*71116*
55-64	*1157*	*1548*
>=65	*34705*	*69568*

Number of Medicare Only members

Denominator	Any BHD	No BHD
55-64	7840	53127
65-74	34078	233173
75-84	37152	170518
>=85	17554	59751
All ages	*96624*	*516569*
55-64	*7840*	*53127*
>=65	*88784*	*463442*

B11. Proportion of MassHealth Only with 5 or More Selected Chronic Conditions by Age Group, CY 05

MassHealth Only

	Any BHD (SMI, OMI, or SUD)	No BHD
55-64	8.5%	3.3%
65-74	10.5%	1.7%
75-84	16.1%	2.7%
>=85	NA	NA
All ages	*8.8%*	*2.8%*
55-64	*8.5%*	*3.3%*
>=65	*11.8%*	*2.0%*

Number of MassHealth Only members w/ >=5 chronic conditions

Numerator	Any BHD	No BHD
55-64	1140	972
65-74	86	174
75-84	54	145
>=85	NA	NA
All ages	*1293*	*1325*
55-64	*1140*	*972*
>=65	*153*	*353*

Number of MassHealth Only members

Denominator	Any BHD	No BHD
55-64	13432	29650
65-74	817	9978
75-84	335	5354
>=85	141	2629
All ages	*14725*	*47611*
55-64	*13432*	*29650*
>=65	*1293*	*17961*

Twelve-Month Diagnosed Prevalence of Behavioral Health Disorders

Appendix B12. Diagnosed Prevalence of Selected Chronic Medical Conditions by Age Group, Dual Eligibles, CY 05

age group	BHD	Total N in each age/BHD group	Hypertension %	Alzheimers/ dementia %	Eye disease %	IHD %	Diabetes %	RA_OA %	COPD %	CHF %
55<=age<65	No	14824	58.07	3.42	25.13	20.41	35.73	18.67	23.41	9.79
	Yes	15853	61.92	15.4	29.41	22.55	35.97	24.46	34.23	13.12
65<=age<75	No	29276	66.02	4.81	35.9	21.94	36.57	20.69	21.26	10.64
	Yes	15326	74.47	28.13	41.51	34.19	42.63	30.49	37.94	22.22
75<=age<85	No	23252	71.75	16.73	41.68	29.03	35.13	25.92	22.38	18.45
	Yes	14539	78.38	57.16	45.03	43.73	41.93	36.33	35.83	35.21
age>=85	No	13416	67.35	41.07	39.36	32.81	27.13	29.26	21.70	30.90
	Yes	11893	76.05	75.51	46.48	43.35	31.01	41.06	30.14	43.72
all ages	No	*80768*	*66.43*	*14.01*	*36.16*	*25.51*	*34.43*	*23.25*	*22.05*	*16.10*
	Yes	*57611*	*72.33*	*41.74*	*40.09*	*35.29*	*38.22*	*32.49*	*34.78*	*27.43*
55 to 64	No	*14824*	*58.07*	*3.42*	*25.13*	*20.41*	*35.73*	*18.67*	*23.41*	*9.79*
	Yes	*15853*	*61.92*	*15.4*	*29.41*	*22.55*	*35.97*	*24.46*	*34.23*	*13.12*
>=65	No	*65944*	*68.31*	*16.39*	*38.64*	*26.65*	*34.14*	*24.27*	*21.74*	*17.51*
	Yes	*41758*	*76.28*	*51.73*	*44.15*	*40.12*	*39.08*	*35.53*	*34.98*	*32.87*

Appendix B12. (Continued) Diagnosed Prevalence of Selected Chronic Medical Conditions by Age Group, Dual Eligibles, CY 05

age group	BHD	Total N in each age/BHD group	Osteoporosis %	Atrial fibrillation %	Stroke %	Chronic kidney disease %	Cancer %	Hip/pelvic fracture %	Parkinsons %
55<=age<65	No	14824	13.43	5.71	5.35	9.47	5.66	0.47	0.57
	Yes	15853	18.38	6.64	9.09	11.68	7.04	1.38	1.54
65<=age<75	No	29276	16.93	7.42	5.7	8.66	7.67	0.67	0.77
	Yes	15326	23.9	13.64	15.71	15.72	10.73	2.86	3.91
75<=age<85	No	23252	19.37	14.93	10.12	10.93	9.26	2.09	2.34
	Yes	14539	26.1	24.41	24.89	19.44	11.58	6.69	7.22
age>=85	No	13416	19.71	22.57	14.42	11.77	7.98	5.28	2.82
	Yes	11893	28.22	29.5	24.49	17.6	9.29	11.35	5.57
all ages	No	80768	17.45	11.79	8.36	9.98	7.81	1.81	1.53
	Yes	57611	23.83	17.7	18.02	15.94	9.63	5.17	4.44
55 to 64	No	14824	13.43	5.71	5.35	9.47	5.66	0.47	0.57
	Yes	15853	18.38	6.64	9.09	11.68	7.04	1.38	1.54
>=65	No	65944	18.35	13.15	9.03	10.09	8.29	2.11	1.74
	Yes	41758	25.9	21.91	21.41	17.55	10.62	6.61	5.54

Appendix B13. Diagnosed Prevalence of Selected Chronic Medical Conditions by Age Group, Medicare Only, CY05

age group	BHD	Total N in each age/BHD group	Hypertension %	Eye disease %	IHD %	RA_OA %	Osteoporosis %	Alzheimers/ dementia %	COPD %	Diabetes %
55<=age<65	No	53127	24.65	10.74	8.17	7.02	5.96	0.75	6.64	11.61
	Yes	7840	57.81	23.27	22.09	21.1	17.76	9.18	25.32	27
65<=age<75	No	233173	49.43	35.26	16.36	15.64	14.63	1.68	11.72	17.77
	Yes	34078	71.31	46.73	27.68	28.5	26.72	13.64	26.62	25.99
75<=age<85	No	170518	67.97	53.19	27.99	23.66	20.26	7	17.28	23.05
	Yes	37152	80.44	54.15	40.01	35.05	30.94	32.54	30.98	28.49
age>=85	No	58751	66.77	48.27	30.08	25.45	19.28	15.37	17.51	18.42
	Yes	17554	82.48	49.52	45.7	40.83	32.35	53.38	30.67	23.28
all ages	No	516569	55.01	40.16	20.94	18.54	16.14	4.92	13.7	18.95
	Yes	96624	75.75	48.18	35.24	32.66	28.64	27.77	28.92	26.54
55 to 64	No	53127	24.65	10.74	8.17	7.02	5.96	0.75	6.64	11.61
	Yes	7840	57.81	23.27	22.09	21.1	17.76	9.18	25.32	27
>=65	No	463442	58.49	43.54	22.41	19.86	17.3	5.4	14.51	19.8
	Yes	88784	77.34	50.38	36.4	33.68	29.6	29.41	29.24	26.5

Appendix B13.(Continued) Diagnosed Prevalence of Selected Chronic Medical Conditions by Age Group, Medicare Only, CY05

age group	BHD	Total N in each age/BHD group	CHF %	Atrial fibrillation %	Stroke %	Cancer %	Chronic kidney disease %	Hip/pelvic fracture %	Parkinsons %
55<=age<65	No	53127	2.56	2.52	1.58	3.48	2.71	0.17	0.26
	Yes	7840	10.74	6.93	7.02	8.57	9.95	0.94	1.34
65<=age<75	No	233173	4.66	6.24	2.92	9.02	4.44	0.35	0.51
	Yes	34078	13.14	12.38	10.02	14.12	10.6	1.98	2.32
75<=age<85	No	170518	12.02	15.34	6.66	13.52	8.34	1.21	1.34
	Yes	37152	25.54	24.43	18.12	16.06	16.21	5.08	4.81
age>=85	No	58751	21.63	20.9	9.35	11.28	9.92	3.23	1.59
	Yes	17554	39.71	32.45	23.49	13.91	19.39	10.84	4.41
all ages	*No*	*516569*	*8.84*	*10.55*	*4.76*	*10.2*	*6.18*	*0.95*	*0.88*
	Yes	*96624*	*22.54*	*20.22*	*15.34*	*14.38*	*14.3*	*4.7*	*3.58*
55 to 64	*No*	*53127*	*2.56*	*2.52*	*1.58*	*3.48*	*2.71*	*0.17*	*0.26*
	Yes	*7840*	*10.74*	*6.93*	*7.02*	*8.57*	*9.95*	*0.94*	*1.34*
>=65	*No*	*463442*	*9.56*	*11.48*	*5.12*	*10.97*	*6.58*	*1.04*	*0.96*
	Yes	*88784*	*23.58*	*21.39*	*16.07*	*14.89*	*14.69*	*5.03*	*3.77*

Appendix B14. Diagnosed Prevalence of Selected Chronic Medical Conditions by Age Group, MassHealth Only, CY05

age group	BHD	Total N in each age/BHD group	Hypertension %	Eye disease %	Diabetes %	Alzheimers/ dementia %	IHD %	RA_OA %	COPD %	Osteoporosis %
55<=age<65	No	29650	34.31	9.76	20.15	1.31	8.7	8.33	11.2	6.81
	Yes	13432	51.25	15.87	29.14	7.12	13.99	16.51	24.19	12.75
65<=age<75	No	9978	29.83	11.65	13.14	1.52	5.32	5.36	3.93	5.82
	Yes	817	57.28	30.11	27.78	16.52	16.4	14.08	12.73	13.1
75<=age<85	No	5354	25.1	13.8	10.29	4.26	6.07	4.67	3.85	4.22
	Yes	335	49.85	31.64	25.37	27.76	17.31	15.22	15.22	NA
age>=85	No	2629	NA	NA	NA	NA	NA	NA	NA	NA
	Yes	141	NA	NA	NA	NA	NA	NA	NA	NA
all ages	*No*	*47611*	*30.95*	*10.68*	*16.67*	*2*	*7.36*	*6.92*	*8.37*	*6*
	Yes	*14725*	*51.33*	*17.07*	*28.81*	*8.37*	*14.17*	*16.3*	*23.2*	*12.68*
55 to 64	*No*	*29650*	*34.31*	*9.76*	*20.15*	*1.31*	*8.7*	*8.33*	*11.2*	*6.81*
	Yes	*13432*	*51.25*	*15.87*	*29.14*	*7.12*	*13.99*	*16.51*	*24.19*	*12.75*
>=65	*No*	*17961*	*25.41*	*12.2*	*10.95*	*3.14*	*5.15*	*4.6*	*3.69*	*4.68*
	Yes	*1293*	*52.13*	*29.54*	*25.44*	*21.27*	*16.01*	*14.15*	*12.92*	*11.99*

Note: "NA" – Not reported due to the small number of individuals in the cell.

Appendix B14. (Continued) Diagnosed Prevalence of Selected Chronic Medical Conditions by Age Group, MassHealth Only, CY05

age group	BHD	Total N in each age/BHD group	CHF %	Atrial fibrillation %	Stroke %	Chronic kidney disease %	Cancer %	Hip/pelvic fracture %	Parkinsons %
55<=age<65	No	29650	3.61	2.3	2.27	3.48	3.72	0.2	0.21
	Yes	13432	7.33	3.81	4.91	6.34	5.43	0.71	0.46
65<=age<75	No	9978	2.26	1.79	1.6	1.98	2.22	NA	NA
	Yes	817	8.08	5.75	6.24	5.88	5.88	NA	NA
75<=age<85	No	5354	3.87	2.86	2.32	2.35	1.77	NA	NA
	Yes	335	NA	NA	NA	NA	NA	NA	NA
age>=85	No	2629	NA	NA	NA	NA	NA	NA	NA
	Yes	141	NA	NA	NA	NA	NA	NA	NA
all ages	*No*	*47611*	*3.39*	*2.23*	*2.1*	*2.91*	*3.04*	*0.22*	*0.25*
	Yes	*14725*	*7.63*	*4.11*	*5.04*	*6.34*	*5.44*	*0.76*	*0.58*
55 to 64	*No*	*29650*	*3.61*	*2.3*	*2.27*	*3.48*	*3.72*	*0.2*	*0.21*
	Yes	*13432*	*7.33*	*3.81*	*4.91*	*6.34*	*5.43*	*0.71*	*0.46*
>=65	*No*	*17961*	*3.01*	*2.11*	*1.81*	*1.96*	*1.91*	*0.27*	*0.32*
	Yes	*1293*	*10.67*	*7.19*	*6.42*	*6.34*	*5.49*	*NA*	*NA*

Note: "NA" – Not reported due to the small number of individuals in the cell.

B15. Twelve-Month Diagnosed Prevalence of Behavioral Health Disorders by County, All Payment Sources, Age 65 and Over, CY 05

County	N (total)	12-month Diagnosed Prevalence			
		Any BHD	SMI	OMI	SUD
BARNSTABLE	48436	19%	5%	17%	2%
BERKSHIRE	22686	19%	5%	17%	1%
BRISTOL	65381	20%	5%	18%	1%
DUKES	2300	19%	7%	16%	NA
ESSEX	83508	20%	5%	17%	2%
FRANKLIN	7442	18%	5%	16%	2%
HAMPDEN	49855	18%	5%	16%	2%
HAMPSHIRE	16144	19%	5%	16%	2%
MIDDLESEX	140996	19%	6%	16%	1%
NANTUCKET	1083	14%	NA	13%	NA
NORFOLK	70624	19%	5%	17%	1%
PLYMOUTH	51359	19%	5%	17%	2%
SUFFOLK	63479	21%	6%	18%	2%
WORCESTER	55222	20%	5%	18%	2%
OVERALL	*678515*	*19%*	*5%*	*17%*	*2%*

Note: "NA" – Not reported due to the small number of individuals in the cell.

B16. Twelve-Month Diagnosed Prevalence of Behavioral Health Disorders by County, Dual Eligibles, Age 65 and Over, CY 05

County	N (total)	12-month Diagnosed Prevalence			
		Any BHD	SMI	OMI	SUD
BARNSTABLE	3202	47%	16%	40%	4%
BERKSHIRE	2768	42%	15%	37%	3%
BRISTOL	14170	39%	13%	35%	2%
DUKES	172	45%	NA	43%	NA
ESSEX	12727	39%	15%	34%	3%
FRANKLIN	1056	45%	17%	39%	NA
HAMPDEN	9705	37%	14%	31%	3%
HAMPSHIRE	1845	45%	16%	39%	3%
MIDDLESEX	17648	38%	15%	32%	3%
NANTUCKET	NA	NA	NA	NA	NA
NORFOLK	8151	40%	16%	35%	3%
PLYMOUTH	6881	43%	16%	38%	4%
SUFFOLK	19189	34%	13%	29%	4%
WORCESTER	10045	42%	16%	36%	3%
OVERALL	*107627*	*39%*	*15%*	*33%*	*3%*

Note: "NA" – Not reported due to the small number of individuals in the cell.

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